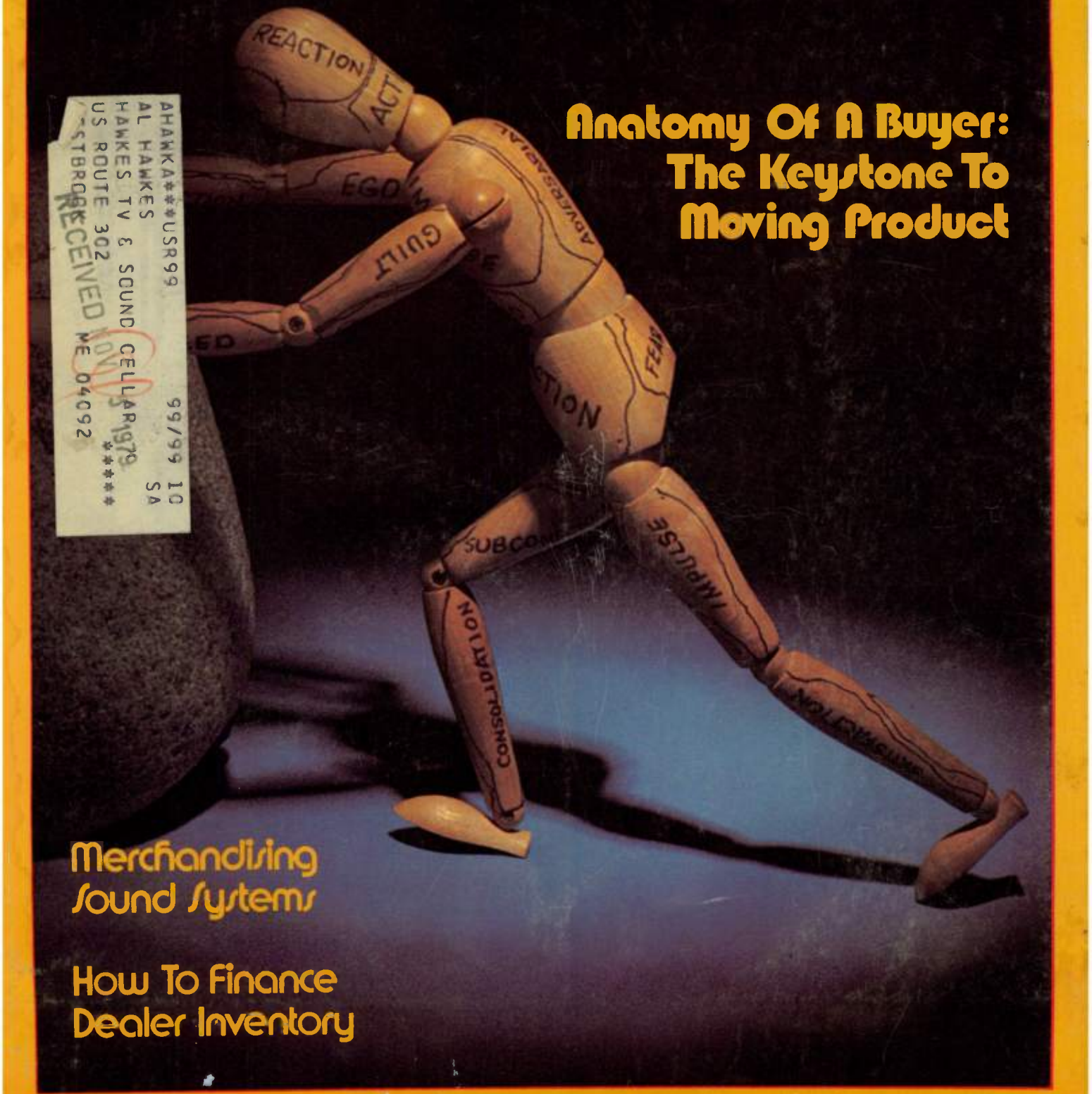
SERVING THE CREATIVE AUDIO AND MUSIC ELECTRONICS INDUSTRY

SOUND ARTS

MERCHANDISING JOURNAL

VOL. 2 NO. 9
OCTOBER 1979

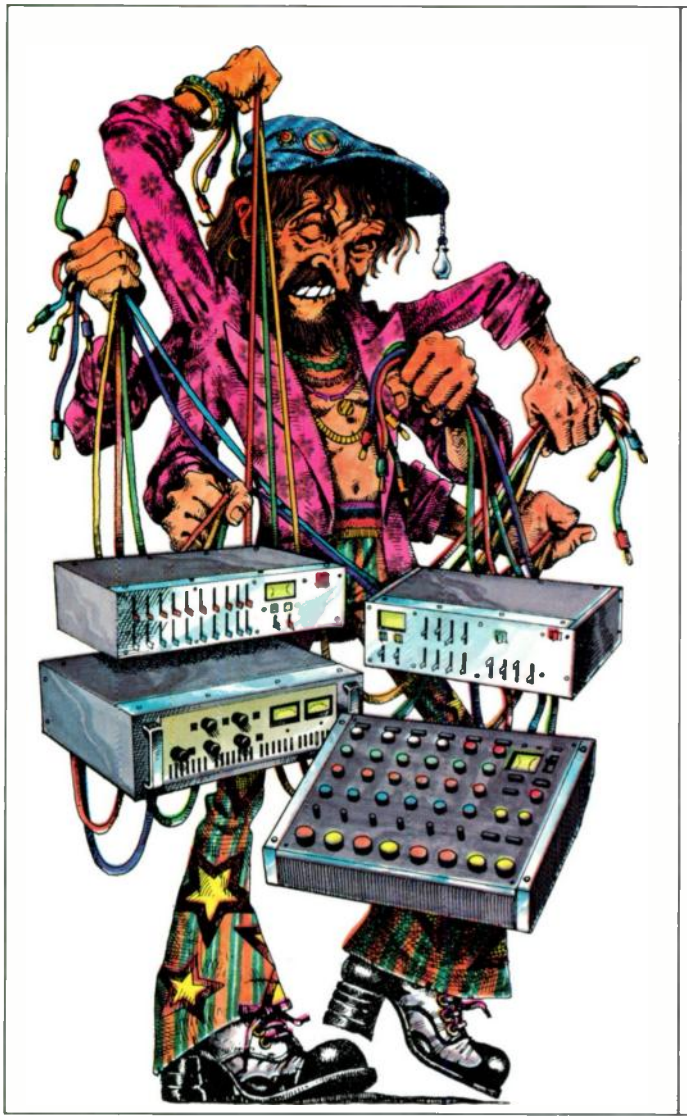


Anatomy Of A Buyer: The Keystone To Moving Product

Merchandising Sound Systems

How To Finance Dealer Inventory

THE LONG AND THE SHORT OF SOUND REINFORCEMENT.



You know about the long part. Separate components can keep your hands full, what with the extra help and time needed to get your sound reinforcement act together.

Now for the short part. The Yamaha EM-200 and EM-300 stereo output integrated mixers. They leave you free to concentrate on the creativity of your job, not the mechanics of it.

You get the mixer, power amplifier, 9-band graphic equalizer, echo and reverb control **all in one unit**—great flexibility with options to expand and enlarge.

The EM-200 and EM-300 are ideal for small to medium size reinforcement applications, wherever you need a precisely placed, superbly clean and well-defined sound from a compact source that is easy to set up and operate.

The EM-200 has eight input channels and 120-watt speaker output. The EM-300 has 12 input channels and 200-watt speaker output. For increased flexibility, both the EM-200 and EM-300 have hi and lo impedance monitor output levels (+4dB into 10K ohms, and 0dB into 600 ohms). Additionally, eight patch points allow you to connect accessories directly to the mixer's power amp for dramatically lower noise levels.

The EM-200 and EM-300 give you the short-cut to reinforcement that won't short-change the quality of your sound. They're convenient to set up, operate and locate...at your Yamaha dealer now.

YAMAHA

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

CIRCLE 96 ON READER SERVICE CARD

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!**

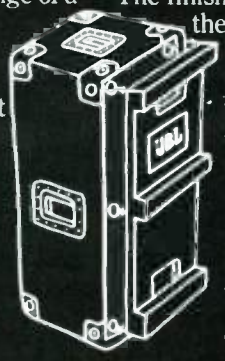
PEAVEY

PEAVEY ELECTRONICS
711 A Street/Meridian, MS.

NOW SOUND AS GOOD AS YOU PLAY. JBL'S NEW CABARET SERIES.

Both you and your audience deserve to hear exactly what you're playing. Which is exactly what JBL's Cabaret Series is about.

These new systems have the power-handling to reach every listener with every note. Your audience hears the lowest bass. All the vocalist's lyrics. The full range of a multi-octave lead.



And it's heard accurately. Undistorted. Uncolored.

There are three Cabaret Series sound systems: lead instrument, reinforcement and stage monitor.

The lead instrument system features JBL's patented interlocking stackability. All three systems feature JBL's famous K Series musical instrument loudspeakers. All systems are fully portable. And built to endure the punishment of the road.

Their housings are made of the best birch ply available. The front covers fit flush to protect the drivers and grilles during travel. The finish is extra-rugged. Even the voice coils have unique protection: To minimize bounce during transit, they're automatically shorted when there isn't a plug in the input jack.

With these JBLs you don't have to invest your sound system budget in traveling cases.

The Cabaret Series offers enormous value in other ways. For example, one JBL column probably puts out as much sound as four of the systems you're now using!

And JBL quality assures you of avoiding costly "down time." It's the same quality standard that so many pros rely on.

Hear JBL's new Cabaret Series soon. Because your sound system should be as good as you are.

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

JBL

FIRST WITH THE PROS.

CIRCLE 71 ON READER SERVICE CARD

SERVING THE CREATIVE AUDIO AND MUSIC ELECTRONICS INDUSTRY

VOL. 2 NO. 9

SOUND ARTS

MERCHANDISING JOURNAL

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Cover photograph by Doug Hanewinckel

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A LETTER FROM THE PUBLISHER

It has become clear that 1980 will be a year of recession in the United States. Past history shows us that in these times most discretionary dollars disappear from retail sales. People focus in on the inflationary cost of living. Rising costs of food and fuel cause the average consumer to re-evaluate his spending. What's more important? Priorities!

In the hi-fi industry—recessionary signs are already blaringly *red*! Sales have fallen off dramatically at the retail level on most mid-priced, middle market hi-fi product.

In the music industry—sales of band instruments and the more general and casual musical instrument products have fallen off. Why? Well, in addition to demographic statistics, it becomes obvious that serious, serious fear exists in the *average* consumer. Those new people coming into audio on the "hi-fi separate components level" are generally young married couples or single males or females, 18-30. These newcomers are not generally compact, console stereo buyers, nor are they esoteric, hi-end audio enthusiasts. And today, buying new mid-priced hi-fi separates is not a priority in their lives. Those average consumers who already own hi-fi components are not in the market to upgrade in these times. With musical instruments, the story is similar. Most beginners in music are funded by their parents. Well *today* mom and dad are more worried about their children's clothing and food than they are about buying a trumpet or a guitar or piano.

What about those who are already playing music? In this area, the position varies. If they are *casual consumers* or "mass market music players," chances are their parents or they themselves will decide that their current instrument is sufficient to fulfill their casual needs. *Again, priority based, discretionary dollars!!*

None of this should be of any surprise to the intelligent manufacturer and/or retailer. But if all this is valid, then *why the constant healthy growth in hi-end creative audio, semi-pro and professional recording equipment, music electronics equipment and sound reinforcement products?* The buyer of these products has *different, very different, priorities.* He is not the casual consumer, the average mass market buyer. He is selective; he's attuned to technology, he is actively and creatively using these products in some *income producing* way or another. To him these products represent the fulfillment of a creative need as well as *an investment* in success and prosperity. His decisions to buy are not based solely on discretionary dollars because his needs and goals in audio and music are much different.

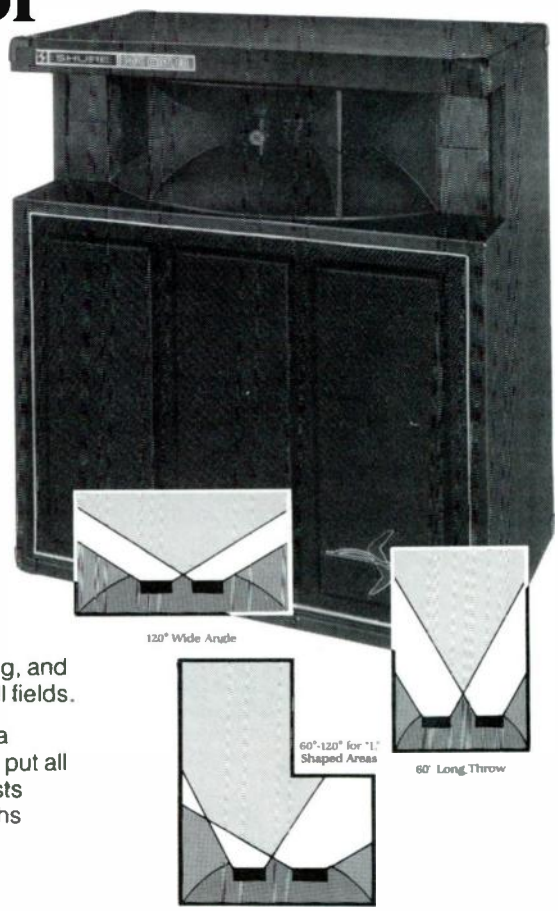
So while others in the hi-fi and MI industry are worrying, those of you in the creative audio and music electronics market are in a perfect place at an ideal time. Congratulations for being a part of the only growing market of the 80's.

Cordially,

Vincent P. Testa

fact: Shure's new loudspeakers may look compact...but there's plenty of room for all your sound!

PRO MASTER™
Model 701 Loudspeaker



- **Adjustable dispersion—for long- or short-throw applications.**
- **Easy to transport—practically abuse-proof.**
- **High efficiency—100 dB SPL at 1.2m (four feet) with one watt power.**
- **High power handling—handles up to 150 watts continuous.**

A giant step forward in compact, professional quality sound reinforcement equipment! The PRO MASTER 701 Loudspeaker is specifically designed to meet the needs of today's entertainers and musicians, in intimate clubs, lounges, large auditoriums, churches, and schools.

The revolutionary PRO MASTER loudspeaker is the result of sophisticated computer-assisted design techniques, state-of-the-art materials engineering, and countless hours of consultation with performers and sound technicians in all fields.

The highly efficient design allows the PRO MASTER loudspeaker to deliver a walloping 100 dB SPL at 1.2 m (four feet) with only one watt power. And, you put all the sound *where you want* it with exclusive adjustable dispersion, that adjusts for wide-angle (short-throw) or long-throw applications. Each speaker weighs only 26.4 kg (58 lbs), and two fit into many subcompact cars.

PRO MASTER Modular Loudspeakers

These modular units may be used to construct a custom speaker stack, add high- or low-frequency emphasis to another full-range system, or create custom stage monitor systems. Each speaker is designed to operate with an amplifier capable of delivering up to 150 watts continuous to an 8-ohm load.

Model 708 High-Frequency Speaker

The high-frequency portion of the Model 701, including adjustable dispersion horn. It has a frequency response of 2,000 to 15,000 Hz, an internal crossover filter rolling off at 18 dB per octave below 2,000 Hz.

Model 707 Low-Frequency Speaker

The low-frequency portion of the Model 701, with rubber feet on two surfaces and a diagonally beveled back allowing the speaker to be tilted. It has a frequency response of 50 [illegible]00 Hz, an acoustic rolloff above 2,600 Hz.

PRO MASTER Stage Monitors

Really cut through in monitor applications! The Shure-developed shaped response is a performance-proven way to put the sound energy where it belongs.

Model 703

Special removable wedges enable the monitor to be used in a wide-angle or narrow pattern. Rated at 100 watts to 8 ohms, output 117 dB SPL at 1.2m (four feet) with 100 watts.

Model 702

A compact two-way system rated at 50 watts to 16 ohms, output 114 dB SPL at 1.2m (four feet) from only 50 watts. Features a built-in volume control.

VOCAL MASTER® Stage Monitor

The VA301-S is a highly directional stage monitor, featuring a built-in volume control. Designed to be used with the Shure VOCAL MASTER Sound System, it is rated at 50 watts to 32 ohms.

Compact Speaker Systems

Three professional speaker systems (SR112B, SR112W, and SR116B) that combine high output capability, high power handling ability and wide frequency response into a compact package. Extraordinarily efficient, they produce 95.5 dB SPL at 1.2m (four feet) with just one watt. And, each is rated at 100 watts to 8 ohms!

SR112B (SHOWN)

Designed for permanent or semi-permanent installations indoors or outdoors.

SR112W

Same as SR112B with woodgrain finish, matching many indoor decors.

SR116B

Carrying handle and extra built-in corner protection, built to stand up to the bumps and scrapes of touring.

Shure...The Sound of the Professionals

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

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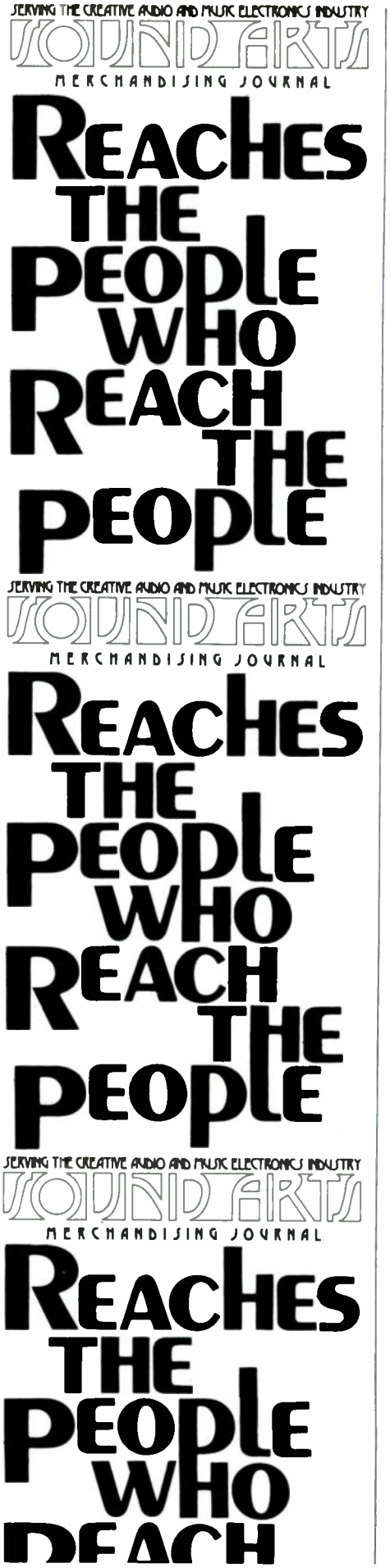

A LETTER FROM THE EDITOR

Verbatim from the Port Washington *Pennysaver*: "Untalented drummer wanted to play with novice musicians in multitrack professional home recording studio. Contact Chuck." Since I'm not an untalented drummer—nor for that matter any kind of drummer—Chuck and I haven't met and I'm not conversant with his music or his studio. I am, however, interested in this display of the emergence of the home studio from the esoteric to the commonplace, and its acceptance by "novice musicians" as a natural extension of their music, whether for fun, as Chuck's music apparently is, or for profit.

