SERVING THE CREATIVE AUDIO AND MUSIC ELECTRONICS INDUSTRY

SOUND ARTS

MERCHANDISING JOURNAL

FEB. 1978
VOL. 1 NO. 1

S

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An Introduction to Cables & Connectors

Terms: A Continuing Glossary & Answers to the Most Common Consumer Questions

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VOL. XCVII JANUARY 20, 1978

UNI-SYNC SECRETS EXPOSED

WESTLAKE VILLAGE, CALIFORNIA: Uni-Sync, Incorporated, well known manufacturer of the Trouper Series line of sound reinforcement equipment, secretly revealed today the production of several new products going on display at the NAMM Western Market, Disneyland. Included in the line-up is a stereo version of the highly touted Trouper I. The Trouper I Stereo according to anonymous industry sources features both house and echo pan pots. Informers also reported the existence of three professional power amplifiers sized 50, 100, and 250 Watts. Sources confirm reports of the competition sweating heavily. Dealers have been told to sneak over to Booth 42 in the Embassy Room without being seen. Look for the following logo:

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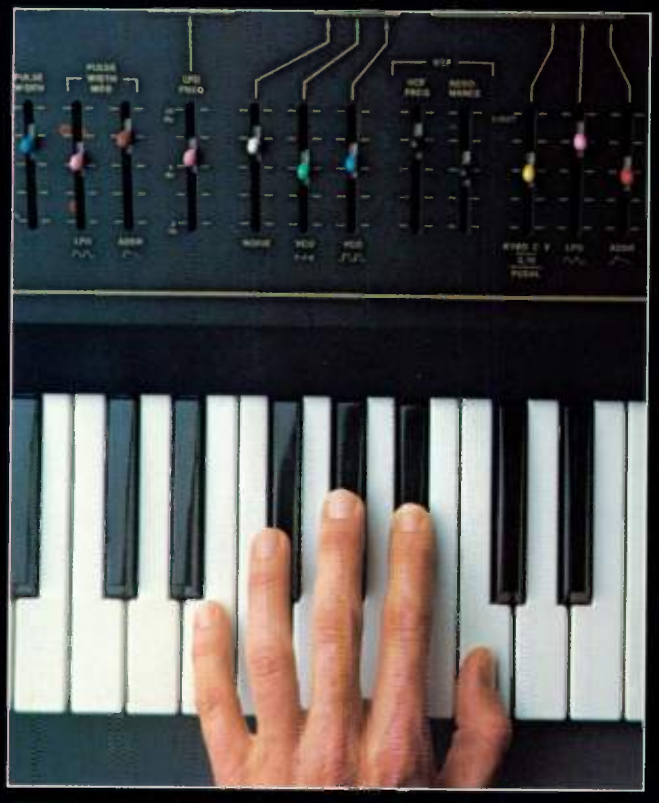

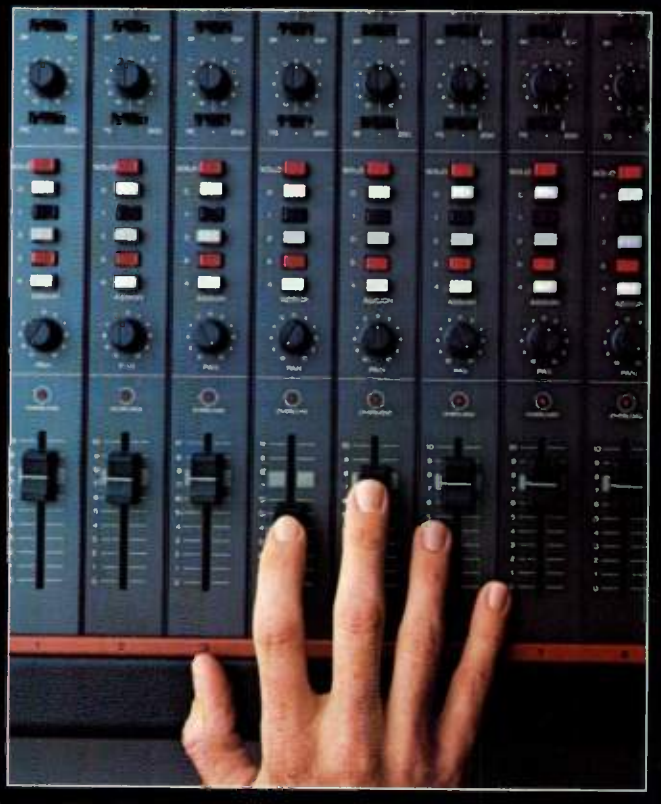

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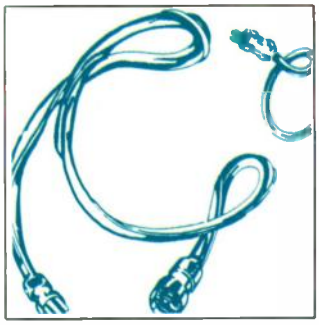

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Cover photo by
Doug Hanewinckel
Equipment Courtesy of Audio by Zimet

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A LETTER FROM THE PUBLISHER

A new industry is upon us! In the 60's it was the progressive musician who was making the waves and now in the 70's it is those musicians, and many creative non-musicians, who are causing the stir. They are creative consumers today—consumers who are using electronic musical instruments and accessories, sound reinforcement and recording gear as the vehicle for their particular talents. The creative consumers of today are unlike any audio or musical instrument consumer of yesteryear. They are a whole new breed of serious, well-informed professional consumers who are out there doing it and living it with their equipment everyday.

Now, however, there is a problem ... So intense is the creative consumer's interest, and so complete is his education, that manufacturers producing products in the electronic musical instrument and audio field are experiencing major educational problems on a distribution and sales level. Dealers, retailers, and salespersons on the floor are more commonly less knowledgeable (due to the lack of education) than the end user. So while manufacturers are pleased with the sales and growth of their particular product line, they are becoming increasingly aware of how much better sales could be if the retailer had a better understanding of the equipment and how it interfaces with other electronic equipment and musical instrument accessories. Therefore, it becomes apparent that *help*, in the form of education, is badly needed. Sound Arts Merchandising Journal is the help that is on the way.

It is our hope that Sound Arts will become the intra-industry communicator. With the entire art, production, and circulation staffs of Modern Recording, Sound Arts will service manufacturers and dealers by educating the salesperson to the needs and desires of this sophisticated creative consumer. Each month Sound Arts will be the learning journal for the industry. You can expect articles on equipment like equalizers, mixing boards, delay lines, effects pedals, monitor systems, etc. These articles will point out how the equipment operates and its various applications to the end user. It will profile the consumer for the salesperson and help him to recognize his needs. It will offer troubleshooting tips that can save both time and money.

We think Sound Arts is a unique trade journal both editorially and graphically and we are confident that each month it will serve as a continuing reference library for those who are in the business of selling sound.

Cordially,

Vincent P. Testa
Publisher

TEAR HERE

TERMS:

A CONTINUING INDUSTRY GLOSSARY

RECORDING

By Michael Tapes

In defining terms used in the recording process, one can put forth two line definitions that certainly define the term, but more than likely the reader is even more perplexed by the definition than by the lack of understanding of the term. Rather than use two lines or single paragraph definitions alone, this column will attempt to expand these definitions with usage and application techniques. The single most asked question regarding recording systems (other than--What mic do I use on this?) is: Can I use this piece of gear with that piece of gear; will they work together?

Interface: Interface can be defined as the connecting of 2 or more devices in a common signal chain. But that, in itself, doesn't tell you or your customer how to hook up the various components, or even if the gear is compatible at all. The most misunderstood portion of the interface process is impedance matching.

Impedance: Impedance is defined as the opposition to the flow of an alternating current in a circuit. In order to delve into a useful understanding of impedance, let us for the moment limit our discussion to the interfacing of line level devices. (The only microphones used in any competent recording situation are low impedance and the circuits they are plugged into should be designed to accept low impedance microphones!)

Let us agree that the devices that we wish to connect, or interface, each have one input and one output. The outputs each have a source impedance, and the inputs each have an input impedance. The trick is to match, properly, the inputs and outputs in terms of impedance. The common understanding is that the output impedance and the input impedance *must* match. In reality the input impedance can also be 10 times greater than the source impedance of

ELECTRONIC MUSICAL INSTRUMENTS & ACCESSORIES

By Fred Ridder

Preamplifier: The first stage of amplification in an amplifier set-up is called a pre-amp. The term can either refer to the input stage of the amplifier itself or to an accessory preamp. Accessory preamps are used to lower an instrument's impedance to minimize line losses, or to allow the musician to overdrive the input stage of the amplifier and achieve a "dirty" or distorted sound quality.

Power Booster: Generally another name for a preamp. Actually a misnomer, since it cannot increase the output power of an amplifier, but rather allows the amp to be overdriven for a sound that *seems* louder and more sustained.

Fuzztone: A very high gain amplifier which is designed to overdrive itself even with quite small input signals to produce a highly distorted output signal. Since small input signals will produce virtually the same output as large signals, fuzztones have the effect of producing a high degree of sustain in an instrument, but at the expense of completely changing the tone quality of the sound.

Clipper: Another name for a fuzztone. Derives from the action of the device which is to distort or "clip" the input signal.

Compressor: A special type of amplifier circuit which amplifies large signals less than small signals. The result is a compression of dynamic range or an increase in the sustain of an instrument without significant distortion or change in tonal quality. In other words, a *clean* sustain as opposed to a fuzztone which is a "dirty" sustain.

Treble Booster: A preamp that selectively amplifies higher frequencies (the treble range) more than bass or midrange frequencies. Produces a bright, piercing sound quality.

Bass Booster: A preamp that selectively emphasizes lower fre-

SOUND REINFORCEMENT

By Bob Heil

Amplifier: An amplifier is a device which enables an input signal to control power from a source independent of the signal and thus capable of delivering an output which bears some relationship to, and is generally greater than, the input signal.

Attenuator: Attenuator is an adjustable passive network which reduces the power level of a signal without introducing appreciable distortion.

Audible Frequencies: Audible frequencies are sounds with wave frequencies which the average human ear can hear, ranging from 15 to 15,000 Hertz.

Bass Reflex Speaker Enclosure: A bass reflex speaker enclosure is a type of extension loudspeaker cabinet frequently available as an accessory item for tape recorders. Design employs a "port" or opening which greatly reinforces the bass, yet requires a relatively small cabinet.

Crossover Network: A crossover network is found in multiple component systems and is a circuit employing electrical filters of frequency that discriminates certain audio paths for routing highs, lows, and in some elaborate systems, middle frequencies to the particular speakers and components designed to handle them for reproduction.

Decibel: Decibel is abbreviated dB, it is a relative measure of sound intensity or volume. It expresses the ratio of one sound intensity to another. The dB is about the smallest change in sound volume that the human ear can detect. Also used to express logarithmically voltage and power ratios.

Distortion, Harmonic: Harmonic distortion is the nonlinear distortion of a system or transducer characterized by the appearance in the output of harmonics other than fundamental component when the input wave is sinusoidal.

TERMS: (CONTINUED)

A CONTINUING INDUSTRY GLOSSARY

RECORDING

the devices feeding it and exact matching can be disasterous in some situations.

At this point let's define low and high impedance. *Low Impedance:* is usually considered 600 Ohms or lower. *High Impedance:* is considered 10k ohms (10,000 Ohms) or greater. Today's circuitry is such that most input circuits are 10k or higher. A device with a high impedance is compatible (as far as impedance is concerned) with *almost* anything according to our previous statement that the input impedance can be 10 times greater than the source impedance feeding it. With an input impedance of 10k, any device with a source impedance of 1k (1,000 Ohms) or less (or 10k Ohms exactly) will feed it properly.

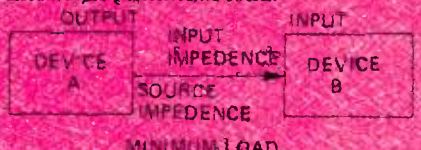
Most output impedances in today's gear are very low, usually 100 Ohms or less. By our ten times rule, a 100 Ohm source impedance should feed anything with an impedance of 1k Ohms or greater. It *will*, but not all specs regarding level and distortion may be met. The output's ICs (integrated circuits) in common use want to be fed into circuits having an input impedance of 10k Ohms or greater, if all specs are to be met.

What then, do we have to know in order to properly interface two devices and have no impedance mismatch:

1—Input impedance of unit "B".

2—Source impedance of unit "A".

3—What "A" wants to feed into for proper realization of specs. This is known as *minimum load.*



I would appreciate any comments or questions you would have in regards to this column. Just write me in care of Sound Arts Merchandising Journal.

ELECTRONIC MUSICAL INSTRUMENTS & ACCESSORIES

quency components of an input signal. Produces a "thicker," heavier tone quality.

Equalizer: An accessory or a section of an amplifier circuit which allows particular portions of the audio spectrum to be emphasized or de-emphasized relative to other frequencies. May be as simple as normal tone controls or as sophisticated as a tunable multi-band equalizer.

Parametric Equalizer: Refers to a particular type of equalizer in which other parametrics besides the gain (or loss) of a given frequency band can be varied. Typically, a parametric equalizer will allow the user to introduce one or more peaks or dips into the frequency response which are tunable as to their center frequency and the width of the peak or dip as well as the height, or amplitude, of the peak or dip.

Wah-Wah Pedal: A special type of filter or equalizer whose frequency range may be varied by moving a control pedal up and down. Wah-wahs are generally either high-pass or band-pass filter types, and have the effect of emphasizing the treble range, or thinning the sound, when the toe of the pedal is depressed and emphasizing the lower frequencies when the heel is depressed.

Envelope-Controlled Filter: Also referred to as an ENVELOPE FOLLOWER or as a TRIGGERED FILTER. These devices are basically wah-wah type filters whose active frequencies are controlled by an envelope follower rather than the position of a control pedal. The result is a wah-wah effect which responds automatically to the instantaneous signal level in terms of its operation frequency, i.e., the filter will sweep upward at the initial attack of a note and then will sweep downwards as the note decays and fades. This might also be called a "touch-controlled wah-wah."

