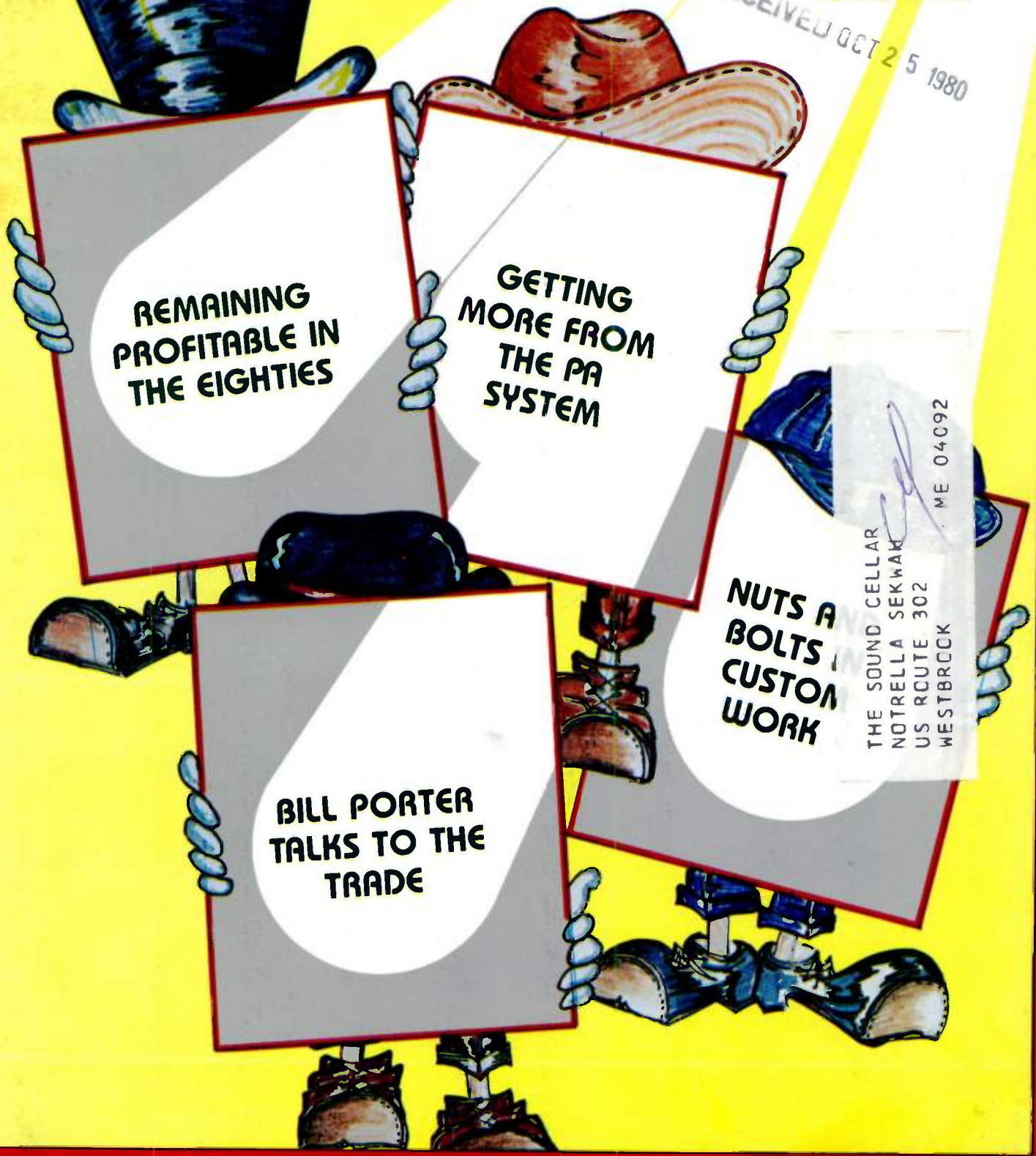
SERVING THE CREATIVE AUDIO AND MUSIC ELECTRONICS INDUSTRY

SOUND ARTS

M E [illegible] H A N D I S I N G J O U R N A L

VOL. 3 NO. 8
SEPTEMBER 1980



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Our culture, our ingenuity, our music.

MXR

Our music means a lot to us. Ever since the Blues, we Americans have had a language in which to share our history and our dreams. We've moved together in a common rhythm that tells us who we are and unites us as a people.

Every one of us has been involved. As performers. As listeners. As Americans who support the freedom and the youthful energy that make our music unique.

You see, you can't separate our music from our culture—because our music reflects how we live and what we value.

Take our ingenuity, for instance. It's an integral part of our music and its heritage. Americans invented the electric guitar. The phonograph. A multitude of new techniques and sounds.

It was here where the Blues gave birth to Rock 'n' Roll. And artists from around the world have come here time and time again for inspiration and support.

But the sounds and the techniques that make our music what it is are so deeply rooted in American culture that they resist imitation. To create genuine American music, you've simply got to use American methods. Others may try hard to reproduce our products, but *a copy is still a copy.*

That's why we at MXR are so strongly committed to providing a vocabulary of special effects that will enable us to express ourselves in our own special way. From Blues to Country, Rock to Jazz, we Americans have something unique and important to say. At MXR we understand that nobody can say it for us.

Because our music is who we are. It's our history. It's our culture.

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VOL. 3 NO. 8

SERVING THE CREATIVE AUDIO AND MUSIC ELECTRONICS INDUSTRY

SOUND ARTS

MERCHANDISING JOURNAL

SEPT 1980

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COMING NEXT ISSUE!

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Merchandising Pointers and Promotions

Cover art by Fran Vitrano

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A LETTER FROM THE EDITOR

I was slaughtered at Monopoly last week, partly because I was dumb enough to sell Park Place and keep Baltic Avenue, but also because the rules had been changed on me. Or so I thought. Money paid to Community Chest always went to the player who lands on Free Parking; if you landed on Go, you got $400; the 10 percent luxury tax didn't apply (the tax is a flat $200). Those were the rules as I knew them. Unfortunately, those particular regulations don't exist for Parker Brothers or for my current opponents.

The fact of the matter is that I had never read the instructions. Nor apparently had any of my peers who taught me the game a zillion years ago. Throughout those zillion years I'd functioned fine, with long strings of hotels to my name. But when I came up against some heavy duty competition, I lost my shirt and my hotels. Fortunately, I don't depend upon Monopoly money for food. But in the music business it can work differently; there's real money at stake.

The ignored-instruction-book syndrome is well known to any purveyor of technological products. The consumer walks away with his new goody knowing he knows how to work it whether he does or not. And the folks who write the accompanying manuals and the folks who have sold the gear can with some justification often sit back and feel happy that they have given the consumer the best info—in writing—on how to make the most of the equipment. In the perfect world. But in the real world manuals get lost or go unread. Or some people just think they know everything. Or some people create their own rules (like landing on Free Parking). And the resulting loss can be acute in the sound quality and the flexibility of the equipment that has been purchased.

In this issue of SOUND ARTS, Don Gayle gives some basic information on the uses and flexibility of P.A. systems. It's pass-along information that can be used to advantage in discussing equipment with your customers. You may not always be able to get them to read the instruction manual, but perhaps you can verbally offer them some of what's in it.

More ideas from which you can pick and choose are offered in the edited transcripts of two educational sessions that were offered at the Summer NAMM Expo by CAMEO, the organization of manufacturers of creative audio and music electronics. Bill Porter, who aside from his personal niceness, has of course a long string of acclaimed credits (mixing engineering for the likes of Elvis Presley, Chet Atkins and others) presented a talk on Mixing for Recording and Sound Reinforcement. And a panel of retailers discussed maintaining profitability in the eighties. Precisely because of the tight money situation of the eighties, many of you missed this NAMM, and thus missed what we considered some important talk. So as a fitting completion of our NAMM coverage, we're presenting these talks in this issue.

Regards,

Judith Morrison Lipton

THE NEW 900 SERIES MODULAR SIGNAL PROCESSING SYSTEM.

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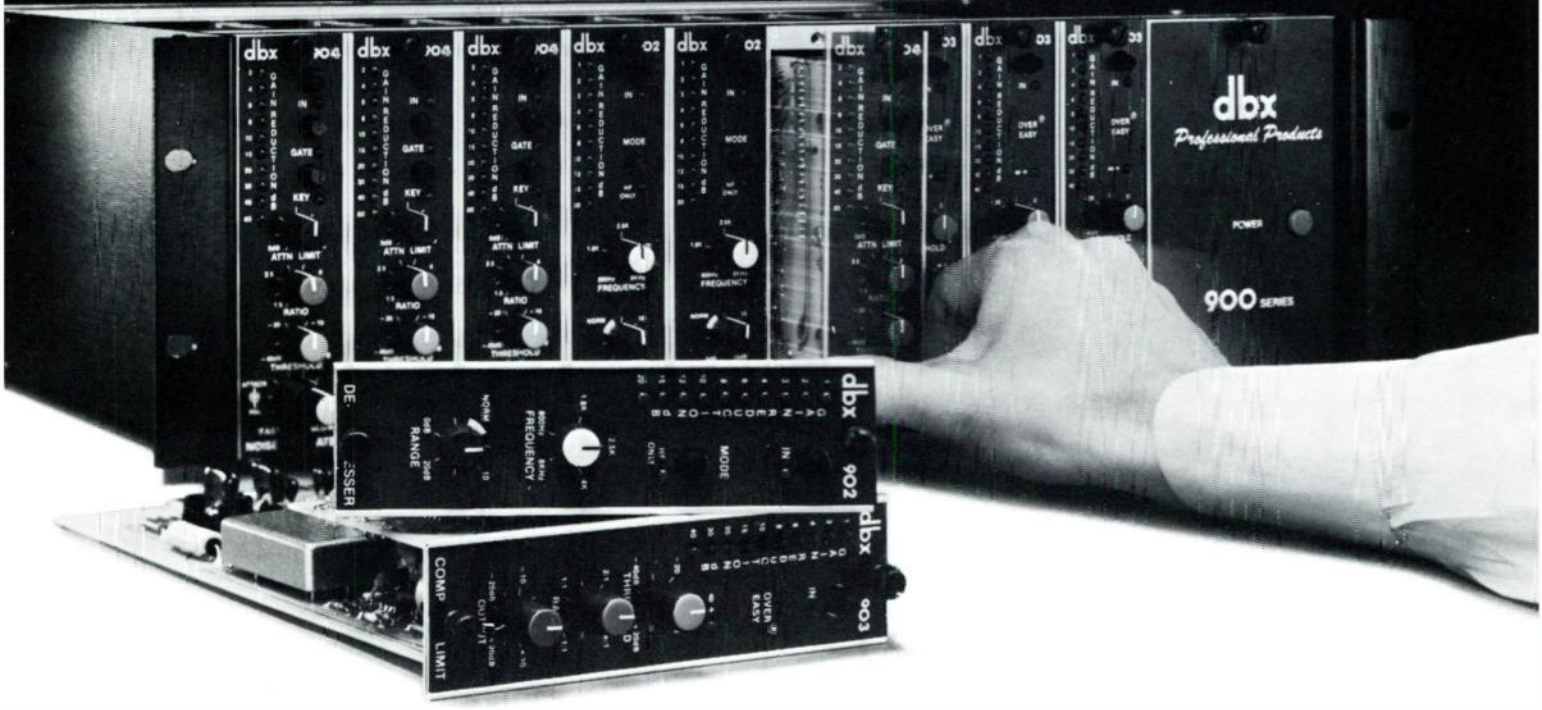

With rack space at a premium, you want to save space anywhere you can. That's why dbx is introducing the new 900 Series Modular Signal Processing System.

You start with a single, easy-to-install 5¼" x 19" rack with built-in power supply. Then just slip in the modules you need. Up to 8 dbx signal processors, with storage for a ninth.

But the modules themselves are the real stars.

Our Model 902 is the only de-esser that continuously analyzes the input signal spectrum, providing the exact amount of de-essing you want regardless of signal level. And the 902 can be used broadband or on high frequencies only.

The 903 Compressor offers a special negative compression feature. In use, it actually begins to attentuate at the threshold, which gives the signal a new sense of punch. Of course the 903 also features our Over Easy compression as well as true RMS level detection.

Our 904 Noise Gate features adjustable attack and release rates, Over Easy downward expansion, a special key input that allows you to gate one instrument by another, and a unique "gate" mode which eliminates the need to gain ride solos during multi-track mixdown.

The 900 frame accommodates dbx noise reduction modules as well.

And this is just the beginning of our signal-processing system. Soon we'll be offering an equalizer, a flanger, and more.

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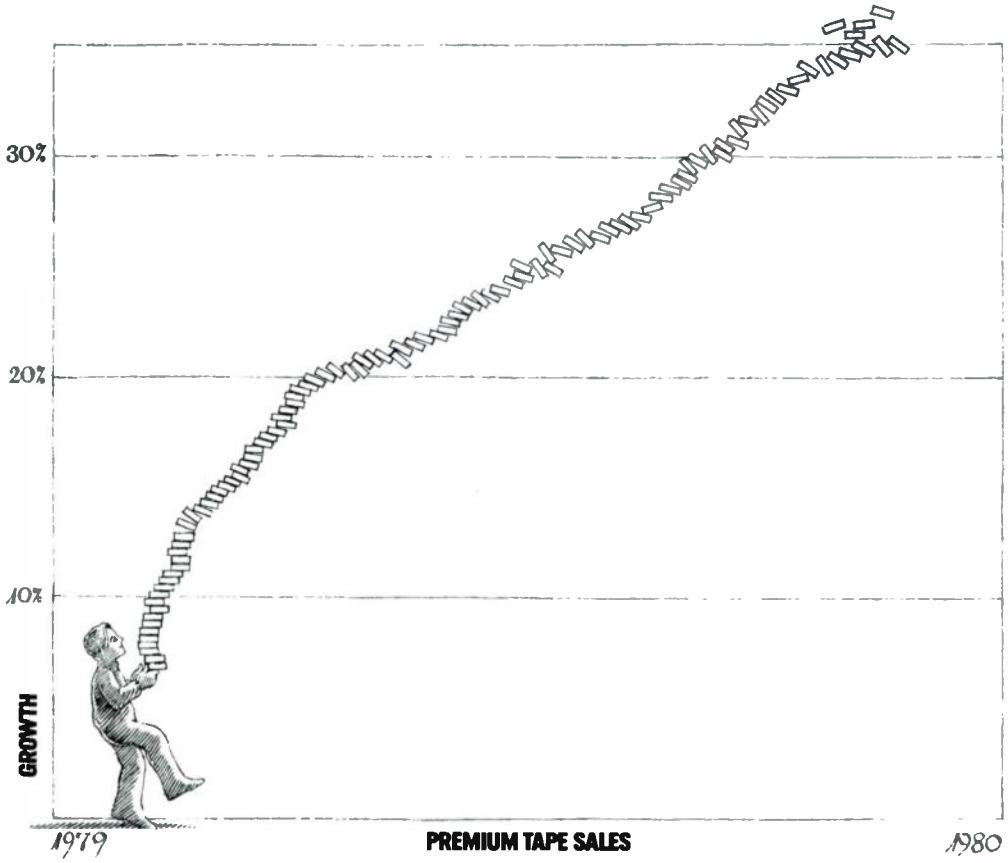
CIRCLE 92 ON READER SERVICE CARD

THE ECONOMY MAY BE IN REVERSE, BUT TAPE SALES ARE STILL IN FAST FORWARD.



Blank audio cassette sales are getting to be very predictable. Every year, regardless of economic trends, it's the same old thing. Another record-breaking year.

One thing is changing though. Consumers are shifting from "cheapie" cassettes to premium. In fact, premium cassette sales enjoyed their biggest year ever in 1979 with sales of over $350 million.

As you might imagine, 1979 was also a good year for Maxell. Even in a soft economy, people will spend a little extra for a quality product.

Projected sales for 1980 indicate it'll be an even better year. Your customers will be putting even more of their money into premium cassettes like Maxell.

Maybe you should too.

IT'S WORTH IT.

Maxell Corporation of America 60 Oxford Drive Moonachie N J 07074

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TERMS:

SEPT. 1980

A CONTINUING INDUSTRY GLOSSARY

RECORDING

By Larry Blakely

Concentric Switch: A dual rotary switch that has two shafts, one outer shaft and an inner one. This allows each of these switches (sections) to be switched independently. This type of switch is found on some types of professional audio equipment.

Concentric Control: Any type of control where there are two knobs on the same basic shaft system. These are usually either switches or pots. Sometimes there can be a pot on one shaft and a switch on the other.

Edit Mode: A mode on a tape recorder where the take-up reel motor is stopped during the play mode (to spill the undesired tape). During the fast-forward mode, the tape lifters are defeated so the tape will rest against the head (to aid in the location of a recorded segment). On some models of tape recorders, when the edit button is depressed and the tape transport is in the stop mode, the brakes are loosened to enable easier rocking of the tape (to locate the beginning, end or some other given segment of the tape).

Flashing: An extra edge that is made up of extra vinyl that comes out of the mold when a record is being pressed. When the record is removed from the record press, it is placed on a flashing cutter to remove this flashing or extra edge from the actual record. The flashing is then usually ground up and remelted and used for pressing other records.

Monitor Amp: A power amplifier that is dedicated to driving the monitor speakers in a control room or recording studio.

Pinch Roller Pressure: The amount of pressure (usually measured in ounces or pounds) that is applied by the pinch roller to the capstan of a tape recorder. This adjustment is made to insure that there is enough pressure to pull the tape through its path on the tape transport.

Quad Panner: A 4-channel pan pot which will pan (move) a signal from left

ELECTRONIC MUSICAL INSTRUMENTS & ACCESSORIES

By Wayne Howe

Voltage-Controlled Amplifier: A voltage-controlled amplifier or VCA is a device which varies its gain or volume in proportion to the level of an incoming control voltage signal. In synthesizers, it is used primarily as an automatic volume control, so that a varying control voltage will govern the transient level of the sound. Some VCA's also have a variable DC control level so that the VCA will continuously pass a preset volume level.

Inverted Inputs: This is an input that inverts or shifts the phase 180° from the incoming signal. As a result, if the incoming signal increases, the inverted input causes a decrease. If the incoming signal decreases, the inverting input effectively causes an increase.

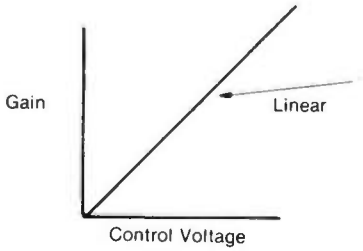
Non-Inverting Input: A normal input where the incoming signal is fed directly in to the device with no inversion.

Inverted Output: An output that is inverted or shifted 180° from the input.

Non-Inverting Output: The normal in-phase output signal with no inversion.

Linear Control Voltage vs. Gain: The type of relationship between the control voltage and the VCA where the voltage gain is directly proportional to the input control voltage. (See figure 2.)