As creative audio gains more practitioners in general, and makes more sophisticated practitioners out of current adherents, the retailer himself has to be sophisticated not only in the technical and artistic aspects of music and recording, but in the nature of selling itself. The ex-technician and the ex-musician may be fortunate enough to have the needed technical knowledge, but sales savvy often needs reinforcement.

I'm not going to get into the old controversy of whether salesmen are born or made, but as an educational theorist once told me, there can be no art without a learned, orderly technique.

A magazine for the hi-fi and car stereo trade is currently plugging creative audio as the way to go for their readers. As we all know, however, creative audio sales are not a panacea for hard-pressed retailers of unrelated products; those sales necessitate a specific feel and knowledge. To translate that knowledge into sales requires comprehension of the components of a sale. To aid in that comprehension, we have planned, for this issue a compendium of stories on the nature of a sale.

Empathy and sympathy of the seller go hand in hand with the psychological state of the buyer. Sensitivity to the buyer's head keeps the salesman ahead of the game. Hartley Peavey, in this issue, investigates the psychological factors of a sale, and has written the first part of a series on the intangible components of a sale of any kind. Bob Heil gives specific tips on the merchandising of sound systems, with attention paid to the frame of reference of the potential purchaser. Bill Hussey gets more specific still in his discussion of floor planning, a method of financing inventory that has traditionally been used by the car dealer *et al*, but whose use perhaps should be expanded in our industry.

At any rate, Viva Chuck, his friends and the *Pennysaver* for spreading the word of the existence of home studios. Chuck and his friends are variations on a theme of the special interests of consumers, and are presumably customers for industry wares.

Regards,

Judith Morrison Lipton

...the Superior electronic crossover

- **Maximally Flat 18dB/Octave Butterworth Filters**
- **Continuously variable from 100Hz to 16kHz**
- **Power turn on/turn off Transient Suppression**
- **Hi Frequency Phase Inverting Switch**
- **+20dBm Output Level**

Superior quality and features were the design criteria for the new CP-X Electronic Crossover. A single knob continuously adjusts the crossover frequencies, with ease and accuracy, from 100Hz to 16kHz. Maximally flat, 18dB per octave Butterworth filters significantly reduce fatigue and failure of the high frequency driver diaphragms, and also reduce unwanted woofer-tweeter interaction. Power turn on/turn off transient suppression helps prevent damage to loudspeaker components. The CP-X +20dBm output level provides additional headroom, along with the ability to drive long lines and multiple amplifiers. A high frequency phase inverting switch provides a quick and easy method of optimizing the phase of your speaker system. Both XLR and ¼" phone jacks are incorporated on the rear panel for input and output connections. Exceptional electronic specifications are also an important part of the CP-X Electronic Crossover for the quietest and cleanest results.

The TAPCO CP-X Electronic Crossover is the obvious choice for those who desire both quality and performance from their sound reinforcement systems.

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the cp-X ELECTRONIC CROSSOVER

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The biggest difference between a $17,000 mixer and our M-12 with Expander is about $12,000.

If you're thinking about 24 channel mixing, you can stop thinking money and start thinking *performance.*

Fender's new 12-Channel Expander—coupled with Fender's M-12 Live Performance Mixer—gives you 24 of the most sophisticated mixing channels in the business with features you'd only expect to find in mixers at two, three or more times the price.

Bring your live concerts to life. With 24 in/4 out capability, the Fender® M-12 with Expander gives you the functions you want for the options you need. And that includes live *recording* as well (plus optional interface with other master mixing modules).

Limiters, cueing-talkback, high-level in/outs that run multiple effects simultaneously and the capability of assigning signals anywhere on the board give you unsurpassed control.

And sophisticated submasters let you mix as many mike or direct inputs on one channel—drums, keyboards or vocals, for example—while you mix the balance of your band and patched-in effects on the other.

A new standard in electronic performance. Any mixer is only as solid as its electronic components. So all Lo-z input and output channels are transformer coupled and floating. High slew rate, low-noise op amps are used throughout. Continuous gain controls allow input impedances to remain unaltered. Equivalent input noise is—128 Dbm.

Built to take life's ups and downs. Rely on the M-12 Expander to perform concert after concert. The rigid extruded front panels and built-in case keep this set mixing *every* set. And modular construction makes a rare servicing a snap.

Let Fender's new 12-Channel Expander expand your band's horizons. Check the specs and get the whole story at your authorized Fender dealer. It could start making a big difference in the cheers you get from your audience.

And the smile you get from your accountant.

NEW from Fender®
MADE IN U.S.A.

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CIRCLE 58 ON READER SERVICE CARD

TEAR HERE

TERMS:

A CONTINUING INDUSTRY GLOSSARY

RECORDING

By Larry Blakely

Twenty-four Track Tape Recorder: Refers to a multi-track tape recorder that has twenty-four tracks. The twenty-four track tape recorder utilizes neither the half-track nor the quarter-track standard tape recording formats. The twenty-four track recorder has twenty-four tracks on a 2" tape width, as does the sixteen-track half-track format. The actual track size of the twenty-four track format falls somewhere between the size of the half-track and quarter-track tape track size.

Tape Width: There are standard tape widths, as there are standard track widths. The standard tape widths for recording tape used in the professional recording industry are: ¼ inch (.635 centimeters) ½ inch (1.27 centimeters); 1 inch (2.54 centimeters); 2 inch (5.08 centimeters).

Tape Speed: There are also standard speeds for tape recording that are used in professional recording. The most commonly used tape speeds are: 7½ inches per second (19 centimeters per second); 15 ips (38 cps); 30 ips (76 cps).

Sync: A method or process used in multitrack tape recorders where the record head can be used for both record and playback functions. This allows previously recorded tape tracks to be played from the record head while additional tracks are being recorded. This process of recording and playing from the same tape head allows all tape tracks to be recorded in perfect synchronization (SYNC).

Magnetic Tape: Acetate or plastic that is coated with a layer of fine ground metal particles, usually ferric oxide or chromium dioxide. Some of the newer type of magnetic recording tapes actually use metal particles instead of the conventional metal oxides or dioxides. The most commonly used magnetic tape for professional tape recording is that of ferric oxide, while chromium dioxide is a popular magnetic tape for cassette recording. The new metal particle mag-

ELECTRONIC MUSICAL INSTRUMENTS & ACCESSORIES

By Wayne Howe

Compressor: A device similar to a sustain device, but used for the purpose of making soft notes played into it become louder, and loud notes played into it become softer. With a guitar or other instrument it tends to make the varying dynamic range "compress" to sound like each note is at about the same volume level. When driven to its limits, a pumping or breathing sound will occur between short staccato notes. This "pumping," when used tastefully, can make a nice rhythmic effect between notes.

Compression Ratio: The ratio of the output level of the compressor to the input level.

Limiter Threshold: The level above which a limiter becomes active and decreases the output level. Notes below the threshold level are not affected. Some of the more sophisticated devices have variable threshold levels that can be set by the customer.

Limiter Attack Time: The amount of time it takes for the limiter to react to a loud note and turn the volume down. Some interesting effects can be obtained by varying the attack time and playing staccato.

Limiter Release Time: The amount of time it takes for the limiter to release its volume "turndown" circuit so that a new note can be played to retrigger the limiter's attack time.

Noise Gate: An electronic device which passes signals with volumes above a certain level and doesn't pass signals with volumes below a certain level. The general use for such a device is to pass musical signals above a minimum volume level and to "gate out" or turn off the residual electronic noise when no music is being played. In playing an amplified instrument on stage, a certain amount of residual noise is caused by electronics; a certain amount of 60 Hz hum is picked up by balanced cables and pickups; and sometimes high frequency radio signals can leak into the circuitry. All of these unwanted signals are increased

SOUND REINFORCEMENT

By Glen E. Meyer

Lavalier Microphone: Generally, an omnidirectional microphone designed to be worn on a cord around the neck. Variations of this includes the tie tack and lapel microphones. They are primarily used for announcers, news shows, etc. Sometimes the high-end frequency response is boosted to compensate for the off-axis high frequency response rolloff of the human mouth. The tie tack and lapel microphones are generally of the electret condenser variety due to their small size and weight requirement.

Moving Coil Microphone: Another name for the dynamic microphone, this is a microphone in which the diaphragm is attached to a voice coil which is suspended in a magnetic field. Voltage, which is proportional to the amplitude of the sound entering the microphone, is generated by the voice coil moving within the magnetic field.

Noise-Cancelling Microphones: The noise-cancelling microphone rejects distant sound on and off axis. The communication microphone type is characterized by a single port or hole a short distance back from the head opening. This small port allows the sound waves originating at a distance (a few inches or more) to strike the back of the diaphragm at about the same time it strikes the front. Since the sound pressure is essentially the same on both sides of the diaphragm, little or no output results. If one moves very close to the front opening with respect to the back port, the sound will cause the diaphragm to vibrate before the sound wave can get around to the back—thus producing an output. Generally, noise-cancelling microphones have a narrow frequency response, which is suitable for communication work but unacceptable for general P.A. and recording.

A reasonable quality noise-cancelling microphone can be accomplished by using two high quality microphones having identical frequency response curves, taped

TERMS (CONTINUED)

A CONTINUING INDUSTRY GLOSSARY

RECORDING

netic tape is currently used on some types of special tape recorders. This metal particle tape will not record on standard tape recorders.

Backing or Base: The actual acetate or plastic material on which the metal oxide, dioxide, or particles are coated, in the process of manufacturing magnetic recording tape.

Acetate Base: A cellulose plastic film that is used for the backing or base of magnetic recording tape. Acetate was the preferred backing for professional recording tape for many years because it was more brittle in nature than the Mylar (polyester) tape bases or backings. If an acetate tape were to break, it would break "clean" with little or no stretching of the tape. When the broken acetate was spliced back together there would not be any slight musical pitch or time changes prior to and after the break due to any stretching of the tape. Magnetic tape often stretches before it breaks and will also often become deformed (narrower in width, and/or curl inward or outward thus causing problems with tape to head contact). However, acetate base or backing will generally break before any excessive stretching or curling of the tape can occur, and is therefore preferred by many recording engineers.

Polyester Base: A popular type of plastic backing for magnetic recording tape. "Mylar" is perhaps the most popular type of polyester base.

Mylar Base: A popular type of (polyester) plastic backing that is used for magnetic recording tape. It is claimed that Mylar is much stronger and will not break as easily as tapes with acetate backing. However, the Mylar tapes will usually stretch a great deal before they break, causing the tape width to narrow and curl up. If there is an accident in the movement of the tape on the recorder transport, the strength of the tape may prevent breaking, but stretching may cause slight pitch or time changes.

ELECTRONIC MUSICAL INSTRUMENTS & ACCESSORIES

through the amplifiers so that the audience can hear these unwanted sounds when no music is being played. The nose gate eliminates this problem by only letting through signal levels that are loud enough to be coming from the musical instrument. When no music is being played, the noise gate senses only the low volume level of noise, hum, and RF, and turns these unwanted signals off.

Threshold Level: The volume level, usually in volts or dBV, where the noise gate "turns on" or "turns off." If the input signal is above the *threshold level*, the noise gate turns on and passes the signal through to the amplifier. If the volume of the noise is below the threshold level, the noise gate turns off and the noise is not passed through to the amp.

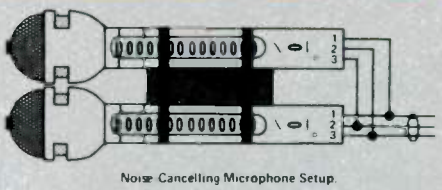
Variable Threshold: Most noise gates have a threshold control on the front of the unit with which to set the threshold level. The easiest way to set this level is to hook up all the equipment being used. With no music being played, turn the threshold level all the way down to where it passes the noise and hum. Then turn up the threshold level a little past the point where the noise and hum turn off.

Filter: An electronic device that alters, shapes, adjusts, or compensates for the levels of certain frequencies or frequency ranges. Theoretically, the device lets some frequencies pass and stops other frequencies. In reality, filters attenuate or boost certain frequencies or frequency bands more than other frequencies. However, there is a gradual transition between the frequencies that are passed and the frequencies that are not passed. A total cutoff at a certain frequency is nonexistent in today's technology.

Tone Controls: Filters which boost or cut broad ranges of frequencies, thus altering the overall tone.

Treble Control: A tone control that alters the level of the upper or high frequencies of the music.

SOUND REINFORCEMENT



Noise Cancelling Microphone Setup.

together head-to-head and wired out of phase. (Note the figure.) If the sound originates at a distance, the two heads are essentially at an equal distance, which means that they would generate an equal but opposite voltage, thus cancelling out all of the signal. If the source (such as the mouth) is brought close to one head with respect to the other, a signal would be generated.

This, by the way, is an excellent way to check the consistency and quality of similar model microphones. Make up an out-of-phase "Y" cable and plug a known quality microphone into one of the legs. With the unknown quality mic plugged into the other leg, perform a quick A-B test by speaking into each mic separately. Now hold the standard about a foot in front of you. While speaking, bring the unknown mic head close to the standard mic which you are holding in front of you. If all or most of the sound goes away, the microphones have similar frequency responses. If you still hear a lot, the microphones have a different frequency response. Note that it may be difficult to put the heads real close together if the microphones have large windscreens or pop filters.

Impedance Matching: In usual practice, Hi Z (high impedance) microphones operate properly when connected to Hi Z preamplifier inputs only. Connection to a Lo Z input results in drastic low-frequency attenuation. Lo Z microphones are designed to operate into Lo Z inputs. However, they will usually operate in Hi Z inputs when the sound system has sufficient gain. This technique has been used to control input overload, since a drop of approximately 20 dB usually results when a Lo Z mic is moved from the board's Lo Z input to its Hi Z input.

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CIRCLE 70 ON READER SERVICE CARD

TROUBLESHOOTERS' BULLETIN

LOUDSPEAKERS IN A REVERBERANT FIELD

(1)

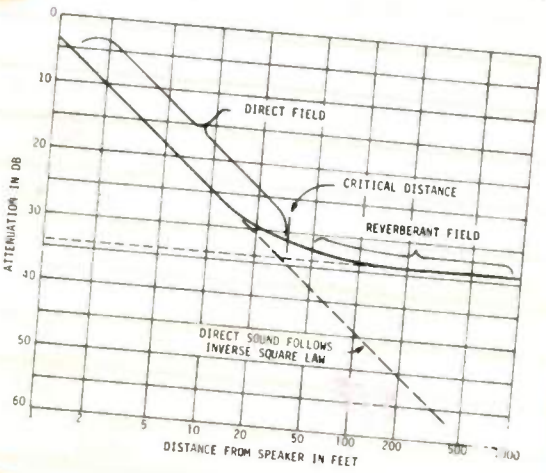
In a reverberant environment, there is a point away from the speaker beyond which the reverberant field dominates the sound heard. The SPL tends to remain constant in the reverberant field, no matter where you're standing in it. Constant SPL throughout the room is, of course, a good thing; but when the reverberant field is what's doing it, you can get into trouble.

Typically, the reverberant field begins to dominate 10 to 20 feet from the speaker, and is longest for the least reverberant rooms and the most directional speakers.

(2)

The "critical distance" is the distance from the loudspeaker where the direct sound and the reverberant sound are at the same level. (In the figure, you can see the two equal sound pressure levels add and become 3 dB higher at the critical distance.) Because of the reverberant field problem, a single speaker system cannot be the answer to all sound problems, even if it has flat frequency response, high efficiency, uniform dispersion, and a big amp driving it.

(3)



Attenuation with Increasing Distance in Typical Large Room

(4)

Large rooms require both narrower dispersion and higher efficiency than the best single speaker system can offer. A narrow coverage system will aim more direct sound at the back of the room. Wide or narrow dispersion does not denote a good or bad loudspeaker, providing the system is designed to provide proper coverage in the room or hall. There are applications where one or the other is needed to best solve a specific sound problem.

JEFF WHITE
ELECTRO-VOICE

(5)

ZENITH ADJUSTMENT

The face of a tape head should be perpendicular to the deck surface or parallel to the tape guides. If the head is tilted, zenith error will result. This will cause the tape to ride up or down on the head face during operation, creating amplitude changes in the recorded signal and cross-talk from adjacent tracks. To verify the head zenith, sight along the side of the

(6)

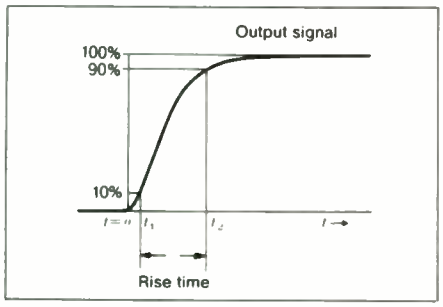
head face to compare it to a tape guide or along the vertical edge of a business card held flush against the deck surface.

Recorders generally have zenith adjustment screws which enable you to adjust the head to eliminate zenith error, although the position of these screws may vary.

J.D. STRAND
NORTRONICS

What is rise time?

Rise time is the time it takes for the output signal level to increase in amplitude from 10 percent to 90 percent of its peak value. If an amp's transmission characteristics and the input signal content are known, one can use complex mathematical computations to obtain the waveform by



solving for t, from which the rise time can be derived. It is much more common, however, to just use visual observation of the waveform. (There is also a simpler algebraic alternative for finding time response called the Laplace transform.)

Technics
Secaucus, New Jersey

Are there any limits to delay time?