SOUND REINFORCEMENT

Dynamic Microphone: A dynamic microphone is a high-quality electromagnetic-type pressure microphone which employs a moving coil in a magnetic field to convert sound pressure to electrical energy in a manner similar to that of an electric alternator or generator. Impedance and output are generally lower than those of the more common ceramic or crystal types. Low impedance permits the use of longer connection cables.

Equalization: Equalization is the selective amplification or attenuation of certain frequency intervals to compensate for amplitude variations in an audio system. Also refers to recognized industry standards for recording and reproducing characteristics, the proper use of which can assure uniform reproduction of prerecorded tapes and improvement of system signal to noise ratio.

Feedback: Feedback is the howling oscillation, or regeneration of sound caused by a system's microphonic pickup of the sound output from its own speakers. Negative electrical feedback in amplifier design is a singularly effective scheme used to improve stability and reduce distortion.

Frequency (also Tone): Frequency is the repetition rate of cyclic energy such as sound or alternating electrical current, expressed in Hertz (1 Hz=1 cycle per second).

Gain: Gain is the voltage ratio of the output level to the input level for a system or a component of a system. Usually in terms of dB.

Ground: A point in an electrical circuit used as the zero voltage reference and which is connected to the earth or a part of the circuit serving as the earth.

Hum (Power Supply): Interference from a power system characterized by the presence of undesired energy at power supply frequency or harmonic thereof.

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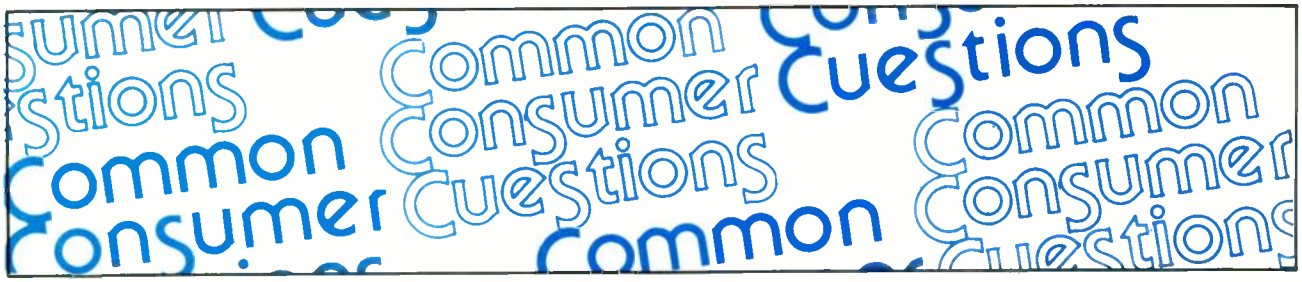

Each month Sound Arts *will take your common consumer questions and have them answered by experts in the field. Send your questions to* Sound Arts, *c/o Common Consumer Cuestions, 14 Vanderventer Ave., Port Washington, NY, 11050.*

What does pre and post fader mean?
In relation to a mixing console it's a common feature on better made desks. As an example, on a pre-fader signal on a monitor bus, the signal is taken, or derived, before the master volume. So if a sound man were running a pre-fader signal on the monitor and not on the main mix, and both were running, he could turn down the master volume on one of the channels and still hear the signal in the monitor. As another example, if it were a post-fader signal on that monitor and the same test were run by our soundman, you couldn't hear anything because the signal *there* is taken directly from the master and then realized. The volume from which that post-fader signal was getting its 'feed' has been turned down, so no signal comes through in that post-fader mode. The pre and post-fader features offer the consumer the ability to add a certain depth or texture to the overall sound. One can also utilize pre and post-fader EQ as well, just as pre and post-fader volume. The theory and method of reproduction and signal placement would be the same.

Doug Caraway
Don Wehr's Music City
San Francisco, Calif.

What does an echo return do on a mixing board?
Lets say we have four channels utilizing echo on a mixing console. We'll take those four channels and set them up on pre-fader echo on the echo buses and then route those signals into our echo unit. Now you still don't have any echo on that signal in the main system, you simply have an original signal going *into* the echo unit and nothing is coming out of that echo. You have to pick that echo back up. On some boards you'll have a separate circuit that is just specifically for returning that signal back to the board for reproduction. That is an echo return. Should a board not feature an echo return mode, such as a Yamaha, the consumer would have to use an input for that echo return signal. Basically, an echo return is an auxillary input.

Doug Caraway
Don Wehr's Music City
San Francisco, Calif.

Why does a musician need a monophonic synthesizer after he has bought a polyphonic synthesizer?
It would seem that if a consumer has a polyphonic synthesizer they wouldn't need a monophonic unit. Why have *two* synthesizers? Well the answer is quite obvious in that the polyphonic and monophonic synthesizers are designed to do different things. The best analogy that I can draw to illustrate that difference; it's like having a whole brass section in an orchestra stand up and take a solo or having a solo trumpeter stand up and take a solo. The sounds and textures and even musical structures are totally different. On a monophonic synthesizer a musician can take a single note solo run and come up with a totally different sound and texture than with a polyphonic unit, there are more subtle tone variations and colors you can get with a monophonic as opposed to the polyphonic. It's like doing a single note solo on a piano compared to taking a single note solo on a guitar. On the guitar you would have more control of the subtles of the tones and notes you were playing, such as bending and wiggling notes etc. You can bend notes on a polyphonic too, but your control is greater on a monophonic. A polyphonic is exactly what it says it is, it uses multiple notes to create its own subtles. Neither instrument is designed to replace the other and both have applications in a total keyboard instrument setup.

Dominic Milano
Contemporary Keyboard Magazine
Saratoga, Calif.

What is "pre-emphasis/de-emphasis" in recording?
Pre-emphases (in terms of tape recording) is the process of increasing high frequency content of signals going on to the tape. As a result, the tape signal is artificially bright. By adding an equivalent amount of de-emphases, or high frequency reduction on playback, the sound is returned to normal. In the process, any high frequency hiss present on the tape is reduced by an amount equivalent to the amount of de-emphasis.

There are three major applications of this particular technique: pre-emphases networks within the tape recorder itself compensate for high frequency losses that are a part of the recording process; outboard complementary pre-emphases/de-emphases networks can form a simple noise reduction system; and pre-emphases/de-emphases networks used in conjunction with companding noise reduction systems can reduce modulation noise and "breathing" effects.

Craig Anderton
Electronics Author/Expert
Clayton, Calif.

What is the difference between analog and digital delay lines?
The difference lies in the technology employed to accomplish essentially the same feat. Analog devices work directly on the signal and are relatively inexpensive. Commuter-like digital devices convert the signal to a code which is then delayed and decoded at the output. There is less signal degradation in the digital devices, especially with long delay, but digital devices cost more to implement at the present time. However, the differences between the two technologies are begin-

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ning to blur as the costs of digital devices decline and the quality of the analog units improve.

Craig Anderton
Electronic Author/Expert
Clayton, Calif.

What is the difference between compression sustain and fuzz sustain?
Compression reduces the dynamic range of a signal without introducing distortion, in theory. Fuzz is the musical instrument effect which happens to reduce the dynamic range, but its main function is to introduce distortion and therefore the harmonic content of the signal. In that respect, fuzz is a dirty effect and compression is a clean effect.

Craig Anderton
Electronics Author/Expert
Clayton, Calif.

What are the advantages of having an 'EQ' type guitar and how did the design and applications come about?

First off the idea of circuitry on a guitar isn't particularly new. The earliest efforts that I can recall that were mass marketed were the old Vox guitars that had a built-in wah-wah and a built-in fuzz tone. Hofner had a guitar back then that had a built-in fuzz and Gibson had the Fuzz Bass. These instruments passed from favor pretty quickly because of the 'death' of the fuzz tone back then. When the popularity of the fuzz died, these guitars died right along with it. Most people think of their investment in an electric guitar as something they're going to be getting some *use* out of for a number of years, rather than something they're going to use during a fad period and then dispose of afterwards. A pedal that will cost the consumer $80 can be tossed aside after its 'value' has worn off and the customer hasn't really lost that much money. But in those early models with the built-in fuzzes and such, you were pretty much locked into that instrument and effect due to your investment. It was only logical that if a consumer went out and forked over several hundred dollars for that Vox axe featuring the built-in wah-wah and fuzz tone, he would certainly be hesitant to chuck the instrument or go out and sell and lose a couple of hundred on his investment! So if you got tired of fuzz—"tough!" I began working on this idea of inner-guitar circuitry about two

(continued on page 49)

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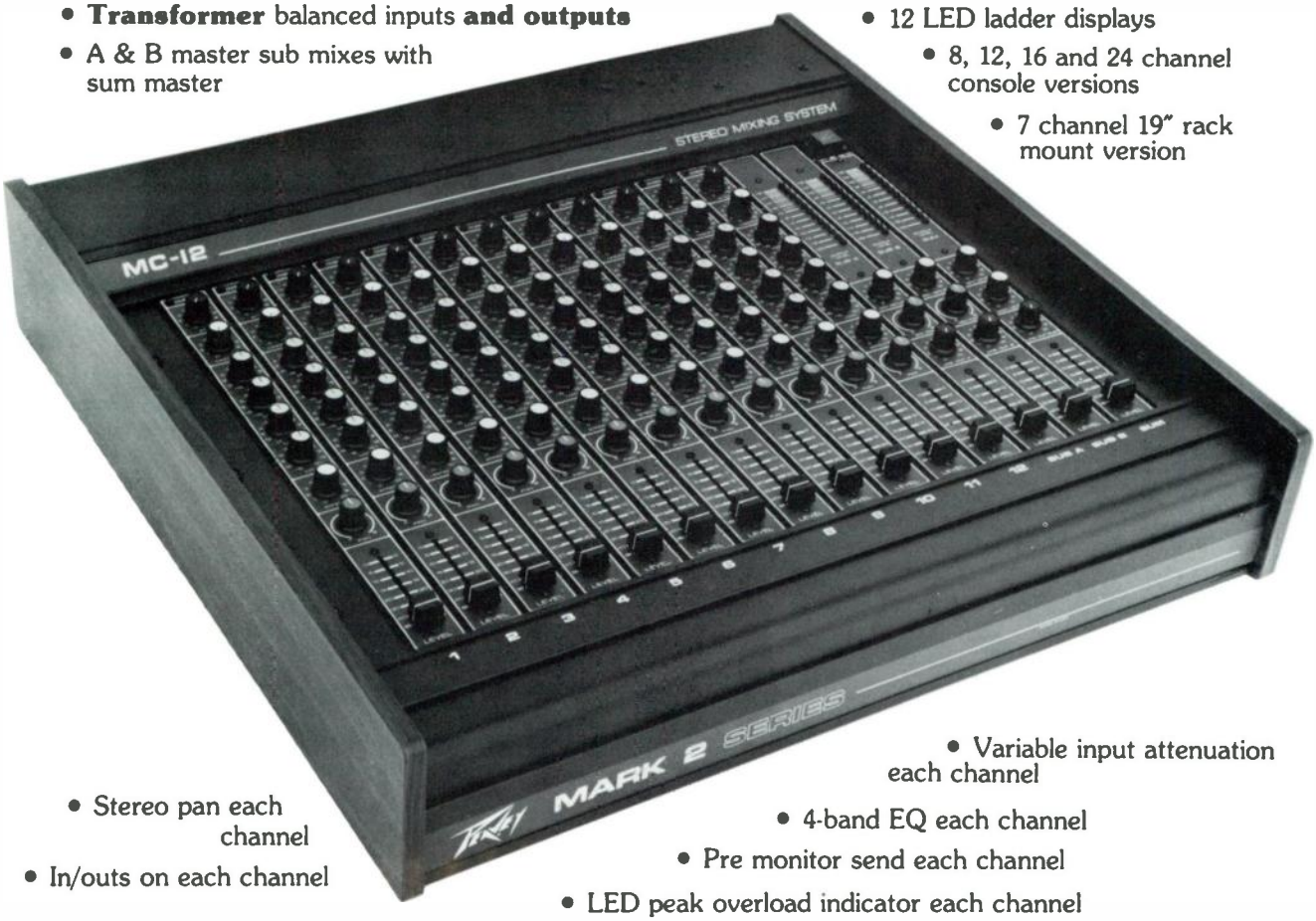

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TROUBLESHOOTERS' BU

1

By Chris Foreman/Altec Sound Products

"Troubleshooter's Bulletin" is designed to assist the dealer with various trouble-shooting tips that may be applied on a dealer's level. Any contributions to "Troubleshooter's Bulletin" should be sent to Sound Arts, 14 Vanderventer Ave, Port Washington, NY 11050, c/o "Troubleshooter's Bulletin".