FIGURE 2



Exponential Control Voltage vs. Gain: The relationship between the control voltage and the VCA where the voltage gain increases exponentially to the input control voltage. Some synthesizers have a switch so that either linear or exponential gain may be selected. The exponential type has a formula of:

A (gain) ≅K (constant) V_c(control voltage)

SOUND REINFORCEMENT

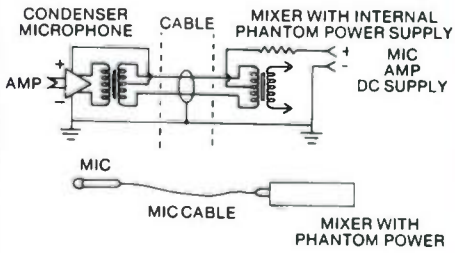
By Glen E. Meyer

As promised last month, here is a chart of typical octave-band centers and the frequency range contained in that octave band segment.

Octave Centered Frequency	f_{lo}(Hz)	f_{hi}(Hz)
250	176.8	353.6
500	353.6	707.1
1000	707.1	1414
2000	1414	2828
4000	2828	5657
8000	5657	11314

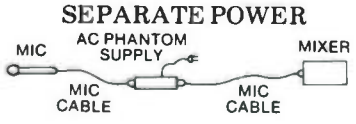
Phantom Powering Condenser Microphones: Electret condenser microphones require power to operate the internal impedance converter of the microphone. This power may be supplied by the use of integral or external batteries, from a remote AC power supply, or directly from a mixer with phantom powering built in. The remote powering methods are accomplished by feeding the required DC voltage back over the same cable conductors which carry the signal. This is known as phantom powering.

INTERNAL POWER



If required by the microphones, and if this phantom supply voltage is not available in the mixer, a separate phantom supply module may be place in series with the microphone cable. This remote phantom supply may be battery operated or operated by an AC power supply built into the unit.

SEPARATE POWER



A CONTINUING INDUSTRY GLOSSARY

RECORDING

To right or front to rear. In fact, the signal can be placed anywhere within the quadrant (center, side to side, around in circles, etc.).

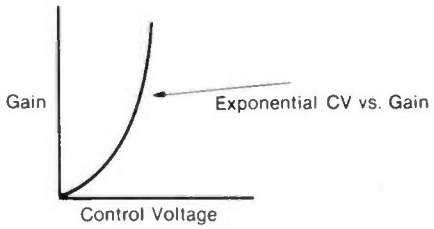
Four Pole Motor: An electric motor that is often used in some types of turntables and tape recorders. The speed of these motors will vary as the voltage feeding it changes. If a four-pole motor is designed to provide a given speed at an operating voltage of 117 VAC (volts alternating current), a higher voltage such as 120 VAC would make the motor go faster, and a lower voltage such as 110 VAC would make the motor go slower. If such a motor is to operate at a very stable and accurate speed, it must be supplied a carefully regulated voltage to insure its accuracy. The standard AC power lines that feed out homes or offices are supposed to provide us with 117 VAC. However, this voltage will usually vary a great deal depending on how much power is being utilized in the neighborhood at any given time. The voltage will typically vary from 110 to 124 volts. This will definitely affect the speed of a turntable or tape recorder that is utilizing a four-pole motor.

Hysteresis Synchronous Motor: Most often referred to as a hysteresis motor. This motor, unlike the standard four-pole type, will not vary in speed with the change in voltage that is feeding it. The speed of the hysteresis motor is determined by the frequency of the alternating current rather than the voltage. The standard household current 117 VAC (volts alternating current) at 60 Hertz. The power companies are required to hold this frequency to a high degree of accuracy. While the actual voltage supplied by the power company may vary a great deal, the frequency of 60 Hz will not vary. Turntables and tape recorders utilizing hysteresis motors will provide a high degree of speed accuracy. One may wonder why plug-in AC electric clocks do not gain or lose time due to the large fluctuations in household voltage. It is because such electronic clocks utilize hysteresis synchronous motors.

ELECTRONIC MUSICAL INSTRUMENTS & ACCESSORIES

Exponential gain starts more slowly, but then rises higher more quickly as the control voltage increases. (See Figure 3.)

FIGURE 3



Manual Control Voltage: Some synthesizers have a manual DC control voltage which can turn the VCA on to a desired level. Control voltage signals can be added to (or subtracted from) this manual control voltage point to obtain varying levels.

VCA Panning: Stereo VCA panning techniques can be implemented where a VCA is used for each channel and a phase inverted control voltage is fed to one of the VCA channels. Quad panning can also use VCA's for accurate control and repetition of panning. Automated mixing boards are now using VCA's for panning as well as for overall volume level in multitrack mixdowns.

Rise Time or Attack Time (T_1): This is the initial increase in output voltage and can be set to be very short or very long. Figure 4 shows a short rise time. Figure 5 shows a longer rise time.

FIGURE 4

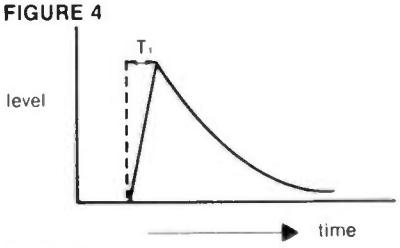
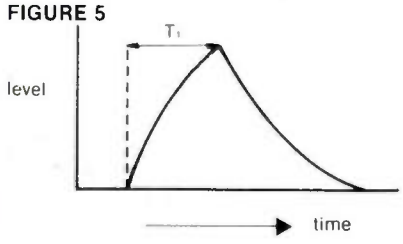
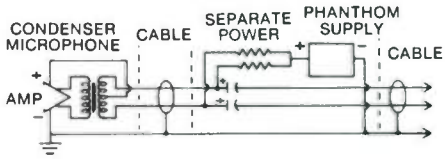


FIGURE 5



SOUND REINFORCEMENT



Although the balanced nature of the phantom supply minimizes interaction and noise between the DC and signal, a severe thump will be generate if the cable is unplugged when the fader is up on the mixer. So when you are plugging condenser microphones into a circuit that has phantom supply voltage on it (this holds true for dynamic mikes when used with condenser microphones), make certain the system is turned down to avoid damaging the transducers or your ears.

Line Level Connections: The output of a typical microphone mixer usually provides a signal level on the order of 1 volt, which is considered to be "line level" as opposed to the much lower voltage of a microphone. If the mixer has VU meters, they are often calibrated so that the 0 VU reading corresponds to an output level of +4 dBm (decibels relative to 1 milliwatt). When several pieces of line level equipment are connected together, such as mixers, equalizers or crossovers, one has to make certain that their input levels and output levels are compatible.

Another consideration regarding compatibility of units has to do with input and output impedances. It is particularly important to connect each piece of equipment to its recommended load impedance. Recommended load impedance, as its name implies, is that value which the device should "see" when looking forward into the circuit it is driving. Usually a minimum recommended load will be specified, meaning that the unit will operate properly as long as it sees a load of any impedance above this limit. In other words, a mixer with a minimum output load impedance of 600 ohms will nicely drive an amplifier that has an imput impedance of 10,000 ohms. However, the contrary is not true.

Continued next month.

'58 was a very good year...

The '80's will be even better!

As a dealer you need a great product to sell, great profit when you sell it, and a great company to help you sell it. The new PL80 and Electro-Voice give you all three.

A hot selling vocal microphone becomes a hot selling vocal microphone because it has the sound vocalists want. The sound of the PL80 is the result not only of extensive user field testing with rock superstars like Steve Perry of Journey, but also of side-by-side product comparisons and interviews with many of the most highly respected sound men in the business. Most of all, the PL80 is the result of an entirely new application of computer-design technology called "fast Fourier transform" that allows the design engineer to predict, as it's being designed, precisely how a microphone will sound in use, not just in a sterile test environment.

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To learn how the PL80 can add to your bottom line, contact your Electro-Voice sales representative today. You won't be ready for the profitable '80's without a stock of the profitable 80's.

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CIRCLE 90 ON READER SERVICE CARD

TROUBLESHOOTERS' BULLETIN

CONNECTORS

(1)

One really common problem is connectors. They are often abused and rarely noticed except when they create a problem. Often they create problems that are easily solved. Also, many connector problems are mistaken for something else, since they are usually overlooked and considered last. Good signs of connector problems are: no signal (no connection) or intermittent signal (connector is loose and makes and breaks contact). Next time, look for a

(2)

connector problem before assuming the microphone element or power output transistors have gone bad. You might be pleasantly surprised.

Here are some quick, simple tips for checking, repairing and maintaining connectors. To clean connectors, try using a cloth, like terry cloth, on the male side of phone or XLR types. You might try putting some rubbing alcohol or tuner cleaner on the cloth. If the connector has tough-

(3)

to-remove corrosion, stains, rust, etc., those small brushes sold for cleaning suede shoes work very well.

Phone plugs with loose shield connections can result in breaks on shield continuity. This may allow hum and RFI pick-up. Gently push the shield flaps inward a little bity and they will make good connection again.

Removing or inserting connectors when the power is on can result in sparks across

WRH

(4)

the contact's which can cause pitting and carbon on the contact surfaces. (This can also be harmful to you and/or the equipment.)

In multi-pin female connectors you can sometimes push the contact fork tines closer together for a tighter grip and better connection to the mate's pin.

Never work on connectors that are connected to a piece of equipment that is turned on or even plugged into the power outlet or other pieces of equipment.

(5)

If the connector is attached permanently to a piece of equipment, such as the connectors on the back panel of a console or guitar amp, use a shorting resistor before working on the unit. Short all possible combinations of pins to each other and each pin to the equipment ground. A capacitor can old a mighty charge long after the unit is turned off and unplugged.

When soldering cables to connectors, use a small piece of heat shrink tubing on

(6)

each lead. After soldering the lead, slide the tubing down over the solder lug, solder joint and the wire. Then shrink the tubing. This strengthens and supports the physical connection and reduces the chances of shorting between the wires or solder lugs.

NEIL LEWBEL
Technical Writer

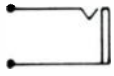
How do I read a block diagram? Why should I?

An examination of the top and back panels of a complex mixing console doesn't always tell you everything you need to know about what it will do. In fact, it can make things more confusing. A plug may be marked "echo out," but there may be nothing on top marked "echo send." A connector may be marked "sub in." But what's a "sub in"? And into what?

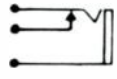
A schematic diagram would give the answers, showing all the parts and wires of an electronic device as well as the signal pathways. All this information (part numbers, component valves, and such) is necessary if something burns out and needs repair, but is more than is needed just to see how a device processes an audio signal. True, you can solve your signal flow problems by using a schematic, but a simpler way is with the use of a block diagram.

A block diagram is a schematic simplified to show only the function of a part and the signal pathways through the device. A reference chart will help you with the most commonly used symbols.

XLR INPUT OR OUTPUT CONNECTOR

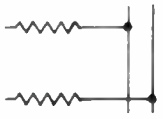


STANDARD PHONE JACK



SWITCHING TYPE STANDARD PHONE JACK

FADER OR VOLUME CONTROL



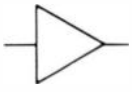
SUMMING RESISTORS FEEDING TWO MIXING BUSES

LED INDICATOR

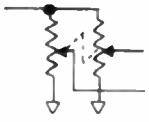
SELECTOR SWITCH

VU METER

TRANSFORMER



AMPLIFIER STAGE (line amp, mic preamp, booster amp or output amp)



PAN POT

It's important to realize, by the way, that the meanings of these symbols, and the symbols themselves, may differ from country to country and, indeed, from industry to industry. So a block diagram is really a relative reference. It should be used in addition to, not instead of, the actual reference: the schematic diagram.

Yamaha International
Combo Division

How are correct mic line levels determined; what are the variables in their treatment?

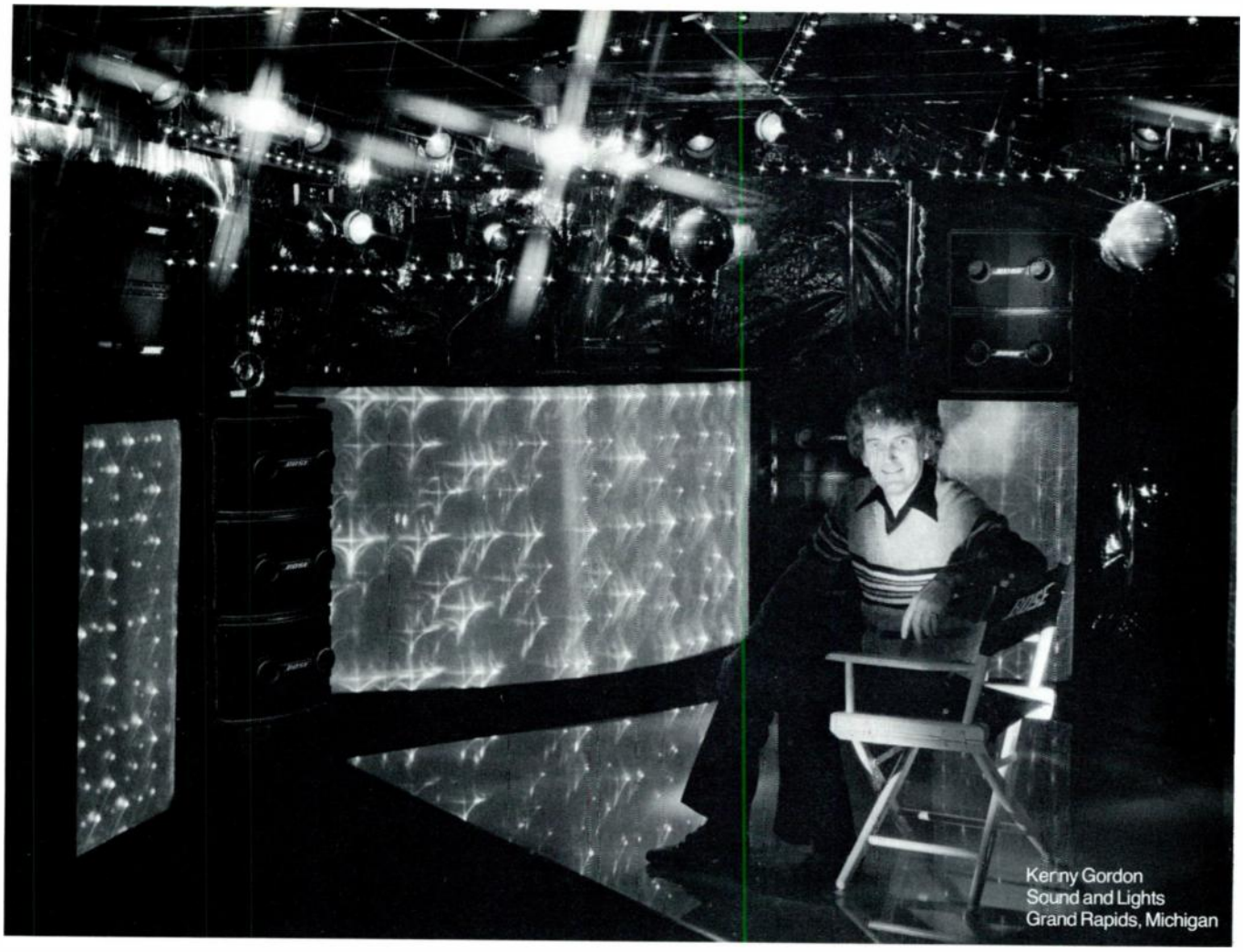
Microphone levels vary greatly, depending upon the type of microphone used and how it is used; that is, microphone placement. For example, a given mic may have an output level of -90 dBv when placed 20 feet from a violin soloist, while going beyond 0 dBv on peaks when used by a rock vocalist. Thus, to properly handle the large range of mic output levels, it is really a question of how to determine the correct sensitivity; that is gain and/or attenuation of the input stage of the mixing console or amplifier with which the mic is being used. In fact, the input stage or preamplifier is the most critical stage of most sound systems in that when too much gain or too little attenuation is employed, distortion will result when mic levels get high. When too little gain or too much attenuation is used, signal to noise ratios suffer when mic levels become low.

The key to proper input stage adjustment is to use as much gain as possible without allowing input and succeeding stages of the mixer to clip and distort. This can sometimes be a difficult task with mixers that don't have visual indicators to show you input stage signal levels. You must then rely on your own judgment and knowledge of the particular type of microphone used, in conjunction with the sound pressure levels it will encounter, as well as your ears for adjusting the input stage.

Mixers employing single peak LEDs for each input stage are helpful in identifying excessive input levels, but do not indicate when below-minimum input levels are present. Mixers that use multiple LEDs for each input stage are very helpful in adjusting the preamp gain. Simply adjust the input sensitivity of the channel until the LED or LEDs indicating proper signal-to-noise ratio and adequate remaining headroom on musical peaks are lit.

Finally, mixers and amplifiers which use transformer type inputs are susceptible to saturation and distortion when high mic or line levels are used. The use of in-line pads or pad switches employed on the mixer or amplifier will most often eliminate this problem. Transformerless or electronic inputs do not require these pads, thus making the task of input stage adjustment a bit more straightforward.

David Tkachuk
Audy Instruments



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

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

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

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

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

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

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

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

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Better sound through research.

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By Craig Anderton

(Column update: In a recent column on recording, I mentioned that people don't clean their tape recorder heads enough, and recommended that some folks might want to try cleaning heads after a session if they're too impatient to do so beforehand. However, Jay Lee gave me a call and said that perhaps I've been spoiled by living in a bucolic environment; if you live in New York or Los Angeles, you had better clean your heads prior to each session in order to scrub off all the pollution and other particulate matter than can accumulate on the heads between sessions. Good point . . . now, on to this month's column.)

The replacement pickup business is booming; more and more guitarists are tearing down their guitars and installing new pickups, rewiring and modifying old pickups, and generally searching for new ways to improve their sound. But while there is an ever-proliferating array of pickups and accessories, there doesn't seem to be a corresponding increase in awareness of exactly what pickups are and how they work. I have yet to see any comprehensive book on the subject; most pickup experimenters are very reticent to talk about what they're doing, and articles on pickups in the musical press are rare. As a result, the entire subject of pickups and guitar re-wiring is shrouded in mystery, myth, and very often, misinformation.

I learned what I know about pickups from three major sources. These are: 1. Fooling around with the pickups in my guitars. 2. Interviewing Dan Armstrong for *Guitar Player* magazine (Dan is one of the fathers, if not the father, of the hot rod guitar movement). 3. Fooling around with the pickups in my guitars.

Hopefully, this series of articles will clarify what happens between the guitar's strings and its output jack. We'll start off with pickups, move on to alternate ways of wiring pickups to obtain different sounds, and close out with information on on-board electronics such as preamps and tone controls.

By the way, I don't claim to be an expert on pickups . . . no way! But, I do feel that I know enough to help those who know next to nothing about the way these mysterious little coils of wire work. If anyone has additional information on the subject that should be included in this series, or references that would help other people, I'll be more than glad to note them.

THE BASIC PICKUP

A pickup is nothing more than a coil of wire used in conjunction with a magnet, although some pickups include more than one magnet and more than one coil. This combination sets up a magnetic field. As a guitar string vibrates in this field, it disturbs the magnetic lines of force, thereby causing some electrons to get excited and generating a voltage at the output of the coil. This voltage corresponds to the vibration of the string; by amplifying this voltage through a guitar amp, we can control the cone of a speaker and make it move in a manner that replicates the original string motion, but with much greater power.