Two different approaches may be taken in answering this question. I'll limit my discussion to totally electronic delays (no moving parts). From a purely theoretical standpoint, a signal may be delayed essentially forever using digital technology. It is difficult to imagine a practical use for an infinite delay, however. From a more practical standpoint, there will always be limiting factors in the maximum amount of delay attainable. Cost is the ultimate limitation. The question becomes, "How much delay can you afford?" As a rough guideline, today a half second of delay with a 10 kHz bandwidth costs about a thousand dollars minimum.

Let's ignore cost for the moment, however, and see what other factors determine maximum delay time. First, some background. Most electronic audio delay systems operate by taking discrete samples of a signal and then storing those samples until some later time when they are converted back into a replica of the original signal. In analog delay systems, samples are stored as analog quantities of charge which are transferred through a number of "buckets," in a Bucket Bridge Device (BBD) or "energy wells," in a Charge Coupled Device (CCD). The amount of delay depends on how many stages there are and how fast we transfer charges through them. The more stages there are and the slower we transfer charge from one stage to the next, the longer the overall delay. The number of stages is indirectly limited by current semiconductor technology. Each time a charge is transferred from one stage to the next, some of the charge stays behind in the previous stage. This is analogous to pouring water from one bucket to another. The bucket you're pouring from stays wet—not all the water is transferred. The charge that is left behind represents lost information and ultimately limits the number of stages we can string together and still reconstruct an intelligible signal. The measure of "completeness" of transfer is called "transfer efficiency." Although current devices have very high transfer efficiency (better than 99.998%), they are not perfect and cumulative errors limit the number of stages that may be used and still maintain signal fidelity.

What about transferring the signal at a slower rate? First, the rate of transfer must be the same as the rate at which we're generating new samples. If the transfer rate is lower than the sample rate, then the storage device will overflow with a continuous signal (i.e. music). Second, we must sample the input signal often enough to get an accurate representation of the signal. How often is often enough? According to sampling theory the lowest rate of sampling at which we can hope to get an accurate representation of the original signal is a rate at least twice the frequency of the highest frequency we wish to process. This is known as the Nyquist rate. At sample rates less than twice the frequency of the incoming signal (or its harmonics) a type of distortion known as "aliasing" becomes apparent. Thus, the higher the sample frequency, the greater the allowed bandwidth without distortion. Extending the delay time by lowering the sample rate is done at the expense of bandwidth.

The situation is somewhat different with digital delay systems. In this type of system, samples are stored as digital "words" in a memory device. The quality of the processed signal is determined by the quality and resolution of the encoding and decoding process (converting the analog input signal to a digital word and back to an analog signal again.) Once the sample is in digital form, it is immune to the noise of the analog realm. Transfer efficiency does not apply here due to the essentially "all-or-none" nature of digital signals. The Nyquist rate still applies and sets a lower limit to the sampling rate, but to extend the maximum delay time all we have to do is to increase the amount of memory in our system. Assuming no errors in storing the information, a digital word to be converted back into an analog signal will be the same regardless of the amount of memory in the system. This is analogous to an analog delay device with perfect transfer efficiency. Of course adding memory costs money, which brings us full circle.

In the future we can expect improvements in both analog and digital delays in terms of their price/performance ratio and maximum amount of delay. Digital delays have the greatest potential since the technology in this area is increasing performance and reducing cost faster than the rate of inflation—a rare find in today's economy.

John A. Porubek
Applications Engineer
MXR Innovations, Inc.
Rochester, NY

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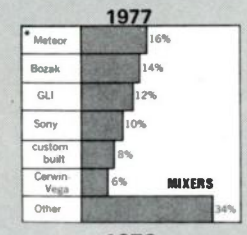

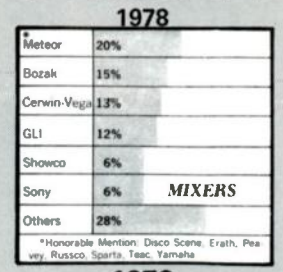

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CIRCLE 58 ON READER SERVICE CARD

Digital Sequencers

By Craig Anderton

From a musician's standpoint, the development of the digital sequencer is a true breakthrough. Just as computers have taken much of the drudge work out of accounting, industrial control, and word processing tasks, they also have the ability to greatly facilitate the composition of music. In essence, the digital sequencer is a miniature recording studio with no moving parts that allows for sophisticated editing, experimentation, and retrieval of musical data.

While purists might flinch at seeing musical notes and timing parameters referred to as "data," it is important to remember that in the end, all a computer can do is process data; it cannot process music directly, unless that music is entered into the computer in a form which the computer can understand. As a result, certain elements of computer programming must be understood by the prospective user of a digital sequencer system in order to use that system to maximum advantage. So, let's take a look at some basic computer concepts. I hope you find it all interesting.

TURNING DATA INTO CONTROL VOLTAGES

In the past, we've stressed many times that synthesizer modules tend to be voltage-controlled; in other words, certain crucial aspects of the module may be altered by injecting a voltage into the module. However, a computer does not understand voltages per se; it understands data.

Data are organized in very much the same way as language, and share many of the same concepts. For example, a written or spoken statement will consist of words, and these words will consist of various combinations of letters. With our alphabet, we can create a virtually infinite number of words. The computer's "alphabet" is far simpler, and only consists of two "letters": 1 and 0. In electrical terms, 1 usually means something is on, and 0 means something is off. Computer users refer to each 1 and 0 as a *bit* of information that tells the computer whether something is on or off.

To get into it a "bit" further, the computer tends to group these bits into "bytes," which is the computer equivalent of a "word" in our language. A byte usually contains 8 bits of information; so, the computer recognizes, say, 00001111 as being distinctly different from 11001101 or 11111111. Each one of these bytes represents a piece of data, and just as we humans string words together to form sentences (and therefore express a particular concept), the computer will recognize a pattern of bytes as forming a "program." How the computer reacts to these "words" and how it actually manipulates the data is not of importance to us; all we need to know is that the process does work.

The way we turn these data control voltages involves the use of binary language, converters, and a bunch of other stuff that is not really all that exciting. Just as you don't have to know how a carburetor mixes gas and air in order to drive a car, you don't really need to know very much about the computer's inner workings: You may simply treat it as a black box that conforms to certain rules, and leave it at that. Suffice it to say that when the computer is told to output a certain piece of data to a music synthesizer, it will take that piece of data and turn it into a control voltage that the synthesizer can relate to. Maybe the byte 00000000 means C, and 00000001 means C#; maybe 00000010 means D, and 00000011 means D# . . . it doesn't matter to us. But the important thing to note is that the computer does have a means of translating data into control voltages.

This process can also work in reverse. For example, let's say you're playing a synthesizer keyboard, and that the note you're playing is a D. This generates a certain control voltage; the computer can examine this control voltage, and again by a sophisticated conversion process, turn that control voltage into a piece of data. Once the control voltage is in data form, it can be stored, altered, or erased at will by the computer.

ENTER MEMORY

A computer usually includes a lot of memory in order to store all the data you're going to be working with. You can think of memory as being a huge series of post office boxes, *each with its own identifying number.* If you wanted to see what was in post office box 480, then you'd scan the numbers on the various boxes until you found 480, then you'd open up the box and look inside. The computer operates in a similar fashion. For example, suppose you wanted to store a four note

sequence in a computer's memory. You would hit a note on the keyboard; the computer would look at the control voltage generated by the keyboard, turn it into a piece of data, and store that data in post office box—I mean, memory cell—#1. Now let's say you hit another note. The computer looks at it again, turns it into a piece of data, and stores it in memory cell #2. Hit a third note, and it gets stored in memory cell #3 . . . and so on.

Playing back the four note sequence is very simple. You ask the computer to examine memory cells 1-4 in sequence, and to sequentially output the data it finds in each cell. The data goes through a conversion process to get turned back into a control voltage, which we can then feed to the synthesizer and . . . like magic, it plays back our sequence.

One of the nicer things about computer memory is that it holds a lot of data, so storing a 256 or even a 1,024 step sequence is really not difficult at all. Another nice feature is that you can usually examine any particular memory location at will. Let's say you decide you didn't like the note you chose for the fourth note of the above mentioned sequence; you simply examine memory cell #4, and write in a new note without having to alter any of the other notes.

COMPLICATIONS

I've been a little simplistic in talking about how we store sequences; although the *concepts* are accurately presented, in real life we'll run into several problems. As an example, let's say that the first note of our sequence has a longer duration than the remaining three notes. This would mean that the note would take up more memory cells. If you had a composition with a few long notes interspersed by clusters of very short notes, then the long notes would hog a disproportionate amount of memory space. So, sometimes the piece of data associated with a note will not just indicate the pitch of that note, but also its duration; additonally, that same piece of data might also store the dynamics of the note, or an envelope generator trigger. There are other things to consider, but to keep this brief . . . let's move on.

PROCESSING THE DATA

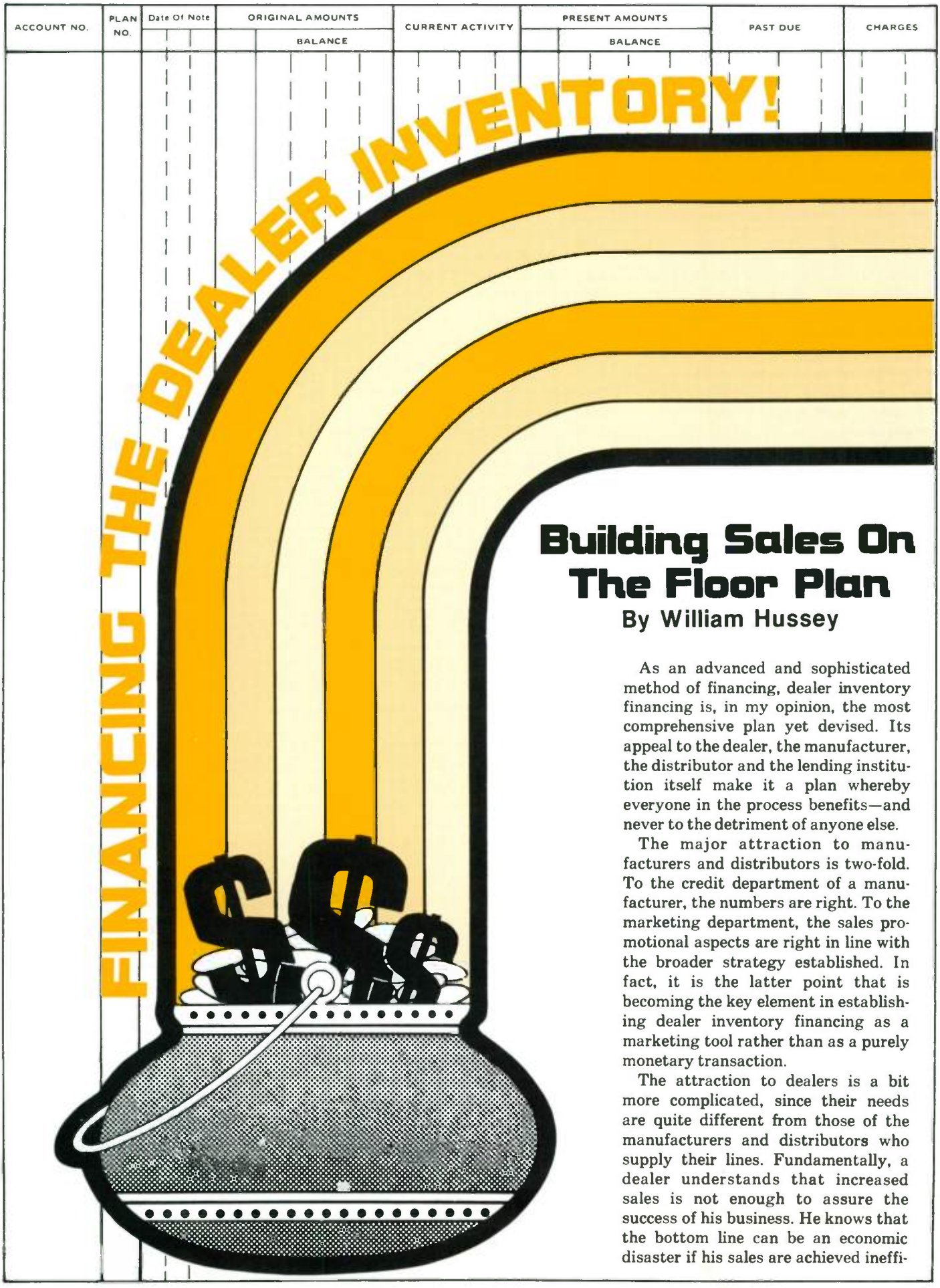
A computer doesn't only contain memory, but also includes a section known as the central processing unit, or CPU. This is the part that performs actual mathematical operations on the data stored in its memory. This means that we don't have to content ourselves with merely storing a note—but we can transpose it, play a sequence in reverse or in random order, speed it up, slow it down . . . or anything else within the computer's capabilities. Perhaps you'd like to arpeggiate certain chords; or, maybe you'd like to generate four part harmonies from a single root note. These desires could be taken care of by the computer.

WHAT IT ALL MEANS

I recently had a PAIA 8700 computer installed in my synthesizer, and from a composer's standpoint the results are most impressive. When you have an idea for a composition, you simply enter it into the computer's memory. After listening back to it for a while, you can elect to make various changes, do transpositions, or whatever. Some computerized composers allow you to create multiple harmony lines, and again, you can work on those lines over and over again until they're perfected. With my particular model, there is also a "save" feature that allows you to transfer the *data* for a particular composition onto ordinary cassette tape, so that you can make changes in a sequence many months after the initial experimentations.

With a computerized sequencing system, any decent synthesizer, and a multitrack studio, the composer—for the first time—can make the otherwise difficult transition to being a complete orchestra. Think of having a player piano, but one with a practically unlimited choice of timbres and with its "paper rolls" replaced by fast and efficient semiconductor memory which can be instantly altered in any desired way . . . that's what music processing is about.

At the moment, the Roland MC-8 is probably the best known of the various computerized "music processing" systems. However, the declining price of computer systems, coupled with the growing awareness of both computer designers/programmers and musicians, insures that in the years ahead the computerized music processing machine will become as common as the four track home recording studio is today.



Building Sales On The Floor Plan

By William Hussey

As an advanced and sophisticated method of financing, dealer inventory financing is, in my opinion, the most comprehensive plan yet devised. Its appeal to the dealer, the manufacturer, the distributor and the lending institution itself make it a plan whereby everyone in the process benefits—and never to the detriment of anyone else.

The major attraction to manufacturers and distributors is two-fold. To the credit department of a manufacturer, the numbers are right. To the marketing department, the sales promotional aspects are right in line with the broader strategy established. In fact, it is the latter point that is becoming the key element in establishing dealer inventory financing as a marketing tool rather than as a purely monetary transaction.

The attraction to dealers is a bit more complicated, since their needs are quite different from those of the manufacturers and distributors who supply their lines. Fundamentally, a dealer understands that increased sales is not enough to assure the success of his business. He knows that the bottom line can be an economic disaster if his sales are achieved ineffi-

ciently or if his money costs and inventory planning are at odds with his sales forecasts.

Conventional floor planning, whereby the manufacturer in effect simply underwrites key dealers' inventories, is no longer a viable proposition for the sophisticated retailer today. He must look to the manufacturer—who himself has looked to the financial institution—for true *inventory service.*

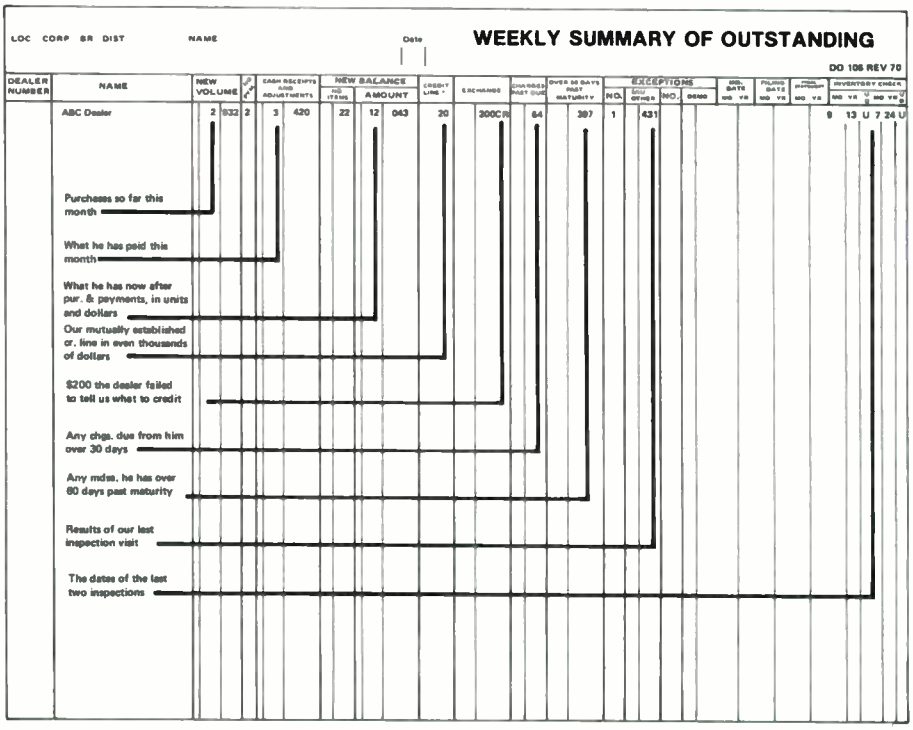
The financial institution should provide a service above and beyond the conventional in order to be competitive in helping the manufacturer and distributor provide essential services to their customers. In a word, there are significant differences among money sources—banks, finance companies, factorers—and the differences are not necessarily exclusively concerned with rates and terms.

There is the matter of record keeping and controls. And there is the matter of timely reports, renewals and personal coverage. In three-party financing the retailer's concern with who handles the "paper" is a product only of rate and terms—and making the sale easy for the customer. In floor planning, though, he must be assured that the financial source is as adept in providing the "intangibles" as he is in providing the funds that make the sale possible. Granted that the contract for dealer inventory financing is between the financial institution and the manufacturer or distributor, to the degree that the institution provides better ancillary services, a measure of the retailer's ability to generate additional profitable sales will be determined.

That is not so complicated a thought as may at first appear. If a manufacturer can "load" his dealers, he sees a benefit. But the retailer also benefits, since his additional inventory is financed, his showroom and warehousing facilities are kept fluid and—most important—his relationship with his supplier (manufacturer or distributor) is carefully monitored by professionals at no cost to him.