COMMON SYSTEM PR
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shielded, twisted-pair cable whenever possible (in most cases, unbalanced and unshielded speaker feeds are OK). b) Avoid ground loops (a ground loop occurs whenever two pieces of equipment are connected in such a way that there are two or more ground connections between them, such as their AC grounds and a shielded audio cable). c) Whenever possible, ground the mixer or preamplifier to a cold water pipe or other

"earth" ground
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the Audio Cyclo
published by H.
gineering by Dor
published by Sam
Techniques in El
published by Wil

LETIN

3

ed as some sort of black magic. Actually it's not that hard to ground (and shield) a system properly. There are two goals in grounding and shielding a sound system. The first, and most important, is electrical safety; the second is reduction or elimination of EMI (electro-magnetic interference of all kinds). There are several "rules" that you can follow to help achieve these goals. a) Use balanced lines, and

2

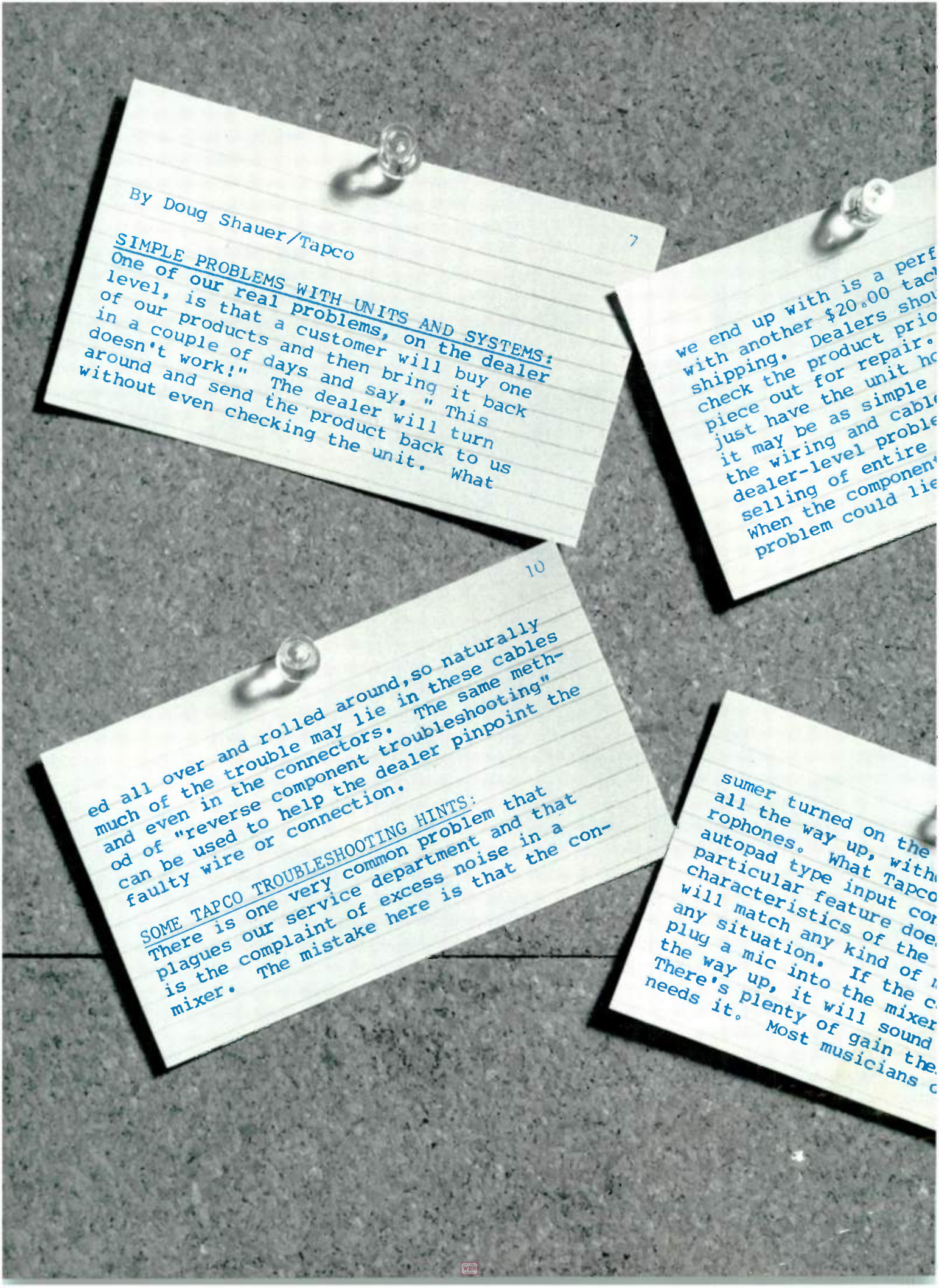
MS: As often as not, your repair shop t is distorting", blown", or "These high end", the roblem that can- a faulty compo- os in the area and shield- s often regard-

6

FAULTY CABLE: This is such a common occurance that about all that needs to be said is that a versatile set of patch cables, adapters, connectors, and soldering tools will solve a significant number of system problems. Whether it's a rock and roll band or a high school gymnasium system, you will find "home-made" cables with shorts, opens, cold solder joints, misplaced wires, etc.,etc.

5

This grounds the chassis s (through their shielded safety. For more infor- ding and shielding, see ia by Howard Tremaine, Sams, Sound System En- nd Carolyn Davis, also and Noise Reduction ronic Systems by Ott,



7

By Doug Shauer/Tapco

SIMPLE PROBLEMS WITH UNITS AND SYSTEMS:
One of our real problems, on the dealer level, is that a customer will buy one of our products and then bring it back in a couple of days and say, "This doesn't work!" The dealer will turn around and send the product back to us without even checking the unit. What

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ed all over and rolled around, so naturally much of the trouble may lie in these cables and even in the connectors. The same method of "reverse component troubleshooting" can be used to help the dealer pinpoint the faulty wire or connection.

SOME TAPCO TROUBLESHOOTING HINTS:
There is one very common problem that plagues our service department and that is the complaint of excess noise in a mixer. The mistake here is that the con-

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tem's units. What the dealer must do is check all the individual pieces of gear, from the speakers backwards, to find which component is faulty. In this test, start at the speakers, and work all the way to the microphones. Using this method, each area of possible trouble will be checked out in the 'signal chain'. Surprisingly, 80% to 90% of most minor system problems lie in the cables. The customer will exclaim, "This just doesn't work!" Well, cables have a rough existance, being walk-

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are used to turning the volume control on a mixer to about 7. With the Tapco, featuring the extra gain at the preamp, the volume would be set at about 3. One other specific Tapco problem is in the effects loop in some of our mixers. This particular effects area is not made to be used with guitar level boxes, it's designed to be used with line level boxes. In other words, effects like wah-wah pedals and phase shifters will not work with the Tapco effects loop on our mixers. The only way a musician could use those devices through our effects loop is

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if the guitar effects were pro-level line level designed equipment. It's a simple case if misuse that causes that particular noisey signal problem. Anytime a dealer has a problem with any piece of equipment he should first call whomever manufactured it and ask about the trouble. That phone call could save time and many unnecessary headaches. There are many situations where a manufacturer's service rep would know the problem and suggest the proper avenues of troubleshooting.

An Introduction To

In the past few years, technological advancement in the electronic industry has pummeled the music and sound reinforcement professions with an ever increasing complexity in equipment design. Generally, "state of the art" apparatus lends itself to modularity, enabling today's audio consumer to build a more sophisticated sound package than the "all in one" units used in previous years. One obvious side effect of this upgrading, which necessity is strongly pushing to the foreground is the requirement that individuals in the industry learn about diverse cabling and connectors—a key to success or failure of any chosen system. It's estimated that nearly 90% of the "inability to perform" problems of a sound system lies in the interconnecting modes of that system. Thus, poor customer service and representation.

A systematic approach should be used when selecting the proper cable for any given application. Improper choices can result in failure or eventual breakdown of the sound system and ultimately frustration in the user/consumer. Consideration should be given to the differences between permanent installations and portable systems that will be torn down and set up numerous times. Materials used in construction will vary and directly effect costs. The number of conductors, types of shielding, if any, and kinds of insulation are determinants when planning a cable's usage.

So in order to approach the subject of cables and connectors properly, we should first understand what it is, and how it works.

Any cable will utilize a minimum of one center conductor. Copper is generally the material chosen for this purpose because of its electrical properties and low costs in comparison to other conductive metals.

A signal flowing through a cable is made up of two parts; a positive, or hot; and a negative, or return. In an *unbalanced cable* the signal is carried through the single conductor while the negative is transmitted through the shield, composed of stranded copper usually woven in a braided fashion around the center conductor, or in a spiral wrap around the center core. The shield acts as an antenna and thus the unbalanced or high impedance cable is subject to unwanted interference, caused by close proximity to AC, when using lengths in excess of 25 feet. Because of the cost and weight factor, this cable is primarily used for instruments and connections for less expensive microphones. Other common consumer applications of unbalanced cable include using it as the cable that interfaces different pieces of equipment between amplifiers and preamplifiers. Unbalanced cables are also used in connecting guitars to signal processing equipment, such as, wah-wah pedals, phasers, and various distortion units.

Given the proper amount of length, this type of cable is perfectly suitable, though the more wire in its length, the more apt it is to pick up unwanted-outside signals. Termination of high impedance cables is usually with a standard ¼" mono phone jack or an RCA type plug, used mostly in home stereo applications.

Our point of view: You can't know too much about a good thing. One of a series of factual discussions.

audio-talk from audio-technica®

MICROPHONES: Opening a market.

These days, almost $20 out of every $100 spent in your store is paid for tape equipment. Which makes tape a major part of your current marketing success. And since most of the sales are of tape *recorders*, rather than just playback units, these sales can lead to another opportunity to expand sales with aggressive marketing.

CREATE AN ACTIVE MARKET

Introduce your customers to "live" recording. Get them *fully* involved in the hobby, far beyond the "just listening" stage of most hi-fi buyers. In fact, live recording can be a full-fledged activity in itself, or an adjunct to other customer pastimes such as movie or slide photography, music, or other interests where a sound record of events is valuable. Once involved in live tape, these customers are much more *active*, becoming prospects for a host of new equipment. More microphones, of course. And blank tape, tape splicers and accessories, mike stands, equalizers, mixers, noise reduction systems, and on and on.

START WITH MICROPHONES

And it all can start with the sale of a pair of good microphones. But if this sale is not made while interest in the new tape recorder is still high, the opportunity can be lost forever. With our introduction of microphones to the high fidelity market, we intend to make that sale easier than ever before. First, we've created a short —yet remarkably complete— line of excellent microphones well suited to consumer use. The line is organized to make it easy for the consumer to understand.

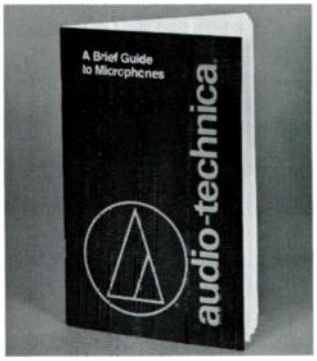
HELP IS HERE

For instance, we've color-coded both literature and packaging, to distinguish dynamic and electret condenser models. We've used simple graphic symbols to label omnidirectional and cardioid versions. And we've created a guide to microphones that is written to appeal to laymen, covering the basics of microphone design, choice, and operation. A handsome microphone display is another essential element of the selling package. And additional sales and educational materials are in the works.

THE 8 BASIC TERMS

Until now, you've had very little help in selling microphones and accessories. Explanations of microphones and their use have been either too simple to be useful, or too long and complex to translate into effective sales tools. But Audio-Technica is changing all that. We've begun by explaining, in non-technical language, the *8 basic terms* you need to understand to become a microphone expert on the salesroom floor. Knowledge of these 8 simple concepts will allow you to sell microphones just as you sell any other high fidelity component.

We'll not get into "how to sell" in great depth... chances are good that your present hi-fi selling techniques will work just fine in this new area. But we do want to point out some of the basic appeals you can use when discussing microphones and live recording with a prospect.



YOUR CUSTOMERS BENEFIT

Microphones are the key to unlocking much of the potential in tape recording equipment... the key to getting *full value* from this major investment. Just copying from other tapes, discs, or FM doesn't utilize many of the features of the equipment. And live recording is the *most creative* aspect of hi-fi. It's an opportunity to display judgment, good taste, and develop creative abilities. This should appeal to prospects who seek an *active* involvement in music.

To some, live recording can be a *self-supporting* activity. Friends and neighbors will often pay for tapes of once-in-a-lifetime events (marriages, graduation ceremonies, concerts, recitals, theatricals, and other similar moments in their lives). And the live tapes your customer makes are *exclusive*, unique recordings. No one else can play anything like them. Recording "live" can also be great *fun to do*. It can be a way to *participate in music*, even when you can't carry a tune. And there are gratifying personal rewards of *satisfaction* and pleasure when a recording comes out just "right". The same rewards an amateur photographer feels when an important photo pleases him and his friends, or when he solves a challenging problem.

EXPAND WITH US

Selling good microphones along with a modern tape recorder, permits the prospect to expand his horizons and increase his level of activity. And it opens up new avenues for sales for a host of high fidelity products. In our next talk, we'll begin the explanation of the eight basic terms you'll need to know to sell microphones effectively. Or, if you can't wait, ask your Audio-Technica rep for a copy of our Brief Guide to Microphones. We think you'll find it interesting and helpful.

Jon R. Kelly
Vice President & General Manager

AUDIO-TECHNICA U.S., INC.
Dept. 28SA-30, 33 Shiawassee Avenue
Fairlawn, Ohio 44313

Available in Canada from Superior Electronics, Inc.

(Circle No. 37 on Reader Inquiry Card)

A low impedance cable is normally a *balanced line* which consists of two identical center conductors and a shield. The positive part of the signal is carried through the first conductor while the negative is transmitted through the second. The shield acts as an earth ground eliminating any interference regardless of length. Balanced lines are ideally suited to professional stage use and are most often utilized with low impedance microphones. Additional applications of balanced cable include use with mixing consoles that use a balanced line output and with components that accept balanced line inputs. The balanced line, when used on the input and output modes, allows the consumer to handle a signal, such as at a mixing console, from greater distances without the fear of signal loss or pickup of unwanted outside signals and interference. Termination of low impedance, or balanced, cable is normally with a standard three-pin audio connector that allows for three separate and isolated connections.

distance	impedance		
	4Ω	8Ω	16Ω
0'- 50'	14 AWG	16 AWG	18 AWG
51'-100'	12 AWG	14 AWG	16 AWG
101'-200'	10 AWG	12 AWG	14 AWG

DIAGRAM 1

The gauge, or overall diameter, of a conductor, partially determines the amount of flow or resistance the cable will have. For high and low impedance applications, a center conductor(s) between 20 and 24 gauge will generally suffice. A conductor's gauge becomes critically important when a cable is being used to link an amplifier output to a speaker enclosure. In varying circumstances and under certain conditions, resistance in a speaker cable line, caused by improper gauge selection, may cause amplifier failure. This failure, under these circumstances, is caused by the amplifier trying to move a large amount of energy through too small a cable. The energy that can not pass through the cable dissipates back into the amplifier in the form of *excess* heat. It's this excess heat, or thermal overload, that can fry even the best amplifier. (For proper gauge selection, see Diagram #1.)