SINGLE COIL AND DOUBLE COIL PICKUPS

A single coil pickup, which has become identified with Fender guitars such as the Telecaster and Stratocaster, includes a single coil that responds to the vibration of the string. Unfortunately, coils are rather sensitive little devices that can easily pick up unintended signals as well, such as AC hum. If you'd like to see just how sensitive these coils are, take a single coil pickup and move it close to a transformer in a piece of equipment; you'll hear plenty of hum. In recording studios, hum will often enter into a pickup from some ancillary piece of equipment; the cure is to change the physical relationship between the musician and the hum-producing piece of equipment (moving further away from the source of the hum is one possibility).

Generally speaking, if the guitar neck is pointing at the source of the hum, you'll have less interference than if the guitar body is parallel to the source of the hum. Other forms of interference, such as radio stations and the buzzes caused by dimmer circuits, are harder to eliminate.

Double-coil, or humbucking, pickups are generally associated with Gibson guitars and were expressly designed to overcome the single coil pickup's sensitivity to interference. This is done through an ingenious process whereby two coils are housed in the same pickup case. These coils are hooked up in such a way that signals hitting both coils with equal intensity (such as hum and

interference) are electronically cancelled. So why isn't the sound of the guitar string cancelled? Because the vibrations along different parts of a string are different (the most obvious example is the fact that a pickup located near the bridge sounds different from one located near the neck). Since the two coils are located under slightly different sections of the string, and since the humbucking design only rejects *identical* signals, these non-identical signals from the string pass without much impediment to the pickup output. Should you find this confusing, don't worry about it . . . just remember that humbuckers are designed to cancel out hum and other types of interference, while single coil types are not.

At this point, you might wonder why all pickups aren't humbuckers. Well, as it so happens you don't get something for nothing, and humbucking pickups aren't as crisp-sounding as single coil types. As a result, some people prefer the "single coil" sound, while others prefer the alternate sound and hum-cancelling properties of humbucking types. Still others like both sounds, and have rewired their humbuckers to give either humbucking performance or single coil performance at the flick of a switch . . . but we're getting ahead of ourselves.

PICKUP ADJUSTMENTS

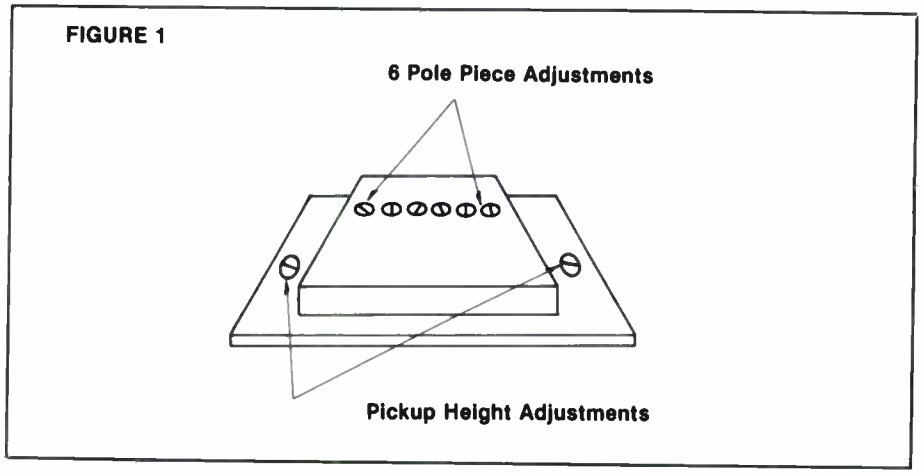
Most pickups have two separate adjustments that you can make. (See figure 1). The two screws on the side of the pickup case allow you to change the angle of the pickup in relation to the body of the guitar, and bring the entire unit either closer to, or further away from, the strings. Additionally, many pickups have six little screws (called pole piece adjustments) which allow you to balance out level differences between individual strings. Bringing the pole piece closer to the string produces more output from that string, while screwing the pole piece further into the pickup de-emphasizes that string.

What most people don't seem to realize is that these adjustments are crucial to getting a good guitar sound. I repeat, crucial. And yet, I've had dozens of players who had never bothered to make these adjustments come to me complaining of a "bad sound." Here's how I go about setting up these adjustments for a guitar.

1. Make sure you have new strings on the guitar. Not last week's strings, *new* strings of the type that the player will be using. Remember, the strings and pickup work together as a pair.

2. Screw all the pole pieces into the pickups so that the screw tops are flush with the top of the pickup case. Now, simply play the guitar for a good five minutes, switching back and forth between the treble and bass pickups. Carefully note any inconsistencies in sound. Does the bass pickup sound boomier? Which pickup predominates when you put both pickups in parallel? How is the level match between the two pickups? After noting these differences, start playing around with the pickup height adjustments. For example, if the bass pickup is boomier, move the treble pickup closer to the strings and the bass pickup further away. If the levels are more or less matched but the lower three strings on the treble pickup are much louder than the top three strings, angle the pickup slightly so that it's further away from the bottom strings and closer to the top strings.

FIGURE 1



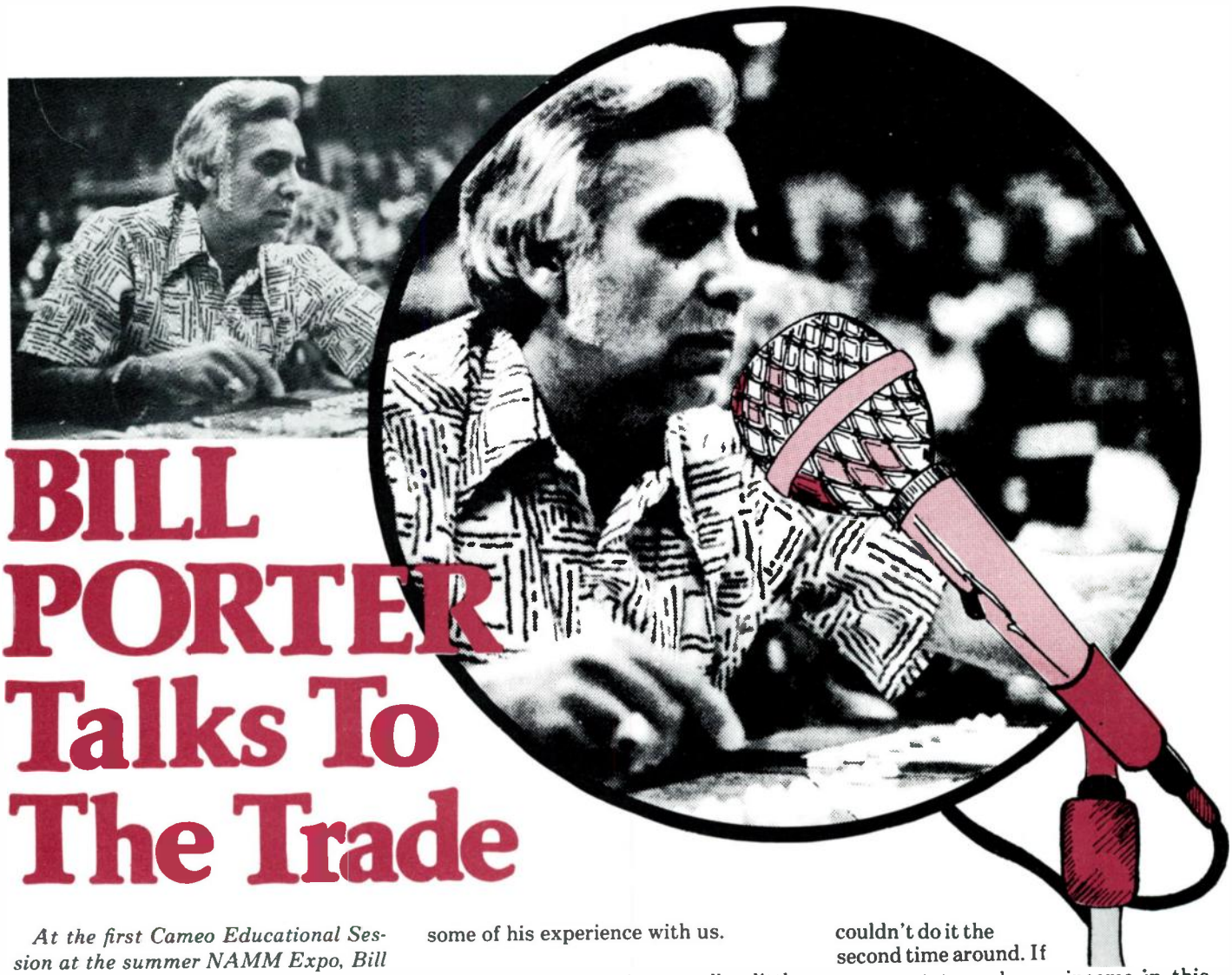
These adjustments should make a big difference in the sound. The goal is to achieve a consistent level when switching between bass and treble pickups (they should put out the same apparent level), and the sound of the two pickups should be evenly matched when both pickups are selected.

Now it's time for fine tuning the pole piece adjustments. Select one pickup and carefully strum all six open strings; listen for any level differences between strings. When a string sounds weaker than its neighbors, screw its associate pole piece counter-clockwise so that it moves closer to the string. Continue strumming and adjusting until all six strings are balanced. Next, try strumming a bare A or B major chord. Chances are the balance will be somewhat off, since it is virtually impossible to adjust the pole pieces so that all strings respond equally regardless of where they are fretted. As a result, you may want to make some minor adjustments in order to obtain a "compromise" setting that works adequately with both open strings and fretted strings.

Now make the same adjustment to the other pickup. After all the pole pieces are balanced, you may have thrown off the balance between pickups, necessitating another go at the pickup height adjustments to bring them back into perspective again. Doing this might throw off the pole piece adjustments, requiring a little more fine tuning. However, these differences will become smaller and smaller; eventually, you'll hit upon the right pickup height adjustments and pole piece adjustments to give a truly balanced and spacious sound. Proper tweaking of these adjustments can make the difference between a guitar that sounds like mud or one that sounds bright, full, and wonderful.

One caution to bear in mind is that if the pickup or pole pieces are exceedingly close to the string, the magnetic field can actually pull on the string slightly, causing unpleasant side effects such as detuning and loss of sustain. So, while moving the pickup and pole pieces closer to the strings does produce more output, there are practical limits.

Now that we've talked about pole piece adjustments, I should mention that many newer pickup designs do not include pole pieces at all . . . and there is a real good reason for this. However, we've run out of space for this month, so you'll just have to tune in again next issue for additional information as we continue our discussion of pick-ups.



BILL PORTER Talks To The Trade

At the first Cameo Educational Session at the summer NAMM Expo, Bill Porter spoke on his career in recording and sound reinforcement. This is an edited transcript of that talk.—Editor.

Larry Blakely. Our speaker today is Bill Porter, and we're very pleased to present someone with his background. Bill has had a distinguished recording career. He was the mixing engineer for the late Elvis Presley, and recorded other artists such as Roy Orbison, Chet Atkins, Paul Anka, Louis Armstrong, Barbra Streisand, Buddy Rich, Frank Sinatra, and so on. Bill has 296 chart records to his credit, and as far as I know, that's more chart records than any other mixing engineer that's ever lived. At one time, Bill had 15 chart records in the top 100 that he had personally engineered.

About five years ago, Bill went to the University of Miami where he teaches a course called Music Engineering. It is a recording course, and I think it was the first four year degree course offered by any university in the world. And so we're very pleased to have Bill share some of his experience with us.

Bill Porter. I'm going to talk a little about my personal history—maybe it will be of some benefit to you younger people—and a little about the crazy things that happen in the recording and sound reinforcement business, and maybe give you a few tips that might help on some of your sound problems.

Let me tell you first, before I say anything else: There is no magic in this business. Everybody says, "I have this black box that does that, and this black box that does this." Well, this black box and that black box only take the basics and apply them in different ways. Since I've been teaching, I have found out that everybody wants to bypass the basics. They want to step in and be a recording engineer right off the bat. I hate to disappoint you, but it's not possible to do that. Because somewhere you've got to learn the basics; there is no short cut. I've seen one or two guys come through with a fluke hit; they made a lot of mistakes, but they cancelled each other out and so the end result was a hit record. But they couldn't do it the second time around. If you want to make an income in this business, you need to have a little background so you can stay.

I started in television repair in 1950. After five years of that, I went into television broadcasting, and I got into audio at the time. I spent five years in television broadcasting, and then got a job with RCA Victor. And I thought that with my television experience, I had the world by the tail. There weren't any publications around except one or two radio operators handbooks that told you how to do this and that. You'd try to get a certain kind of sound and you'd do a lot of maintenance to try to keep the equipment going, and that's about all there was.

I used to watch the network shows and try to look at mike placements and see what they were doing and analyze and try to orient the picture with the sound. That will get you part way, but you don't know what the guy's doing with the microphone or whether it's even turned on or not. Anyway, after I thought I had the world by the tail and

I was mixing as many as four microphones at one time [laughter], I went to RCA. My training for the RCA job involved one day of going through the gear. I thought, God what have I done to myself? Here was this big studio, and I didn't really know anything. Chet Atkins gave me a lot of help in analyzing balances and he told me a few tips on microphone placement.

Now I want to emphasize the basics on microphone placement, because in the days that I learned, we didn't have equalization. I recently was at a school in Montreal holding a two-day seminar, and one of the engineers told me, "You know you made a record in 1960 that I use as my standard—it really blew me away." He said, "It's got the cleanest sound and the best frequency response of any recording that I've ever heard." It happened to be a Floyd Kramer album. That particular album does have a lot of low end to it and a lot of high end and a lot of transparencies, and the reason is that I put the right microphone in the right place—and I did not have equalization. I'm not against the modern day techniques. Do not misunderstand what I'm saying. But you people have the opportunity to create much better musical compositions, much better sound than we have. But you're not doing it because you're bypassing the basics. [Applause.]

People talk about the personality problems in this business. You're dealing with artists who have egos that are monumental. That's not to put anybody down—that's a fact. You have to be that way to be an artist. And I think engineering is an art too. So, frequently you get an ego clash. I've found that the artist coming in is intimidated by the black boxes. So he's got this attitude. The first thing he does is try to intimidate the engineer. If he gets the upper hand, your creative abilities go out the window. I know because I've been there.

Let me tell you a story. I was intimidated by Connie Francis because I hadn't been in the business very long when the A&R men brought her over to the RCA studio. She didn't want to come; she was used to recording over at Columbia or else in New York. So when she came in, everything was wrong: The studio didn't have the right temperature; she didn't like the mike I was using; she didn't like the way this was set up; she didn't like the way that was set up. So we went through about 20 or 30 minutes of recording part of her voice and changing it around and changing the mike angle to where she wanted it. This makes a person very nervous, because you're not sure exactly what you should do. The artist can't tell you. (And this is another problem—the lack of communication in terms that we can comprehend.) Anyway, we finally got the sound she wanted. So we did three or four takes of a tune and she said, "Okay, play it back." Everybody scurried out to get a drink of water or go to the bathroom. About halfway through, she came running in the control room and said, "Stop the take. I want to do it again; that's not quite right." So everybody scurried back into their seats, except for the rhythm guitar player. He couldn't be found. I looked at the A&R man. He said, "Don't say anything." I said, "Okay, it's your show." So we started the take minus the rhythm guitar player. We did the whole take and then played it back, and about three or four bars in she came flying in the control room again, saying "We've got to do the tune again; there's too much rhythm guitar." That's a true story.

Now I'm not putting Connie Francis down; do not misunderstand me. I worked with her many times after that and she was a sharp lady. But the story illustrates the point I'm making. She came in to intimidate me, and I fell for it. But I found out she didn't know exactly what she was talking about.

Now, I'm a firm believer that anybody can turn the knobs. You can train a monkey to do that, but it's interaction with people that's very important. If you can't handle that, you can't handle the gig. A few people talk about this as one of those big deep dark secrets that you just find out along the way. But I tell you, it's a hell of a lot easier if you find it out before you really get into it—how to interact with people. In our program at the University, we have a few courses in psychology that are mandatory, especially on interacting with people, and that's very important in this business.

I'll tell you a story about reacting under pressure that's not very complimentary. My first year in the business, I'd been working at RCA just about two months, Archie Blyer was the producer and the artist was the Everly Brothers. We spent two or three days changing the console, just taking out the old board, which was literally a radio board with eight microphone inputs and putting in this new modern 12-input three-output channels new board. An RCA engineer came down, we did the wiring and put the new console in and we were literally wiring the last connections a couple of hours before the date—which is normal. This engineer went through and set levels on the limiters and everything, differently from the way I had them. He just wanted them done the RCA way. I didn't realize he had made any changes, and the Everly Brothers started to sing. About a couple of phrases in, there was the God-awfullest distortion I had ever heard. Archie looked at me. "What was that?" I said, "I didn't hear anything." He said, "Well, I heard something."

I found out later on what actually happened. RCA had a tube type limiter with a 6B6 output stage single ended, and with some types of harmonics, if you clamp them down, limit them hard, you get high-end distortion that's unreal. And that's what was happening. But I had been working so many hours and was so tired I couldn't even think. So Archie was saying, "Well, find the problem, find the problem." Time was going by and I couldn't seem to find the problem because I couldn't even think. Finally I said, "That's all I can do." He started freaking out. "I got the studio, people out here, it's costing me money, and that's all you can do?" So I said, "Yes sir, that's all I can do." Because all I could think of was getting this guy off my neck; the pressure was really becoming too much. So he called off the date.

I got a telephone call Monday from the chief engineer, and he chewed me out. He said, "Don't you ever tell a client that's all you can do. I don't care what your excuses are, Bill, that's something we never do. You blame it on the equipment or whatever. You never say that's all you can do. If you do that again, you're fired: no ifs ands or buts about it." Two weeks later Archie came back; same song; same gig. The pressure was pretty intense. In the meantime I had found the problem and adjusted the limiters back the way I wanted them. We started the date and that phrase came along and went through nice and fine. That recording happened to go on to sell a million copies. That just shows you the problems that you can get into—and you *have* to learn to handle them.

Some people don't want to hear about this part of the business, but it's realistic and it's something we all need to cope with. You get into problems because you're unable to handle the pressures that are put on you. And the reason you can't handle the pressures is

that you don't know the basics. If I had known limiters properly, I would have known exactly what the problem was and could have adjusted it and gone on. But I didn't know. I had to find out the hard way.

I want to tell you that the reputation of your work goes with you. It always precedes you. And if you don't start to establish a standard of quality within your work, it's so easy to slough it off, if you're in a big hurry. *I'll fix it in the mix* will sometimes get you out of trouble, but it won't get you the best quality product you can have. There's no way. Drop the phrase of *fixing in the mix* and say *fix it as I mix.*

As far as sound reinforcement, I've tried to add up my concerts, and I've probably done about 1200 with different artists—not a whole lot compared to some people, but it is quite a bit. You can't get on an ego trip from doing concert stuff. A lot of engineers say, "Well, I'm an engineer and the roadies are going to do their gig and I'm going to be a prima donna and come in and do my thing." Well, if I had done that, a couple of times we wouldn't have had a show. Everybody's got to carry their fair share of the load. I don't think you can be a prima donna mixer. You've got to know some of the problems that go on.