For example, a typical floor planning program might be established by a manufacturer on a "dealer direct" basis—that is, there is no intervening distributor network. Although the dealer is not obliged to participate in a manufacturer's financing arrangement, the manufacturer usually tries to make the deal so attractive that a dealer would be hard-pressed to find as attractive and sound financing for his inventory elsewhere. Thus a manufacturer's field selling force will visit dealers, explain the plan to the dealer and then get the retailer's signature. Some finance companies, if the total amount of money is large enough, will undertake to make the calls on the dealer and instruct the retailer on how the plan works, what it costs, and the advantages the dealer will enjoy. A typical financial transaction might take this form. To enable a qualified dealer to stock and easily order an in-depth inventory, a manufacturer will enter into a floor planning arrangement with a finance company. It is essentially a form of short-term secured financing.

The first 90 days would be serviced by the finance company for a charge of about 4.0 percent of the amount of each invoice. The manufacturer would absorb that charge as a means of stimulating dealer participation at the very outset.



The second 90 days would be serviced for a charge of 1.7 percent simple interest per month on the average daily balance. Normally the dealer pays this charge on a renewal basis and the rate is figured on a daily basis.

In a typical floor plan no down payment is required unless the manufacturer wishes dealers to be billed for some reduction of the amount that is outstanding at the end of the first 90 days.

Each dealer in this example would be visited by an inventory inspector at least once in 30 days. This will vary somewhat on the size of the retailer's business, but in no event should it be fewer than ten times a year. During these calls the inspector—who may be in the employ of the finance company (as is the case with FinanceAmerica) or an independent survey house—is expected to check the inventory, record the serial numbers of the merchandise, check these against shipping invoices and monitor goods at remote locations. The inspector must also train the dealers in the use and benefits of the manufacturer's plan. He also is required to collect any amounts that are due.

In this example, all balances are due and payable at the end of 180 days. As merchandise is sold by the dealer during the 180-day financing period, the dealer would be obligated to pay the amount outstanding for those items sold. A delinquency charge of 2.0 percent simple interest per month would be assessed against the dealer who is in arrears on amounts remaining unpaid after 180 days.

Dealers generally are required to provide insurance coverage for the inventory being financed. They may supply evidence of an existing policy with adequate coverage or they must purchase coverage through the financial institution at a cost of ten cents per hundred per month based on the

---

Bill Hussey is affiliated with FinanceAmerica.

outstanding balance on the last working day of the month. There is a $100 deductible.

But the true benefits to dealers participating in an inventory financing plan are derived in great measure from the controls and record keeping provided by the finance company working in conjunction with the manufacturer. Here are some of the ancillary services that are performed in a typical floor planning undertaking:

Statement of Transaction—As each invoice is processed by the finance company, this document is prepared and forwarded to the dealer. It serves as a confirmation of the units financed and, more important, it also provides the dealer with a means for recording payments.

Statement of Account—This report is received by the dealer as well as the manufacturer at monthly intervals. It functions as a summary of the financed invoices as well as a billing for those past due. It also serves as a billing for all accrued but unpaid finance charges and insurance premiums, if any.

Volume of New Inventory Financed—This is designed to confirm all invoices processed and paid. The report, generated daily, lists all invoices financed that day. Its total matches that of the check which is attached to it.

Weekly Summary of Outstandings—This comprehensive report is prepared weekly on a month-to-date basis. It is designed to update all dealer activity for the previous week. This is a great time saver in that it eliminates the necessity of calling for approval numbers prior to shipment.

Inventory Checklist—The finance company field representatives are supplied with this report as a means of inspecting financed inventory. Collections for units not present during the inspection and for units that have matured prior to the inspection are made and recorded on this document.

Maturity Notice—Prior to the expiration of any finance period, this form is sent to the dealer as a reminder of the final maturity date on unpaid units. It also functions as a billing vehicle for all curtailments when due and, if the financing program calls for it, flat renewal fees.

Certain advantages that seem only to benefit the manufacturer in typical floor planning can be beneficial to the dealer as well. Careful use of the reporting system by the dealer will eliminate much of the paper work he would be doing if he were handling his inventory financing through a local bank or independent financing agency. The sophisticated systems and contemporary methods devised by national finance companies can automatically provide current data to the dealer. Information for the manufacturer such as dealer outstandings, available credit lines and "sold out of trust" situations are equally germane to the dealer's operations.

Used well and intelligently, floor planning becomes a marketing tool for the dealer. It helps in sales forecasting, automated ordering procedures, and functions as a monitoring device on sales performance. If the manufacturer is able to make in-house shipping decisions without contacting regional offices for approvals, the dealer is certain to benefit. Time is saved and product can be made immediately available.

Floor planning may only deal with common problems dealers face. But it provides uncommon solutions. Finance companies provide modern, sophisticated controls, a ready-made reporting system and exclusive lines of credit. And rates are almost always competitive within the industry served.

New ATM31 *Fixed-Charge* Condenser

Road Tough Vocal Microphone

A great vocal microphone must do just two things:

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

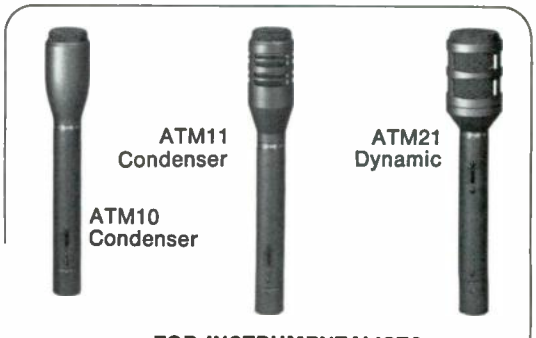
The result is honest, very musical sound. Vocals with punch and clarity—a direct result of our frequency-aligned response. The ATM31 curve takes into account every element in the chain...voice, amps, and speakers. It's the same kind of sound you hear on the finest recordings, but delivered on the road,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

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

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

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

FOR VOCALISTS



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CIRCLE 98 ON READER SERVICE CARD

SALESMAN, MOVE THAT PRODUCT: MERCHANDISING SOUND SYSTEMS

By Bob Heil

We have all experienced a greater demand for high quality sound reinforcement systems during the past decade. The musicians have constantly demanded higher sound pressure levels, wider frequency responses and better packaging to make transportation easier. The technicians are demanding simplicity in design techniques so that the equipment can be built with modular packages that can be simply plugged into or out of the circuit to correct any malfunctions or damaged equipment.

These great advances in technology are placing heavier burdens upon the music merchant who keeps trying to stock the right equipment and sells it to customers who often know much more about the equipment than the merchant!

EDUCATE YOURSELF FIRST

The worst thing a salesman can possibly do is to try selling a product that he knows very little about. The salesman can read and memorize spec sheets, but the best way to really get to know a product is to hook it up and actually use it. There has to be some idle time each day and if there isn't, come into the store an hour earlier each day. Use this extra time to get better acquainted with new products and to learn more about proper system hookups or uses by actual *listening*! Notice I said, *listen*! Evaluate what is happening. This is a classic statement for all salesmen to remember. (You may even want to posterize this for your own sales department.)

Hearing is a physical process. Listening is a mental process. Spec sheets can be slanted for the best looking results, but in actual use tests, the gear with the better spec sheet doesn't always sound the best or operates the best. Figures 1 and 2 show the same response curves. The difference is the method used in the graph.

MODULAR COMPONENT SYSTEM

The hi-fi, home stereo industry has taught us that the component-type system is the ultimate way to achieve better fidelity and maximum flexibility. With sound reinforcement systems, the same is true and is even greatly magnified when modular systems are used. Ease of service, much greater flexibility, and simplicity of changing equipment for expansion are the best assets when designing a com-

plete system around the electronics end of things.

To achieve "state of the art" quality sound, we must use a multichannel mixer, electronic crossover, a dual channel amplifier, and a proper three way speaker system. A basic system like this can be sold to your prospective customer with planned expansion, so you don't put him in a corner right off the bat. You also have sold him a "starter" system which is light years ahead of the column and reflex boxes. The basic starter system can be similar to that shown in Figure 3.

After several months on the road, your "star" customer will want to expand his system. If you had sold him the "mixer, EQ, amp" in-a-box, expansion would be almost impossible and highly impractical. But now you are able to expand his system as seen in Figure 4.

Keep in mind that this system can be increased to infinity as long as the output drive of the electronic crossover will provide enough non-distorted drive to properly drive the bank of power amplifier inputs.

MODULARIZATION

This modular approach can be used to great advantage when planning a system for a customer. Expansion can be used as a great sales tool. This same modular idea is of advantage to you, the retail merchant, as it allows you to sell your customer *exactly* what he can afford, with further expansion available to him at any time.

How many times have you been in a situation where your customer was several hundred dollars short of your selling price of a mixer? It's late Friday evening, your floor plan is due Monday, the telephone bill is due tomorrow. In your dilemma, you may have simply turned the mixer by matching your customer's pocketbook—to your disadvantage.

Yes, you were able to pay off the floor plan, but you never really produced any profit. If you had a mixing console with modular panels, you could have simply unplugged three or four inputs or changed them to less expensive inputs and closed the sale by building the mixer to meet your customer's pocketbook, and—most important—opened the door for a several hundred dollar sale of additional channels to him later on. You must remember: *Sell to meet their budget. Don't match their price.*

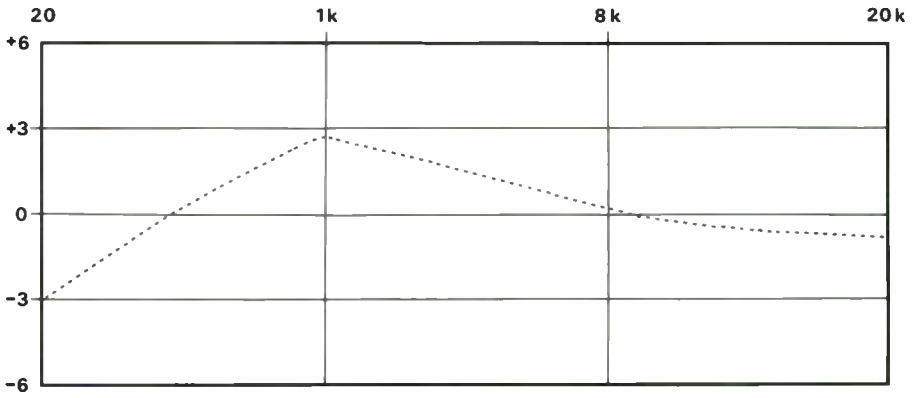


Figure 1

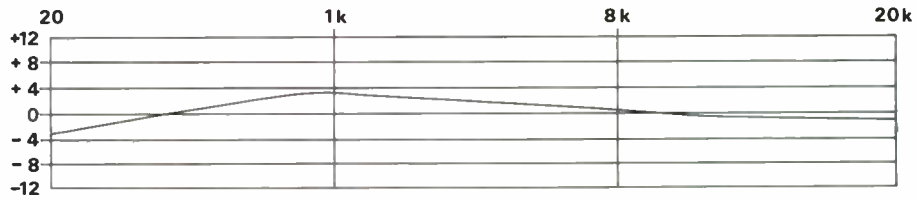


Figure 2

GOOD DEMO—HIGHER SALES

Ever watch those commercials on TV where they sell the vegetable slicers or glass cutters? You know that the demonstration is what sells and it is a powerful demo. Just for the heck of it, evaluate your own demonstration. I know that you can improve your sales just by properly demonstrating the various products involved within the sound business. The guy with the glass cutter has one little old tool that basically does one or two things—*period*! You have thousands of dollars worth of sound equipment that, if desired, could be used in demonstrations strong enough to make *anyone* listen, watch, and become thoroughly interested. The important factor is *you*, the retail salesman.

To properly merchandise and sell any product you must be aware of what I call the *Three D's:* desire; demand; determination.

Obviously, you must have the *desire* to sell sound reinforcement equipment. If your soul is really into electric organs or accordians, your customers will soon be able to sense your attitude. Many times, this very lack of desire is sensed by your customer as a lack of knowledge, when really the actual problem is you really don't have your heart involved in giving him 110 percent of your efforts.

If you do desire to get your sales happening, you must promote the fact thoroughly and let the public know you are really in the business of selling *total* sound systems. When they find this out, you will have the *demand* for those products which turns on your *desire* to sell, and further motivates you to make *determined* efforts to close those sales.

Now that you understand what it takes mentally, your next move is to pay some attention to your physical setup on the sales floor. Part of the *demand* by your customers for certain products is due, in part, to your displays. In so many cases, there really isn't an actual display with a typical subject heading. What is confused with an actual demonstration display is a rack of various equipment, half stacked in the corner; bare wires; gaffers; tape and an old rubber hose holding the bent corner level. A prospective customer gets totally scared away when seeing this most common sight.

What the salesman *must* do is take great pride in setting up a professional looking and professional operating display instead of a corner looking like old Uncle Sam's Army Surplus Music Store!

It really doesn't take a great deal of

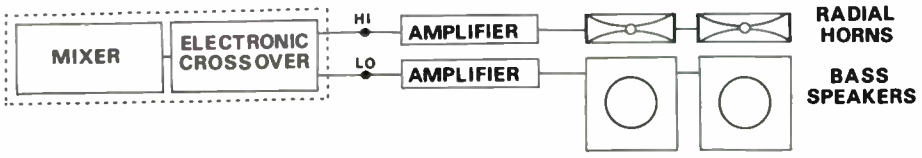


Figure 3

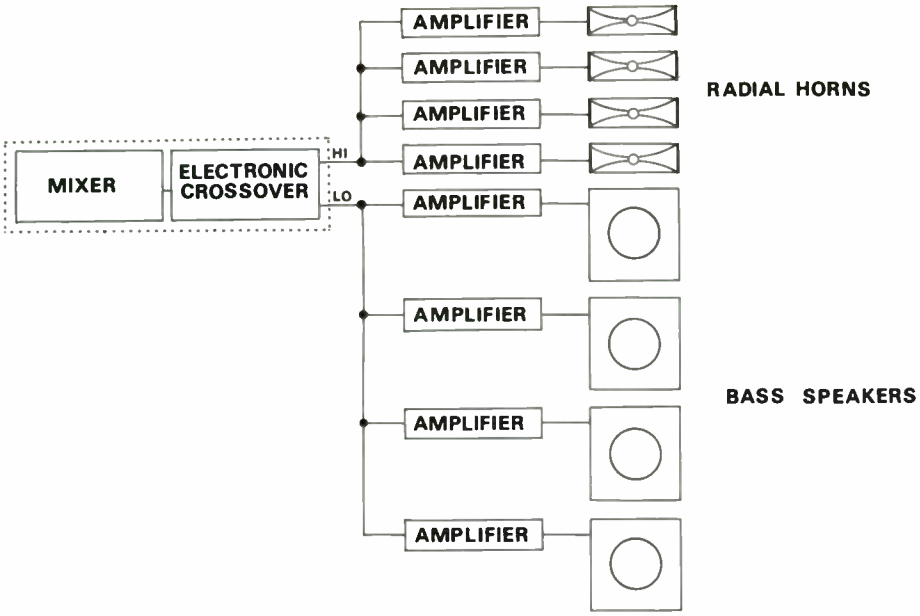


Figure 4

effort to plan the display. It *does* take a little more time to plan a display that looks inviting, easy to operate, and sounds terrific. Have you ever seen a swimming pool display with old dark green ugly water? Heck no! They are sparkling. They are inviting, and practically everyone entering the store comments, "Wish that were mine!" Does your display of sound reinforcement gear get those comments?

GIVE YOUR CUSTOMER A CHOICE

It will be easier for you if you plan a minimum of three basic systems. Each one can be sold up or down a few percentage points by substituting different brands, but the basic components remain the same. Two systems don't really give your customer a good enough selection. It has been determined that the average human, when purchasing any item, *likes* to have the right to select among several different products. It becomes *much* easier to sell an $800 spinet piano when you begin by showing the prospect an $8000 grand, even when you know darned well they would never be able to afford the bench! Let them play that grand. Sit at it. Dreaming to themselves. When they get the little spinet home, they actually have their own fantasy that the spinet really is the grand. It works in all walks of life . . . automobiles, boats, appliances, and oh, yes . . . sound systems.

A very simple plan for your display is to set up three prime systems. These can be packaged systems, if you prefer, but it is better yet to build or buy some really nice looking colorful equipment racks. I grant you, they are hard to find, but they *are* available.

THE THREE EIGHTS

Select the equipment so you can have your three systems priced like this: Display System A—$800; Display System B—$1800; Display System C—$3800.

This method will give you latitude to move components around, either adding or subtracting from Systems B and C, so you can actually have an endless variety of price points. You will have to sell your customer's budget, not match his pocketbook. It is very easy to discount your price to his pocketbook. It takes a little bit of salesmanship and planning to sell him on a budget plan.

You will probably find that one of the most difficult problems in any selling situation is to know exactly how much your customer has to spend. You can play all kinds of price games, but it is really difficult to get your customer to verbally admit to his finances.

There is a way, however. Also, at the same time, you can find out many other things about your customer, his needs and his knowledge. Print a questionnaire sheet (Display A) asking all kinds of important questions. The main one is in the top right next to "budget." As with all sales, you must qualify your customer. This does it very gracefully. It also gives you helpful information about his needs and desires.

FILL OUT A PROPOSAL

To answer his questions and to make a formal proposal, print a second sheet

DISPLAY A

PA SYSTEM REQUIREMENT SHEET

This requirement sheet provides necessary information so your individual needs for a perfect sound system may be achieved.
Please provide as much information as available, so our representative may present your system to its fullest capabilities.

CONSOLE DESIGN

Number of group members_____ Budget consideration $_____
Number of microphones to be used _____ Hi or Lo impedance _____
Number of vocal mics_____ Instrument mics_____ Leslie mics_____
Need individual EQ? _____ Reverb? _____ Echo send? _____
Need individual monitor send? _____ Tape recorder input? _____
Need tape record output? _____ Input attenuators (pads)? _____
Do you need stereo capabilities? _____ Need VU meter? _____
Need electronic crossover? _____ Need external input for outboard mixers? _____
Need graphic equalizers? _ If graphics are required, do you need them on MAIN or MONITOR System, or both? _
Will you use multicord? _____ How long? _____

AMPLIFIER—SPEAKER DESIGN

What will be the largest hall system will have to fill? 500, 1500, 3000, 8000
If used in clubs, will system have to be hung from walls? _____
What type vehicle is used for hauling? AUTO, VAN, 12 FT, 16 FT, 20 FT TRUCK
Will any existing amps or speakers be used in conjunction with the sound system? Yes or No If yes, describe.