The two basic types of conductor construction are solid and stranded. In permanent installations a solid construction can provide a lower cost cable meeting all requirements with excellent results. However, it would be highly impractical for use in repeated setup and tear down situations. Solid conductors lack the limpness and flexability of a stranded type and constant use would lead to quick breakdown. Dealers should take note that roughly 75% of all equipment that is sold to the amateur musician or local band is going to be used as part of a portable/moveable system. But if the gear is to be a part of a home studio or a commercial/permanent PA system the dealer can look again at solid conductor cable to give maximum efficiency at a smaller cost.

Some cable applications have no requirement for shielding. This is basically true for use in amplifier output to speaker input, and AC power cordages. However, an unshielded cable used at the input of audio am-

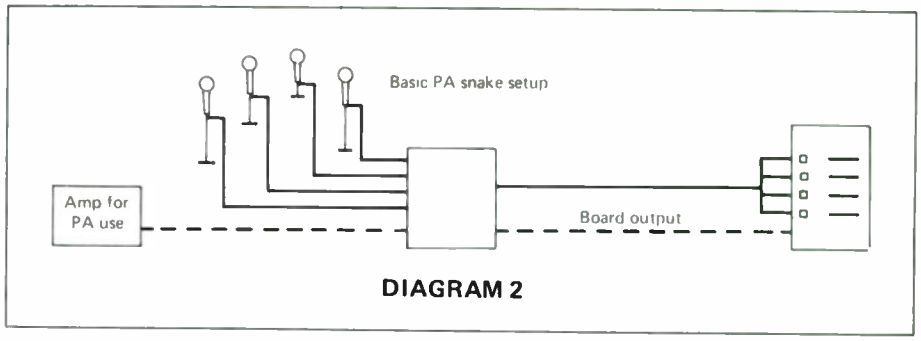
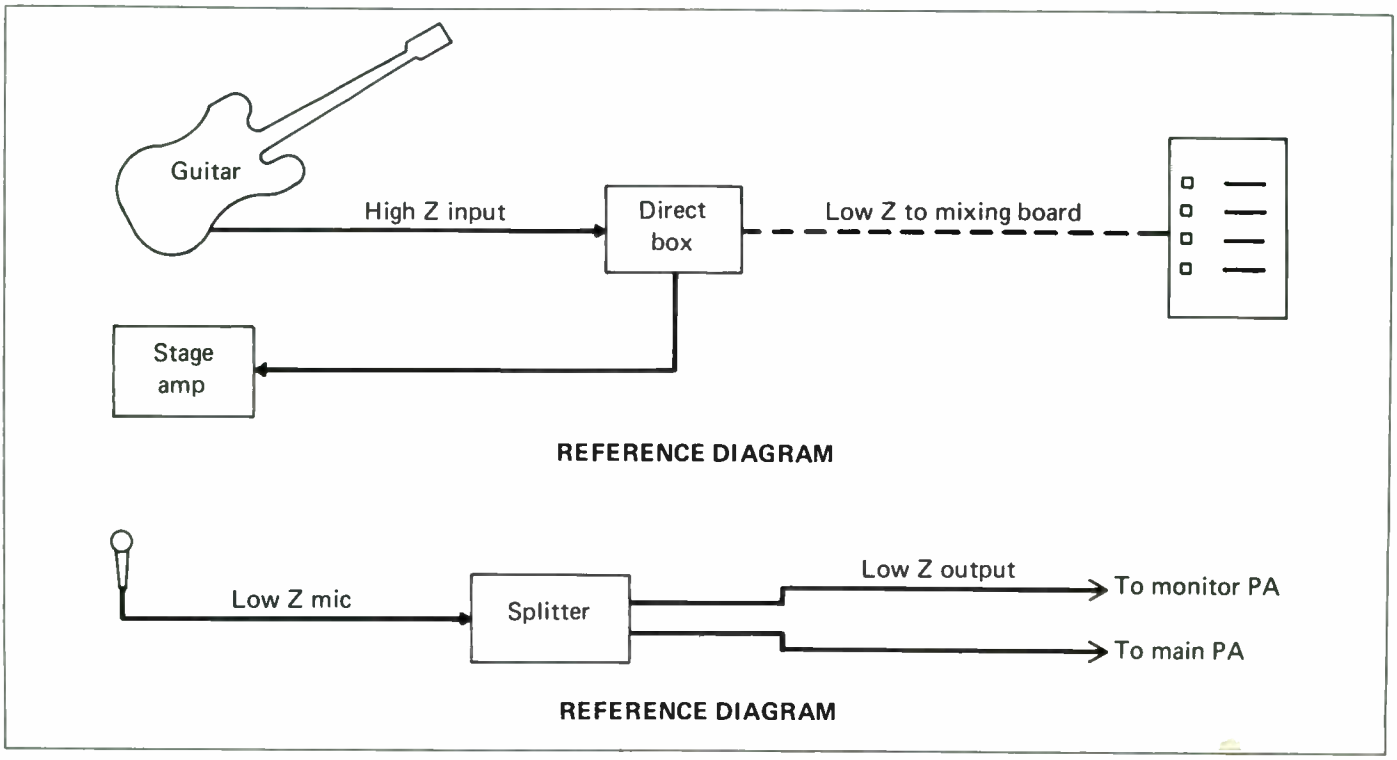


DIAGRAM 2



REFERENCE DIAGRAM

REFERENCE DIAGRAM

RP Avatar.
Stolen from the gods of the keyboard. Bestowed on the disciples of the guitar.

Arp introduces the first full capacity, fully variable guitar synthesizer. Send us a dollar and we'll send you a demonstration record and brochure. Or hear it at your nearest Arp dealer. Say one Hosanna and three hallelujahs.

ARP

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CIRCLE 27 ON READER SERVICE CARD

plifiers, preamplifiers, mixing consoles, and other miscellaneous audio processors will result in unwanted noise and interference entering into the system.

Spiral copper, or braided copper, and aluminum foil with a mylar wrap are the three basic types of shielding. Since the foil shielding tends to break down with constant movement and use, its practicality is for the most part limited to permanent installations. Technically, braided shielding gives better coverage than a spiral type. However, the ease of workability, and small difference in coverage makes the spiral shielding an even trade off.

Cables must be insulated by various jackets of non-conductive materials. The insulation prevents interference and/or failure in sound reproduction equipment caused by conductors and shielding shorting out by rubbing against each other. Insulation is also used because of the oxidizing of copper and other metal when exposed to the air and the resulting loss of electrical conductivity. Because of its flexability and ease in handling, natural rubber, neoprenes, and hypolons are usually selected as cable insulation materials in portable systems. These materials do not generally have memory and are less apt to kink. In cold weather conditions they resist becoming rigid.

Plastics and poly vinyl chlorides are insulating materials commonly used and associated with permanent installations. They are lower in cost than natural or "live" rubber and will meet the insulation requirements. If these materials are used in portable applications, the user should be aware that the cable will stiffen in cold temperatures, has memory, retains kinks, and has an overall shorter lifespan.

Greater demands are being made today for the control over the musician's sound on stage. A proper balance requires a mixing board to be placed in a central location in respect to the stage or performing area. The PA snake (see Diagram #2) has come into wide use for this reason. This piece of equipment has several functions. In the snake's first application, it carries a number of microphone and instrument lines from a stage to a mixing console. Depending on the number of inputs on the board, six to 27 balanced lines may be grouped together in one main PA snake cable. The length of the main cable is dependent on the distance of the mixing console from the stage. A PA snake can secondly carry the output control back to the stage, supplying inputs to the various power amps and crossover units necessary for dividing the signal's frequencies for reproduction purposes. The third function provides for a private-isolated communication line used for sending directives between the stage to the mixing console.

Because of the vast amount of materials needed for the construction of PA snake cabling, aluminum vinyl mylar shielding and synthetic center cores, such as the various plastics, are used as insulators. The mylar shielding prevents cross talk, one mic line 'bleeding' into another mic line, and ground loops, two pieces of equipment not sharing a common ground which causes an annoying buzz and hum, and has been specifically chosen for the cost factors. *Use of cable reels to wind up and unroll the main cable is recommended.* Due to the type of materials used in cable construction and the resulting

When Jerry Garcia, Bob Weir, Steve Miller, Billy Cobham and George Benson all use the AD 230 Delay...

You know it's good!

AD 230

Continuously variable delay up to 600 milliseconds

4 bandwidth selections up to 20 KHz

Built-in flanger with separate controls

Studio quality signal to noise ratio

LED ladder-type VU meters for input and delay levels

High/low impedence with either ¼" or 3-pin connectors

19" rack mount cabinet

And you can bet that these experienced electronic pioneers know how to judge a delay line. The Ibanez Analog Delay with Multi-Flanger does what no other analog device of its kind has been able to do – beat the digital delays at their own game *and* at a price that almost any band can afford. It's unbelievably quiet, features selective bandwidth, and has the most versatile range of controls of any comparable device.

You can get double-tracking, slapback echo, long delay, flanging, automatic vibrato, reverb, and most any other time delay effect possible. Ask about it at your Ibanez dealer today.

AD 220

Continuously variable delay up to 500 milliseconds

3 bandwidth selections up to 10KHz

Built-in Flanger

Extremely low noise circuitry

Input sensitivity and output level controls

19" rack mount cabinet

Ibanez

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CIRCLE 32 ON READER SERVICE CARD

memory, reels will store the wire in such a way as to prevent kinks and twists in the line.

Though not a cable, a *direct box* allows for the control of individual instrument and microphone levels *at* the mixing console for an overall sound mix. Proper selection will transform a high impedance signal (unbalanced) to a low impedance signal (balanced) and at the same time maintain the necessary frequency response going into the main system. The direct box should have a provision for a high impedance return signal so that a musician on stage can still operate any stage instrument function without affecting the power levels going to the mixing console. What this direct box usage gives the outfront sound man is greater individual control of each mixable sound component. This method may be used as opposed to using mics on the amps, horns, drums, etc., for the mix and possibly experiencing leakage of signals from one mic to the others.

With the increased awareness of sound control over the past few years, the need for a monitor mix and a main mix has evolved. The *main mix* emphasizes the overall ground sound while the *monitor mix* emphasizes individual instruments and vocals; enabling the performers to take cues and hear themselves while on stage. A mixing board is usually placed on or behind the stage for the monitor mix and requires the use of a *splitter device*. This type of device will take an original signal from a microphone and/or instrument and will split it into two identical isolated output signals. One is sent to the mixing console out in front of the stage and the other is transmitted into the stage monitor mixing console. A splitter device provides for no impedance fluctuations or level losses to either mixing console, so each board would have isolated and individual control over each of their sound mixes.

Although only a few basic principles have been touched upon, it is hoped the information presented can give some insight into the complexities evolved in the music and sound reinforcement industries. These points have been presented as a take off point for any novice who feels the need to better understand and keep up with today's changing audio electronics.

If all we did was build great sound systems, we'd be in trouble.

Fortunately, at Altec Lansing we manage to do a lot more.

Because even the highest quality products can't sell themselves, we have to be good businessmen too. That's where you come in. We're looking for quality-conscious dealers who are interested in good profit margins and product turnover. We've found that superb products coupled with sharp business sense is a successful combination. We know. We've been doing business with music retailers since electronic instruments were invented. Successfully.

Incidentally, we do build great sound systems.

At Altec Lansing, we manufacture a full line of top quality, portable sound reinforcement speaker systems, each designed to meet the tough and demanding requirements of professional and semi-pro musicians. Roadworthy. Reliable. Ask the pros. Ask our competitors. They'll tell you Altec Lansing is a name to be respected.

What can Altec Lansing offer you? The best. National advertising support, sales promotion, excellent delivery, a complete dealer financing program, a new sales organization sensitive to your needs, top quality products, and a reputation as good as our clean, clear sound. We won't brag. We'll just let our products and programs speak for themselves.

If you're interested in becoming an Altec Lansing dealer and are not afraid of making a good profit selling top quality sound equipment, write to Jim Johnston, Vice President-Consumer Sales. Share the reputation that has made Altec Lansing number one among professionals.

Altec Lansing International, 1515 South Manchester Avenue, Anaheim, Calif. 92803

ALTEC
LANSING

CIRCLE 22 ON READER SERVICE CARD

The SOUND SH

A new, moderately priced, professional quality microphone, featuring a smooth, fat frequency response that makes it ideal for speech, vocal and instrumental pickup has been announced by **Shure Brothers Inc.**, Evanston, Illinois.

Called the SM59, the new microphone is a dynamic type with a wide 50-15,000 Hz frequency response that, according to the manufacturer, provides clean, natural reproduction without a presence peak in the higher frequency range. This feature, coupled with its anti-feedback, cardioid pickup pattern makes the SM59 perfect for use in studios, live performance, churches, and meeting rooms.

CIRCLE 22 ON READER SERVICE CARD

Another major feature of the SM59 is its patented mechano-pneumatic shock mount system that dramatically reduces mechanical noise and pickup of floor and desk stand vibrations. A special "pop" filter also protects against explosive breath sounds.

In addition to its performance characteristics, the SM59 has a slim, sleek appearance. It weighs only 215 grams (7.6 oz.), is just 197.3 mm ($7\frac{25}{32}$ in.) long, and is built to withstand rough use both indoors and out. The announced price is $132.00.

CIRCLE 23 ON READER SERVICE CARD

Wasatch Music Systems announces the Flanger 900-A , a professional audio delay device which can produce effects such as positive and negative flanging, doppler, vibrato and chorus, pitch shifting, double tracking, Leslie speaker simulation, and 'cardboard tube' echo. Delay times of more than 20ms will create flanging effects over six octaves.

