SERVING THE CREATIVE AUDIO AND MUSIC ELECTRONICS INDUSTRY

SOUND ARTS

MERCHANDISING JOURNAL

VOL.2 NO.1
FEBRUARY 1979

A Survey of Retailers

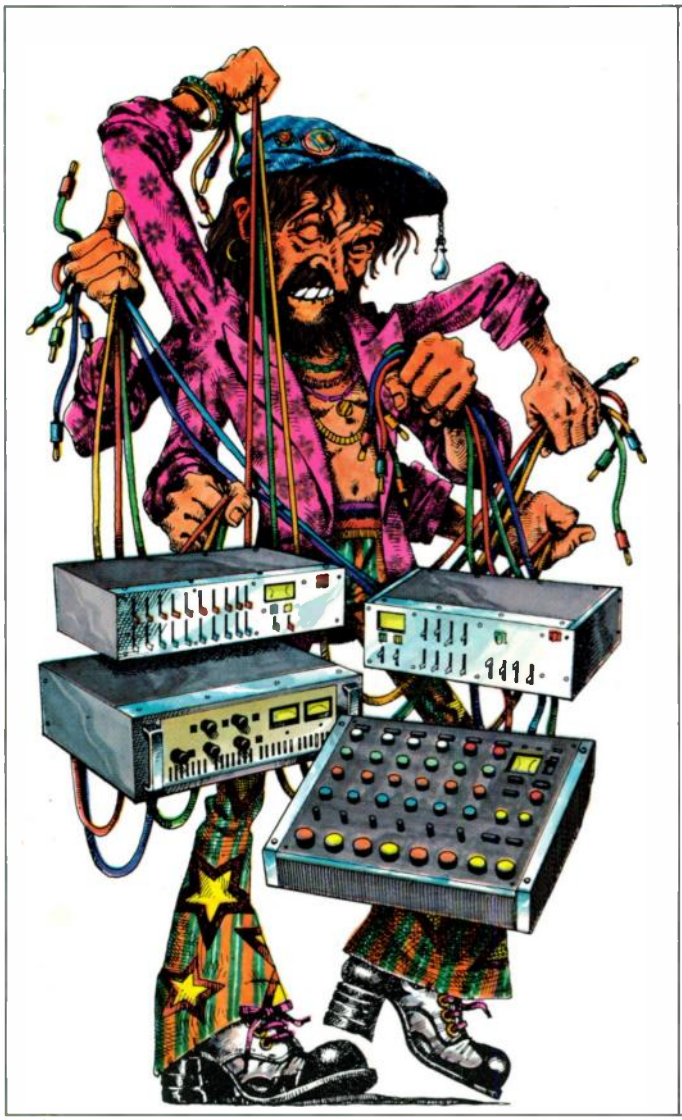
Cameo Discusses Creative Audio

FIRST ANNIVERSARY ISSUE

Digital: A New Direction in Musical Synthesis

Targeting the Retail Ad Campaign

THE LONG AND THE SHORT OF SOUND REINFORCEMENT.