Let me tell you a story about a problem that I encountered with Elvis. It was a basic thing that I didn't assume would make any difference. He was real bad about throwing the microphone on the floor, using it to wipe his brow with, on his pants and everything else. The windscreens, as you know, are on when the microphone itself will receive quite a bit of abuse. We had a problem where the sound of his voice seemed to be going downhill. The mixer didn't make a difference. I changed microphones and all; it still didn't matter. Sometimes the people that really don't know give you the little tips on what you can do. One of the guys said, "What about the wind screen; maybe it's dirty." And I thought, "Dirty windscreen?" I took it off and took it in the bathroom and put some water on it and when the black dirt came out, that thing was unreal. It just turned the water completely black. That solved the problem. The simplest thing like a dirty windscreen. The sound blossomed again after we did that. When I had changed microphones I put the same windscreen on, so I was transferring the problem; I wasn't fixing it.

Elvis was a bass freak. He used to say his ambition was to sing bass in a gospel quartet. We went through a lot of microphones to get the right sound that he wanted. In desperation, I went out looking myself. He was always climbing over the speakers, kissing girls and everything else, and boy you had to get that microphone down when he got close to that speaker, there were no ifs ands or buts about it or he'd let you know about it. Let you know about it in front of the audience, too.

In Elvis's show, we'd do an opening two numbers on one microphone, and then he would change microphones. That was his pattern. So I put a new mike up for two numbers and he sang on it a little bit and looked at me and didn't say anything and then he said, "I think I like this mike." That's the way he did his shows.

The microphone this time was a CS15, which E-V's had on the market now for about ten years I guess. With the full windscreen on the microphone, you get quite close to the diaphragm and I think the mike almost puts out DC. Now you don't want that kind of sound in normal application, but that was what Elvis actually wanted, and so I was able to satisfy him and get pretty good quality control of the sound. I'm a firm believer in trying to please the artist, although not at the standpoint of sacrificing the equipment.

In live concert tours, we always hung the speaker system. If you know anything about basics, you know you get much more bass coupling if you put the speakers on the floor. In Elvis' show, J.D. Sumner would do an opening song; he'd do one of his vocal slides down to the low end. The microphone, bear in mind, at about 50 herz is about 15, 16 db of gain. So as J.D. would do a slide down, I'd grab the low frequency equalizer—which was about 50 herz—and crank it wide open, and we would literally vibrate the seats in the auditorium with the hanging speaker system. I defy anybody else to do that with a bass voice. Elvis would freak out, because the whole stage would rattle. The guy with Clair Brothers would scream at me. He said "You're going to tear up the equipment, you're going to blow everything out, we can't finish the tour." But it was a case of Elvis liked it, so I did it. But I was careful not to let it clip. I didn't send square waves into the speaker system. But we did boost it quite a bit anyway.

Let me talk to you about some problems as I see them in the recording business today. We're into multi-track recording, which is fine. But we're losing the ability to do a simultaneous two-track stereo mix, and if you think your mixing chops are good, try it one time. I may step on some toes, but on some of the direct-to-disk recordings I've heard, the mixing is atrocious. The quality may be great, but the balance is bad.

Most people don't know how to get a simultaneous mix. They have no idea what the finished concept is supposed to sound like. If you have a recording studio situation, it's important for you to know the overall musical content and what the finished product should sound like. If everything's recorded at one time, it's up to the engineer to walk into the studio and listen to what the sound sounds like: where the balance is supposed to be; what is being featured. You get some idea of the musical content.

A lot of guys go in and get a balance, and they have no idea who's got the melody, what's happening in the song or whatever. And they're out to lunch. That happens a lot in what I call music by jig-saw puzzle. A piece at a time. I've had dates where the guy comes in and plays the bass and gets the sound he wants; we overdub drums, guitar, and nobody knows what the finished thing's going to be till you get it done. In a case like that, there's not much you can do.

There's a problem that's becoming quite prevalent in this industry. It's the blending of electronic instruments with acoustic instruments. With electronic, everything is closed circuit. There are no acoustic parts involved. Everything is direct, through the wire into the console into the speakers. With acoustic, you're using a microphone, using the acoustic properties around the microphone, and it's very difficult to blend the two and make them sound proper, because one has so much apparent loudness. I'm not against electronic music; don't misunderstand me. Any time you've been to a concert, you hear a guy playing electric piano and that's all you hear; because you can't equalize it out. There's too much up front no matter what you do with it. I don't have answers to all these problems, but I think we should be more aware that we're not creating a proper balance of music any more.

Go to a concert that's not amplified sometime, like a dance band concert or a big band. Listen to it. And then tell me how many records you hear that sound like that. I know people who say, "Well, I don't want that kind of sound. I want it in my ear." Fine. But let's not lose the concept. Basics again.

PERFECT HARMONY!

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CIRCLE 81 ON READER SERVICE CARD

GETTING MORE FROM THE PA SYSTEM

By Don Gayle

The Encyclopedia Britannica defines a PA (Public Address) System primarily as: an assembly of devices designed to increase loudness of speech or music or both, live or recorded; true, but a very limited definition. It's difficult to imagine a modern mixer-amplifier with all its signal conditioning, handling and enhancement capabilities as merely a "loudness-increasing device." But historically, PA evolved as a remedy to the acoustic ills of architectural design, and only recently as equipment to meet the needs of contemporary music.

Today's sound man also underwent an evolutionary process. Yesterday he might have been a non-performing disc jockey/technician, but things are really different now. Often as not, today he's a musician, one of the group. He knows and plays the music, and he knows what the group's sound should be. Most of all, he knows that he must use all the tools of his trade—electronic and musical—to enhance the performance.

Modern PA's, the product of the demands of the music industry and heated competition among manufacturers, are extraordinarily versatile. What is done with the PA is often limited only by the user's imagination.

Too often, the PA user thinks of his equipment in terms of vocal or instrumental sound reinforcement only. The instruction manual may list some great ideas on what he can do with his mixer-amp, but usually it's either not read or put on the back burner for future consideration.

And that's the purpose of this article: to jog your mind about some of the uses the PA can be put to, presented in language you can pass on to your customer to show him that what's done with the PA can yield a greater return than he imagined.

If a PA is of recent vintage, it probably has most of the following features—they're becoming standard on modern PA's. If not, it's worth it to make your customer aware of them.

Inputs. The trend today is to provide both low- and high-Z (impedance) micro-

phone inputs, usually for simultaneous use. The low-Z inputs permit connection to dynamic, ribbon or condenser microphones. Some PA's have built-in simplex power supplies for powering condenser microphones through the low-Z input connectors. The high-Z inputs can be used with high-Z microphones, direct instrument pickups, keyboards, amplified instruments, tape recorders or other high-level sources. Should it become necessary, a line matching transformer can be used to couple a high-Z source to a low-Z input or vice versa.

Many PA's also have separate aux-level inputs for tape recorders, synthesizers, amplified instruments, background music sources, preamplified phonographs, or other mixers. They can also be used for the return signal from an external effects device. When an additional mixer is used in an aux channel input, the aux channel volume control becomes a submaster.

Input Attenuators. These handy knobs adjust the input preamp gain to permit the channel to accept low-level microphone signals, "hot" condenser mic levels, direct instrument pickups, or high-level aux signals from amplified instruments or tape recorders. Depending on the attenuation range, almost any input source can be accommodated. The control range is generally from 0 dB (distant miking) to about 30 dB (condenser microphones or amplified instruments).

Input Clipping Indicators. Generally LED (light-emitting diode) types, these indicators are constantly on (indicating distortion) when the signal level is too high, and never on when the input is low (this may mean noisy operation). They're designed to light at some level just prior to clipping of the preamp or input EQ. For an optimum signal-to-noise ratio, adjust the input attenuator and channel volume controls for only occasional flashing.

Pan Pots. The panoramic potentiometers are used for stereo (left-right) positioning in stereo sound reinforcement or recording. Generally, the full counterclockwise position assigns the input signal to the left channel and full clockwise assigns it to the right channel. Position it straight up (center) for equal assignment to both channels or for mono sound reinforcement.

Effects/Reverb Controls. These are controls that set the amount of reverb (built-in or external) and/or effects on the channel. They generally follow the channel input attenuator, volume and EQ controls, and can be used simultaneously with reverb and effects devices, or as a second monitor (post-fader) to the effects output jack.

Monitor. The monitor control independently sets the channel monitor level to the monitor output jack. It's adjusted for the desired monitor mix when using a monitor system. The control generally precedes the channel volume (pre-fader) control, EQ, effects /reverb and pan pots, allowing a totally independent monitor mix.

DB Peak and Power Amp Overload Indicators. DB peak LED indicators seem to be fast replacing VU meters in many PA designs. They're connected to the power amp outputs and they indicate peak output level. Although calibration numbers may vary from model to model, the general design is as follows. The 0 dB LED represents some given output power, say 25 watts to a 4-ohm load. A 6 dB change is a 4-times power change; therefore, a −6 dB LED would indicate 25/4=6.25 watts, and a +6 dB LED would indicate 25(4)=100 watts. All the LED's in the string *below* the peak lit LED generally light as well.

Power amp overload LED's light when the power amp exceeds some preset value of distortion level, usually about 1%. This may be due to clipping, mismatched speaker loads, or any condition resulting in imperfect signal amplification. Turning the master volume down generally eliminates the overload condition; if not, the speaker load may be improper (too many speakers on the power amp) or a speaker cable may be shorted.

Graphic Equalizers. Graphic equalizers permit adjustment (boost and cut) of the sound system frequency response for a tonal balance appropriate to the performance and a reduction in the tendency toward feedback. They can also be used to compensate for electrical and acoustical variations when adjusting the frequency response of an audio playback system. Disco-type sound can be produced by moderate amounts of low- and high-frequency boost.

It's important to note that equalization by ear requires skill and time. A commercially available EQ analyzer is preferable. It's possible that the PA has a built-in system for locating feedback and controlling it with the graphic equalizers. By all means, remember that since the graphic equalizers can overemphasize or remove desirable program material, it's best to minimize acoustic problems (including feedback) by careful microphone and speaker placement *before* equalizing, and then only use as much EQ as is absolutely necessary.

Patching. Some of the more versatile PA's offer a capability for patching—coupling by means of short lengths of cable between PA sections—which allows the PA to be "split" and used as separate components, or to be easily incorporated into a more elaborate PA system. For instance, both output channels of a stereo console can be patched into one power amp and the second power amp used for a monitor setup. Or the monitor can be patched out to a separate amp and speakers. There may be microphone- or aux-level outputs for feeding a house system, freeing the PA power amps for other uses. Biamping, taping, multiple monitors, the possibilities for different circuit applications are almost endless!

The first thing to teach your customer is that PA setup needn't be a hassle. Today's equipment has simplified setups to a great degree, as well as giving more power per pound and improving reliability and maintainability. It might be equipment knowledge and technique that require updating. Try passing along the following suggestions for a faster, smoother, more trouble-free performance.

Establish a routine. Check out the equipment before the performance. Show time isn't the time to discover defective equipment. A fast run-through, checking microphones, cables, mixers, amps and speakers is the cheapest insurance. Just as numbers are rehearsed, so is the PA.

If the sound man alone is responsible for the equipment, fine; if he's one of the musicians, the responsibility for hauling the PA should be shared and everyone should know what they're supposed to handle and how to handle it. It's better to hear gripes about the work than for someone to stare blankly and say, "I thought *he* had it."

Planning it out. If possible, visit or obtain a layout of the performing area and figure out where the console, microphones and speakers will go. This will help determine the power requirements, too, as the area to be covered will be known, and will help define lighting and stage access.

Consider which of the almost infinite combinations of PA setups is right for the individual. Check the figures in this article for a traditional setup employing six microphones for vocal or instru-

mental use. The microphones feed a mixer or audio console which is also connected to an external effects device and an external equalizer for response shaping. The mixer feeds separate monitor and program or house amps, which send the amplified signal to monitor and house speakers.

A newer and somewhat more specialized use is shown in the next figure (a modern instrumental setup). Here, an instrumental setup using multiple keyboards feeds a power console—a mixer-amplifier which contains both program and monitor amplifiers, and an integral equalizer. Effects devices can be run through the console to affect the entire mix, or inserted in individual lines from each keyboard for separate effects control. The power console amps in this case have been used to feed separate monitor speakers, while a separate output goes to the house system for routing to house speakers. Notice that this setup only depicts a group of instruments; if you've got the console inputs, you can run more instruments or microphones without an additional console. If you're short on inputs, consider a small slave or submixer to feed one input of the console.

Locating the PA. Where the PA goes during the performance depends primarily on whether the sound man only runs the PA or whether he's one of the musicians. The offstage PA should, if at all possible, be located in the center of the audience area, where the sound man can hear what the audience hears. More and more auditoriums are providing audience-area sound booths, and many clubs have found it advantageous to locate the console near the customers.

The musician-sound man must have a small table or shelf near his playing area for the PA. He needs access to the controls without undue stretching or other movement. For proper operation, air flow around the PA must not be obstructed; check the manufacturer's instructions for required clearances.

Enough of the Right Microphones. There are quite a few considerations for choosing the number and type of microphones. Unidirectional microphones compared to omni or nondirectionals, are less prone to feedback and less sensitive to background (audience) noise. Low impedance permits greater cable length without hum or loss of high-frequency sound than high-impedance microphones. Separate microphones for each performer can allow the sound man to provide the best mix possible. "Pop" or blast filters let the vocalist work close to the microphone without overloading the preamp and creating objectionable sounds in the speakers. Three-pin connectors—of the Cannon XLR or Switchcraft A3 (Q.G.) type—make the microphones compatible with most modern PA inputs. And don't forget colored windscreens or some other way of identifying the microphones.

Speakers Here, Speakers There. The traditional (and optimum) placement of speakers has always been to either side of the stage and slightly forward of the microphones to minimize feedback. This is still a good basic setup, but many modern groups prefer the "wall of sound" multi-speaker setup or splayed speaker clusters to either side. Note the shape of the room as well as its size. It may be necessary to provide a non-symmetrical area coverage for a peculiarly shaped room (some speakers have adjustable high-frequency dispersion and are easily adaptable to odd-shaped rooms). And a steeply inclined audience area with a low stage may require tilting the speaker upward to reach the topmost seats.

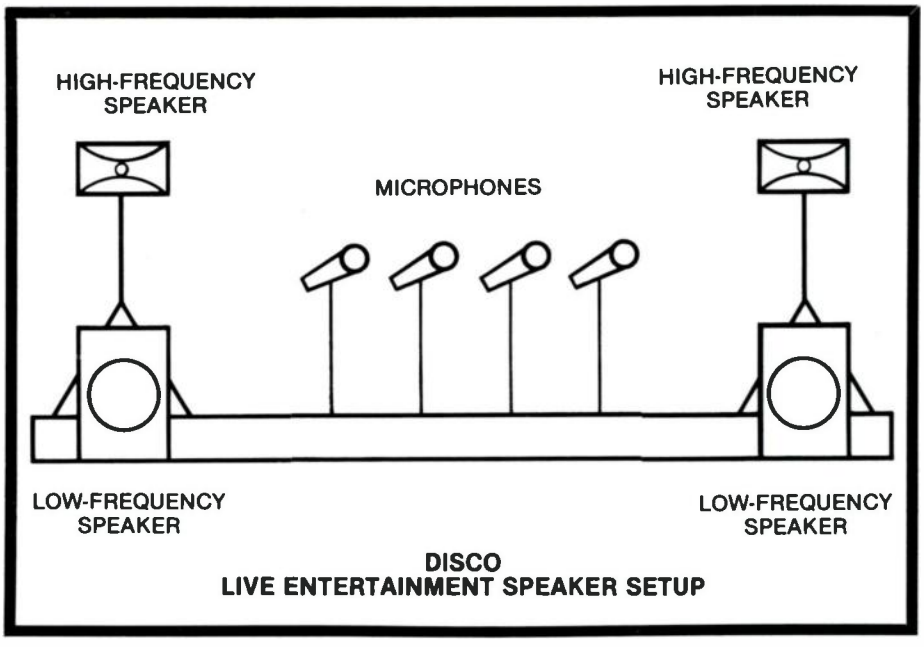
Stage monitor speakers, usually the wedge-shaped variety with minimal visual interference, are spaced around the performing area, normally in front or to the sides of the musicians. Though not generally recommended, some performers prefer monitor speakers behind them, facing the audience, so that the monitors become center audience "fill" speakers. Nothing wrong with that if there are no feedback problems, but the sound man must remember to provide these speakers with a fuller mix, rather than a highly selective monitor mix.

The group that provides recorded music between sets may require a different speaker setup, especially if the break music is disco. It's not practical to set up full disco speaker stacks around the dance floor. But even with the group's PA, you can get closer to the disco sound. First, if you've got separate low- and high-frequency speakers, put the woofers at floor level and raise the tweeters using tripods or other means. This will provide an optimum dispersion of high-frequency sound through the dance floor crowd. Next, add moderate amounts of low- and high-frequency boost. The result can provide a good disco sound.

Cables—a Fresh Connection. Microphone and speaker cables take more abuse than any other part of the PA. Check them out carefully before a performance: look for deep gouges or cuts in rubber or plastic jackets—they may indicate conductor damage. Sharp bending or kinking can break conductors or shields: examine the cable and test it electrically. Look at the cable connectors: are the insulators intact and pins straight? The few minutes spent on these checks will be worth it in terms of easing your mind.

And even though all the cables check out okay, it's still a good idea to carry spares. A few extra microphone and speaker cables aren't too heavy or bulky, and they can prevent a band from being wiped out during a show. (Think about heavy-duty power cords, cube taps and extensions, too; they're not always there when you need them!)

If the cables were properly coiled after the last use, they're a cinch to unwind the next time. When cables are



DISCO
LIVE ENTERTAINMENT SPEAKER SETUP

laid out for a show, they should be as short and out-of-the-way as possible. Tape them down with duct tape in areas likely to have performer or audience traffic. And if especially heavy traffic is likely, check out the flat plastic or rubber cable protectors available. If the microphones are a good distance from the audio console, a multi-conductor cable or "snake" should be considered to improve appearances (but remember: if one connector or cable goes out in a snake, you may have lost that position for good).

Keeping It Under Control. No matter how perfectly it is set up, the PA controls generally need touching up during the performance. Not large changes, of course, just small amounts of volume or EQ. In fact, *large* instantaneous changes can be quite disturbing to the audience; if you ever have to make them, do it slowly or wait for a rest in the music so it's not so noticeable.

Some control touchup or "tweaking" may be needed because of changed acoustic factors: an audience may have been added, or curtains or drapes may have been moved. Performers may be working closer to or further from microphones; windows or doors may have been opened or closed. Watch out for feedback—upward changes in volume, tone or EQ can easily lead to this, one of the biggest audience turnoffs. The thing to remember is: don't panic! Make small adjustments *without* overcompensating—this can bother your audience more than the original condition.