The 900-A unit is rack mountable (19") and is designed for rugged use by shock mounting all internal components. The unit is powered by a dual IC regulated power supply which is built in; it requires 117 VAC 60Hz. The 900-A's rear panel includes input/ output jacks (¼" standard, BAL XLR's optional), an extra remote programming input and output for driving additional units in parallel, a power switch and detachable power cord. Input impedance in 20K ohms, while the output measures 600 ohms. The announced price is $350.00.

CIRCLE 24 ON READER SERVICE CARD

A new 12" bass line driver from **ATC/Forsythe Audio Systems** is designed for high SPL sound reproduction in live performance, studio bass, organ, guitar, and monitoring applications. The PA-75 series of bass drivers, for which there are four, uses the same six-spoke cast steel spider and magnetic structure but each varies in cone characteristics and surround material to optimize the design for a particular application. For example, the studio bass version uses an extremely long-throw voice coil and butyl rubber surround, and achieves free air cone resonance at 18Hz. The wide frequency response version, by contrast, uses a standard voice coil and linen surround and specifies cone resonance at 65 Hz. All PA-75 drivers are rated for power handling capacity of 150 watts continuous sine wave power. Available voice coil impedances are 8 and 16 ohms.

CIRCLE 25 ON READER SERVICE CARD

OPPE

SEND ALL NEW PRODUCT INFO. TO SOUND ARTS.
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From **Guild** comes the new S-60 solid body electric guitar. The S-60 is available with a single Guild hummbucker while the S-60D is the same instrument, but equipped with two DiMarzio SDS-1 pickups. With both versions of the Guild S-60, the player gets the same new shape, wide frets, bridge, tailpiece, and quality finish as on the Guild S-300; including a two full octave curved rosewood fingerboard. The S-60 is available in six different finishes, including sunburst, cherry, black, walnut, natural, and white.

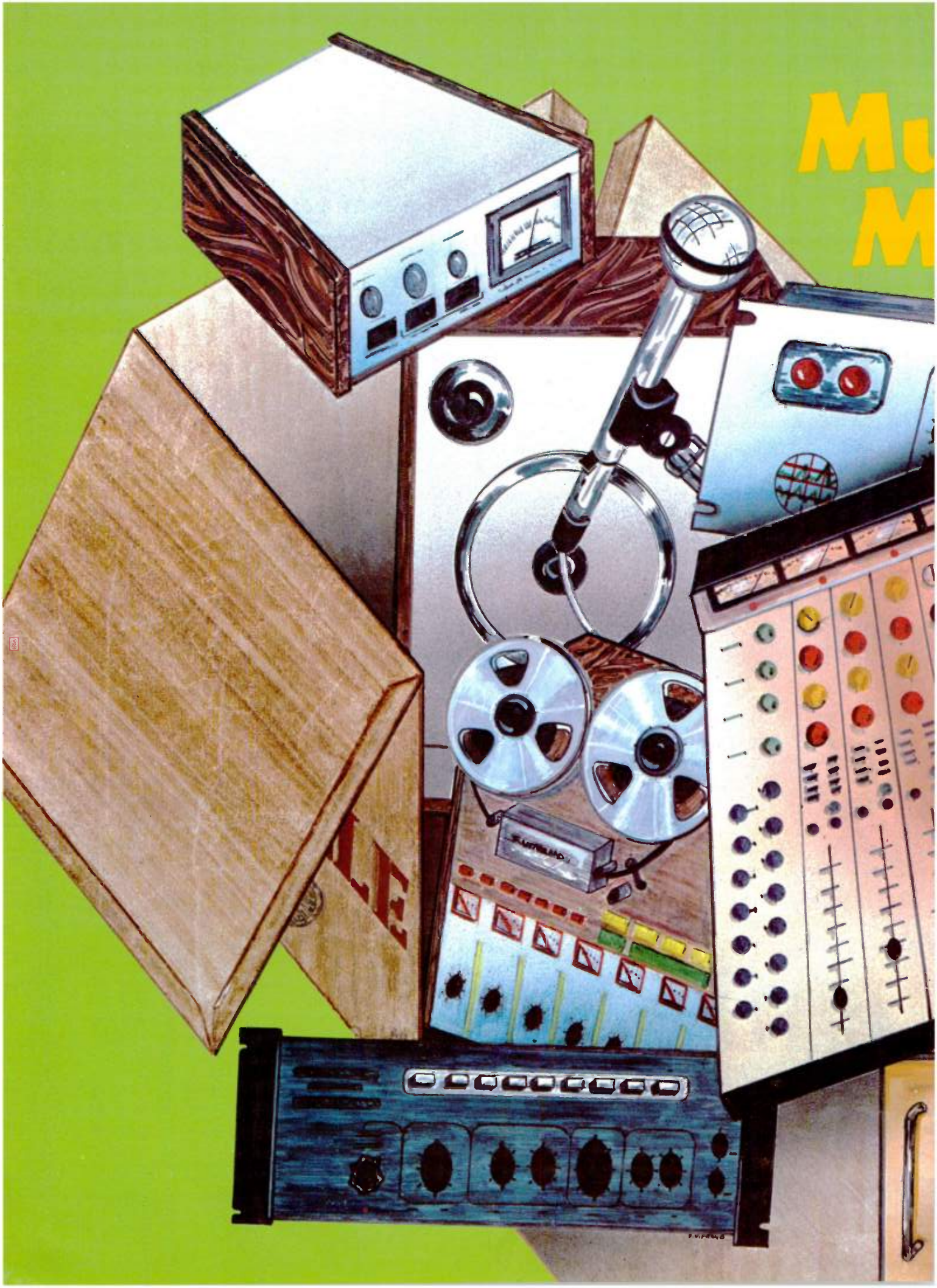
CIRCLE 26 ON READER SERVICE CARD

EMS, Ltd., manufacturers of the Synthi line of music synthesizers, has recently introduced a compact version of their sophisticated Vocoder speech synthesizer, introduced in 1976. The new unit, The Vocoder-2000, analyzes input speech sounds; then in a separate 16-channel filterbank, it synthesizes a new sound by treating an excitation source on the basis of the input filter information. The Vocoder-2000 contains a noise source and a 0 to 1 kHz pulse-wave oscillator or excitation, but it also accepts any external sound as its source or excitation. According to the maker, the result of the process is a well formed and intelligible reconstruction of speech bearing the timbre of the excitation. Speech functions —voltage-controlled slew, "freeze," pause stuffing, and pedal inputs—are also provided. A demo cassette of the Vocoder-2000 is available at $5.00. Tentative price of the unit is $4,000.

CIRCLE 27 ON READER SERVICE CARD

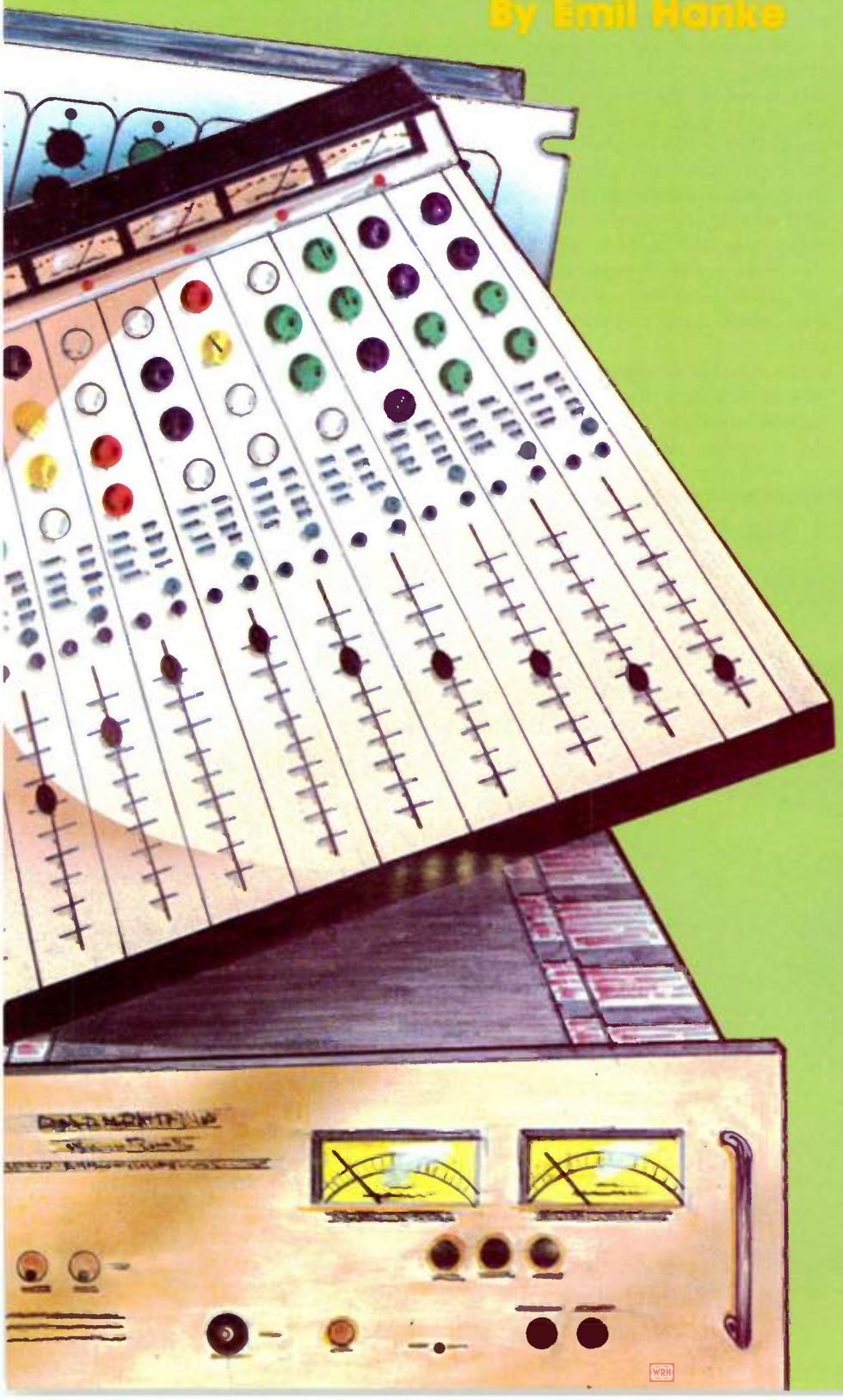
In the manufacturer's words, **Analog/ Digital Associates** has abandoned the classic phase shifter design and developed the latest in phase shifter technology, incorporating patented phase shift stages and a sweep modulation scheme to achieve the ultimate in phase shifting. A/DA's new Final Phase features the exclusive fully adjustable 'sweep modulation' which has freed the musician from the limitations of monotonous back and forth sweep. Asymmetrical sweep patterns, multiple phaser effects, modulated sweep, syncopated beats, and many other effects are easily obtained. Also highlighted on Final Phase are continuously variable range and intensity controls which will produce effects as subtle as rotating speakers, to phasing so intense it resembles flanging. The overdrive foot-switch introduces distortion ranging from a thunderous jet-phase lead to that "smooth" tube amp harmonic distortion that may either enhance phasing or be used by itself as a separate effect. The Final Phase is synthesizer compatable and may be triggered, swepted, or modulated externally from 0 to +5 volt control voltage. An optional A/DA Control Pedal may be used to sweep the Final Phase to obtain wah-phase effects that makes the ordinary wah-wah unit sound normal. This unit has a low noise FET input stage that will not load down even the most sensitive of guitar pickups, resulting in clear, undamped high frequency response. Very low current consumption, 3 milliamps, guarantees long battery life, or use the optional AC/DC converter. The Final Phase is housed in a rugged sand cast aluminum case with recessed knobs to insure dependability. This effect unit comes with two 9-volt batteries and has a one year warranty. Listed price for the Final Phase is $139.95.

CIRCLE 28 ON READER SERVICE CARD



lti-Selling ulti-Track

By Emil Hanke



I have spent the past five years selling recording equipment. My forte is packaging systems. The first three years were spent with Studio Supply Company, Nashville, TN. The last two years with Nashville Studio Systems packaging 2, 4, 8 and 16 track systems.

To understand multitrack recording, you must know about its evolution. Before the multitrack there was a single track recorder known as Monophonic. A recording session recorded with a Mono machine was very difficult for everyone involved. The recording engineer and the musicians had only a few passes to get the song on tape. All the musicians and the vocalist had to be assembled in the studio at one time. Each usually had their own microphone. The recording engineer had to set all his sound levels, equalization and echo levels as the group rehearsed. Everything had to be just right before the engineer pressed the record button. Should a mistake occur by anyone, the recorder had to be stopped and the whole group had to go back to the beginning and start all over again. As you can see, it placed a lot of pressure on the vocalist, musicians and engineer.

The multitrack recorder was a welcome invention. Legendary guitarist Les Paul was the inventor of the multitrack recorder. He needed to be able to re-record over the guitar part he had just recorded, without losing the first part. A lot of determination, knowledge, patience and experimentation and finally Les Paul had Ampex build his multitrack recorder.

The starting point of the system is the multitrack recorder. This establishes the number of tracks the client wants, and enables you to know what type of mixing console to place in the recording chain. A multitrack recorder is any tape recorder from 2 tracks up to the now present 40 track machine. Normally you will be selling 4, 8 or 16 track recorders for your consumers' multitrack requirements. There are, however, numerous customers whose needs are limited to 2 tracks.

In selling a multitrack machine, first find out from your customer what specifically he is going to use the equipment for. If the consumer is using the unit for demo purposes, as a songwriter, he could usually use a 4 or 8 track. All they want to do is lay

down the basic melody and elaborate a little bit. If the consumer is going to cut "jingles," now-a-days he usually needs a ½"-8 track machine, and that's bare minimum. If he is going to get very elaborate and he's really getting fairly good dollars, then he'd need at least a 1"-8 track to a 1"-16 track or a ½"-16 track.