Volume group plays? SUPER LOUD LOUD AVERAGE SOFT
Do you need tweeters? _____
Any special requirements needed? _____

DISPLAY B

SOUND SYSTEM SPECIFICATIONS AS ENGINEERED FOR

_____
Group

Microphone type _____ Stand type _____
Number of input channels _____ Individual EQ? _____
Monitor sends Individual or overall _____ Reverb _____
Impedance Hi Lo _____ Multicord length _____
Type mixer _____ Graphic Equalizers _____
Amplifiers—Bass _____ Treble Horns _____
Monitor _____ Full Range _____

Speaker Complement

Woofers _____
Drivers _____
Tweeters _____
Crossover _____
Cabinet Types _____
_____
Monitors _____

System Total Power R.M.S.
_____

TYPICAL SETUP

Miscellaneous: _____
_____
_____

System Total Price $ _____

Specifications prepared by: _____

with room to make a line drawing of the system with each component spelled out, your price, the customer's name and your signature. (Display B.) Place this sheet with proper supporting literature into a folder, mark the group name on its cover with your card and name affixed, so he can reach you for further questioning or further ordering.

This package looks professional and is not usually done by your friendly competition. Your customer will remember your display and your demonstration, but most important, he will have his own folder full of information prepared especially for him and his group. Believe me, this definitely works!

EFFECTIVE DEMONSTRATIONS = SALES = PROFIT

Whether you realize it or not, many sales that could have been closed successfully are lost during the demonstration due to lack of experience and familiarity with the equipment.

So much of the time, the equipment is not connected and rather than simply turning a switch, the poor salesman spends the crucial first five minutes of the demo nervously trying to find the right wire or connector. To add to the misery, after he *does* find the right connector the first thing that the anxious customer hears is screeches, howls and whistles from the microphone just handed him. If first impressions really mean anything, our customer has already made up his mind that this is *not* the place that "has it together" for professional sound reinforcement equipment.

A cardinal rule for any salesman is *not* to plug in a microphone and stand two feet in front of the massive speaker stack trying to get any volume. All you will achieve is to give your customer another "negative" for your system. It becomes very important during your demo to make *every* move simple, easy, and very effective. You *cannot* make mistakes. Each turn of a knob must be spelled out by you, verbally, before actually attempting the move. Talk your prospect through. Tell him what is then going to happen.

Display C shows a typical *section* of very successful demonstration, spelling out every verbal and physical move for you. Your customer's name is, for this demonstration, Sam.

As can be seen, we walk the prospect through each move, explaining what is going to happen, why it happens, and how to correct a problem or use the function with a positive purpose. Several important factors of good basic salesmanship are also noted in the example.

First we try to use the customer's name occasionally. Explain each move in a semi-technical manner to build confidence in our customer that the salesman knows a little something about the equipment. There is a thin line here, however, between too much and too little. Don't become to technical. Sam gets bored and *scared* if you talk over his head. Make this *first* presentation very simple. You can get more technical at a later meeting. Try to build confidence much like building a brick wall—a single brick at a time. Don't hit Sam with the entire brick wall at your first meeting.

Also, at least once during the demo, refer to the product as already belonging to Sam. Be careful not to drive it into the ground. Be tactful. Mention it once or twice in a nice subtle part of your presentation.

Be very aware of any questions Sam might have. He will probably never come forward and ask specific questions for fear of looking too dumb, but

DISPLAY C

Salesman's Dialog

"Sam, let me show you each control on this mixing console's microphone input channel. Starting at the top, we have *mic attenuation.* Microphones are designed to produce very small voltages when spoken into. Normally, however, when placed in the hands of a rock star, his heavy voice can create as much as *two* volts, several thousand times what the input channel can normally handle. Input "overload" occurs. (Start recorder.) When did you last hear a PA sounding like this? Probably last night! By simply reducing the input voltage with your attenuator, Sam, we can clean that signal right up."

Physical Movement

Point to position of Mic Attenuation knob

With a recorder capable of 3 or 4 volts out, so overload can be shown, start the recorder, with no attenuation.

Sound should be *very* distorted. Slowly rotate attenuator until the distortion goes away.

you must constantly be aware of his eye contact, facial expression, and just plain interest level during your presentation.

To be perfectly honest, you, the salesman, are "on stage" during your demonstration. You *must* keep interest high during the entire demonstration by proper selection of music tracks you play—both the material and the length. Try to play no more than five seconds of music for each function you are demonstrating. Sam can go down to the local disco for entertainment! Keep Sam's attention throughout your entire presentation. Present him with your literature package, including the proper system selection sheet you have prepared for him, showing him the complete system wiring diagram, component breakdown, and complete price. Needless to say, if you have done the proper things, you will close another sale. It may take several phone calls to Sam to remind him that you "thought of another hookup possible" or to find out if he wants to break the system into a smaller package. Using a sales technique like this can offer you many doors to call Sam and "rap" about the system and 99 percent of the time ole Sam will spill the beans to you about what his holdback is. No matter what it is, you have an answer. By selling the modular component system his budget *can* be met!

DAMAGING DEMO

There should be a note here about the *quality* of sound you are getting from your systems. Many frightening cases are evident in music stores across the country.

Make sure that all sales people who will be using the systems know and understand all aspects of the patching systems you are using. The entire demo must sound superb. It would be wise to even call in an outside source, someone you respect, and make *sure* that things are working correctly and sounding good. Have your technicians or repair department go through the three demo systems periodically, cleaning up any bad cables, loose wires, over driven mixers, amplifiers and speakers.

Don't use record changers! Mixing consoles are designed for microphones. They don't have equalization for phono cartridges, FM radios, or worse yet, AM radios! A phono cartridge, no matter how much you paid for it, needs a specialized preamp that is equalized for the RIAA industry response curve. Most FM tuners are not good enough program sources. Most of the eight-track players aren't much better, which leaves you only one thing—a high quality tape recorder, preferably reel to reel. To really do it up right, have a local recording studio record some live material; an actual master tape. The dynamic range is really superior to any commercial recordings and gives you a terrific sound for demonstrations.

ANALYZE THE ROOM

It has always been an accepted fact that music stores are usually terrible sounding places for demonstrating high quality sound systems. However, with the proper equipment you can equalize the system to the room and in many cases get some very excellent results. It also gives you a terrific case-in-point to demonstrate to the customers just how easy and how effective analyzation is to a system. The price for some of the new analyzers is as low as $239 list, so it is not a costly item to sell a group who really desires high quality sound.

Keep in mind, always, that your customer's desire is to be treated as a professional. Any movement or actions outside those boundaries simply alienate him and encourage him to shop in other stores. Try to use a practical, simple approach as you discuss the various systems. Set down a specific plan using three basic systems. Learn their positive features. Learn their limitations. Be prepared to answer a question from your customer with, "Sir, I don't actually know, but I can find out for you," if you really *don't* know some specification or application note. Find out from the manufacturer. Don't guess.

Build a firm, honest reputation and try to help educate those customers. They really *do* remember that *you* were the one who cleared up a problem for them.

We are merchandising sound reinforcement systems and have a complex job. It takes many hours of our free time preparing presentations, calling, and following up new leads. It is easy to sell anything *once*. But it is very difficult to attain respect from your customers and keep them coming back. *That's* tough work! But that *is* the part that is rewarding.

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:

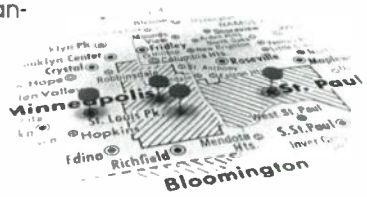
Musicians know all about Mu-tron because all sorts of professional musicians play Mu-tron effects. Artists like Jan Hammer, Larry Coryell, George Duke, Lee Ritenour, Joe Zawinul and Alphonso Johnson are just a few of the many professionals who play Mu-tron, and recommend Mu-tron in interviews and articles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

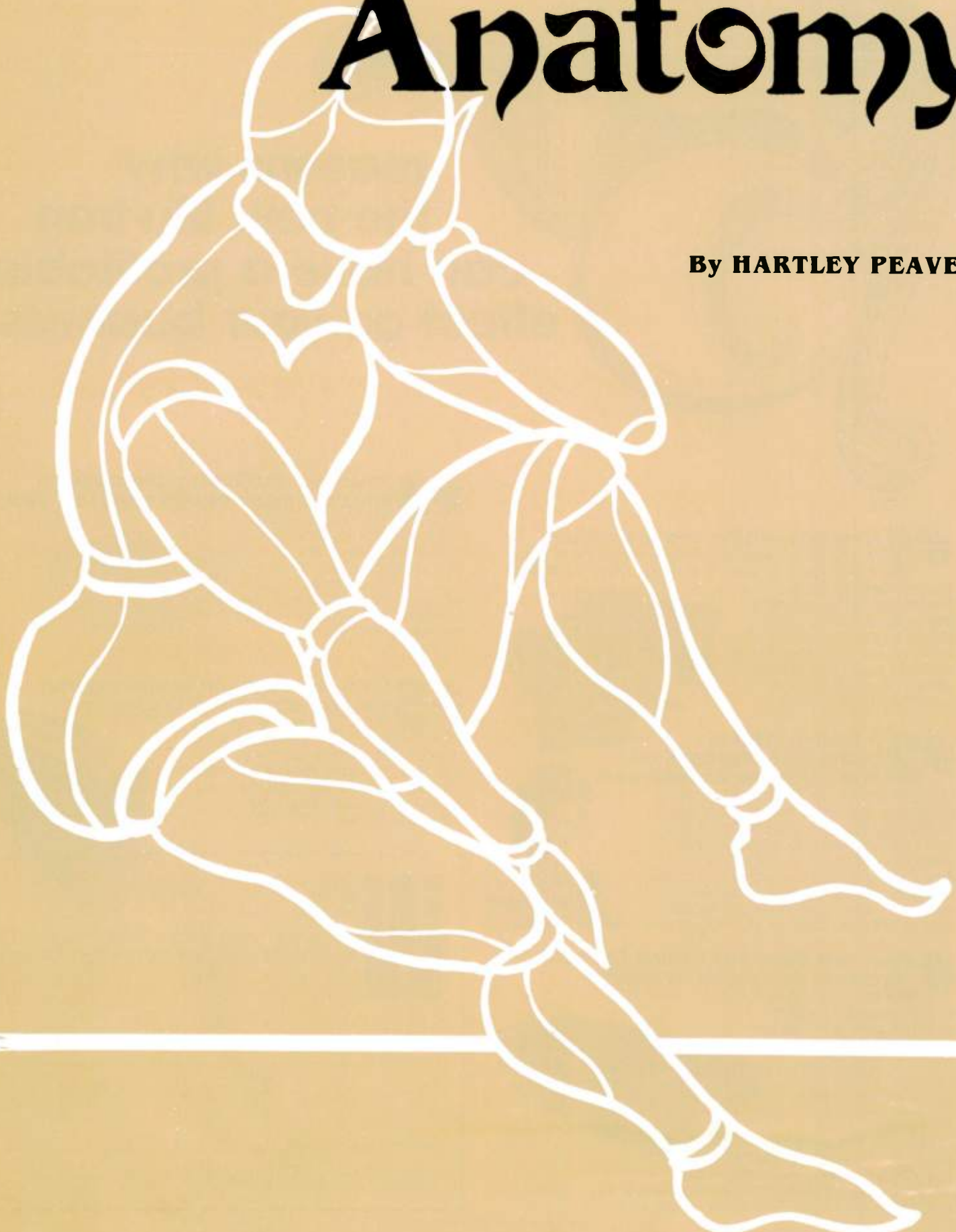
Best Time to Contact: _____

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

CIRCLE 78 ON READER SERVICE CARD

Anatomy

By HARTLEY PEAVEY



# of a Buyer-

The Keystone to Moving Product

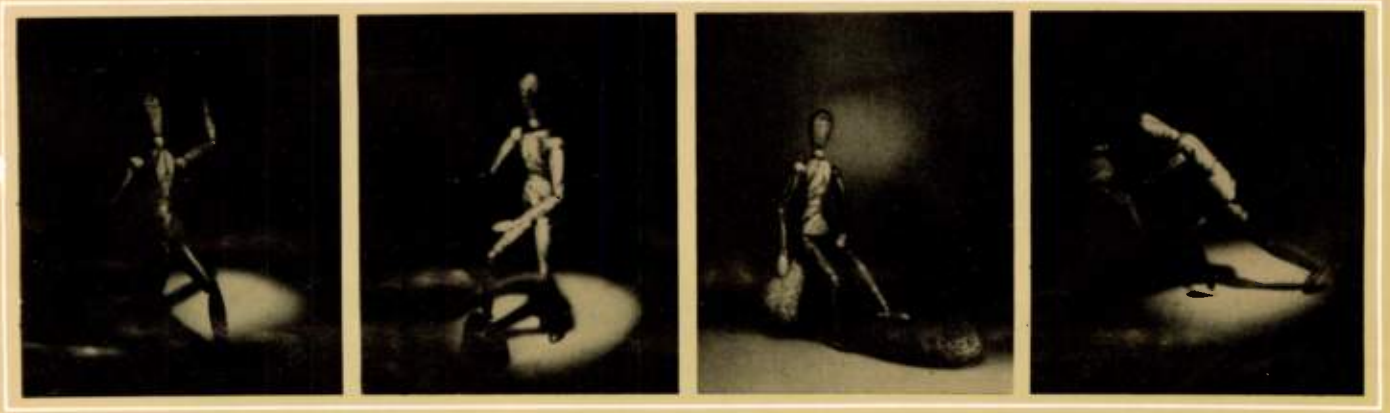
Most of us accept the buying of things to be just as natural as breathing and almost as automatic. We have been buying things for years and tend to think of the buying habit as an uncomplicated process in which *we pays our money and takes our pick.* Unfortunately for many people in the sales business, this simplistic approach has cost them and their employers untold profits.

Almost all successful salesmen have a basic understanding of the rules of the selling (and buying) game. Often, however, this understanding is intuitive and the salesman hasn't really examined, for his benefit, the psychology of sales and buying. Interestingly enough, many of the components of this psychology can be found within ourselves . . . in our own feelings, our priorities of wants, our fears, our overall thoughts about the *things* we buy and *why* we buy *what* we buy and from whom. It's a very interesting and informative exercise to take a few minutes to talk to yourself about buying. Just ask yourself the four *W's:* what, why, where, and when.

In order to fully utilize any kind of primary knowledge, be it of an atomic reaction or a buyer-seller interaction, we must, as nearly as possible, understand the action, the reaction, what makes them happen, and why . . . especially if we want the interaction of the various elements to benefit us in some way! The benefit will come only *if* we make the sale and *if* we make it profitably.

At this point, let me clarify one thing: Selling at close to your real cost is *not* selling—it's *giving* things away. Giving your merchandise away is relatively easy to do and invariably invites fiscal failure (except when it comes to the government . . . and it simply prints more money.)

All of us want to succeed, since most of us perceive that success will bring us the monetary and psychic rewards we so desperately want. Assuming adequate product to sell, the factors of understanding, motivation, and confidence when combined with rational, purposeful action will insure long-term success.



In this article and those to follow, we will be dealing with the phenomena of sales/buying primarily during the three major phases of a sale—*pre-purchase, sales reaction* including closing the sale, and *post-sale* customer satisfaction. We will begin with the basics of *understanding* as it relates to why people buy things and what we can do to determine where and from whom the customer actually buys.

THE ANATOMY OF A SALE

The key to successful selling is usually found within ourselves. In order to fully exploit our individual sales potential, it is vitally important that we be introspective and understand how people think. We need to be extremely perceptive of the customer's needs, his wants, and his overall feelings ... since it is *he* that always makes the ultimate buying decision. He must have confidence in the product as well as in the person and/or organization that is selling the product to him. Additionally, he must feel confident that he is making a wise purchase. Top salesmen attend to these customer needs while maintaining their own definite and defined goal (closing the sale) during the sales encounter.

I have had the good fortune to know many successful salesmen from various fields, and the more successful ones almost invariably thoroughly understand the whys and wherefores of the buying/selling psychology. The *indispensable* key to selling is to thoroughly understand buying. In my sales training seminars, I often refer to the buying transaction by asking the famous "chicken or egg" theory: Did the customer come in and buy the item *or* did you make the sale. Amazingly, often times it's difficult for the salesman to actually decide which situation did actually occur. A good salesman always wants to "make the sale." A fundamental mistake that many sales people make is selling the *product*. We must avoid such mechanistic (surface) thinking and realize that the customer is not interested in the product itself; he is actually interested in the pleasurable results of the *use* of the product. Don't sell the steak, sell the "sizzle."

MOTIVATING FACTORS

Just why do people buy things? Actually, there are many reasons, but most of these reasons fall within distinct groupings. The most obvious, but perhaps *least* important, is *actual need*. For our discussion here, we will assume that actual need would be for such staples as food items—hamburgers, potatoes, etc.—and basic clothing items. These are things that each of us *must* have in order to exist and, without question, the need for such commodities is *actual*. In order to maintain perspective, however, we must understand the difference between the actual need versus the perceived need.

The key word here, obviously, is *perceived*. The human mind is indeed a wondrous instrument possessing the ability to solve complex and abstract problems, while also being able to deceive itself completely. Under the perceived need category, we find *impulse purchases*, which are generally not expensive items, and *ego purchases*. Surely, we all will accept that ego is the strongest motivating factor there is. The entire concept of *ownership* is an intensely personal (ego) related thing. Ego generally plays a major role in most everything we buy. To some degree it is present in all purchases except those reflecting actual need. Most of our buying is done under what I refer to as the "little or lot" theory, meaning that there is a little need and a lot of ego involved with the great majority of the things we buy. Rationalization is an extension of the ego and enables us to effectively convince ourselves of the perceived need for various items. The very power of the ego, combined with the various needs and wants, produces a buying urge in us that is often far greater than the sum of its parts. Rationalization generally occurs because the conscious mind seeks reason and order. Therefore, we tend to convince ourselves that the need is real and that making the purchase is "the right thing to do." We convince ourselves to buy things to achieve identity, peer acceptance, recognition, and lastly, to profit in some way. Interestingly, most people will list profit and/or monetary gain as one of their primary reasons for buying; in actuality, this is not the case with the great majority of purchases.