A MIX OF THOUGHTS

The features found in modern PA's continue to grow. Indeed, today's "luxury" options seem to become tomorrow's standards. But whether the PA is the latest model or bordering on the antique, the following tips may give you some ideas on getting more audio "mileage" for less money.

Keyboards. In the past, keyboard meant either an acoustic piano, played loud and unmiked or soft with an overhead mike, or an organ with its own speaker-amp or possibly a guitar amp. Today, most groups carry several keyboards—electric pianos, organs, string ensembles and synthesizers—and they need a systems approach to connect them all. A small, versatile PA, with all the keyboards connected to its Hi-Z inputs, can mix all the keyboards through a single mixer board. Equipment cost and weight are reduced, and the artist has complete control, not only over the volume, but over EQ, reverb, effects and other controls affecting all the keyboards.

If phasers, flangers and other external effects devices are to be used, connecting them through the PA means that all keyboards can use them—you don't need separate devices for each keyboard.

In large halls, if the PA has an XLR 3-pin mic output, this connector can be run to the house system. The group's PA can be used as a stage keyboard system under control of the artists. This simplifies the house sound man's job, and guarantees that the keyboard mix is what the musicians want.

Acoustic Instruments. Acoustic musical instruments are generally miked by either stand- or boom-mounted vocal microphones, or by a direct instrument pickup running to its own amp and speaker. Using an instrument microphone—a small unit designed specifically for acoustic instruments—and running this microphone to the PA offers several advantages. First, avoiding vocal microphones means you eliminate much of the sound of other instruments and ambient noise that the vocal microphone would pick up; the instrument microphone's pickup is pretty much restricted to the instrument it's attached to. And replacing the direct instrument pickup and amp means that the instrument's sound is in the hands of the sound man; he can bring the instrument's sound up, instead of the musician's having to play louder for more output.

Note, too, that when playing an instrument with a stand-mounted microphone, as the performer moves, the distance to the microphone changes and the level changes. This doesn't happen when the microphone is attached directly to the instrument.

Effects Devices. Short of buying additional instruments, the easiest way of increasing the versatility of a group's sound is of course by using effects devices. Phasers, flangers, echo, delay and other effects devices can be used with a PA as well as between electronic instruments and their amps. Simply connect the effects device between the PA EFFECTS OUT jack and an AUX IN return. Make sure the effects device output impedance is the same or lower than the PA input following it. Also, the PA should have separate channel send controls to permit different amounts of effect on each input.

Tape Recording. The simplest method of taping a live performance is to plug the recorder high-level input into the PA AUX OUT jack and adjust for volume (and tone, if available). This type of recording can be made with a mono or stereo, cassette or open-reel recorder. The advantages are that a relatively inexpensive recorder can be used, and the PA controls can be used to modify the recording. The PA's EQ controls compensate for the lack of these controls on the recorder. The disadvantage is a lack of control over what's recorded; the same emphasis given through the PA will be on the tape. Taping off the PA can't pick up the balance of direct and amplified sound present in the room. Since the taped signal from the PA will undoubtedly emphasize vocals and miked acoustic instruments, it's obvious that the amplified instruments have to be picked up too. A stereo tape recorder permits you to record the PA signal on one track and the group's amplified instruments via an overhead microphone on the second track.

The two-step recording method offers a compromise between 16-track (or 24 or 32) studio taping and the simple one-step method described above. This method is not for live performances, but should be done in the performing area or somewhere approximating studio conditions. What's needed is an open reel tape recorder capable of recording four tracks simultaneously. A typical session has each recording subgroup (rhythm, featured instruments, vocals, etc.) laying down separate tracks. The PA mixer output feeds the 4-track recorder. With the rhythm track or tracks recorded first, the featured instrumentalists can listen to the rhythm through headphones as they record. Finally, the vocalists can listen to all recorded instruments through headphones as *they* record.

At this point, the four recorded tracks are plugged into the PA mixer, which now functions as a mixdown console. The outputs, any outputs before the power amp, that is, are fed to a two-track tape recorder. As the four tracks are mixed down, the mixer can be adjusted for EQ, reverb, pan and any other effects desired on the two-track tape. Effects devices can be added to the mixer through the EFFECTS OUT and AUX IN jacks. In this way, the added effects can be changed without altering the original, or master, four-track tape.

House PA's. Sometimes a club owner

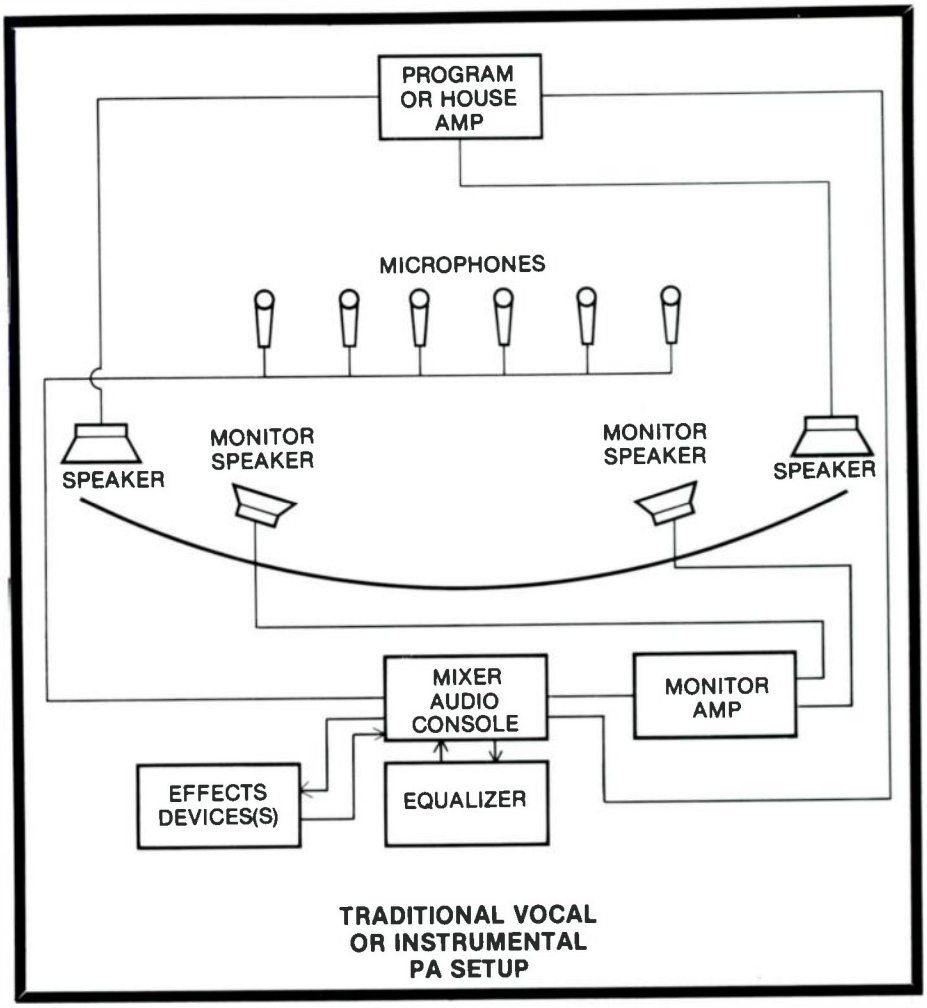
(or a contract) requires use of the house PA instead of your own system. Then, too, the stage may be too small for your speaker stacks. All may not be lost. It's even possible that the house system is as good or better than yours.

Anyhow, when the house PA *must* be used, your own console can still be used to advantage. By connecting your console's microphone level out to the house system input, you retain the group's mix and eliminate the big speaker stack that normally accompanies your PA. The equalization and feedback control of your PA are still usable. And the power amps in your system can still be used for monitor mixes. This way, you get the sound you need, and the club owner is still happy.

Monitor Mix. The monitor mix—providing a separate functioning channel for the use of the performers—is an outgrowth of regular PA systems. On-stage monitoring, or foldback, is available with most PA's. With a stereo console, one channel can be used to feed the house system or the group's amps and speakers, and the second channel feeds a separate power amp for the monitor speakers. Some mono audio consoles have a separate monitor channel for this purpose. A stereo PA with a separate monitor output requires an external power amp to feed the monitor speakers.

On a large concert hall stage with the group spread out, four or more monitor mixes may be required. This is because each musician needs to hear only certain vocals or instruments to play; thus, you have different monitor mixes: the lead guitar may only want to hear rhythm, the vocalist may want the full band mix, etc. Luckily, in most clubs, the stage is small (though this may seem a paradox), and because the group is physically close and can hear each other, only one or two monitor mixes are needed.

Submixing. If you've ever found that the six, eight or even 12 inputs to the PA just aren't enough, there's a way to expand with relativly little cost and increased versatility. You *can* "Y" your microphones—run two microphones into the same input—using available adapters, but the instruments or vocalists on each microphone need to be at the same level. (Be careful when "Y-ing" condenser microphones; some can't be operated this way. Check the microphone manufacturer's data sheet.) This is because one pot controls *both* microphone levels, and both will get the same EQ, reverb, etc. Then, too, you lose 6 dB of level when you place a second microphone on the same input.

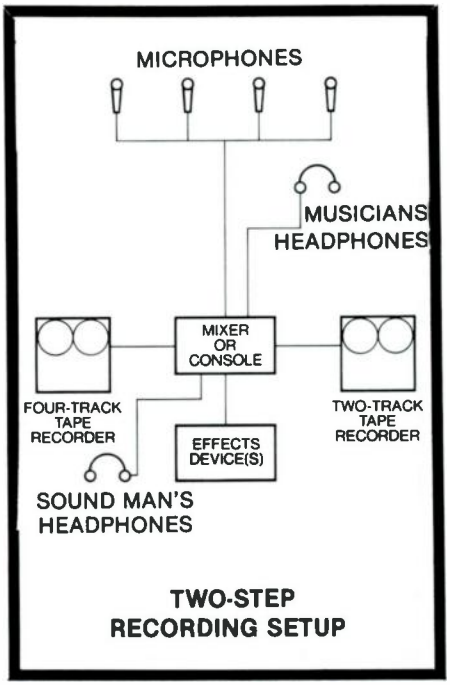


TRADITIONAL VOCAL OR INSTRUMENTAL PA SETUP

A better way is to plug a submixer into one microphone input. That means you've got the additional submixer inputs to use, though you've lost one input (the submixer) on your main console. And now you have individual microphone controls plus a submixer master control. This technique is quite useful for miking backup vocalists or a group of instruments such as a drum set.

Shielding. For high sound quality, low-noise applications, lo-Z microphones with two-conductor, shielded, balanced lines are recommended. In a balanced line the audio signal circuit is carried in two individual conductors. A separate shield carries no signal and is grounded. External hum and noise are capacitively coupled to the ground and are canceled. Magnetic interference is minimized by the two conductors that form the balanced line inside the shield. Note too that, since the shield doesn't carry the audio signal, it can be used as a power supply return while both audio conductors are the positive supply for simplex (phantom) powering of condenser microphones.

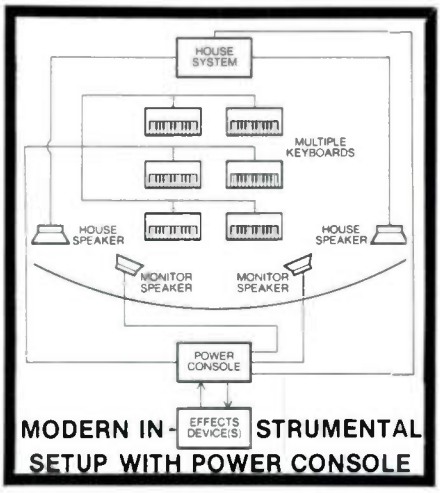
In hi-Z microphone cables, the shield is both a grounded shield and part of the signal path, and therefore can't eliminate electromagnetic hum interference. Since the circuit is hi-Z, the cable capacitance is now a problem, and high-frequency response rolloff may



TWO-STEP RECORDING SETUP

result. Cables should be kept to less than 20-foot lengths to avoid degradation of the high-frequency response. If a longer length is needed, convert to low-impedance balanced lines using matching transformers (between the hi-Z microphone and the lo-Z line and between the lo-Z line and a high-Z PA input).

High-Z microphones and microphones used near radio transmitters should have shielded cases to minimize radio-frequency interference or hum



MODERN INSTRUMENTAL SETUP WITH POWER CONSOLE

pick-up. This shielding may be in the form of all-metal cases, Mumetal shields around the cartridge coils and magnets, or plated metallic plastic case linings. Adjacent power lines, lighting controls and other sources may induce hum or other noise in PA consoles, and the best units are adequately shielded. Console shielding is generally accomplished through metal cases, metal partitions, and/or deposited metal coatings inside molded cases.

IN CONCLUSION

In this article, I've tried to list some more and less common features and uses of the PA. Obviously, the hints and tips are by no means a comprehensive guide to PA use. The manual supplied with the equipment—depending on the ingenuity of the manufacturer—probably contains quite a few suggestions on using the PA to advantage. Encourage your customers to read it, and take a look at what other groups are doing. It'll pay off . . . in better performances for the customer, and a happier for you.

Don Gayle is Senior Technical Writer at Shure Brothers. Information was supplied by W. Bevan, P. Bugielski, D. Patten, R. Schulein and D. Smith, all of Shure.

BUY THE TIME YOU NEED TO DO IT WRONG.

Sometimes you get exactly the sound you want. Other times, it's a bust. That's why you go through the endless hours of practice and rehearsal. And that means you need the time.

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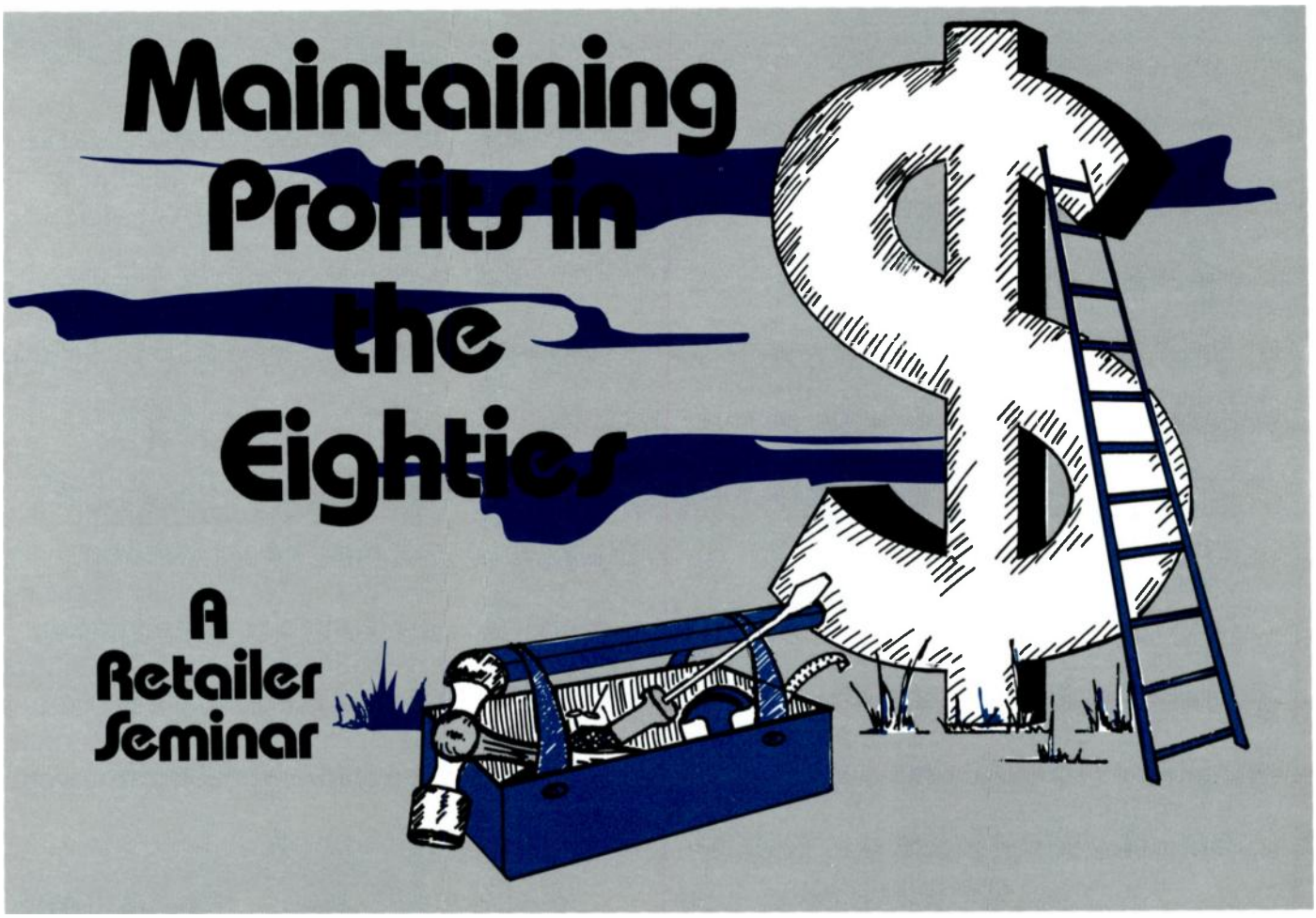


The Cameo Educational Session held on the Monday of the NAMM Summer Show was entitled "How Pro Sound Dealers Can Remain Profitable in the '80's." The moderator was Larry Blakely, President of CAMEO. Panelists were Fred Helm of Far Out Music, Jeffersonville, Indiana; Ray Hartman, California Musical Instruments, Anaheim: Dick Rumore, Paragon Music, Tampa; and J.D. Sharp, Bananas at Large in San Rafael. This is an edited transcript of that session.—Editor.

Larry Blakely: One of the things that we at CAMEO are interested in doing in the marketplace is providing information from knowledgeable dealers to many of those of you out there who are concerned about what's happening in the future. We've assembled this panel for that reason and hopefully we're going to find out today that everything's not really as black as some of us may think. Each one of the panelists will give an opening statement about how things are in their businesses —problems they've had in bad economic times of the past; the way they see things today; and what kind of measures they're taking to hedge against some of the difficult times they see coming. The first person we'll hear from today is Dick Rumore.

Rumore: I'm from Paragon Music in Tampa. I've been in business in Florida for approximately 11 years and into pro sound for approximately six. Initially, in terms of the pro sound industry, we were dealing primarily with the professional musicians, larger reinforcement systems. The economy at that time could withstand larger systems. Groups would come down and actually purchase the system. As the economy has tightened financially, we still have had our commitment in pro sound reinforcement, so we had to find a second outlet and this second outlet that we found proved to be much much more profitable than dealing with the pro musicians, in terms of discounting and everything else that you get involved with at times.