If you will divide the recording studio equipment into four categories it will make the package easier to explain. The four are (1) Major Equipment, (2) Periphial and/or signal processing equipment, (3) Accessories, (4) Interfacing.

Major Equipment

The major equipment purchase is the largest investment the client will be required to make. This purchase is the most important to the financial institutions. The major equipment includes the multitrack recorders, mixing console, monitoring system, reverberation device (echo) and noise reduction.

Normally you must have 2 recorders in the studio. The multitrack recorder has the greater number of tracks such as 4, 8, 16, 24, 32 and 40 tracks. This recorder is the *real* workhorse. The second recorder is the two track or in some cases mono recorder. This recorder is the machine that everything on the multitrack is mixed down to.

There is a third recorder that most studio's have. It's called the copy machine, which is normally a second 2 track recorder. It's usually a less expensive machine, but nevertheless a much needed recorder. Remember, every studio must make copies and safeties. This machine may also be used for slap-back type echo.

The second major equipment purchase is the mixing console. The console is where the mixing, equalization, echo, and stereo panning are done. This is the blender that is the *heart* and the major piece of equipment used in recording. The number of tracks on the multitrack recorder determines the number of outputs the mixer needs to have. For example, if you have an 8 track recorder you need a mixer capable of 8 outputs.

The number of inputs of the console denotes how many microphones may be mixed or blended at one time. An 8 output mixer should have a minimum of 8 inputs. Ideally you should always have a greater number of inputs than outputs.

The monitoring system is a very delicate and personal subject. Every recording engineer has his own very strong preference. You must have a good pair of speakers to monitor the progress of your recording. Therefore the speakers need to have relatively flat response. Two or three way speakers are normally preferred. A good clean stereo power amplifier is also needed. A 2 channel 1, ½ or ⅓ octave graphic equalizer would be placed in the monitor chain. This is done to tune the monitor speakers for a flat response in the control room. The monitors are the only reference for you to know exactly what you are putting on the tape. If your monitor speakers are not accurate, they will "hype" or "lie" to you by making the tape sound different than it is.

Noise reduction is needed more in the semi-professional studio than in the pro studio. It is a must for the semi-professional, because of tape recorder speed and head configuration. Most semi-professional recorders have a top speed of 15 I.P.S., versus the 30 inches per second on the professional recorder.

Professional recorders have a track width and head configuration for 2 tracks on ¼", 4 tracks on ½", 8 tracks on 1", and 16 tracks on 2" tape. It can be easily seen that the professional recorder's track width is double that of the semi-professional recorder. These are termed "half track" (wider professional format) and "quarter track" (semi-professional format). Whenever the width of the tape hand (on tracks) is decreased by one half there is a substantial increase in the signal to noise of the recorder. In the multitrack process many channels are recorded, then mixed together and placed on one or two tracks, then the old tracks are erased and recorded with new musical parts, etc. Everytime two tracks are added together or a track is re-recorded to another track, there is approximately a 3 dB noise build up. When a multitrack mix is completed, it will many times have 10 to 20 dB of additional noise added. Tape noise reduction systems that will provide 30 dB of noise reduction, reduce this problem to below the point of audibility and will allow the small studio to produce a noise free product as good as a full

Our amp had a few rough critics to please. Moog. Gibson. Les Paul. Ronnie Montrose. Our oscilloscopes. And you.

Nobody knows everything there is to know about amplifiers. The Lab Series engineers were ready to admit it... and do something about it. We went to several outstanding audio experts. And they helped us put more good ideas into the Lab Series than any one company could ever think of.

When you're making a guitar amp, it helps to work with an expert on guitars. So, the Lab Series engineers studied with the world's foremost experts—Gibson.® And we learned the nuts and bolts, from humbucking pickups to "f" hole acoustics.

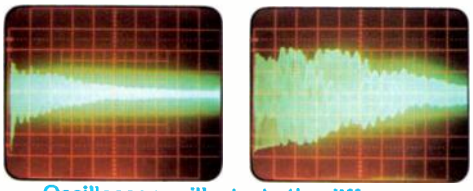
As for musical electronics, there's no better place to go than Moog.® So that's where we went. And we studied with the people who have an ingenious reputation for putting electronics under the musician's control.

Then we put the Lab Series amplifiers through some heavy studio sessions. And set out to please some heavy artists, like Les Paul and Ronnie Montrose.

Next, we took it to the streets to talk to our most important critics—the people we really built the Lab Series for—working musicians.

And for two years, we kept asking for criticism, until all we got were compliments.

Advancing an amplifier takes advanced technology—something that today's amplifiers haven't really enjoyed. For example, the Lab Series engineers applied new advancements in high voltage transistor technology that let us overcome the problems of low voltage transistors. And that enabled us to create the exact sound our musician advisors were after. But technology has a lot more to offer. After all, if Moog can engineer an orchestra of sounds into a small, 20 lb. keyboard, we felt an amplifier should offer more control over its voicing. Our new circuits overcame basic amp shortcomings. For example, if you like the overtones you get when you overdrive your amp, chances are you like your sound at high volume levels. But if the room is small, you're either too loud, or too lackluster. The Lab Series Compressor lets you sound great at any volume level, so you can turn on intense overdriving distortion without overpowering the room. You can even equalize your sound to help overcome poor room acoustics.

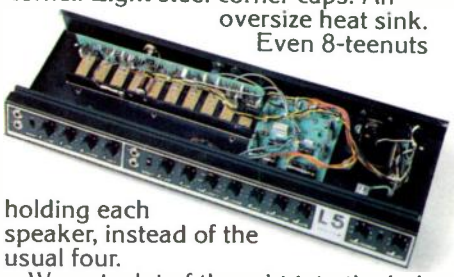


Oscilloscopes illustrate the difference between soft, uncompressed sound (left) vs. loud, compressed sound.

What's more, we engineered several outstanding sounds into the Lab Series. The Frequency and Midrange controls let you tune into different frequency bands and tone colors the same way you tune in stations on your radio. It also lets you overdrive sections of a chord, so you can create new chord colors that really expand your rhythm horizons.

There's more, including some guitar tricks Gibson helped develop. The Lab Series lets you match the voicing of your guitar. Sustain notes that swell as you hold them. Vary your picking attack from a punchy delivery that explodes off your pick, to a smooth, even flowing performance. The Multi-filter control rearranges the high harmonics to add an acoustic guitar flavor. And get rid of those transient peaks of overload that send recording meters into the red.

But technology doesn't mean much if an amp can't take the punishment of the road. Lab Series amps are rugged, reliable and lightweight. With pine sides that fingerlock at each corner. Eight steel corner caps. An oversize heat sink. Even 8-teenuts holding each speaker, instead of the usual four.



We put a lot of thought into the Lab Series. And so did a lot of other people. The result is an amp that pleases the critics, like you and your audience.

And that's why there are only two types of amps today...the old ones, and the new one—the Lab Series.

LAB SERIES™
Another Quality Product From Norlin

7373 N. Cicero Avenue, Lincolnwood, Illinois 60646
51 Nantucket Blvd., Scarborough, Ontario, Canada
Write for free Lab Series brochure. Norlin®

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blown professional studio.

The Peripheral Equipment

The periphial equipment is the signal processing gear necessary to the engineer. A patch bay allows the engineer to patch the signal processing equipment in and out of the mixing console's accessory section.

The reverberation unit, sometimes called "echo," is usually a stereo spring device used to add echo to the desired tracks. It's a must for all studios. The reverb devices vary in price from $400.00 to $15,000.00. In larger professional studios the reverb device is a major purchase. I placed this in the periphial classification because we are discussing semi-professional equipment. I have found that the reverb devices most sought after by the smaller studios are in the range of $400.00 to $1,500.00.

Limiters and compressors are needed to aid the engineer or mixer to control or contain the signal within set boundaries. A compressor/limiter can restrict the dynamic range, thereby raising the average level and helping the operator to avoid clipping distortion and, in so doing, improve the overall sound quality. There are several other "black boxes" that are either purchased with the initial system or added on as optional accessories at a later date.

The phaser which alters and/or reverses the phasing of the signal for certain effects such as the jet plane effect.

The harmonizer will add harmony parts electronically to vocals, strings, horns, or any instrument. This black box is fun and helpful.

The delay line is a device that can make drums fatter, improve vocal quality and such effects as doubling or slap-back.

There are many more "black box" type signal processors on the market than mentioned above, and there are many more new black boxes on the way from various manufacturers.

Accessories

Studio playback monitor speakers. These are important for the musicians. It allows the musicians to hear a quick playback without getting up from their positions and walking into the control room. You need a pair of good 2 way speakers for the studio, and one good clean power amplifier.

Que system, sometimes known as the headphone system, is a system that the musician relies upon. It all starts with the musicians, so try to give him a good Que system so he will perform better and like the studio.

You need a minimum of 5 to 6 sets of headphones. At least 2 sets should be open air type phones for the vocalist. The rest can be closed type phones. You will also need a power amp to drive them. I suggest a headphone amp that has 30 to 50 watts per side. The last important item in the Que system is the headphone boxes. This is a box that allows the musician to select mono or stereo, with a volume control for the left and right. You will need approximately 5 to 6 of these.

Microphones are another subject that is very personal to the engineer. Generally speaking my customers would specify what microphones they wanted. Other customers would want me to recommend microphones for particular instruments. I found the best solution, was to package a wide variety of microphones together and let the user experiment. What you would use on a particular instrument may not be what the customer would prefer to use. When the customer experiments, it becomes educational to him. I will state that you must *always* use a very good microphone for the lead vocal. When you are packaging a system, provide a microphone for every input on the mixing console.

You also need at least two *direct boxes*. This is a box that allows an electrified instrument to be plugged onto the box which gives it two outputs. One output goes to the instruments amplifier and the second output goes directly to the console. This box is used when the mixer wants more direct control of an instrument or if the musician's amplifier is noisy, this will bypass the amplifier.

The accessories are:

Microphone stands. You need a stand for every microphone in use. Do not forget baby boom arms. These are a must in the studio. When you have packaged a large microphone in the system, such as a Electro-voice RE-20 or a Neumann U-47 or 87, you will need a major mic stand. You do not want an expensive large mic on a small stand that may fall over on the floor.

Microphone boxes and snakes. This mic box is used in the studio to plug the mics into. The opposite end of the box goes into the control room and is connected to the mixing console.

Extra Microphone Cables. There must be spare cables around for emergencies. There may also be a need for microphone extension cables.

First of all before *any* adjustments or work is done to your tape machine, consult your manufacturer's manual for specifics on your particular unit. To set up your machine you'll need *alignment tapes*, which are necessary for care and feeding of your unit. You want to set up your machine's bias adjustment and check your head alignment with the alignment tape. To do this you must have an alignment tape for each speed you're checking *and* for each tape unit your adjusting.

Splicing blocks. This is a necessity for editing, as well as the need for splicing tape and leader tape.

Recording tape. You should stock audio tape in the size and width to match the recorders you are selling.

Interfacing

Assuming you sell a "turnkey" type package similar to the one in this article, interfacing will become most important.

System Layout

You and the technician should lay out the entire system on paper. Decide on placement of the equipment, then you will be able to calculate the cable lengths. Cable lengths are critical because we are dealing with high impedance equipment and cable lengths longer than 20 feet will cause high frequency signal loss.

Figure out what type of connectors are needed and how many. The three basic connectors for this type system are Cannon (XLR), R.C.A., pin, and ¼" phone jacks. Make an effort to document on paper each customers system layout. Keep the original and give the customer a copy.

Preparation of the equipment and system: Standard procedure is to thoroughly check out and calibrate all the major equipment, (recorders, mixer, reverb unit, etc.). You should be able to assemble all the cable harnesses in house before the installation. Installation should go

If Akai, Aiwa, Centrex, JVC, Kenwood, Meriton, Nakamichi, Optonica, Pioneer, Royal Sound, Sansui, Sharp, TEAC, Toshiba, Uher and Yamaha, in addition to Bang & Olufsen, Dual, Fisher, Harman-Kardon, Lafayette, Sankyo and Tandberg all recommend our SA for their machines...

...shouldn't you?

All of the tape deck manufacturers above recommend our SA cassettes for use in their machines in the "High" or "CrO_2" bias position. In addition, all those in the first part of the list clearly indicate they prefer SA, since they bias their decks specifically for it.

So it only makes sense, when you sell one of these machines, to make sure you sell a case of TDK SA cassettes to go along with it. Especially, since tape sales are so profitable, and take up so little sales floor and warehouse space.

Our barrage of consumer advertising in over two dozen national publications, on syndicated radio shows on 225 FM stations, plus co-op local radio and print, helps you sell by telling millions of potential customers that TDK SA is "The Machine for Your Machine." All this, plus the extra help we give you with a full complement of in-store P-O-P and promotional aids.

Selling a tape deck without selling tape to use in it, is like selling a camera without film. Put extra profits into your component sales by selling the tape that's recommended for so many leading tape decks: TDK SA. It's only one product in the trend-setting TDK full line of cassettes, open reel and eight track tapes.

And if you have any doubts, all you have to do is check our references.

TDK®

The machine for their machine

TDK Electronics Corp., 755 Eastgate Boulevard, Garden City, New York 11530.
In Canada, contact Superior Electronics Industries, Ltd.

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smoothly if the preceding steps have been followed. Don't be too alarmed if the first half dozen installations are full of havoc. Once the technician gets his installation "chops," it will start smoothing out.

Upon completion of the installation, the technician should sit down with the customer and familiarize him with the entire system and signal flow. I've found that it is best to actually lay down a few basic rhythm tracks, then go through the procedure of overdubbing, and mixdown.

Back-Up and Support

Do not forget to support your customer's system. Needless to say a "Happy Customer is a Good Customer." He will be one of your references. If he is satisfied he will send you more clients. More clients, more dollars! Simple fact!