PREPURCHASE PERIOD

The *prepurchase* period is the time when we first mentally toy with fleeting fantasies of ownership of various items. The desire for ownership can occur in any one or several ways. The impulse purchase is generally construed to be one wherein the customer decides instantaneously that he wants a particular object. Experience has proven that most impulse purchases of major items really aren't impulsive, since the prospect has generally fantasized about enjoying the benefits of ownership at some previous point in time. Another strong motivating factor in the beginnings of desire is envy (he's got it and I want it!). All of us exist in a world wherein we have many unfulfilled desires for things around us such as a new car, a new mixing console, etc., etc. ... just because "old so-and-so" has one. Quite obviously, envy is ego-connected. The desire for a particular object often seems to come wafting up out of our subconscious. It suddenly "occurs" to us that it would be pleasurable to own a product. Generally, however, this desire occurs not spontaneously but as a result of some previous stimulus such as an advertisement. The desire then comes bubbling to the surface months or years later. I like to refer to this prebuying period as "fantasy land," inasmuch as the prospective purchaser mentally flirts with imaginary situations wherein he is deriving great pleasure from the ownership of a particular item. The fantasy stage is most definitely necessary in order to plant the seeds for a *commitment to buy*.

Once the prospect has thoroughly titillated himself during the fantasy stage, he is generally at the point of shuffling the cards or deciding who or what can scratch his itch. Once the seed of desire has found fertile ground in the prospect's mind, he begins the sorting process wherein he examines the various alternatives available to him. Once the prospect has focused his awareness on a particular product or service, he begins a period of increased sensitivity/awareness of the existence of that product and/or class of product. For instance, once you decide to invest in a new car, you suddenly begin to notice all the new cars as well as information needed to determine what makes and what dealers offer the most positives. A process of elimination begins in the prospect's mind based on available information. This information can be actual or imaginary. What's important to the buyer is the perceived facts based on the knowledge he has. This knowledge may

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Hartley Peavey is President of Peavey Electronics Corporation.

have been gleaned from many sources such as his friends, publications, television or radio, or from widely varying stimuli to which he has been exposed. During this crucial period of product awareness, our advertising and our overall image are very important in attracting the fancy of the prospective customer.

The *consolidation phase* occurs after the above mentioned *consideration phase* and is characterized by the prospect's beginning to put it all together. During this period, he has taken the available facts, as he perceives them, and his own economic and/or personal situation, and his mind has begun to seek some sort of order, or as I call it, *product desire priorities*. By this time, the prospect has actually begun to say to himself: "My first choice is product A, but if I can't have that, then product B might be nice, and if not that, then product C, etc. . . . but I'd rather have product A." By the end of the consolidation stage, the potential customer has already arrived at some type of product priority.

COMMITMENT TO SHOP

Once the product priority has been determined, and possibly during the latter stages of the consolidation phase, the prospect has made the commitment to shop. This phase of the prepurchase period is the one during which the actual commitment to take some sort of concrete action is made. This commitment phase is generally the one during which the abstract mental process of consideration begins to take the form of *alternatives of action*; i.e., where can I find it, where is the best deal, and what do I have to do to get it. During the latter stages of the consolidation stage and definitely in the commitment phase, the prospect has evaluated various products, various vendors, and their respective reputations. This critical period is one of the most vital stages in the prepurchase period, since it is now that he actually get his *affirmative action program* underway. He will generally examine the market standing of the products and the dealers and often he will examine the *modus operandi* (modes of operation) of the dealers in his market area. The future customer's opinion about the dealer as well as the product is vital. People select products as well as retail vendors in several ways. The *supermarket method* is one by which the customer purchases on

the basis of price and availability, but not identity. This also results in no loyalty. Or he can deal with a friend who generally treats him right and encourages repeat business. He can deal with a vendor who has established a reputation for knowledge and can actively assist him in achieving the product satisfaction he really wants. Or he can deal with a vendor because of sheer convenience. While the prospect may be shopping for satisfaction, price, backup, and several other factors, the ego (although it sometimes clouds the issue) remains the single most potent source in the consummation of the sale.

Once the mental decision to buy has been made, most people have a nagging sense of *urgency* about completion. By this time the customer has more or less convinced himself that ownership will have pleasurable results—and we all seek pleasure, real or imaginary. Accompanying the need-want-acquire feeling is the low level anxiety of prepurchase wherein the prospective purchaser experiences varying degrees of fear, guilt (I should do something else with the money . . . but I want it!), as well as varying degrees of antipathy toward the vendor which are the beginnings of what I generally call the *adversarial purchasing syndrome*.

It's time now for the customer to make his move. For some time now abstract ideas have giddily slipped in and out of the prospect's mind, titillating his fantasy with all sorts of flashes of pleasure wherein he imagines himself basking in various pleasurable modes of product use. After the mental flirtation period, during which many various pleasures of ownership are fantasized, he begins then to think about the second most important commitment . . . to actually walk through the door of the prospective vendor's operation. When the customer enters the store, he is often already sold on the *idea* of owning a certain product. It then remains for us as salesmen to encourage him to make a decision . . . hopefully in favor of the product we are selling. It is the object of all sales people to assist a customer in *finalizing* the decision he has in fact already made—to make a purchase of a certain item at some point in time. As sales people, we obviously want the sale to occur as soon as possible, since closing the sale *is* the name of the game.

The above constitutes a very general description of the prepurchasing syndrome. If we examine our own feelings about things we have bought and/or are contemplating buying, we can easily identify with the various "stages" that we have gone through in anticipating and/or in finalizing the buying decision. If we will realize that the prospective customer often has already made the buying decision, we can eliminate a lot of the superfluous sales talk and get right down to the closing of the sale.

In future articles, we will be dealing with interpersonal relations between buyer and seller, and we will explore the theory of adversarial selling. I would ask that you consider the points made above and try to think introspectively into the reasons you yourself buy things. By doing so, you maybe better able to understand the thoughts, feelings, and emotions of your prospective customer. It is my considered opinion that to be effective salesmen, we must *understand* buying and there is no beter way to gain understanding than by investigating ourselves.

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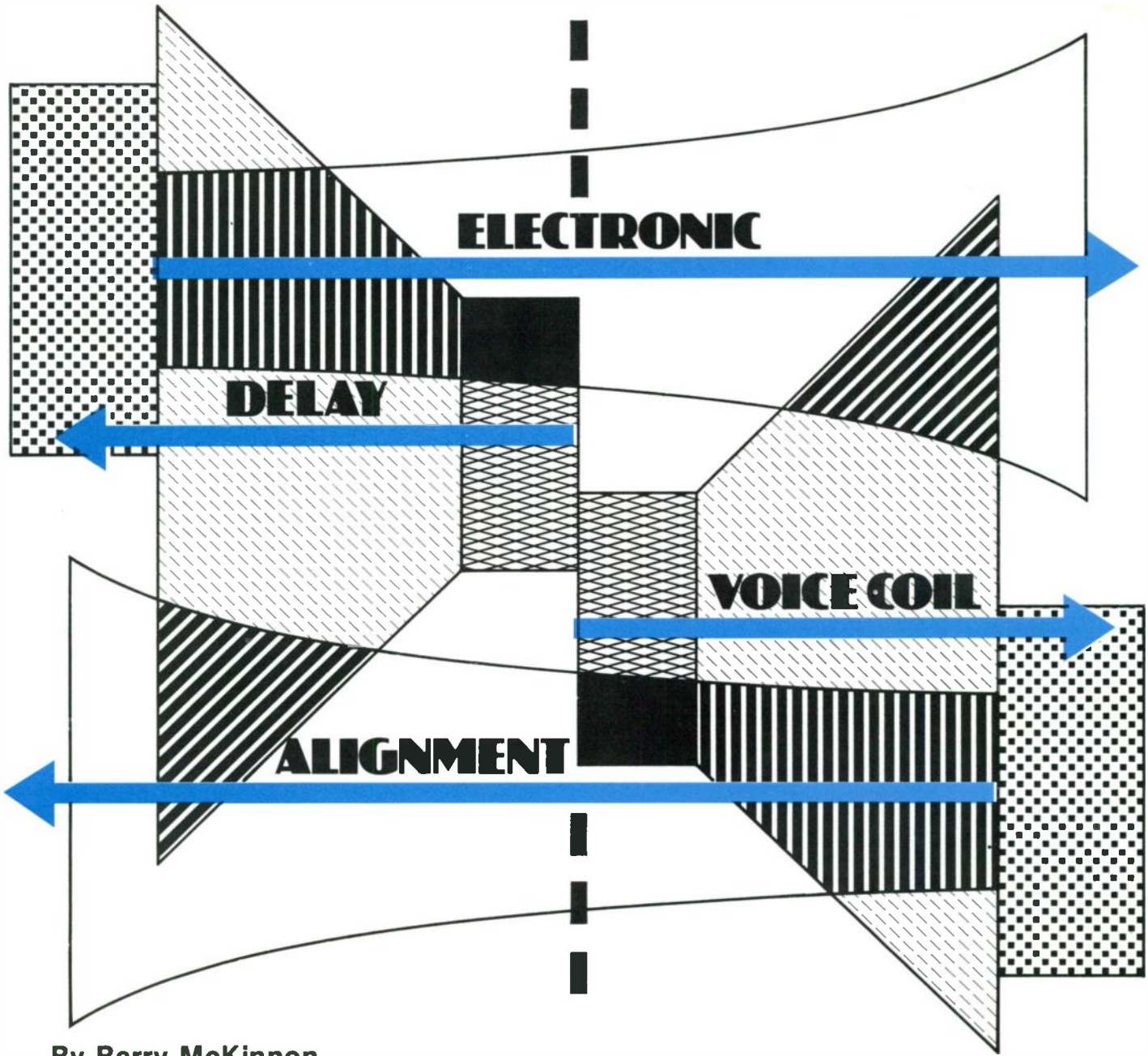
CIRCLE 90 ON READER SERVICE CARD



By Barry McKinnon

Quite often in the design of a live sound reinforcement system, we are required to use a multi-way, multi-driver speaker system to achieve the desired SPL's. The problems inherent in multi-driver systems have been brought to light recently in a most intense fashion by the consumer hi-fi speaker manufacturers. Everybody and his second cousin's dog is introducing some form of path length corrected speaker system. The benefits do exist; at least there can be a noticeable improvement in the localization and source of sound in a live sound reinforcement system, when you can line up the voice coils in single plane (or get within less than ½″). The aural effect is a little difficult to describe. When you finally line it all up it just sounds a little more right, although in most cases it isn't going to seem like a religious experience. The main advantage is in achieving more predictable coverage in the areas of the crossover frequencies. There can be a noticeable improvement.

The big problem will start to show up as soon as you go from a full range speaker to a two-way system. If you mount a sectoral or radial horn in a box and sit it on top of your low-frequency box (especially a direct radiating type of LF unit), you have a path length difference of probably 18″. There is no stable mechanical method of aligning your voice coils physically. Let's make matters worse. Add a super tweeter, which might have an overall length of 6″. Somewhere in there is a voice coil gap, and you can be relatively sure that there will be no convenient method of aligning it with the horn driver voice coil physically. Now let's make it really tough. Let's have four LF enclosures, four high frequency horns (one a narrow, long throw type), and a small array of super tweeters of some type. I think you can probably see that it isn't about to become any easier to physically align the voice coils.

In live sound reinforcement systems, the designer is faced with a concern for quick and easy setup and a safe stable speaker stack, as he can't afford to have speakers fall off and smash some member of the audience flat. In many cases these factors preclude the possibility of any physical voice c il alignment. With the advent of analog and digital time delay systems at reasonable prices, we can

now look at electronic alignment of the signals with the voice coils, so that the net effect is the achieving of acoustical wavefront integrity (a technicalese term for "it all comes out at the same time"), while maintaining the speaker stack's structural integrity. This may seem like an extravagance, and to many won't seem worthwhile, but it might clean up a sundry assortment of small problems that have plagued your system or your customer's system.

In terms of just what is required to add electronic crossover alignment to a sound system, we must consider what is in the system. A two-way system with only one length of HF unit would require one channel of delay, most likely on the order of .001—.0015 seconds (1 to 1.5 milliseconds). This is convenient, as it allows you to use a relatively inexpensive analog delay. In fact, for physical alignment discrepancies of up to 72", we can use a delay with just .0055 seconds (5.5 msec), which still allows the use of an analog delay. A two-way system involving two lengths of HF unit would require two delay channels; a three-way system with one length of MF unit and one type of HF unit would require two channels, and so on. You can easily determine the number of discrete channels of delay you need from looking at measurements of the units involved. Virtually everything that cannot physically line up to within ½" could be considered for electronic delay. When measuring the components, you can locate the voice coil on the drivers and speakers by using the pole plate on the magnet structure. This is usually the shiny ring on the drive or woofer magnet assembly.

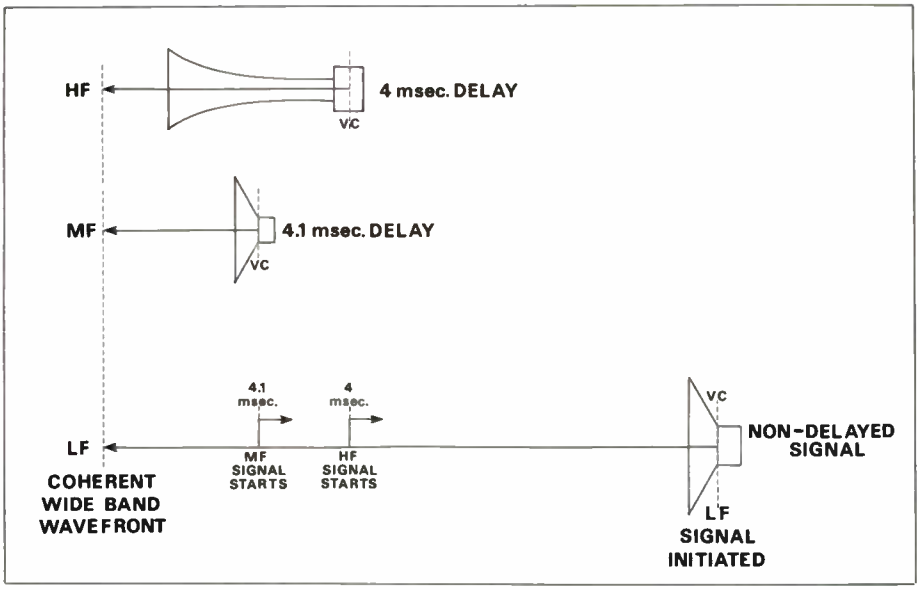


Figure 2

To begin the calculation for the ballpark delay figures required, set the stack up in what looks like the most typical and easiest to repeat configuration, then begin from the voice coil located furthest in the rear. This will be the reference driver(s). All other more forwardly located voice coils must have their signals delayed so that the acoustical output of the most rearward coil is just arriving at the more forward coil location just as its electronic signal is arriving. As an example, let's look at a three-way system utilizing a folded bass horn with a path length of 65" from voice coil to horn mouth, a two 12" midrange direct radiator and a high frequency horn and compression driver with a horn-mouth-to-voice-coil length of 20". In figure 1 we can see how these items might be stacked up. For convenience, we can use the plane of the LF horn mouth for alignment. The crossover frequencies chosen are 250 Hz and 1500 Hz. We can see that in this figure, there exists a 10" lagging path length between the MF unit and the HF unit at 1500 Hz. That corresponds to a .0007 second delay or 1.13 wavelengths at 1500 Hz. Between the MF unit and the LF unit there is a 55" leading path length difference that corresponds to a .0041 sec MF lead-in output or .85 wavelengths at 250 Hz. If you looked at the output into the air at these frequencies with a sine wave signal at the crossover frequency, you would not see a sine wave. The two waves would be superimposed but slightly skewed by that time delay to give a new waveform. The change in shape of the waveform would be the same as adding harmonics in some proportion (like changing a sine wave to a triangle wave). The net result is additional distortion and a new and difficult-to-determine coverage pattern at the crossover frequencies (and to some degree on either side of the crossover frequencies, depending on the crossover slope chosen.)

To calculate the values of time delay,

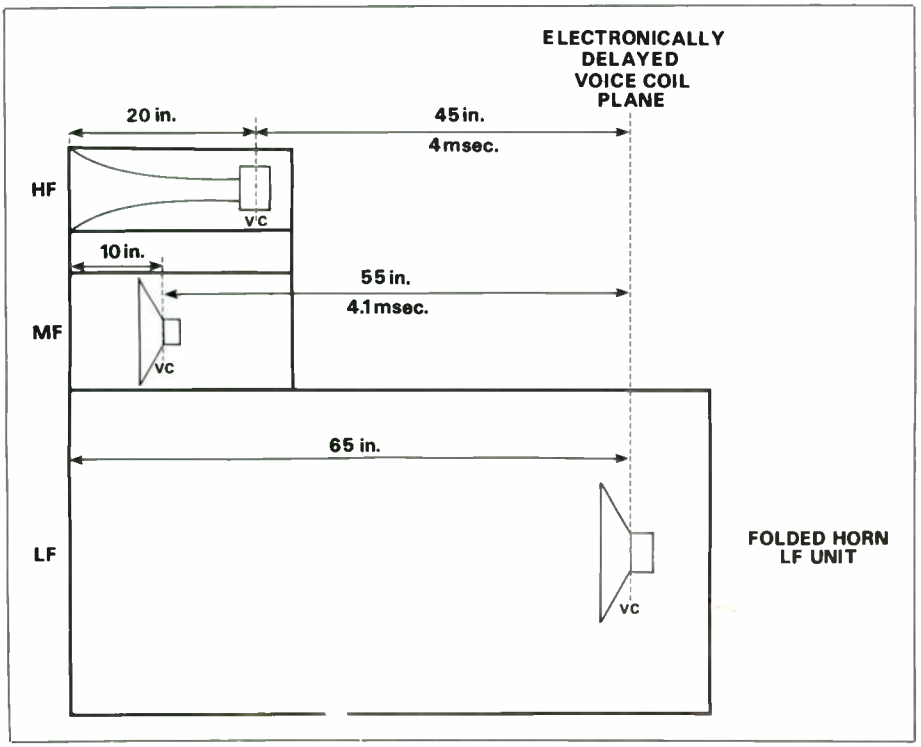


Figure 1

all you need to know is the path length difference and the fact that the speed of sound in air is very close to 13,200 in/sec. How many fractional seconds does it take for the sound to travel the path length distance? Divide the path length difference by 13,200.