Our second outlet was in the sound contracting aspect. And don't let that scare you; when most M.I. dealers hear *sound contracting,* they think of technicalities and wonder if they're capable. Sound contracting is one of the more profitable areas I deal in. Contractors are not discounters; they get a good price for what they sell. Contractors are very much aware of pricing. They're very much aware of cost and they don't give their products away. They have to their advantage the fact that they to out and they make a commitment. They go out and seek the business that's not coming into your stores at this point. You have to go out and make calls.

Where do you get the technical knowledge that you need? You have to have a commitment with the manufacturer. The manufacturers have people —engineers, technicians—who can help you. That's a two-way commitment. If you call the company that you deal with and say, "Hey, I've got a certain job I want to do and I want to get involved in such and such," and seek their help, they are willing to help. I have found them very very cooperative. Sound reinforcement at this stage of the game is there and it's profitable if you go out and if you seek direct installations in one of the areas that are very, very profitable. You don't commit yourself to a heavy discount. You commit yourself to the product knowledge, service. You take care of your accounts.

Another area that we were asked to discuss here is the current economy and how that affects pro sound reinforcement. When dealing with churches and

institutions, the money is usually committed before you actually get involved. When you're dealing with the pro groups and so forth you run into the problems of financing and getting these groups capable of paying their bills. What I'm also saying is that in Florida, in Tampa, we find that it's very, very, very competitive in the musical instrument business. We've been able to turn the corner and get more into the broadcasting area, and get more into the sound reinforcement and institutions. For instance, we picked up a contract with the County. The first thing that you have to do is to commit yourself to having the ability to withstand the situation. We hire the best technicians we can possibly find. In that case, we use their knowledge. We work with our technicians. We work with the manufacturers to present a package.

When we go out to the schools and so forth we have a form that asks the specific questions that we need to know—the size of the room, the budget that they have available, what type of music they want, whether they want recording, whether they want these features or those features. In the musical instrument category, we carry mixers etc. that are more sophisticated than you'll find in a lot of contractors. We've got things in advanced technology that have come to the musical instrument dealers that we're utilizing now in the commercial market. So with all this knowledge and with all this equipment that's available, if you go out, contact the people, work with your manufacturer, go to seminars (a lot of manufacturers have schools which you can attend) just by being out there, I think that you'll find that this can be worthwhile.

J.D. Sharp: Originally, Bananas at Large sold collector item electric guitars. We started out on a shoestring. About five years after, we got the Ampeg line and that was it. That was our line of equipment—used equipment, consigned equipment; and we went from there. Now we've expanded twice. We really need to expand again. We've gone into creative audio, professional audio, professional reinforcement as well as some pretty heavy other commitments. Both guitars, keyboards and some product as far as acoustic guitar.

I got into it by playing in a band. I played too long for too little money but I did learn tons and just about everything I did didn't make me any particular amount of money as a musician. It's done me in good stead on the other side of the counter in terms of being able to look at my customers and know directly what they're actually facing.

We've always tried in our organization to come from that perspective rather than the perspective of what do I have in the back room, what is there a special on this week, what am I going to move out the door, and so on. Not that I don't want to move stuff out the door and not that the two things can't dovetail real well. But our first priority is our customer and his needs and we're very reluctant to buy or expand into any product which we can't see any functional use for.

I can't describe any historical way I've dealt with a recession period, because we really haven't had to. We started our business in the middle of a recession, but our overhead at that point was a fraction of what it is now. And so we just survived and actually grew during that time, but part of the reason we did is that we started out slow to begin with.

I think it's harder than ever now to remain profitable. Diversifying is definitely a two-way street. It's double-edged in the sense that it's a good idea to diversify and expand your market base. It's a better idea to first consolidate your existing marketplace and make sure that you're maximizing what you're doing in your existing market. Then look for what I call logical extensions of what you're already doing. We have a lot of product that has application in several fields. A good graphic equalizer, for instance, is useful in recording; it's useful to the musician if it's properly configured; it's useful in broadcast; it's useful in the church installation; it's useful in a lot of different areas. So the first thing is to understand all the possible applications of what you already have in stock. Don't just expand into new markets. Don't go into, say, sound contracting or sound reinforcement or recording or whatever until, first of all, you know your competitors, you know who else is in the area, what their strengths and weaknesses are. You should, as much as possible, attempt to profile this new market that you're entering into.

An example of this is the hi fi dealers who are going into video, which is both a good and bad thing to do and there are a lot of them that say that it's not really all that tremendously profitable for them. Some guys who went in are getting out. Other guys are still getting in and doing really well. And there's a difference here. I think some of the people researched it, looked at the other stores in their area, found out prevailing prices, researched all the product lines available and then made their move. I think that's really critical, because we have more and more manufacturers, and there are more products, and the temptation is certainly just to come in and buy a line—almost any line—and give it a go. You can fall right on your face if you don't know your customers. The church market, for instance, has its own protocol, and an item that may not be profitable in the music market can be extremely profitable here, but the level of service would be a lot different. The broadcast market is a very specialized field and yet there's a ton of equipment available at this show [NAMM] that broadcasters have never seen and they like it.

I sell synthesizers to radio stations, small production facilities; and the same Tascam equipment that I may sell to a guy to use at home, I also will sell for a little back room production thing. When they get into producing, they may want a pitch transposer or whatever. But before I went in there, I read publications till I turned blue, I talked with people, I got to know people so that when I called them up, I didn't come off as completely unknowledgeable and embarrass myself.

Another thing about expanding your market is that right now maybe the issue is to hold on to your market, to hold on to your volume and maybe increase your profitability. One way to do that is get the most from your promotional dollars. You may find that the telephone's a lot more useful. You may find direct mail. Whatever it is, the main point here is that for a long time in a more booming period we were able to basically sit on our cans and let the business walk in through the door—which was great. We never had to worry about it; we never really hustled. I put out my print advertising and put a lot of energy into that, but never had to really worry about it beyond that. In order to keep the volume coming in my door, I've had to promote a lot more intelligently. I've had to be a lot more aggressive. Not in the sense that I'd rather take a guy by the shirt and shake him but, just in the sense that I'm trying to reach more people, I'm trying to pinpoint who I'm reaching, I'm trying to keep track of all my paying customers and get back to them regularly either with printed material

or on the phone or whatever—just stay in touch.

As far as survival in the economy, I've noticed that every other year I've come here to NAMM and I've gone rushing out to see what's new. That's great and you would hardly want that to stop. But now I have a second prerequisite before I'll buy a product—actually several, but one of them is that now I'm trying to look at what the potential life cycle of that product is. This is very much a problem in the hi-fi industry, and the hi-fi trade publications are just full of dealers tearing their hair out. You go out and buy a line, it's a great line, it's got this, it's got that. Six months later, it's on remainders, it's closed out—the guy down the street bought a hundred and is blowing them out and there's this horrendous pressure on your inventory.

The number of dollars you've got to put in to buy a particular piece has changed. You're perhaps going to be looking at a $5,000 board where previously you were looking at a $3,000 board. You may be looking at a $10,000 synthesizer—whatever. The potential amount of money that you're supposed to lay out into product is going up. The product lifetime in many cases is going down, and I'm real conscious of it now when I go out there. I really don't care in some ways if I see the greatest new thing in the world and it really jazzes me. What I care about is after I get over the excitement if I still think that there's something that I'm going to sell more than once or twice. If I'm just going to sell it once or twice, great—I'll order one or two and sell them. But I'm not going to put in the heavy commitment that maybe the manufacturer or rep might ask me to make, and if they don't like it, I won't carry the product. It's come down to survival decisions in some cases.

I've reached a point where I think that nobody knows your business better than yourself. I think that a lot of the marketing programs that are being offered which are fair and proper and sensible vehicles for manufacturers are potentially injurious if not carefully analyzed. You can make money with specials; you can make money with quantity buys. You can make money in lots of different ways, but there's nothing automatic about it at all and maybe now more than ever the idea of controlling the inventory and controlling the buying is super important.

I think the whole idea of promoting is more critical than ever and I think that as far as promoting your business and your own organization, you need to focus on what it is that you have to offer that's unique in your marketplace. If there's already a guy down the street and he's establishing professional sound and you say, "I have professional sound too," that's okay. You may have a natural customer base and some of them are going to need pro sound equipment and you can get some of that business. On the other hand, if this guy's in pro sound and you get into it, you should have more knowledge, better display, better product selection, whatever. There are any number of ways that you can distinguish your business, and that takes a lot of individual effort, but I think that the most successful merchants I've seen have been the ones who have focused on what they have to offer—product, service or whatever.

The role of financing in the current economy is a real factor in looking at some of these high ticket items. It's very important to remember that despite the fact that there's some talk of easing present controls, it is tough in many ways to roll some of the really big pieces, which are great pieces of equipment. It should be in your consciousness at all times to stay current and know what's going on in the financing market. Just know what's available and know what's available to your customers directly and know what's available to you. Know what if any intelligent floor planning you can do—if you're not opposed to that, and you can make it work for you. Because you can kill yourself.

I started adding up a system last night. The system is fully worth the money. I just added it up and tried to figure out where this system is going to price point for me to put together a two way bi-amped system with four floor monitors, seven microphones, comprehensive mixing board and so on. Well, it's easy to go right past ten thousand and just keep going. Really the sky's the limit, but even there I wasn't talking about a massive system. I was just talking about a system that might suffice for a rock and roll band to play a large club or a small to medium concert. I'm not talking about a big rig system.

You have to watch the dollars, watch the financing and not over-commit to products which are very good and for which there is a market but which are maybe only somewhat affordable. You might have to display this product and your customer may have to look at it and take his time and put together his money and come back six months later. You may go in with every expectation of buying the system and turning it out in a week. And it may not happen. It may. You just have to remain confident and know what you've got going.

Fred Helm: First of all I'd like to clarify one thing. I am not the owner of Far Out Music. Ken Dues is. Ken started out in the business in service as a total service shop. He started out in home organ repairs, going from home to home. He had all the local music stores that sold the home organs. He did all the service for those people. It got to the point where he couldn't handle all the work he was getting so he opened up his own business in his garage.

At the time that he was in the home organ business, they changed over from a tube pipe organ to a transistorized solid state organ and he was one of the few people that knew how to work on them, so he had to figure out how to corner the market on service in that area. That helped him considerably to get into transistorized amplifiers. People would bring their amplifiers in for repair and ask for other services. They'd come in and say, "Hey, do you know where I can get this echo chamber?" Eventually it evolved into where he had to get into the retail business too. Several people said this area needs this service; it was not a service rendered by any other local music store.

Most of the music stores in the local area at that time were more instrument oriented—not sound reinforcement. So Ken took on a couple of amplifier lines and moved into a larger location—a drugstore that he converted into a music store. In a three year period of time he ran out of room. He wanted to take on a larger quantity of products. His concept at the time was and still is, if you don't have a product you can't sell it. Nobody's going to come in and order something from you. If you have it, you can sell it. You know how musicians are when they have saved up their dollars and they want something—they don't want to wait three weeks or four weeks, they want it today and if you don't have it today, they won't come back tomorrow and buy it.

Ken decided he needed a larger location and he was looking for a warehouse store to house a lot of Peavey equipment. He found a location that was way out in Jacksonville, Indiana. Against the advice of several manufacturers, we found an 8,500 square foot building

which sufficed for our warehouse operation service and retail sales. So we moved in there, and the store's done quite well.

I think probably one of the main reasons is that we keep abreast of what's happening, what the needs are in the area. We don't just come to the show and freak out over everything we see. We research the area carefully and we stick with some basic products. We don't get into ten or twelve different lines of sound reinforcement equipment. We stick with two major lines and that's it.

Now I think the transition from service to retail sales was definitely working backwards. We had to convince a bank in the area to finance the musicians. It's a difficult thing to get. We are fortunate to work with a bank in the area. They also carry the accounts of our musicians on a very good agreement. We don't take anything on recourse, but if the bank has a bad account, they will pick up the merchandise, and we will sell it for them to pay off the note. And believe it or not we have had, in about five years, no bad accounts. No bad accounts. I know that sounds hard to believe, but they screen them pretty carefully. They require 20% down and this has worked considerably well for us.

Now another point I might make is that a lot of people are in areas where there's a lot of strong discounting. We have emphasized and reemphasized that we are a service oriented store. We sell Peavey, for instance at full retail and have never discounted it one penny in the entire time we've had it—to no one. No matter what size package they buy no matter what. The customer will say, "But I can go down the road here about 30 or 40 miles and I can buy it for a discount." We say, "Sure you can, but you're going to have to pay for service too." And one of the things that has helped us tremendously is that we have a reputation for not letting the musician down. If he has a problem or his equipment has failed on him in the middle of the night, we'll come out. We're available 24 hours a day.

Another area that you can get into is instead of waiting for a customer to come in and see you, you can get out there and see him where he's on the job. Walk in and say hi to these musicians and they'll say, "Hey, do you guys have this analog delay?" "Sure we've got it." We had two groups last week that were really impressed with the fact that we spent about three nights with them. Three nights in a row. They were directly across the street from each other in opposing rooms, and we got some real good customers who are not from the area at all. We get a lot of phone-in business from them.

There are lots of areas that you can cover if you'll go out after them. You have to go after them. It's not going to come to you anymore. The days of taking orders for all the drums you can sell are gone. You have to research that area carefully too. I don't think it's wise to carry 12 lines of drums or 12 lines of amplifiers. I think you should stick with some basic lines. Make sure that the manufacturer is going to back you up. It's an embarrassing situation sometimes when you take on a particular line of equipment and you can't get service. I mean not being able to get parts from the manufacturer. They're not available yet. Or it's going to be three or four weeks before they get that part to you. We can't have that. We have one-day service on everything we sell. If a customer comes in and he's down, he's going to get that piece of equipment back today. And it has to be that way for us.

We're not in a very large area. We're in Jeffersonville, Indiana, which is a very small town just across the Ohio River from Louisville, and that creates a problem sometimes. We take care of the manufacturers in that we buy our products from them and we expect the same from them. We want some sort of discretion used when they're distributing dealership.

Recently, a very large manufacturer came to us and begged us for our business and we decided well, we'd give it a try. Two weeks later the rep called us up and said, "Hey, would you mind if I opened up this store; it's 25 miles from you." I said, "What?" He said, "Well, he's going to pay me C.O.D. $15,000 for the equipment." I said, "What is it? Where is it?" "It's a record shop." I said, "You're going to open up a record shop with pro sound here, synthesizers. Who's qualified to sell it? "I can get the orders right now." I said, "Take it and you can come and pick ours up too at the same time." Reps are under a lot of pressure to get the sales and then again, we've got to make sales. And if they don't use discretion in opening up dealers and make sure they're qualified to sell the product, it's going to ruin the product for everybody. I said we're not heavy discounters. We discount some items a little bit, but not in the Peavey line, and we're probably one of Peavey's largest dealers in the United States—and we don't discount.

I think the word discount is getting to be a bad word in the industry, and especially in times when money costs are up. It costs you more money to operate your business. You're going to have to have a little bit of profit margin in order to stay in business in these bad economic times. We try very hard to take care of customers and see that they're happy.

Another point I want to make is that we have never ever advertised in any publication. We have never advertised locally in any publication at all. That's not good for the advertising industry, but it's worked for us so far. "We're going to do some advertising; times change. I think we're going to have to. We've got to keep abreast of the times.

I think the most important things in the business are to keep up with the changing times, know your products well, research them before you jump into an area that's going to give you some trouble.

Ray Hartman: I'm from California Musical Instrument Company and I also have a store in Seattle called American Music. I started in the retail music industry approximately 15 years ago. I've had the opportunity to travel on the road as a wholesale representative and I've been through previous difficult economic times.

I had the dubious pleasure of being in Seattle when the SST bill failed, and I honestly can't tell you how I survived all that. All I know is that I'm standing here today and I did not have a set plan at that time, but somehow I managed to make it through. Now 15 years later, I can look back at all this and although I try to do that in the most objective manner possible, obviously hind sight is 20/20. I've compiled a few things that I'd like to share with you.

I see the economic status of today as quite bleak and I don't see it getting much better. What must a dealer do to remain profitable during economic hard times? Well, I think the first thing I'd like to touch on is product line selection.

A lot of people who are in the retail music industry today didn't start out with a degree in retailing or a business degree. The vast majority of them started out as musicians, frustrated musicians at that, and started in the retail industry or the wholesale industry as a means to stay in touch with the music. Now as a result of that, ten years ago the industry was quite immature in

regard to what are commonly known as good business practices. The manufacturers were very eager to get their products on the market and overlooked a number of things and the retailer overlooked the same items. I think in today's marketplace, with money being as tight as it is, that we're seeing a very fast turnaround not only in retail financing but also in dealer financing.

In selecting the line, I first suggest that you go out and shop the competition. Find out what lines they're selling, what their sales techniques are, how they're selling these lines—whether that be on service, financing availability, or straight discounting—and then go out and look at the lines that you see holes in the marketplace for. I also suggest that you cultivate the ability to change your mind very fast, because this is a very fast-changing industry. In line selection I really recommend that you sell yourself on the line. Don't let it be sold to you. People out there are very good salesmen and it's very easy to get yourself committed to something that you really don't know anything about. I've found that the promises dealers get in many cases do not come true.

I would look for factory support, some sort of exclusivity on the line, consistency of the line, serviceability of the line, of course profitability of the line. I would be very leery of esoteric lines. We have seen a number of companies that started out as esoteric companies with whom we had exclusive franchises suddenly get swallowed up by the big ones and come out with unreasonable sales quotas. The next thing you know, the neighborhood competitor comes out with a line that you've had an exclusive on for two years and that you broke your back to get the market open for.

Now that you've got your line selected, I would pay particular attention to display of the line. And display it in the most saleable and easy to demonstrate manner possible. I would also, if possible, obtain some of the direct competition and nail it right down to the floor. Learn how to sell the lines that you're committed to, not just everything that everybody wants or is asking for.

I think the best thing to do is to zero in on particular lines and learn everything there is to know about them and why they're superior products to the competition. Wired demonstrations, particularly in pro sound, can be very efficacious for the simple reason that when you are demonstrating a PA system, it looks very confusing to a customer if you have to run to get a speaker for it here, the microphones there, a transformer, and you trip over everything and you get the whole thing messed up. It really is worth your time to sit down at any of your switching devices and take the time to wire the thing up. It will make your demonstrations go much faster. You will come out looking much more proficient and professional about what it is you're selling.

After you've got your line and you have your display set up, you have to think about selling the stuff. The first thing to do is to sell your sales staff. I'm assuming that everyone has additional sales people. Now I've found that salesmen, particularly in the M.I. business and pro sound are the most opinionated people I've ever run into. They're the people that read all these esoteric magazines and they want to talk specsmanship and if you haven't got whatever it is, they're wondering why. You have to sell your sales staff. You have to get your sales staff committed to whatever it is you're doing, because the final goal is to make a profit. I suggest that you give these people all the information possible, get some good factory representatives and set target sales figures.

If you're bringing in a new line, the easiest thing to do is to put it in and forget about it. A year later you still have the original merchandise. If you set your target sales and review it monthly or weekly, you will keep this in mind. Salesmen are very important and everyone's input is valid and should be heard. The worst thing that can happen is for a salesman to think that his word is not heard by management. The next thing you know, he's bad-mouthing you.