Recommended Equipment and Supplies

1	8 track recorder
1	2 track recorder
1	Mixing console (min.) 12 in 8 out
2	Monitor speakers "control room"
1	Power amp (stereo) control room
1	Equalizer (stereo)
8 channel	Noise reduction for 8 track recorder
2 channel	Noise reduction for 2 track recorder
1	Reverb unit (stereo)
2	Limiters
2	Compressors
1	Phaser
1	Delay device
1	Harmonizer
2	Studio playback monitor speakers
1	Studio playback power amp stereo
6	Headphones
6	Headphone boxes
1	Power amp (Que system)
12	Assorted microphones
2	Microphone stand, large with Boom arms
10	Microphone stands
10	Baby boom arms
2	Direct boxes
1	Microphone box with 12 inputs and cable harness
12	Microphone cables, extra
1	Alignment tape 15 I.P.S. for 8 track recorder
1	Alignment tape 15 I.P.S. for 2 track recorder
1	Alignment tape 7.5 I.P.S. for 2 track recorder
1	Splicing block for 8 track recorder
1	Splicing block for 2 track recorder
1 box	Splicing tape for 8 track
1 box	Splicing tape for 2 track
1 roll	Leader tape for 8 track
4 rolls	Leader tape for 2 track
1 case	Recording tape for 8 track recorder
1 case	Recording tape for 2 track recorder
	Interfacing cables

That's what Kerry Livgren of Kansas asked as he sat behind the keyboard of the new Korg polyphonic synthesizer. It didn't take long to transform Kerry from questioner to convert. Because after a few minutes of playing he found a lot more than the portamento.

Kerry discovered features he had never seen in any synthesizer. Like a totally polyphonic keyboard with each key triggering its own dynamic filter, envelope generator, and VCA. Polyphonic voltage-controlled sample and hold. Six different simultaneous modulations. A programmable wheel, joy stick and transient controllers. And a patch panel that performs musical miracles.

In fact, Kerry liked Korg so much he used the synthesizer on the Kansas album Point of Know Return. Here's what he had to say after the recording session. Take it Kerry.

"A New Ax Every Ten Seconds."

"The Korg Professional Laboratory Systems synthesizer is in a class by itself. It sounds totally different from any synthesizer I've ever played. It's like having a new ax every ten seconds."

There are 10 Korg models of exceptional value, ranging from the Professional Laboratory Systems group to the new Micro Preset, which puts 315 instant voice combinations at your fingertips.

Whether you're looking for a preset, a polyphonic, or a dynamic portamento, you'll find a Korg synthesizer that meets your exacting requirements.

"Where's the portamento?"

KORG

Another superstar of sound from Unicord

75 Frost Street, Westbury, N.Y. 11590

Sold in Canada by Erikson Music Co., Montreal

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WRH

DEALER DOSSIER

Strings & Things
Memphis, Tennessee

Each month Sound Arts profiles one of the country's finest dealer outlets in "Dealer Dossier". Any suggestions? Just write Sound Arts, c/o "Dealer Dossier", and we'll be happy to consider your advice!

Some seven years ago Chris Lovell and Charlie Lawing put their heads together, along with some odd merchandise, and began one of the country's finest musical dealer outlets in Memphis, Tennessee and they called it Strings and Things. They haven't always been in the position as a leading dealer, in fact it took years of hard work and novel ideas to put this particular store "on the map."

Where and when did it all begin?

Lawing: It was the summer of 1970 when Chris and I first met. He was working Amro Music Stores and I was working for Mike Ladd's Guitar City, across from the Presley Mansion. We were both salesmen and in direct competition with each other. B.B. King was to make a brief appearance at Ladd's, so I called Chris and had him come out to the store. Chris showed up, but B.B. didn't. We went out, had a few beers, and talked about the music business.

Lovell: We discovered that neither of us was satisfied with our jobs and the way our stores were being run. Charlie had a lot of really good ideas and he seemed to like mine, so we discussed the possibility of opening our own place.

Where did you get the funds to begin your business?

Lawing: Believe it or not, we never put money into the business. Originally Chris had a used Gibson SG, a Leslie cabinet, and a mic or two; I came into the deal with a Standel PA, a Fender Super Reverb, a Gibson EB-1, and a Bogen PA head. We agreed to combine our "inventories", quit our jobs, and sell out of my apartment using the classifieds. We did that for about three months, eventually we rented a small building in the Memphis mid-town area. In January of 1971, for a couple of months, we worked at getting the place to look like a music store. After totally remodeling the location, we opened and musicians, mostly pros, would come around and just hang out.

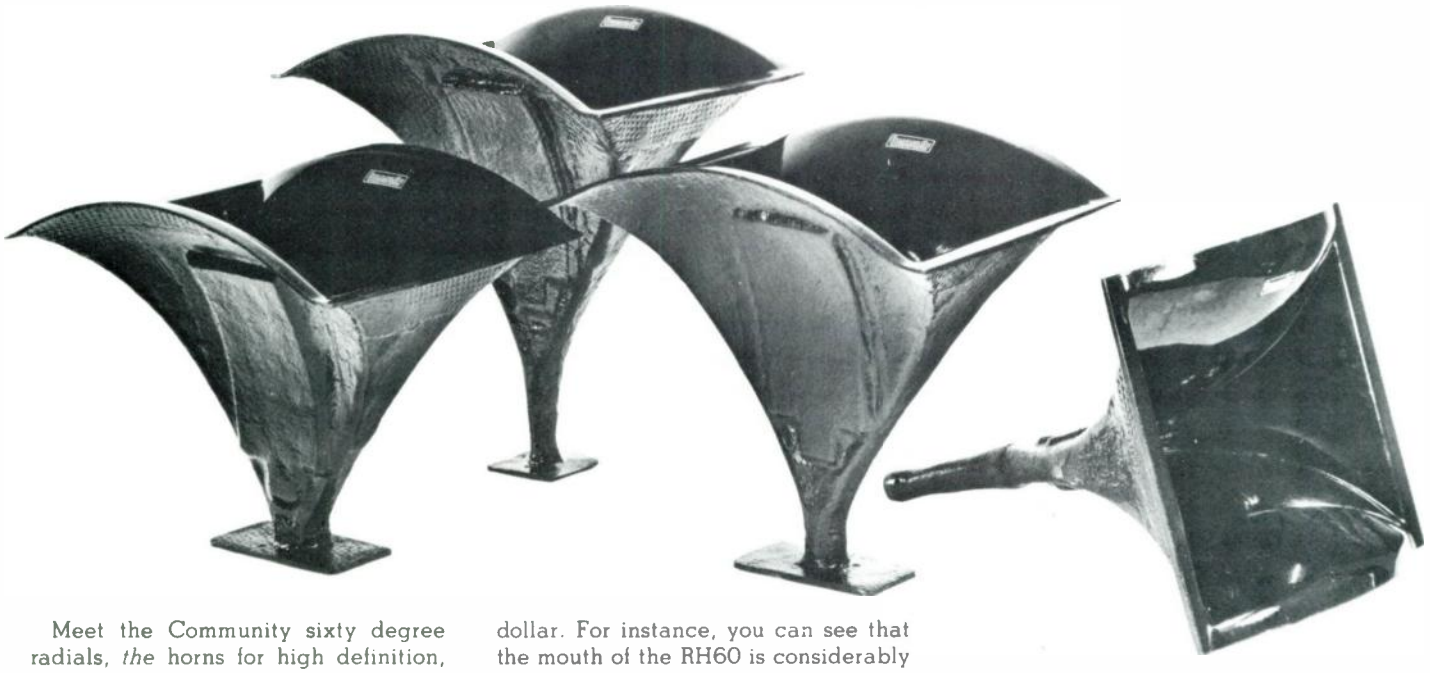
Lovell: Slowly but surely we tried to land various brand name franchises, but they didn't need new dealers. At that time, music stores all over Memphis were going out of business, for one reason or another, so we could see there were going to be some changes! Soon, franchises began to flow like the rivers, and we bought everything that wasn't nailed down. We began to carry keyboards, synthesizers, sound reinforcement gear, and just about everything else. It took us a couple of years to pay for it, but it was a great lesson learned.

What was the secret of getting your business off the ground?

Lawing: Nothin' but good hard work. It's no secret, it's just that most people hate to face it!

Lovell: The idea is to be active, especially when you are self-employed, because if *you* don't make it happen, no one else will! You must take into consideration all your responsibilities as a store owner and then take care of *those* particular items, knowing that until they are *willingly* taken care of you will never be able to clearly see and understand your business. Staying in touch with each and every aspect of your business, such as reviewing your salesmen's performances, *knowing* your profit and loss statements, keeping up to date with your accounts receivable and payable, and knowing your monthly product sales totals. Be aware of what is coming in and what's going out. When you're aware of each aspect of your business, you can then weigh things fairly and decide what needs doing first and foremost. Being self-employed is a make-

RH60 RADIAL HORNS



Meet the Community sixty degree radials, *the* horns for high definition, understandable sound. The horn pictured is our RH60, the midrange mainstay of the large system. We've recently added two new sixty degree horns to our line for HF and VHF projection, the SRH60 and the SQ60.

Some people still think that our horns and cabinets look a little strange, perhaps not realizing that at Community shape and construction are determined by the laws of physics, not marketing, packaging or the almighty dollar. For instance, you can see that the mouth of the RH60 is considerably taller than that of comparable sixty degree horns. Why? Well, if a horn is to act as a wave guide at its lower operative frequencies (which it is) it must have a tall mouth to support the larger wave forms generated near crossover. The idea of a thin, wide-mouthed radial may be pleasing in terms of packaging and handling, but it is a convenience that does not pay off in operation. Some conveniences that do pay off in operation are one-piece construction, low resonance, high strength-to-weight ratios and the meticulously executed design that characterizes a Community horn.

Would you like more information? We recently published a catalog which details the performance of all Community products. Already it has been called a must for anyone wishing to design a sound system on a professional level. Please write or call to order.

RESPONSE AND SPL

RH60-A DRIVER: **GAUSS HF4000** BANDWIDTH PINKNOISE: **250Hz-16KHz**

1 Watt @ 1 Meter **107.24** dB-SPL — 1 Watt @ 4 Feet **107.28** dB-SPL

										−12	−7	−6	−4	−3	−1	0	+1	−1	−2	−1	−3	−5	−5	−9	−9	−9	−13	−17
Hz	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1K	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0	10.0	12.5	16.0	KHz

SRH60-B DRIVER: **ALTEC 288.16G** BANDWIDTH PINKNOISE: **350HZ-16Hz**

1 Watt @ 1 Meter **108.99** db-SPL — 1 Watt @ 4 Feet **105.52** dB-SPL

												−10	−6	−4	−2	0	0	0	0	0	−2	−2	−4	−8	−8	−6	−10	−12
Hz	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1K	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0	10.0	12.5	16.0	KHz

SQ60-C DRIVER: **EMILAR EA. 175.16** BANDWIDTH PINKNOISE: **800Hz-16KHz**

1 Watt @ 1 Meter **103.85** dB-SPL — 1 Watt @ 4 Feet **102.14** dB-SPL

														−6	−2	−2	0	0	+2	0	0	0	−2	−2	−5	−12	−16
Hz	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1K	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0	10.0	12.5	16.0	KHz

Community

Community Light & Sound, Inc. 5701 Grays Avenue Philadelphia, PA 19143 (215) 727-0900

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it or break-it situation, if *you* don't really perform, *you* could go broke!

Where do you find good employees to establish an efficient sales staff?

Lawing: That's hard to say. We've found them most everywhere from Memphis State University to the state pen (laughs). You just have to keep trying people, working with them, examining their particular talents and potentials. Most of all, you have to be able to fire someone who doesn't want to really "work". So really, you have to "hire them" and "fire them" and when you find a good man or woman, pay them well and offer whatever benefits you can, and make it worth their while!

How do you get dedication from your employees?

Lovell: If you take care of an employee, they'll take care of you! We try to let our people know, especially the department managers, what's going on in the business. With that particular policy they can have a clearer view of where we're going and then *they* can lend a hand. It makes working easier. We get with our department managers every morning to briefly touch base and see what's going down in each section of our business. This way it's easy to keep things under control and maintain that overall concept. Every Monday night we have sales meetings and each Tuesday morning, before we open, we'll conduct product sessions. These meetings also help to keep everybody up to date on our activities.

How many departments do you have?

Lawing: Our store is completely departmentalized into eight separate shops, of which seven adjoin the main store. We feel that specialization is where it's at. People naturally feel better about going, and buying at, specialty shops, not to mention how much easier it is to run a large store that *is* departmentalized. Each department has a manager who is completely in charge of running that department. Inventory, displaying, selling, and advertising his section is *his* responsibility. Chris and I try to act as advisors as well as employers.

Can you give us a rundown of your departments at Strings and Things?

Lawing: The *main store* area displays our electric guitars, both stock and custom models, and is managed by Bill Parsley. The *drum stand* is our percussion specialty shop and is managed by Big Dave Patrick, or better known as "Drum Bwhana". The *guitar workshop* offers guitar repairs and refinishing as well as complete custom work. Boasting such references as Jeff Beck, Billy Gibbons, Jimmy Page, and Elvis Presley, it's owned and operated by Tom Stinson and Tom Keckler. Our *keyboard department* displays all brands of electric pianos, organs, synthesizers, sequencers, etc. and is run by Allen Hester. The *flat top shop*, specializing in acoustic guitars, banjos, mandolins, Dobros, and pedal steels, is managed by Jim Lillard. Strings and Things' *PA and recording department* is currently under construction and will consist of a showroom, console room, and functioning studio and will be opened in March of 1978. Our *catalog department* is strictly a mail order operation and is managed by Beth O'Brien and Jim Davis. *Strings and Things instructors* is also now under construction. This particular department will specialize in teaching contemporary electronic music and will be opened later this month.

Do you do a lot of advertising?

Lovell: Yes, in fact we probably spend too much on advertising. Advertising is one of those responsibilities we were talking about earlier. It's something that should be studied, examined, and put to work *for you!* We've always handled all of our advertising on our own, in-house. The artwork, the layout, the copy, everything is done in-house. Charlie is a three year student from the Memphis Academy of Art and I've had some formal instuction in art also. We really feel fortunate to be able to monitor our artwork and display ads so independently.