Once you have the figures calculated, it would be a good idea to mark the locations on the speaker stack components, so that the setup is accurately repeatable. The delay can then be inserted after the electronic crossover and adjusted. It should probably be adjusted using a dual trace scope that is fairly accurately calibrated along its time scale. The delay can be set in steps by first setting the LF to MF delay, displaying the LF signal on the lower trace (this helps to picture the operation in your mind) and the MF signal on the top trace. From figure 2, we can see that the MF signal has to be delayed by 55″ or .0041 secs (4.1 msec). After stabilizing the scope to show one sine wave segment on each display, adjust the delay to lag the MF signal by 4.1 msec. Set the scope up now with MF on the bottom and HF on top. Note that the MF is already delayed at the crossover frequency. Again stabilize the display for one wave, then adjust the HF signal to a delay of 45″ or .004 sec (4 msec). Once the HF is aligned with the delayed MF signal, you are done. If you had LF, MF and HF units that became progressively shorter as they produced each higher band, then you again would have repeated the LF/MF process for the MF/HF delay.

In the event that a dual trace scope is unavailable, the ear could substitute, with very careful adjustment of the delay unit until the source as heard when listening to the speaker stack seems to "fall into place," which is nearly the only way to describe the effect. This could easily take as long or longer than the other method described. But if you happen to be lucky it could be very quick.

Needless to say, this can only be accomplished when using a biamplified system (or tri-, quadra-, quint-amplified). The idea can be extended to ensure alignment in permanently installed arrays as well, or even in studio monitors for ultimate finesse in "time adjusted" monitor systems. It probably won't go down in history as the greatest thing since sliced bread, chocol[illegible] milk and gaffer's tape, but it may sol[illegible] pro[illegible]s that were unrecognized as [illegible]roblems

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CIRCLE 81 ON READER SERVICE CARD

The SOUND SH

The new Quartet by **Arp Instruments** is designed to provide a keyboard player with brass, strings, organ, and piano with a minimum cost (at least as compared to similar units) and a minimum of operating difficulty.

Until the introduction of the Quartet at the NAMM show in Atlanta, the cheapest thing in the Arp line that would play polyphonically was the Omni-2, which is priced at around $2500. The Quartet retails out at around a thousand dollars less than the Omni.

Arp officials state that the Quartet is made in Italy under close supervision by Arp design engineers, who have paid particular attention to the voicing of the string section of the instrument.

The Quartet has a 49-note keyboard (C to c) and is housed in the same type of chassis as other products in the Arp line. Centered on the lower front panel are four status selectors and accompanying status indicator lights

(LED's) for the four main functions of the instrument: brass, string, organ and piano.

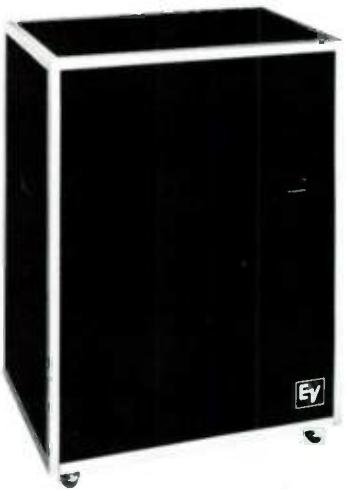
Across the upper front panel, a row of faders controls the various functions of the Quartet. For example, the brass section has an attack fader, brilliance control, and a sustain fader—all three of which serve to shape the envelope and the timbre of the brass section. There is also a separate voicing for "Trombone" and "Trumpet," which amounts to an octave selector or blender with some variation in tone between the two.

The string section contains the basic "Cello" and "Violin" faders, which enable the user to blend the two sounds together rather than have to choose one or the other. Likewise the "Organ" and "Celeste" faders in the organ mode, and the "Piano" and "Honky-Tonk" sounds in the piano mode. Any or all of the sounds can be blended together in various proportions. Attack and sustain for the string section and a master volume fader round out the front panel features, all of which are connected to status indicators for easy reference.

Although one could hardly call the Omni-2 a difficult instrument to operate, the Quartet is even less so. The Quartet is a very simple, yet very attractive multi-keyboard. Musicians with no prior synthesizer experience or inclination in that direction will find the Quartet immediately accessible. And in light of the fact that the popular electric pianos on the market today cost as market today cost as much as the Quartet, it is easy to see how the Quartet would be very attractive to keyboard players, both in rock and in other styles of contemporary music.

CIRCLE 1 ON READER SERVICE CARD

Today's keyboard player, encumbered as he/she is with pianos, organs, string machines and synthesizers of myriad description, makes the greatest demand on an amplification system of any musician in a group. The keyboard player's rig must be able to handle a very wide frequency response and a wide



OPPE

By Charlie Lawing

variety of tones. With this in mind, **Electro-Voice** has designed the S18-3 keyboard speaker system.

The S18-3 is an 8-ohm cabinet with a long-term power handling capacity of 200 watts. The frequency response is appropriately very wide: 40-16,000 Hz. The cabinet houses an 18″ woofer, a midrange driver and an ST350A tweeter. One outstanding feature of this cabinet is that it has a front-mounted midrange/high end level control which makes adjustment during performance very easy. Also, the S18-3 can be biamped if necessary, simply by interchanging two 9-pin plugs on the rear panel, which converts the cabinet for use with an active crossover.

Recessed handles, black finish, aluminum trim and heavy casters make this cabinet look as good as it sounds. Another quality item from Electro-Voice.

CIRCLE 2 ON READER SERVICE CARD

Introduced as the single most efficient speaker enclosure in the entire **Electro-Voice** line, the Dominator, a three-way all-horn P.A. enclosure, is now available from EV.

The manufacturer lists the frequency of the new enclosure at 60 Hz-16 kHz. The cabinet is recommended for vocal and miked-instrument applications, with one exception. Synthesizers which are capable of producing low-frequency signals below 60 Hz are not recommended for use with the Dominator.

The cabinet design itself approximates the old "column" type enclosure, except that it is wider and not quite as tall as the old dinosaurs.

For the bottom end, EV uses the EVM-15L woofer in a folded horn enclosure for improved efficiency and smooth response in the low frequencies. The midrange horn maintains a 100-degree horizontal dispersion angle at any midrange frequency, and is mounted vertically in the center of the cabinet.

On the high end, EV is using the ST350A tweeter, which has an auto-limiting circuit that protects the tweeter from overloads and transient signals.

At a distance of 4 feet with a 100 watt input, the sound pressure level is 123 dB. Additionally, the Dominator can be biamped, using the crossover frequency of 600 Hz.

The Dominator is made of 5/8″ plywood, covered in black vinyl and trimmed in aluminum. Recessed handles are mounted on both sides.

This speaker enclosure was originally designed for the club-circuit musician on the road, but field applications have proven that the cabinet works well in other situations that call for portable yet high-quality sound.

Suggested retail price for the Dominator is $995.

CIRCLE 3 ON READER SERVICE CARD

Lectrosonics, Inc. has departed from their role as a leading manufacturer of battery-powered portable audio products to introduce the Mouse practice amp. The Mouse, unlike other Lectrosonics products, uses a rechargeable battery-pack rather than batteries.

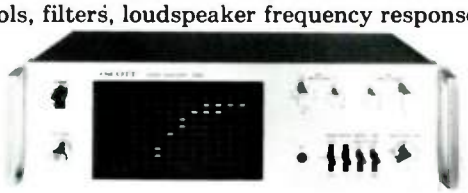
In addition, the Mouse has 5 watts of RMS power, an 8-inch speaker, and a 10 meg-ohm input. That's more power and a larger speaker than comparable practice amps on the market. The 10 meg-ohm input means that the Mouse can be used with lead and bass guitars, as well as acoustic guitar pickups.

Proponents of the rechargeable battery-pack design point out that in as little as 50 hours of operation, the user of a battery-powered amp could purchase a Mouse and save the cost of replacing penlite batteries.

CIRCLE 4 ON READER SERVICE CARD

For some audio buffs, hearing is just not enough. **H.H. Scott, Inc.**, has a new product—the 830Z—which enables the audiophile to visually verify the performance of an entire audio system.

The 830Z will visually confirm the fine tuning adjustments that a user makes to his receiver or amplifier. Things such as tone controls, filters, loudspeaker frequency response,



tape deck bias and equalization can be evaluated with the 830Z. Even loudspeaker efficiency can be measured by means of the built-in SPL meter in the 830Z.

By feeding the oscillator signal of the 830Z into the stereo system and monitoring that signal with the remote microphone in the 830Z, a visual display of the characteristics of the listening room is presented. This 110 LED grid display enables the user, through experimentation with various speaker placements, to determine the optimum position for his stereo speakers.

Another good use of the 830Z is as a visual aid in selling hi-fi components. Customers can rely on the 830Z as "eyes for their ears" which provide help in evaluating various components. Audio dealers may want to rack-mount an 830Z in the display room and use it as a unique sales tool. In fact, Scott officials indicate that many dealers are able to close sales by offering free equalization of the buyer's stereo listening room.

CIRCLE 5 ON READER SERVICE CARD

Dallas Music Industries has introduced the Kelsey Pro-Club Series sound reinforcement mixers in 8, 12 and 16 channels. Features include transformer balanced inputs, three bands of EQ, monitor send, reverb send, VU meters, and stereo tape in and record out facilities. Each input channel has a variable input gain control with overload LED. Components in each mixer are accessible by unscrewing the main control panel from the road case. PC boards are vertically mounted. SMF road cases, integral to all Kelsey mixers, now have fiberglass construction and are available in green, blue, black, white and red.

The Kelsey 6+2 keyboard mixer ("Keymix") is also now available, featuring 6 mic level inputs; 6 line level inputs; left, right and mono outputs; balanced 10-level outputs and balanced hi-level outputs; complete patching facilities for input and output bus; and 10 segment peak level arrays on the left and right outputs. The 6+2 Keymix also includes an SMF road case.

CIRCLE 6 ON READER SERVICE CARD

Norlin's Lab Series L9 has caught on here in Memphis to the point that I have trouble keeping one on the sales floor for more than three days.

The L9 has active midrange EQ and a built-in compressor. It is self-contained, light and easy to transport. And with 100 watts of continuous average power and an Electro-Voice 15" speaker, the L9 can hold its own on stage with the biggest guitar amps available.

The Lab Series L9 is solid-state, yet it does have a good "warm" sound. Since the whole business of how an amp sounds is largely a subjective matter in the final analysis anyway, the only real way I have of measuring how the L9 sounds is by how many of them I can sell to guitar players who have been using tube amps. I can honestly say that a gre

deal of my professional customers have tried the Lab amp and liked it.

The L9 has, as I said, a compressor, active midrange EQ, and other features: an effects in/out loop, master volume, two channels with hi and lo gain inputs on both channels, bright switch, reverb, treble and bass controls and a multifilter. The multifilter, according to the manufacturer, restructures the upper harmonics of an electric guitar signal to sound more "acoustic." Here again, it may work out on paper in the research and development department, but the only real measure is how the customers react to it. The Lab Series may be attractive to dealers who want to be able to offer their customers a viable alternative to both tubes and huge stacks of cabinets.

CIRCLE 7 ON READER SERVICE CARD

Neptune Electronics, makers of various signal processing devices, has a new two-channel parametric equalizer on the retail shelf, the Model 342.

This unit has four bands of equalization per channel—Lo, Lo-Mid, Hi-Mid, and Hi. Each of the bands has its own frequency, band width and gain control, and each one of the four bands on either channel can be removed from the signal path by means of a pushbutton on the front panel.

Master in/out switches are also provided on both channels of the 342. L.E.D. peak indicators are on each band of the 342, and the unit has balanced and unbalanced inputs and outputs.

The Model 342 is rack-mountable in the standard 19″ rack.

CIRCLE 8 ON READER SERVICE CARD

Rock music and an acoustic quality known as distortion go together like Haldeman and Ehrlichman. Distortion is part and parcel of what we have come to accept as a "rock sound" on guitar.

In the prehistoric days of rock and roll, long before amplifiers had such features as "master volume," the effect of distortion was cleverly achieved by loosening the tubes from their sockets. The bad connection resulted in a nasty sound that came to be known as "rockabilly."

the SOUND SHOPPE
REAR ENTRANCE

No sooner had technology caught up with popular taste (which in this case took a decade or so), than amplifiers began to appear with master volume controls which enabled the guitarist to get a nasty guitar sound at lower volume levels. However, the tonal quality of a master volume amp and an amp cranked wide open is different. So the search continued for a means to achieve the *tone* of a loud distorted amp at a low volume.

The **Altair** Corporation manufactures such a device: the PW-6 Power Attenuator. The PW-6 connects between the amplifier and the speakers of an amp. Its function is to control the amount of power which actually reaches the speakers from a wide-open amp. Simply stated, the PW-6 acts as sort of a "heat-sink" by soaking up power from the amplifier, thus limiting the volume of the speaker. However, the most important thing is that the PW-6 adds no tone coloration of its own. In this respect it is different from a master volume, which does alter tone somewhat.

The amount of volume reduction is calibrated in four decibel steps (from 0 to −44 dB) and can be adjusted by a large knob on the front panel of the PW-6. Two speaker outputs are provided, as well as a low impedance balanced output which can be used to run a signal directly into the recording console in a studio. This handy feature eliminates the need for miking, thereby reducing the chance for crosstalk.

CIRCLE 9 ON READER SERVICE CARD

By Murray M. Silver, Jr.

DEALER DOSSIER

Music Mart
Atlanta, Georgia

Music Mart in Atlanta, Georgia is a business which grew out of the trunk of a car twenty years ago and has shown an overall yearly sales increase of 30 percent for each of the past few years.

Those interested in stories about the self-made man will appreciate learning of how Don Howard parlayed a hobby into a thriving business. In the late fifties, Don was buying old broken guitars, fixing them as a hobby and selling them wherever his travels happened to take him. He then opened a neighborhood musical instrument shop on the end of a small row of storefronts and dealt mainly with locals who needed repairs on old favorite guitars or were eyeing the new models.

As the years passed, the shop became a hangout for country western touring bands making regular stops in Georgia. Downstairs, Don erected a small stage and every Saturday afternoon the basement was filled with friends and neighbors playing and singing along with the stars in old country favorites. For six years these Saturday jamborees were the most popular weekend pastime in the area.

Along about the time someone invented the shopping mall, smaller neighborhood shops owned by friendly men were becoming a vanishing breed. Don Howard realized that separating management from sales would be the only way to defeat old man time and the scourge of the shopping center.

When the Music Mart became a business (as opposed to a neighborhood novelty), Howard employed Wayne Stowers as Vice President and General Manager and went about the task of departmentalizing his growing collection of instruments and equipment. Soon the position of Sales Manager was created and John Rathbone was hired to oversee a host of operations and responsibilities.

The showroom for sound reinforcement at Music Mart is set up much the same as a recording studio. The fully functional room displays a wide assortment of speakers, keyboards, mixers, amps and signal processing devices. In one section, there is a display of speakers by Shure, Peavey, Pro, Univox, JBL and Electro-Voice and a group of mixers by Biamp, Yamaha, Tapco and Peavey.

Two racks of auxiliary special effects demonstrate the MXR digital delay, Tapco expander and various models of the Tapco mixers. There are Biamp and Shure crossovers as well as a choice of MXR equalizers. Power can be supplied through any of the JBL, Tapco, BGW, Uni-Sync, Peavey, Yamaha or Biamp amps.

Emphasis is also placed on the keyboard display, where a musician can test anywhere from four to ten units in three separate groupings. For instance, in one corner a MiniMoog with Ribbon Controller, Arp Omni-2 synthesizer, Crumar Performer, Arp Axxe and Pro-DGX synthesizer and a Micro-Moog all run off a Tapco 6-channel mixer and preamplifier 6000 and play through four SG System SG-812 power monitors. Another grouping displays a Rhodes 88 with a Fender amp, a Rhodes 73 and a Crumar OR-15 Orchestrator.

Other equipment not commonly dis-

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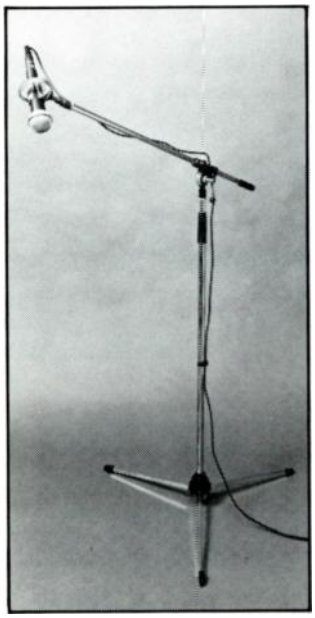
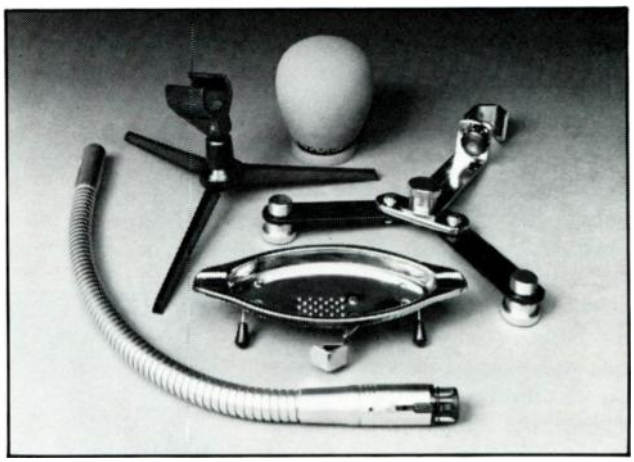
We're looking for a few more great dealers to handle the Beyer line. Contact Norm Wieland at Burns Audiotronics.



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

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In Canada, H. Roy Gray, Ltd.

CIRCLE 77 ON READER SERVICE CARD

played, such as a Korg Vocoder and a Hohner Clavinet D6, are featured in another grouping next to a display of Ashford Audio horns and speaker cabinets by Pro, Peavey and JBL. The entire room is geared to facilitate the sale of equipment in the $1,200 to $4,000 price range. Music Mart also offers a limited supply of used equipment in the $500 to $1,000 range.

Presently, Music Mart plans to expand into already owned adjoining storefronts so that they can facilitate the addition of professional recording equipment and enlarge the sound reinforcement display.

Our conversation with John Rathbone and sound reinforcement specialist Allen Dresser uncovered an ongoing commitment to the consumer, a desire to improve an already successful business and figures which support their claim that business has never been better.