Now, with regards to discounting, I can't stand up here and tell you folks that you can't discount, because that's not realistic. We all have to discount in some way. But I would suggest something that I've done and wish I'd done a lot earlier—to clearly define the break-even point: what sales you have to do, what revenue has to come into the store to cover your overhead and expenses. Obviously, you're not here to just break even, you want to make a profit, but in order to reach that profit goal, you have to break even first. The break-even point is the point of minimum feasibility, the point below which sales cannot drop.

As the store competes more intensively, the break-even point moves upwards. Costs increase, prices are lowered to attract more volume, inventories, receivables and other assets. You need a cash flow to increase sales. To increase the sales, the firm competes harder, advertises more, increases the sales force, does more elaborate merchandising and advertising and promotion and so forth.

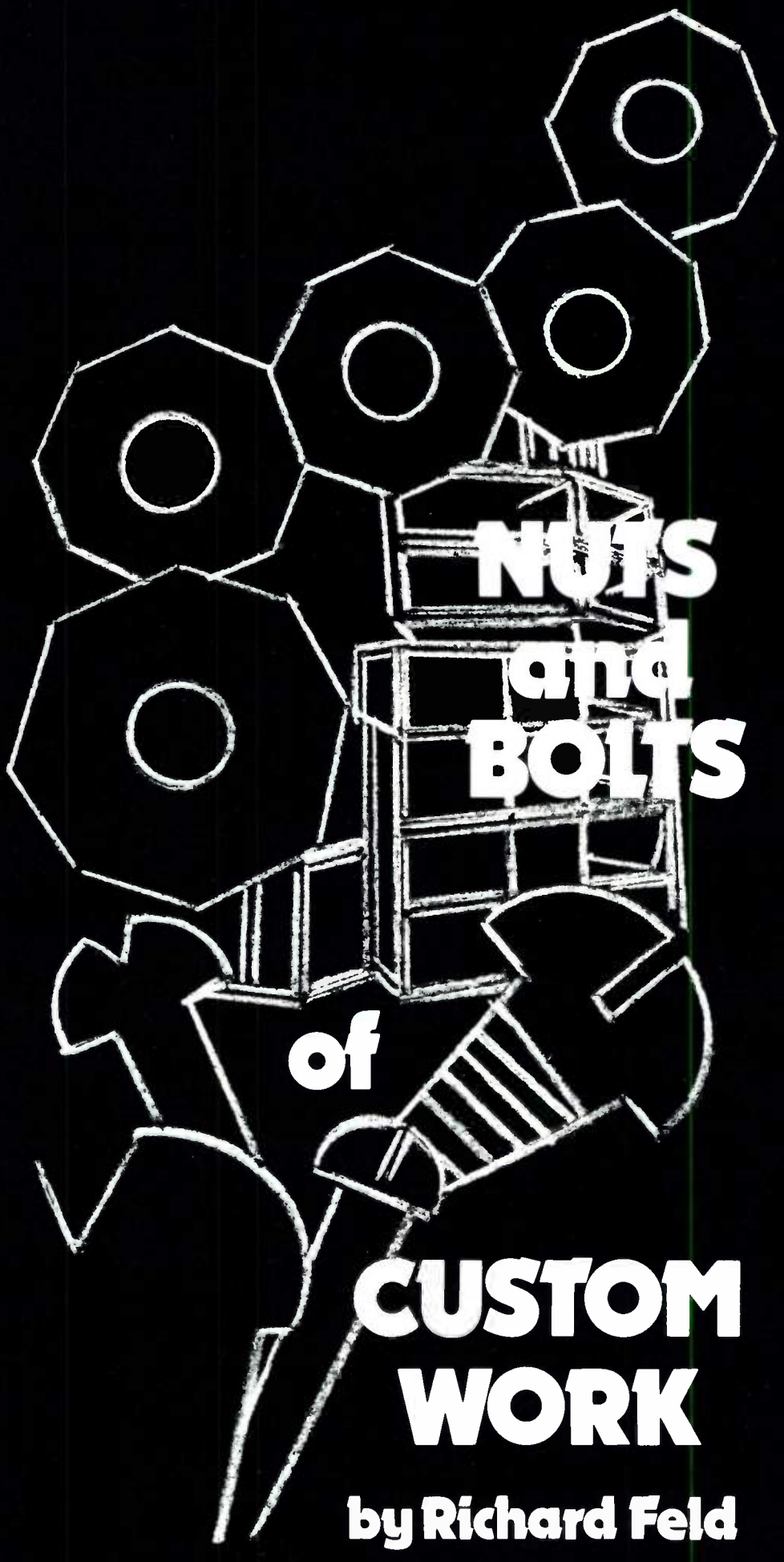
Competing harder coupled with the owners expectations and the employee's increasing expectations, inflation and other factors drive the cost continually upward, thereby putting more pressure on the sales department.

Now I'd like to go through with you how to find out what that break-even point is. To obtain your break-even point, you have to take your fixed operating expenses and figure out what those are. Those are the expenses that are incurred regardless of the sales volume during any one period of time. The easiest thing to do is to take a month's costs—rent, utilities, insurance, maintenance, payroll. These expenses can be forecast in dollars for any time period. Then you have to also ascertain your variable expenses. Those are expenses that are not incurred unless there's a sale; therefore they can be expressed as a percentage of sales which could be commissions, delivery costs, marketing expenses, things like that.

Since the goods sold must be purchased from the manufacturer, overhead is not covered with the total sales revenue, but with the gross margin that remains after those sales. To obtain gross margins, the cost of goods sold in must first be determined. You take a beginning inventory for that time period, and add to it your purchases of goods plus the freight—the cost to get the stuff to the store—and you come up with a total. You subtract from that your cash discounts taken, if any, and your ending inventory, and that will give you the total cost of goods sold in that time period. Taking your sales less the cost of goods sold will give you your gross margin.

Just remember, your cost of goods sold is completely gone after you've made your break-even point.

Larry Blakely: There is something I want to touch on here. The word discounting has come up two or three times, and we as manufacturers and manufacturer organizations have to be careful about words like that. I have to state that the things that are said here are the opinion of the panelists and are not necessarily those of Cameo or any of the member manufacturers.



NUTS and BOLTS of CUSTOM WORK

by Richard Feld

Anyone involved in professional audio retailing sooner or later must be faced with custom fabrication of patch panels, amplifier racks, microphone snake and sub-snake assemblies, etc. Because many of your customers take this equipment on the road, good soldering and cabling technique must be employed if all the wonderful gear you sold them is to work as a system and work reliably.

All too often we look at the rear of an accessory rack and become ill at the sight of the proverbial "snake pit." The standard comment goes, "Lets whip up some garlic and oil and call it pasta with a white sauce." This humor wears rather thin when night after night things buzz, oscillate or just stop working altogether. More often than not road failures are the result of poor cabling, so let's get right down to it.

Throw away those clunky soldering guns and big fat chisel irons. Take those electrician's pliers and strippers out of the shop. Invest your hard earned bucks in the correct electronics hand tools, and you don't need very many. See your local electronics dealer for good quality diagonal cutters (dikes), long nose pliers (needle nose), and a reliable stripper that won't nick stranded wire. Next, get a good quality soldering iron/station with a plated tip. Don't forget the solder; you're not a plumber. Use *thin* resin-core solder, 60% tin, 40% lead.

Think about your expendables, *i.e.*, wire, cable, tie wraps, lacing cord, shrink boot, number tape, hardware, etc. Materials are important; use good stuff! I recommend only stranded wire to avoid breakage, and use foil shielding when needed. And you *need* shielding for any run more than 2 or 3 inches. For very short runs, under 3 inches, use good quality, 22 ga., 7 strand wire and stock your spools in at least three colors.

Now that you have the correct tools and materials, let's go through the process of preparing a typical (if there is such a thing) amplifier input patch panel. You should decide at this point if you plan to job-out your metal work or drill and punch your panel in-house. If you choose to do the work yourself, then add to your shopping list some chassis punches, a drill, drill bits and a bench vise.

The first step in any project is, of course, planning and documentation. Obviously, good planning results in much smoother projects, so remember that time is money. Document your

The SOUND SH

After shoveling their way out of the volcanic ash in Washington state, the good folks at **Tapco** in Redmond, Washington have managed to release their latest new product as scheduled, despite widespread speculation that hazardous soldering conditions would slow their work schedule. But such was not the case.

The new C-12 Series Two mixer is a further development of the Tapco C-12. The sub-grouping feature has been further refined, allowing the routing of input channels directly to sub-groups 1, 2, 3, and/or 4, as well as the direct assignment to the main outputs, bypassing the sub-groups. An added mute switch for each channel allows defeating of all but the pre-fader and solo functions. Other improvements include the addition of pan-pots and solo capability on the sub-masters. The rugged construction of the C-12 has been preserved, as well as the clean circuitry for which Tapco is so renowned. Three-band EQ and the famous Tapco sweepable midrange control make the C-12 Series Two a highly desirable showroom item.

CIRCLE 1 ON READER SERVICE CARD

RMI (Rocky Mount Instruments, a subsidiary of the Allen Organ Company) has a new digital combo keyboard on the market that supposedly is designed "to meet the varying needs of the club musician." Boy, talk about a tall order! Club musicians have been known to need an awful lot of things (meals, rides, divorces, therapy, attitude adjusters of myriad description, haircuts, baths, padded cells), especially in the South where being a musician is one step above being an illegal alien. But for a keyboard to be able to fulfill the every need of a musician—well, it had to happen sooner of later, I guess.

After all, this new DK-20 from RMI has a wide variety of sounds, including guitar, piano, lute and clav. In fact, the sounds can be voiced at the factory to suit the player's taste. The unit has a total of 12 presets, digital envelope, timbre, and touch-vibrato. The instrument features polyphonic timbre modulation, which means that each note played independently exhibits complex timbre changes during during its envelope. Eash note stands out clearly as a result, even in heavy chords and the most competitive band situations.

Another important feature is the built-in mixer for custom blending of sounds. Separate bass and treble outputs are located on the rear jack panel. Legs, pedals and case are included.

CIRCLE 2 ON READER SERVICE CARD

OPPE

By Charlie Lawing

The new **Peavey** EQ-27 is a (you guessed it!) 27-band equalizer with the center frequencies spaced ⅓ octave apart throughout the audio range. Each of the 27 filters has been designed using computer-assisted design techniques and constructed of precision components to yield good performance without the use of trimmers or other internal adjustments that often cause problems under rugged field conditions.

Each of the 27 bands has a separate slider with center detent and a metal actuator instead of the more common plastic shaft. The selected frequencies conform to ISO standards, thereby making this equalizer fully compatible with most professional real time analyzing equipment. This equalizer is impedence and level compatible with most commercial sound reinforcement equipment.

The inputs include both balanced XLR and balanced ¼-inch phone jacks. All outputs have a source impedance of 600 ohms or less and a full transformer balanced output is available. All outputs and inputs have transient, over-voltage, and short-circuit protection for maximum field reliability. The level control allows ±15 dB of gain to readjust average signal levels which usually have changed due to the equalization process. A bypass switch allows the equalizer to be removed from the circuit.

CIRCLE 3 ON READER SERVICE CARD

Take heart, **Fender** lovers, there may be hope for the return of the fabled Stratocaster. But where, you say, has the Strat been since 1966? Well, the popular guitar from out California way has never been out of production, but has had design changes such as the three-bolt neck and the bullet truss rod. Fender design engineers are trying to turn things around for the Strat with a blend of old and new features that should breathe new life into the instrument.

First of all, Fender has gone back to the four-bolt neck. They have gone way back to the early '60's and resurrected the candy-apple red and baby blue "metal-flake" finishes on the body of the Strat, complete with matching color on the headstock. The headstock itself has been reduced (again, back to the old days) and the decal has been changed to resemble the older style more.

From more modern times come the brass hardware, the shielded wiring harness and the two-way mode switch on the new Strat. Fender hopes to beef up the sound of the Strat with the addition of the brass, as well as give the guitar that "hot-rod" look. This is definitely a step forward for Fender. Long may ye prosper, o noble Strat!

CIRCLE 4 ON READER SERVICE CARD

Electro-Voice has a new 12-inch musical instrument speaker available, the EVM-12S. The speaker's frequency response is tailored for lead guitar performance, with a shallow cone that provides a boost in the speaker's output in the 700 Hz-3 kHz range. Fat midrange is what that means to guitar players, and most of them do seem to prefer that sound. The EVM-12S has a power handling capacity of 200 watts, and it is driven by the largest 16-lb. magnet that E-V offers. Both the coil and the magnet structure are vented, and the frame is made of diecast aluminum with a heat radiating back cover. The speaker can be front or rear mounted without an adaptor. E-V notes that the most extended response, with lowest distortion and best control of the bass performance, is realized when the EVM-12S is installed in a vented enclosure. Properly designed, such vents or ports actually reproduce the lowest octave or so of the bass response. E-V also notes, however, that the speaker will improve the performance of virtually any type of enclosure.

CIRCLE 5 ON READER SERVICE CARD

One of the few cast-iron facts that I've run across in dealing with musicians is that the more they work, and the longer they work, the less eager they are to carry a lot of heavy gear to and from their work. The seasoned guitarist takes a certain pride in walking into a job with his favorite guitar and a tiny amp and impressing everyone on the bandstand with pure good chops.

For the player who prefers a small amp, there is probably no better product than **Polytone's** Mini-Brute series of small amps. They speak with conviction. Polytone is endorsed by some of the great jazz players in the world, among them Joe Pass, Herb Ellis and Ray Brown. (George Benson was once a Polytone endorsee.) But no matter, the Mini-Brutes, of which there are now seven, speak for themselves.

Mini-Brute I, at the bottom of the line, produces 80 watts RMS into 4 ohms through a 12-inch speaker. Mini-Brute II is the same as above, with a separate distortion/sustain circuit and reverb. The Mini-Brute III jumps up to 100 watts RMS into 4 ohms through a 15-inch speaker. But these aren't the little amps in the line; there is the Teeny-Brute, a 60 watt amp that measures only 13"×13"×10"! Polytone recommends this one for club and studio work! I guess the others are for the bigger concert halls only . . . anyway, all of these amps have a preamp signal outlet so that the skeptic can use more power if he or she has reservations about so small a unit. Funny thing is, though, these little critters really do the job.

CIRCLE 6 ON READER SERVICE CARD

JBL's newest addition to the Cabaret Series is the 4695 Bass Subwoofer, which features the E Series components mounted in a completely self-contained enclosure. This optimally tuned enclosure houses the new E155 18-inch speaker, which is designed to reproduce bass performance at maximum levels with low distortion.

The new JBL enclosures have a frequency range that reaches all the way down to 30 Hz for those gut-shaking low notes out on the disco floor. The cabinets can handle up to 300 watts continuous power, and can produce a sound pressure level of 100 dB. The 4695 is made of sturdy 3/4-inch plywood, finished in black polyurethane paint, and equipped with corner guards, flush-fit grill covers and flush-mounted road handles.

the SOUND SHOPPE
REAR ENTRANCE

CIRCLE 7 ON READER SERVICE CARD

Cerwin-Vega also has a new speaker enclosure on the market, which is the first two-15-inch bass enclosure ever offered by C-V. The new unit is the BG-215, which can dip down to 40 Hz on the bottom end and still respond up to 4 kHz at the top end. The new speaker is used in this cabinet; it is the 154EB, which according to Cerwin-Vega is the first driver of its type to use an inductance-cancelling copper-clad pole piece, which improves output in the 2 kHz-4 kHz area by more than 5 dB. In addition, this feature allows a significant reduction of third harmonic distortion products, which are the most irritating form of distortion produced by a speaker.

The dual 154EB driver configuration is loaded in a direct-radiating, vented enclosure design. The cabinet is made of plywood and braced inside. The exterior is covered in indoor/outdoor carpet, with flush-mounted carrying handles and a single ¼-inch female phone plug receptacle. Power handling capacity is 300 watts.

CIRCLE 8 ON READER SERVICE CARD

Another such seemingly insignificant item that can make a musician's life a lot easier is the new speaker stand offered by **Bose**. The SS-3 provides the touring pro with a lighter, more rugged stand for quick, easy setup. The SS-3 will support two Bose 802 professional speakers, yet it can be folded up small enough to fit in the new Bose Gig Bag. This zippered bag is designed to accommodate the speaker stands, cables and other accessories. Sounds corny, but a gig bag can extend the life of the hardware and prevent things from turning up lost quite so often. Such products reveal the company's commitment to easier living for the musician, and I, for one, am in favor of easy living.

CIRCLE 9 ON READER SERVICE CARD

By Martin Porter

DEALER DOSSIER

Sam Ash
New York, New York

Since 1924, when a free-lance violinist named Sam Ash pawned his wife Rose's engagement ring and opened a small musical instrument shop in Brooklyn, the name Ash has meant MI sales to many customers in metropolitan New York—where the company now consists of six stores doing a total of $16 million worth of business each year.

Today the company remains a family affair, with Sam's two sons Paul and Jerry running the operation and his two grandsons Richie and Sammy actively involved in every aspect of the business.

SOUND ARTS caught Richie Ash, on his routine inspection tour of the company's 48th St. store, a long and narrow, jam-packed facility that offers a large selection of acoustic and electric instruments and sound reinforcement gear. Unlike the sprawling layout that characterizes Sam Ash's stores throughout suburbia, the midtown New York store is a compact and organized two story operation that must compete with the other shops on the bustling street for both the professional and amateur clientele. The interview was held amid the demonstration of a piece of sound reinforcement equipment.

When did Sam Ash open its 48th St. store?

Ash: We started out in Brooklyn and then opened our store in Hempstead and then in Huntington. Around 1970, we opened two stores simultaneously in White Plains and Manhattan. The store on 48th St., which we always wanted, we bought from Frank Wolf's Drum Shop. Most poeple think that the 48th St. store was one of our first but that's the case.

Why did it take you so long to open here?

Ash: There were no spots. We waited and waited and waited until one became available.

Among the various family members, how do the responsibilities break down?

Ash: In this kind of business, all the family seems to handle all the responsibilities. Paul and Jerry make all the big decisions. Paul spends most of his time in the office doing mainly administrative work. Jerry does less administrative work and more buying and management. He goes to a store every day of the week. I go to a different store every day of the week. My brother Sam goes to a different store every day of the week.

How many people do you employ?

Ash: We have 170 employees.

Which is your flagship store, if you can call one that?

Ash: It's hard to say now. Hempstead was our number one operation, but this year Manhattan surpassed our Hempstead store. This operation here, dollar-wise, is a little bit larger than Hempstead. Our big stores do about $3 million a year a piece.

Is the layout of them all about the same?

Ash: The Manhattan store, which is the largest line store, is about one-third the size of all the others. The store in Hempstead is very, very large. We have a repair shop in every store. We have sheet music in every store. In each store we have a breakdown. Usually the store is cut in half. Acoustical instruments like brass, winds and acoustical guitars and sheet music are usually on one side. And on the other side is the rock stuff like electric guitars, amplifiers and synthesizers. The White Plains store is set up like that, the Hempstead store is set up like that, the Paramus (New Jersey) store is set up like that. Manhattan is set up similar to that too. All the acoustic stuff is downstairs, all the sound equipment is upstairs.