What types of advertising do you prefer to use?

Lawing: Display advertising works exceptionally well for us, as well as radio. People seem to respond better to ads they can see versus ads they can only hear. It's most important, whatever media you choose, that your advertising be *effective.* Work with your advertising and make it pay and don't hesitate to spend what it takes to get some response. Ads won't always get immediate response, sometimes we may have to run an ad five or six times before it finally penetrates.

Do you utilize in-store advertising (i.e. promos, displays, sales aids) much?

Lovell: That's really what we do best. We really 'go deep' when it comes to displays and overall shop appearance. We know no limits! Take our *drum stand*, for instance, we recently remodeled it in a 'jungle motif,' complete with thatched huts (Dave Patrick's office), various tropical birds, palm trees, and astroturf throughout. It's a trip and we

SIX WAYS TO CLEAN-UP YOUR ACT.

If you play electric piano, organ, bass, rhythm or lead guitar, or sing—JBL K Series loudspeakers can make you sound better.

Each of these high-efficiency speakers is specifically built, as only JBL can, to provide the cleanest, clearest, and best possible reproduction of your music.

And that's exactly why more professional musicians and performers choose JBL.

Maybe you should, too.

JBL K-Series Loudspeakers are available in six different sizes, from 10" to 18". Priced from $99 to $240.

JBL

GET IT ALL.

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

love it. So far our customers do too!

Did you ever think you went too far on this tactic?

Lawing: Yeah, the day of the grand opening of the *drum stand*, people literally freaked over it! They looked at everything but the drums. Though since the grand opening, drum sales have skyrocketed!

What about Strings and Things' use of in-store promotions?

Lawing: We work with various manufacturers, like ARP and Gibson, in coordinating various clinics and clinic-concerts. Sometimes for new products, like synthesizers and sound reinforcement equipment, clinics are the only way to get things off the ground. We also work with our factory reps in training our sales personnel, besides product sessions weekly. Another activity we sponser is "The Strings and Things' Rock Band Competition Festival", where young bands (18 years old and younger) compete for prizes, such as sound systems and recording time. It's a non-profit project we've been doing for five years now. Strings and Things donates the PA systems, and local studios chip in the recording time. All the local radio stations help us promote the event via public service announcements—it's great! The bands are judged by local studio producers and engineers—the musicians really get off on it! They go crazy over just the thought of playing on the same stage that Duane Allman once played on!

What about the nature of your clientele? Are you mainly a pro shop?

Lovell: No, though we do serve most of the pros in the Memphis area, as well as many of the other pros that happen to be in the South. We clearly understand the needs of the amateur and semi-professional musician. These people make regular money and are many times your best and most dedicated customers.

How do you get and keep your customers?

Lovell: That's easy, just treat them right and show respect to the people who finance the whole show! Your customers are your most valuable asset. Make the customer mad and they may never come back; treat them right and they'll never go anyplace else! We go out of our way to serve our customers. We also offer a money back guarantee; so if they don't want it, we don't want them to have it.

All the various makes of gear you carry—how is that handled?

Lawing: For most of the major brands and products, a dealer has to become a franchised outlet to handle and service the equipment. If a dealer doesn't have a particular line and is asked for it, sometimes he'll try and bootleg, or trans-ship, some gear from a dealer who has that particular franchise. This practice is frowned upon by most manufacturers and we really don't care for it either! If you can't service it, then don't carry it!

Do you manufacture any of your own equipment?

Lawing: Yes, we make a full line of speaker enclosures and racking consoles. We also manufacture a semi-professional light system that really has made a hit. We really enjoy playing around with manufacturing ideas and I am sure the future will be full of surprises when the time is right.

You said earlier you offer both stock and custom guitars!

Lovell: Guitars were really our *original* trip. Just about everyone here plays guitar well and is into them on one level or another. Electrics are what we specialize in, though our collection is about half acoustic. The guitar workshop is our source of never-ending, incredible, and truly beautiful guitar finishes. It's continuously evolved into some kind of "electric guitar mania"!

You mentioned that you've worked on guitars for various stars. How did you get into that?

Lawing: As long as we've been in business we've been customizing and refinishing guitars, specializing in recreating various early Gibson and Fender finishes. Not really realizing how starved the country was for custom guitars, the word spread fast. Once these pros saw the guitars and what kind of work we were offering, it was all over!

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INDUSTRY UPDATE

Sound Arts' "Industry Update" section is a monthly look into this industry's executive and personnel changes, as well as an examination of the various activities within this business community of ours. Any releases, photos, or suggestions should be forwarded to Sound Arts Merchandising Journal, c/o Industry Update, 14 Vanderventer Ave., Port Washington, NY 11050.

David Friend, President of ARP Instruments, Inc., recently announced the internal promotion of two corporate officers. **David Spencer** has been promoted from Vice President of Operations, the position he has held since joining the Lexington, Massachusetts based firm in September of 1976, to Executive Vice President. In his new capacity Mr. Spencer will have continued responsibility for management of the manufacturing, service, and financial operations of the company. In addition, he will also take a more active role in shareholder related activities. In ARP's second promotion **Robert Hoffman** has been named Vice President of Marketing. Hoffman joined ARP in September 1975 as Advertising Manager, becoming Marketing Manager in October 1976. In his new position, Mr. Hoffman will have full responsibility for the company's sales, advertising, public relations, and marketing research programs.

* * *

Mervin Kronfeld, Vice President of Marketing for Nortronics Company Inc., has announced the appointment of **J.D. Strand** as Sales Manager for the company's fast growing Recorder Care Division. Mr. Strand replaces **Mike Nystrom**, who has left the Minneapolis firm for another marketing position. Strand's appointment actually represents his return to Nortronics after more than four years with Ampex Corporation, where he was Sales Engineer for professional recording tapes. He was a salesman for Nortronics Recorder Care Division between 1970 and 1973, when the division's current consumer product line was in its infancy.

* * *

Creative Audio and Music Electronics Organization, **CAMEO**, has been formed by manufacturers of sound and audio equipment used in producing electronic music for what is generally described as the "pro audio" or semi-professional music market. The new audio organization grew out of two Chicago sessions, attended by manufacturers who met to explore the possibility of organizing such an association to develop active programs for its members, dealers, consumers, to work cooperatively with other trade groups, to gather recommendations for standardization, market research, and product safety, and to amass statistical data. A pro tem board of directors from seven companies, AKG, BGW, dbx, MXR, Phase Linear, Tapco, and Teac Tascam series, was appointed. **David Shulman**, prominent attorney in the audio industry and a partner in the Chicago law firm of Shulman, Silverman, and Krieter, Ltd., was appointed pro tem Executive Director. Temporary headquarters of CAMEO will be suite 3501 LaSalle Plaza, 180 N. LaSalle Street, Chicago, IL 60601. Shulman said a meeting of all companies interested in joining CAMEO will be held at the O'Hare Hilton in Chicago March 25, at which time a

board of directors will be formally elected, standing committees will be named, and bylaws will be approved.

According to **Leslie B. Propp**, President of the American Music Conference, some 40 companies have been notified and many have expressed the desire to join CAMEO. Propp also said that **James Johnson**, President of NAMM, expressed his support of CAMEO and offered to support the new organization.

Shulman qualified companies who may be interested in joining CAMEO as those firms whose primary function is the manufacture or distribution of products under their own brand names sold through retail outlets anywhere in the world. Shulman did say that associate memberships are open to the industry press. At the initial meeting it was decided to levy a $200 initiation fee on incoming companies to defray start-up costs. "At the March 25 meeting, a formal dues structure will be approved," Shulman said. "Meantime, we plan to conduct an aggressive membership campaign among the many companies that fall into CAMEO's area of interest.

Common Consumer Cuestions

(continued from page 14)

and a half years ago. I tried to approach it from a little bit different standpoint. By being a guitarist, I truly believe that effects either belong on the floor or mounted somewhere else with footswitches on the floor to bring those effects in and out. Your guitar should be as straight ahead as possible, having control of tone and volume on the instrument. So I basically took that approach to the design of our 'EQ' guitar. I thought that we should expand on that tone and volume control and apply it to something useful and something that will continue to be for a long period of time. So what I started thinking about was along the lines of what you might find in a mixing console in a studio. That would be, basically, three bands of equalization that have names that mean *something* (bass, mid-range, treble) so that inside your mind, while playing the guitar, you could relate to that section of the instrument. The operation of those controls would be more of a quantitative statement about that particular frequency band. In other words, if you turn it one way you get more bass, and if you turn it another way you get less bass. This theory would apply to each band of EQ on the guitar. Everything I did in the design I applied to that *live* playing situation where the instrument really gets its 'roadwork.' We went through all sorts of methods and modes to get this circuit right. You know, there are only about 5,000 ways to build a tone circuit. Well, we narrowed it down and with the help of some artists like Steve Miller, Bob Weir, Jerry Garcia, Jim Messina, and George Benson we came up with our 'EQ' guitar. The advantages to the end user of this particular type of instrument center around versatility. The guy in a bar band is able to play any kind of music with an EQ type guitar. In other words, the tones and textures are there for any style desired, from heavy metal, to disco, to country, to jazz. It gives the consumer/musician the ability to tailor his sound with one guitar. It really puts all that control right at your fingertips.

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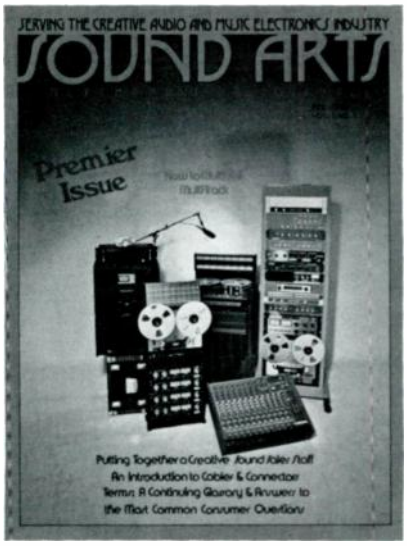

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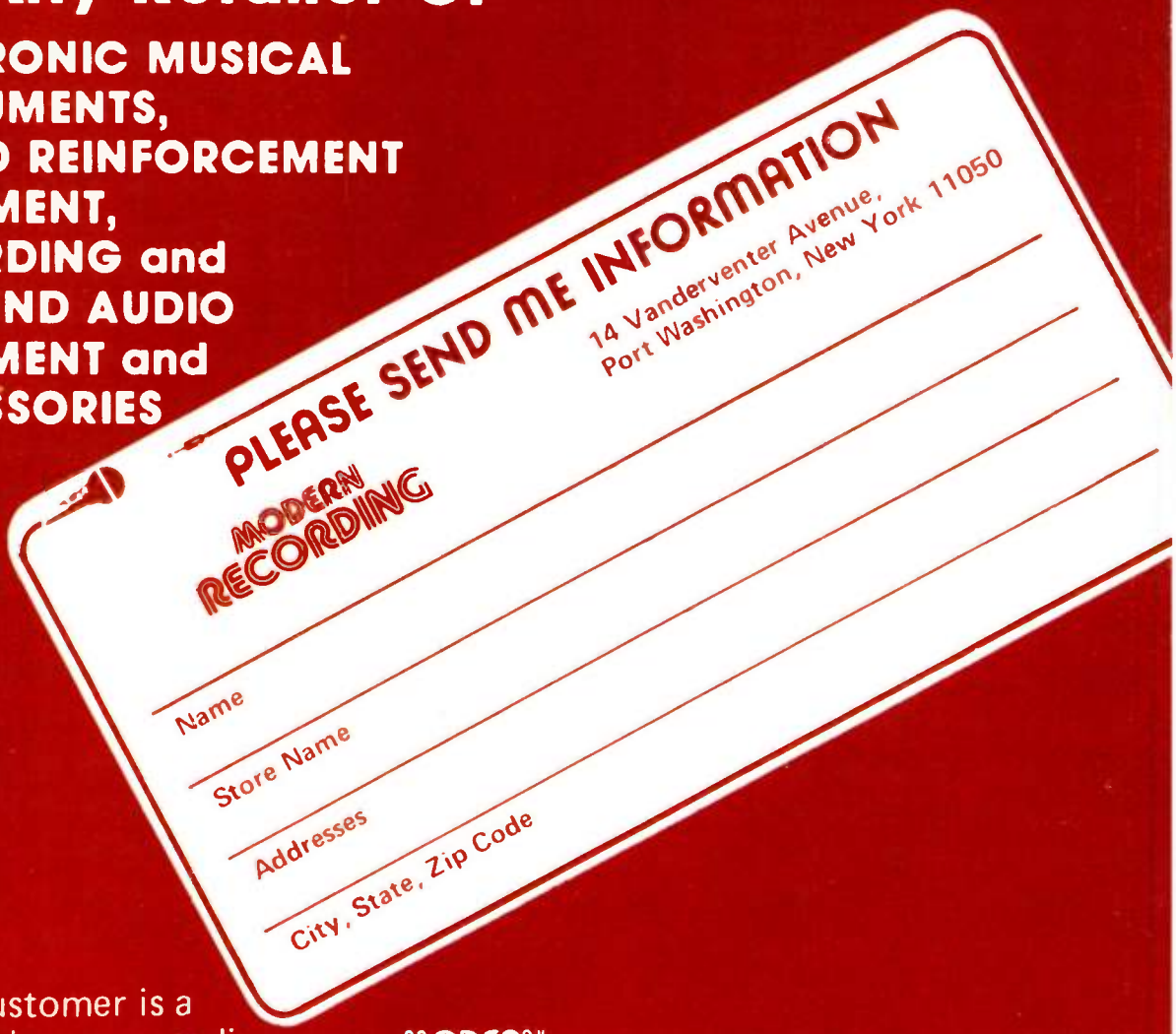

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