Within the past year, the sound reinforcement department at Music Mart has undergone a lot of changes and additions. Are you attempting to satisfy a public demand or trying to create a new market in the southeast?

Rathbone: I look at it this way: If you stand still, you won't make money and eventually you will lose. We have made a lot of additions of new products, but these are additions which the market will support. Our sound reinforcement department has not yet reached a saturation point for this area.

Among the new additions to the department, what items did you consider essential for implementing your plan to offer a wider range of equipment?

Rathbone: We have recently begun to handle the 12 and 16 channel boards, the Tapco Catalina, Biamp, the Fender Pro and multitrack Teac units and they are all moving well. If we can acquire certain lines of professional recording equipment, we will be exactly where we want to go with this department.

Does the possibility of competition threaten you?

Rathbone: No. Actually we have always looked forward to new competition for two reasons. One, the resulting media explosion generates a new public interest in the sound business for everyone, and secondly, comparative shopping brings people back to Music Mart.

What will a comparative shopper find at Music Mart that he won't find anywhere else?

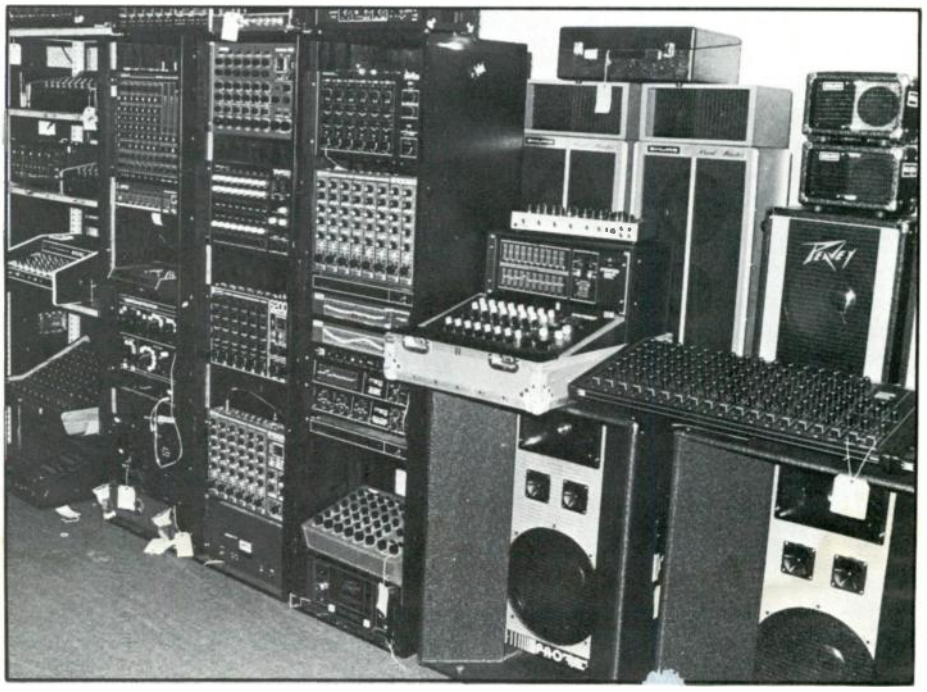
Rathbone: Our average customers reflect a good mix of amateur, semi-pro and professional musicians. All of them require some degree of education about new products, so we make our market in that respect.

Our success, taking into consideration where others fail, is based on effective management of inventory and the commitments made by our personnel. Music Mart is the people who work here, not the building or the equipment. The employees take pride in doing a good job. When hiring, I look for someone who is aggressive but patient, educated and experienced. We have four showroom salesmen who specialize in different areas but are capable of floating from one department to another.

We may not have the lowest prices in town but we are the low ball on many items. The prices bring 'em in but it's our people who bring 'em back.

What incentives do you provide for employees?

Rathbone: Salesmen work on a graduating commission from 13 percent to 20 percent. On a $3,000 gross profit scale, the employee earns 13 percent and increments increase in hundredths so that a $3,010 sale earns the



dbx 158.
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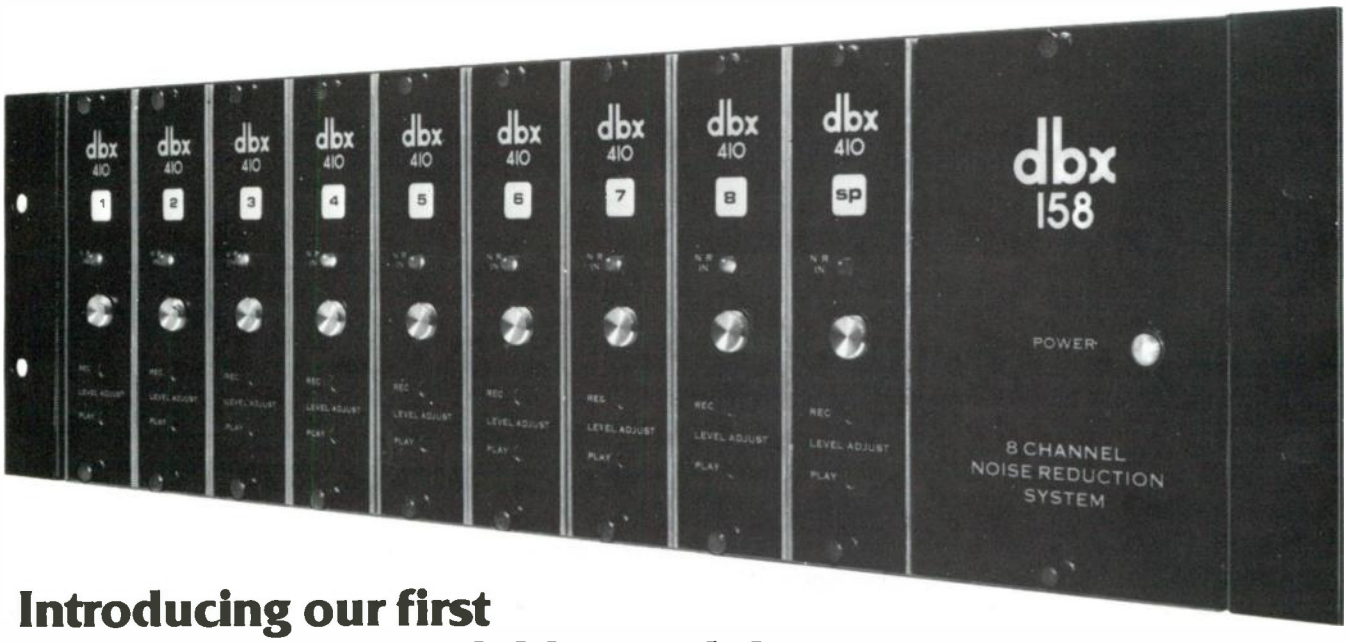

Introducing our first economical, expandable, modular, simultaneous tape noise reduction system.

Now you can have a tape noise reduction system that will stay with you from high-end audiophile, through semi-pro and into full professional equipment.

Our new dbx 158 system can start life in your place with the 158 main frame and as few as two modules or as many as eight modules for its full eight channel capacity. It also has storage space for a ninth spare module in its compact chassis. The rear panel has phono and multi-pin connectors that will interface directly to your cables. Additional 158's can be used for 16 or 24 track recording.

The dbx 158 offers the semi-pro recordist or small studio all the advantages of dbx professional systems, including 30 dB of noise reduction, and 10 dB additional recorder headroom. It's a classic 2:1 mirror image compander which preserves the full dynamic range of program material without audible tape hiss. Each module contains separate record and playback noise reduction electronics. Its simultaneous record/playback capability permits the noise reduced, decoded tape to be monitored while recording without manual switching or remote control.

Requiring only 5¼" of rack space, the 158's light weight (17 lbs.) makes it easily portable for location dates. And naturally, tapes recorded with this system are compatible with any other dbx professional tape noise reduction system as well as on board dbx tape noise reduction in TEAC/TASCAM recorders. We'll be happy to send you further information and the name of your nearest dbx dealer. Just write us.

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Newton, Massachusetts
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Here's a generous offer: buy all 8 channels up front, and we'll throw in the ninth module free.

CIRCLE 99 ON READER SERVICE CARD

employee 13.01 percent and so on to 14 percent for a $4,000 sale, up to 20 percent.

Finding sales people willing to make a serious commitment has been the most pressing need. I was not satisfied until recently. We keep an extensive file on applicants and finally found men who reflected the kind of attitude that I was looking for.

As sales manager do you run the show or is it a group effort?

Rathbone: We have a checks and balances system wherein all employees have a voice in policy making. Salesmen go as far as counseling me or Wayne on buying merchandise.

As sales manager, my job links management with sales and the tasks I perform are numerous. I am in charge of hiring and seeking recruits. On an administrative level, I act as a buyer and set up telephone campaigns and mailings. Most of my time is spent on the telephone.

What is the nature of your advertising campaigns?

Rathbone: In the store's experience over the past twenty years, television and radio ads have not been particularly rewarding. Maybe 5 percent of the audience is interested in what we are selling, so the costs involved are too high. We prefer to go heavy at the most likely place—the Yellow Pages of all the telephone directories throughout the state. We can reach another 200,000 people with a toll free line.

We also use a direct mail system which may be more expensive, but it certainly pays off. Our coverage spans the states of Georgia, Alabama, North Carolina, South Carolina, Tennessee, Kentucky and Florida. These techniques beat radio and TV response.

What new trends are occurring which continue to bring changes to your store?

Rathbone: We are conservative at heart from a business standpoint. We test a market cautiously before we move into any new area. We are putting our money in electronic instruments and signal processing devices and hopefully will expand into professional recording. Guitars and M.I. aren't going to expand from what they are doing now.

Allen, as a salesman who specializes in sound at the Music Mart, to what do you attribute the success of this store?

Dresser: The staff in general is putting the Music Mart across to the public. We are very good at following leads and we maintain a "want" book of things people are looking for that we don't stock. We turn more of these leads into sales than most stores. Our stock is usually large enough to cover most requests and we even supply other stores in other places.

What are the first steps you take in establishing a relationship with a customer?

Dresser: The first question I ask the customer is, "What do you already own?" I qualify my customer because I consider, for example, keyboards to be a system sale. The add-ons create steady customers. We are selling a lot of string synthesizers and Rhodes units and these customers are always returning to find out about new devices.

Musicians today are realizing the importance of miking all the instruments, especially paying more attention to the individual miking of drums. Many drummers walk in with a copy of *Modern Recording* and want to duplicate the techniques described in the articles. So, many established bands are coming back to improve their sound as their pocketbooks can accommodate them.

Are you working with any recording studios?

Dresser: We have not begun to design studios but do furnish equipment. We close a lot of $500 to $1,500 instrument sales.

In what areas are you finding an increasing interest on the part of customers?

Dresser: We are seeing an increase in the sales of signal processing devices and a move towards larger mixers.

We have an excellent repeat business where working bands will spend from $8,000 to $10,000 over a year. I think most of these people are looking for more than a low price. I think they appreciate the fact that we fix everything we sell, make loans of equipment while theirs is being repaired and perform favors much the same as you would expect of any friend. We try to keep in mind that it is our job to help the musician make a living.

What do your current quotas look like?

Dresser: Each of us is selling between $25,000 and $40,000 a month which is 30 percent to 40 percent up over last year at this time for the sound reinforcement department. The overall sales have increased 30 percent steadily over the last several years and we have not seen any signs of this slowing up in 1979.

INDUSTRY UPDATE

Quad-Eight has appointed Studio-Center S.A., Paris, its full-line exclusive distributor for France.

Gerald Brown has been appointed Advertising Coordinator at MXR Innovations. Brown has been with the company for five years, most recently as Southeastern Regional Sales Representative.

Spectrum Sound, Inc. has been formed in Nashville with **Ken Porter** as President and **Bob Leffler** as Vice President. According to Porter, Spectrum will handle sales, installation and servicing of sound reinforcement equipment.

James F. Dowling has been appointed to the new post of Personnel Director of TDK. Dowling was previously corporate director of personnel at H.O. Penn Machinery Company.

BASF Systems has named **Michael Cassettari** Assistant Product Manager, Audio/Video. Cassettari joins BASF from the Personal Care Division of the Gillette Company.

C. Ridley Rhind has been elected Vice President of Marketing for Ampex Corporation. He comes to Ampex from Diablo Systems, where he was vice president of marketing.

Aesthetic Design, a new subsidiary of Stage Engineering and Supply, has been formed exclusively for the design, supply and installation of discotheques and clubs. **David Hale Hand**, owner of Stage Engineering and Supply, is also senior designer for the new company.

Doug Blackburn has been named Midwest Regional Sales Manager of Kenwood. He was previously national sales manager of B.E.S.

Pro Audio Seattle has moved to a new location near Northgate Shopping Center. The new building provides 4,500 square feet.

The retirement of **Victor F. Machin**, Executive Vice President Marketing, Manufacturing, and Personnel of Shure Brothers, has prompted staff changes at the company. A portion of Machin's duties will be assumed by **Raymond E. Ward** in his new position as Executive Vice President of Marketing. Ward has also been named Managing Director of Shure Electronics Limited, England. Manufacturing and personnel functions performed by Machin will be assumed by **J.H. Kogen** in the new position of Executive Vice President-Operations Manager.

Burns Audiotronics, distributors of Beyer equipment, has announced the appointment of four new representative firms: Ted Pappas, professional headphones and microphones; Electronic Manufacturers Representatives, consumer headphones and microphones; Jerry Kaplan, consumer headphones and microphones; and Dan Neumeier and Associates, consumer and professional headphones and microphones.

Raymond Cooke, Founder and Managing Director of KEF Electronics, has been made an Officer of the Most Excellent Order of the British Empire by Queen Elizabeth II.

The Norton Company has changed the name of the Sonic II Noise Filter to the Sonic II Sound Filter in response to musicians' complaints, according to the company.

Dennis King has been named District Manager for Altec-Lansing for the territories of California, New Mexico, Arizona, Nevada and parts of Texas. King's responsibilities include expanding and developing Altec sound systems for professional and industrial markets. He was previously a free lance consulting engineer.

KEF Electronics has appointed Technicon, Incorporated sales representative for KEF speakers in the southeastern market.

Technical Audio Products Corporation (TAPCO) has appointed three new representative organizations: Northern California Marketing; The Cummings Company; and Audio Resources.

Electro-Voice has honored two rep organizations which have celebrated their thirty-year anniversary of "continued service to E-V": The David H. Brothers organization, Baltimore; and the George M. Conneen Company of Newton Square, Pennsylvania.

Douglas R. Smith has returned to Koss-Canada as General Manager after a year and a half assignment with Koss-Europe. **David Carton** has been promoted to General Marketing and Sales Director for Koss-Europe, replacing Smith.

Crown International has trained nine Soviet technicians in design theory, troubleshooting techniques and field service procedures on Crown power amplifiers, which will be used in the 1980 Summer Olympics in Moscow.

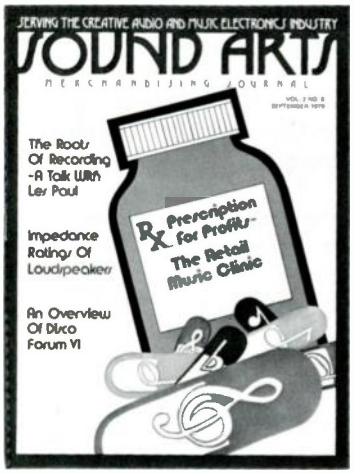
Rank Hi Fi has appointed four new representatives for the Wharfedale speaker line: KSW Incorporated; Brake and Associates; Vector Sales; and Konex.

TDK Electronics has appointed two new full line sales rep firms: SER, Inc, Skokie, Illinois; and Hal Abrams Marketing, Millbrae, California.

Cerwin-Vega has completed internal changes with the addition of a new computer for order entries, accounting procedures and inventory control. In addition, a new marketing team has been assembled under the direction of **Ray Arbuckle**, Director of Marketing/Sales. All Cerwin-Vega products will be handled by the department. Regional marketing areas have been established, with factory marketing representatives to work with dealers and reps.

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.



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

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

For further information write or call:

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

CIRCLE 83 ON READER SERVICE CARD

Sometimes it's the little things that count.

In today's electronic music, some devices can change your sounds radically. You can get a guitar to sound like an organ; or a keyboard to sound like steel drums. But what happens when you need your guitar to sound like a guitar?

Did you ever feel that your sound was lifeless and dull? This is because your pickup is loaded by the amplifiers input. Loading causes a loss of highs and lows. If you play an acoustic instrument with a contact-type pickup you are probably experiencing this. If you are running long wires on stage, or are using several effects devices, consider the following alternatives.

The new MXR Micro Amp is a bi-fet operational amplifier with a high input impedance, which eliminates the effects of loading on an instruments' pickups. It has a low output impedance so it can drive a wide range of amplifiers, and a gain control so you can adjust the gain from unity (output level equal to input level) to 26 dB, or *twenty times* the input level.

If you play an electric piano or electric guitar with a low output level, now you can boost the output without changing the characteristic sound of your instrument.

The MXR Micro Amp was designed to preserve the full bandwidth produced by any instrument and pickup, (freq. resp. 12Hz–25kHZ) without adding any coloration of its own. Using the Micro Amp, you control how your sound is modified, if at all. Your sounds' tonal qualities are not predetermined by the effects of pickup loading. If you are currently using another preamp in conjunction with your instrument's pickups, the MXR Micro Amp will perform better with more transparency and less noise.

The MXR Noise Gate Line Driver was developed to solve the problems of background noise and hum that occur in live performance. This unit is particularly useful when using many effects devices. In the front of a signal chain, the Noise Gate Line Driver, provides a buffer to preserve the proper line level for successive devices and amplification. At the end of the chain, it is used to "gate-out" unwanted noise leaving only clean signal. The threshold level, is adjustable allowing the unit to discriminate between program material and unwanted noise. In addition, the Noise Gate Line Driver provides a convenient high/low impedance interface for direct signal taps (i.e., live recording/PA).

Both the Noise Gate Line Driver and the new Micro Amp are ruggedly constructed, designed for long battery life, and backed by MXR's long term commitment and experience in providing the finest electronic devices for the music industry.

So, in the light of the many different modification devices available today; if musical accuracy is important to you, see your MXR dealer. Sometimes it's the little things that count.

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

MXR **Musical Products Group**

Introducing the new Micro Amp.

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