Do you usually have a separate section for sound reinforcement?

Ash: Reinforcement in some of the stores is in a separate section. We us-

PHOTOS BY CHAS KIMBRELL

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ually have separate salesmen to sell it. We learned over the years that you cannot have everything concentrated in one area; you scare the clientele away. We have gotten very big in the sound reinforcement area lately. We are probably the largest sound reinforcement dealer, as far as music dealers are concerned, in the country. And it has changed the entire shape of our operation.

What percent of your business is in this area?

Ash: I can't break it down for sound reinforcement only. But if you take electronics, I'd say that's over 60 percent of our business. Synthesizers and keyboards are a very, very big part of our business, one of our biggest areas. If you walk into any one of our stores, we probably have somewhere on the floor about $50,000 worth of keyboards.

Keyboards require your largest capital investment?

Ash: In keyboards or sound reinforcement or whatever, we display and demonstrate our merchandise to everyone who comes into the store. So if you walk into a Sam Ash store and you are looking for a synthesizer, you can see what you want, you can play it and try it out, with just about any sound system you want.

Who are your customers?

Ash: Everyone from musicians playing club dates to kids in school. My father imports inexpensive guitars from $19.95 up and we have our own importing operation. So you can walk into a Sam Ash store and buy an Alembic guitar or a Gibson Les Paul and buy a $19 as well.

Do you have special salesmen for each of your areas or do they float?

Ash: We have special salesmen. We have a salesman in charge of acoustic guitars. We have a salesman in charge of sheet music. We have a salesman in charge of brass and winds. Electric guitars too. In some of the stores these people overlap. But we try to have a drummer selling drums, a sound man selling P.A.'s. We want our salesmen to know what they are selling. We demonstrate what we sell.

Do you have a hard time finding sales help?

Ash: Extremely hard. We usually find musicians who have gone out on the road and not made any money. Or sometimes those who want to get married and settled down come to us and look for a job. Often they are very

knowledgeable, since they have been involved in the business all their lives.

What kind of training do you have?

Ash: They need sales trainig as well as technical training. You would be surprised how much technical training even the most experienced musician will need.

What about sales training?

Ash: We draw lines on what we want to sell. We sell merchandise that is the most profitable to us. But we carry the nonprofitable and the profitable. Our salesmen work on an incentive program. They make additional money besides their straight salary to sell something that is more profitable to us. We are very profit oriented. The only way we can survive is to sell profitable merchandise. Selling merchandise at 20 percent above our cost is something we do when we have to because our competition forces us to do so, but we spend a never-ending lifetime trying to find lines that we can have exclusives on and that we can make money on. You can't get away in New York City selling a Gibson guitar a nickle above 40 percent off. However, you can try to get other lines where the manufacturer will give you an exclusive area and get a 40 percent markup or a 50 percent markup. We have a very high markup on our imports from Japan. We work on at least a 50 to 100 percent markup. Plus we take trade-ins and we try to buy whatever we can get our hands on second hand from people. We try to increase our profit margin this way. We need a much larger profit margin than our competitors do to be a healthy business because of our size.

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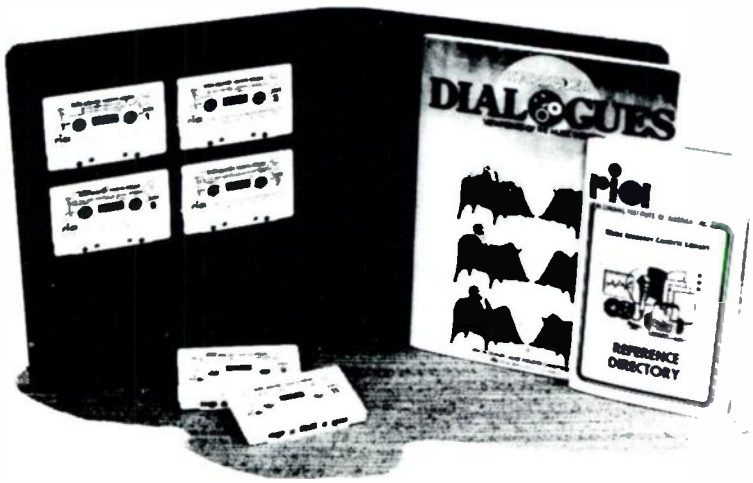

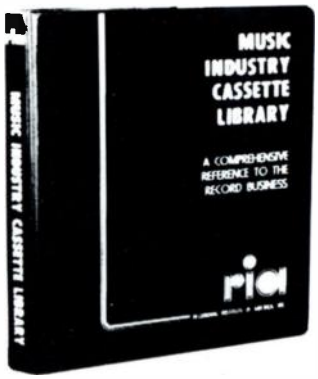

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nicians? Are they easy to find?

Ash: No good help is easy to find. When we can find enough people we have one in each store.

Why don't you consolidate repairs at one store?

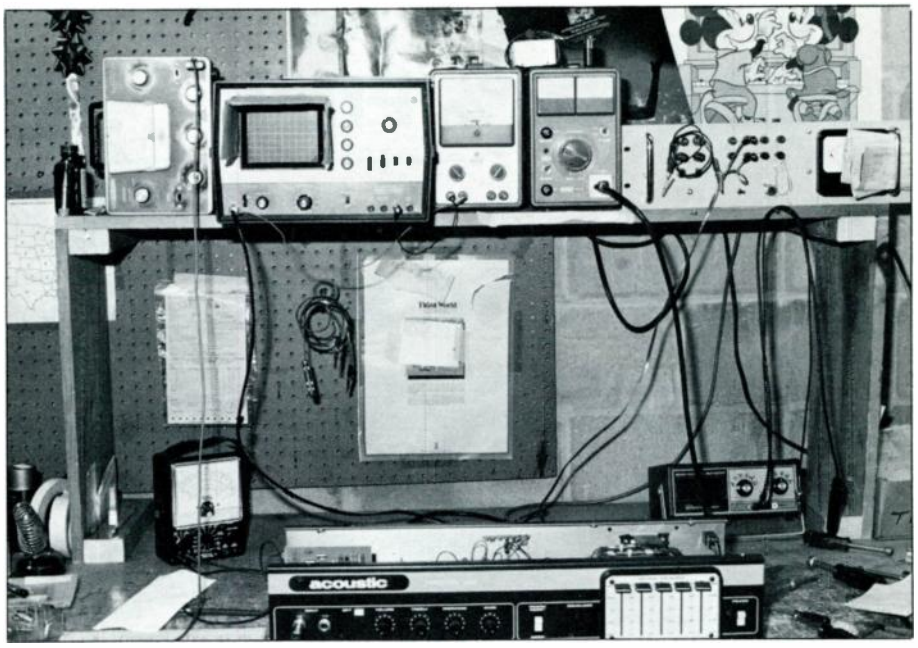
Ash: It would be cheaper that way but we would need a lot of people. We have found in our repairs that people trust us. You realize one thing about repairs—most people involved in it are rip-offs. We can't be rip-offs because we have to be there when they come back to buy things. We have to be straight on it.

Do you make money on your repairs?

Ash: It is probably a break-even situation. It is hard to compute. The salaries are very, very high. We like to think that we work profitably in everything, but most likely in repairs we don't. It's more of a service to our customers.

Why hasn't Sam Ash spread its stores throughout the country?

Ash: We like to have our hands on the operation. It is now not as much in our hands as we would like it to be. But it is basically three bosses trying to run six stores. We can't let anyone else run it. If we moved to Connecticut or Bostom or Chicago we wouldn't have



the control. We have thought about it.

Isn't the New York market the toughest?

Ash: Sure, but we have mastered the New York market.

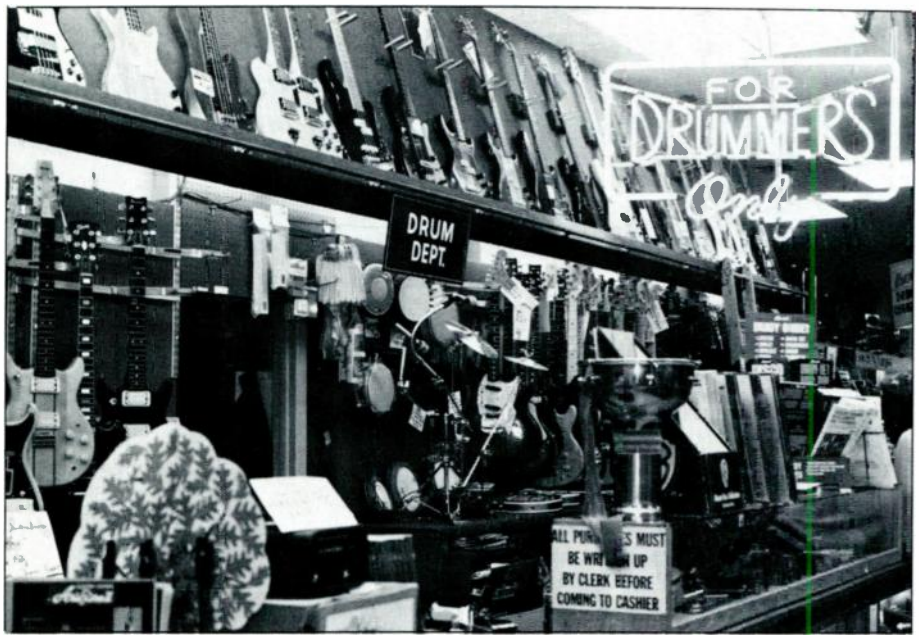
Is there anything unique about the New York scene?

Ash: Obviously, we have to sell all the competitive items at 40 percent off. But there are a couple of things that we have learned. As time goes on there are very few competitors in this business. It costs so much money to stock a store. We have learned that it requires $750,000 to open a Sam Ash music store. And now, with the recession, people are actually causing their own recession. In smaller operations people are coming into the store and finding nothing to see and nothing to try and nothing for sale. The guy says, "If you want it, I will get it for you in two weeks." We've got the display, we've got the stuff in stock. And we are not having a recession. We have had a 33 percent increase over 1979.

What role has promotion and advertising played in that?

Ash: As far as we are concerned, the funny thing is, after having our best year, we advertised less this year than we did the year before. We are getting to be a household word. About the only advertising we do concentrate in is mail-order. Our mail-order business is about three years old. In its very first year it did about $200,000. This year it will do $1,200,000. And we advertise that in about seven or eight different publications. We move a lot of merchandise through the mail now.

We try not to sell as cheap through the mail. We don't want to dirty our manufacturer's names throughout the country. Some of our mail-order competitors sell cheaper over the phone or as cheap as we do in our stores because the rest of the country is so expensive. We feel that we do not have to give the stuff away that bad. We are not out, and I would like to make this clear, to cut throats. A lot of music stores throughout the country think that



Sam Ash is a cut-throat, give-it-away operation. We are totally against that. Tomorrow we would raise our 40-off prices to 30-off and we would be glad to do it. We have competition in our area that won't let us breathe. We are out to be a profitable operation, and any time a manufacturer comes to us with a product and gives us the opportunity to make some money on it we will make money on it.

Do you make use of co-op funds for your advertising?

Ash: There aren't any. The manufacturers are very, very stingy when it comes to co-op. We have asked them many times but they don't want to promote one dealer. They tell us, "We can't give it to Sam Ash because what about everybody else?"

What about your inventory situation? Do you have firm handle on it?

Ash: We are in the middle of computerizing. We went super-live with it as of September 1. We have had the system in for over a year now, but to make sure everything is on track, you have to take an additional inventory for the first year to make sure everything is on the shelf.

Who in the family does all the buying?

Ash: It is split. I buy most of the electronics, effects, things like that. My father (Jerry) buys the Fender guitars, the Gibson guitars, the brass and winds, the drums. We all share the buying. Paul Ash buys a lot of the small things, we sell more accessories than anything. Accessories make up a very large percentage of any music business. But buying isn't such a fine-line situation. We all buy together. It's a family, so it's not that sort of thing.

Why don't you franchise the Sam Ash name?

Ash: Franchising works for McDonalds, it works well for clothing operations. But the music business is a family oriented business; it demands a very personalized touch. And we try to make it as personal as possible. I don't think there are any successful music businesses that are not run by a family. This is a very, very difficult business. You have to keep your nose in every aspect of it every day. It's not the kind of business where you can work two days a week and have somebody fill in for you the rest of the time.

So Sam Ash will continue to be passed on from father to son?

Ash: Sure. Even from the time I was a very small kid I always had a desire to be in the business. And I see it with my friends from other music store families; they are going into the business too. The reason these businesses remain successful is that the family is involved in it, and every member is learning about it from the time they are very young. There are too many products to carry, there are too many things to know, there is too much politics going on through everything we sell. I was working in the business after school when I was thirteen years old, every day from that time on.

When the family gets together for, let's say, a family affair, can you talk about anything but the business?

Ash: We talk about the business a lot. We fight about the business a lot. It means so much to everybody in the family. But sometimes we talk about other things too. Sometimes.

INDUSTRY UPDATE

Crown International has awarded its "Decade of Merit" Award to three of its representatives for their "ten years of leadership, stability and service." The honorees are Fidelicom Company of Georgia, Firestone and Associates of Florida and the Dobbs-Stanford of Texas organization.

Ken Yoshino has been promoted to Manager, Special Markets Development at Sansui. Yoshino had been West Coast Regional Manager. **Len Gielarowski** has taken over as West Coast Regional Manager; he had been West Coast Coordinator.

Jacob C. Turner has joined RG Dynamics, Inc. as Executive Vice President. Turner was formerly Vice President-Corporate Development of Koss Corporation.

Kusuo Hirata has been elected Chairman of the Board of Fuji Photo Film Co. He was previously President. **Minoru Ohnishi** succeeds Hirata as President. **Ichiro Karkome** has been named Executive Vice President. **Bernie K. Yasunaga** has been appointed Executive Vice President of Fuji Photo Film U.S.A., succeeding Fred M. Nakamura who has been named General Manager of the Consumer Photo Products Division in Japan.

Craig H. Sloss has been named Director of Advertising for B.I.C./Avnet. He was previously Director of Creative Services.

Scientific Audio Electronics, Inc. (SAE) has acquired the exclusive rights for American distribution of the Micro Seiki line. **John Gordon** has joined SAE as Sales Manager of the Micro Seiki Division.

Toshiba America, Inc. has opened its new 110,000 square-foot facility in Wayne, New Jersey. The new centralized headquarters include central warehousing, computer processing, parts and service areas, a test chamber and product showrooms.

Robert L. Layton has been appointed International Sales Manager of Shure Brothers, Inc. Layton will be responsible for all international consumer product sales.

Allen Wallace has been appointed Vice President of Sales for Hitachi Sales Corporation of America. Wallace has been with Hitachi for five years, first as General Manager, and later as Director of Sales.

A comprehensive advertising commitment focusing on the women's market was announced by James B. Lansing Sound, Inc. at a dealer meeting in Chicago recently; Gloria Steinem, Editor-in-Chief of Ms. Magazine, was the keynote speaker.

Paul Ackel has been named Sales Engineering Coordinator for Panasonic's Professional Audio Division. Ackel formerly held a position in Product Engineering, and was with Marantz before then.

Harvey Armend has been appointed to the newly created position of Manager, Communications Microphone Operations for Shure Brothers, Inc. **Lee Habich** has been promoted to Marketing Communications Manager.

Michael G. Polas has been named mid-western regional Professional Products Sales Representative for Bose Corporation. Polas will be based in Chicago and will be responsible for sales of Bose concert and public address sound systems.

Dennis McCollom and **Jerry Michael** have joined to create Three M Marketing to represent major audio and video manufacturers in Michigan.

Fred Venitsky, President of F.V. Sound, has announced the opening of a new tape duplicating company, Omni Tape Corporation, located at 11 Teaneck Road, Ridgefield Park, N.J. **Ralph Cariot** has been named as General Manager.

The U.S. Magistrate for the District of Columbia has decided in favor of U.S. Pioneer Electronics Corp., dismissing all claims brought against the hi-fi company by a former sales representative, Ames and Associates. Ames had filed suit against Pioneer claiming, among other things, breach of contract by Pioneer's reduction of rep commissions.

Scharff Communications has been appointed exclusive New York distributor of the Anchor 100 and 200 self-powered speaker systems from Northwest Sound of Portland, Oregon.

Three engineers at Ampex Corporation have won the 1980 Alexander M. Poniatoff (AMP) awards, the highest honor for technical achievement given to employees. The honorees are **Larry Evans, John Corcoran** and **Ray Ravizza**.

T & A Marketing has been named James B. Lansing Sound Inc. sales representative firm for consumer products in Nebraska, Kansas, Iowa and Missouri.

John Bermingham has been named National Sales Manager for Fuji Consumer Video and Audio Tape Products. Previously, Bermingham was with Sharp Electronics Optonica Division.

Akai America, Ltd. marks its tenth year in the U.S. with a move to expanded corporate headquarters. Construction has begun on the new facility located at 800 West Artesia Blvd, Compton, California, with completion expected for the fall.

Robert T. Knight has been appointed Vice President of Marketing for DiscoVision Associations. Knight was formerly Western Region Manager for IBM's Data Processing Division in L.A.

Bob Ess has joined the technical staff of Paia Electronics, Inc., in the newly created position of Technical Liaison. Ess was formerly a computer field technician at Wang Laboratories.

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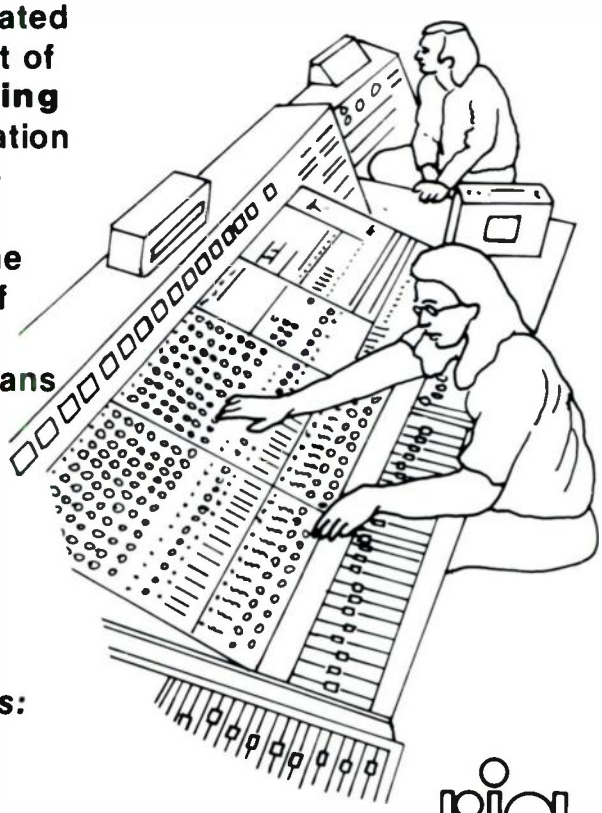

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