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

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

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

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

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

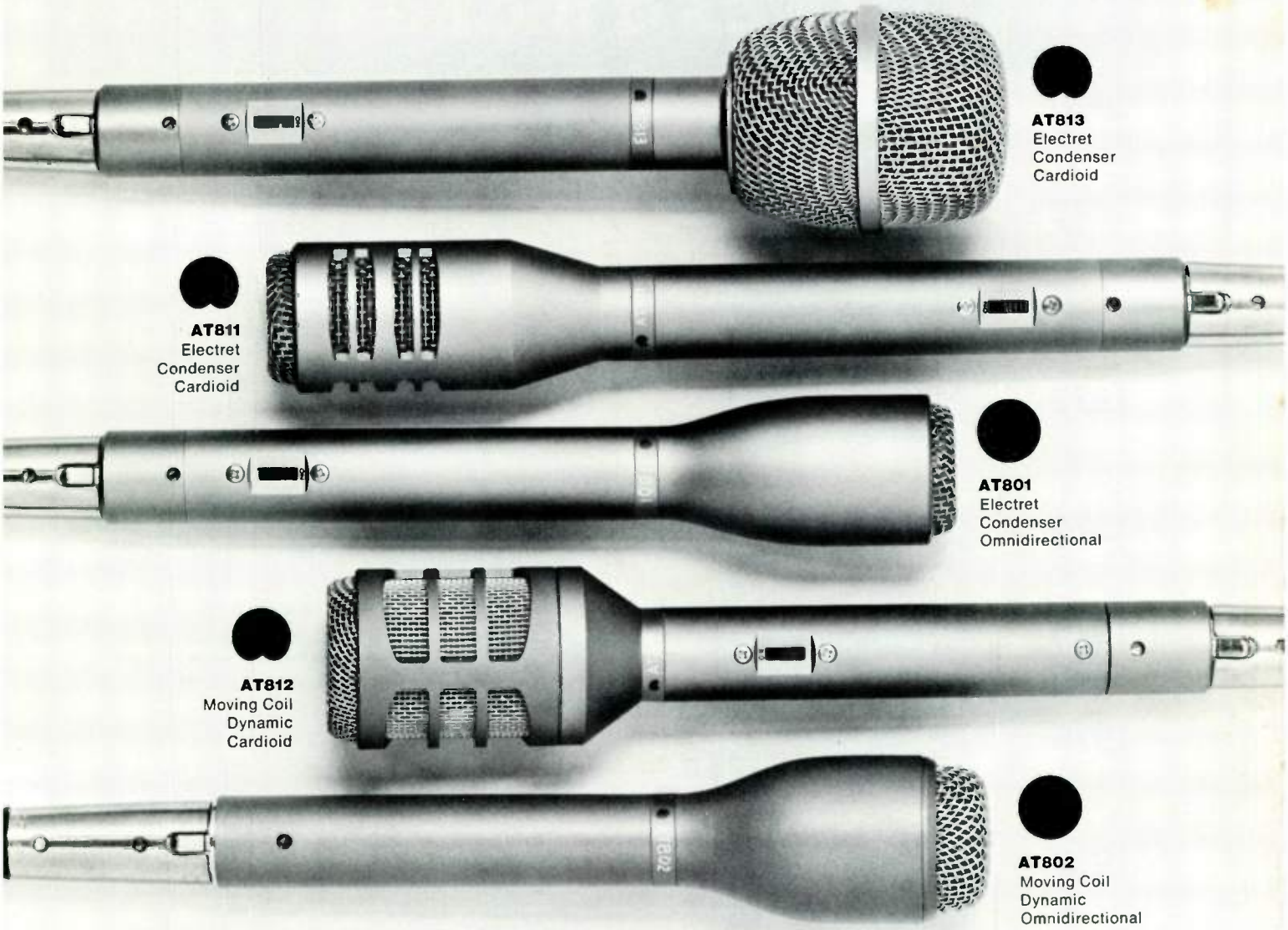
The EM-200 and EM-300 give you the short-cut to reinforcement that won't short-change the quality of your sound. They're convenient to set up, operate and locate... at your Yamaha dealer soon.

YAMAHA

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

CIRCLE 98 ON READER SERVICE CARD

Audio-Technica introduces five new microphones... and a pleasant surprise.



AT813
Electret
Condenser
Cardioid

AT811
Electret
Condenser
Cardioid

AT801
Electret
Condenser
Omnidirectional

AT812
Moving Coil
Dynamic
Cardioid

AT802
Moving Coil
Dynamic
Omnidirectional

Take a close look at these new Audio-Technica microphones. Three electret condensers and two dynamics. Plus two clip-on miniature electrets (not shown). All are superbly finished. Carefully thought out in every detail. With the right "heft" and feel. Professional A3M Switchcraft output connectors, of course.

Then listen in your studio. Full-range, peak-free, clean and crisp. With no distortion even when used close-up to high-level performers. And the balanced, phased Lo-Z (600 Ohm) output matches pro and semi-pro mixers alike.

Now for the surprise. The price. Both omnis are nationally advertised at just $60, for either dynamic or electret condenser element. The two basic cardioids are just $80, while the AT813 electret condenser with integral windscreen is pegged at $95. All complete with full one-year warranty.

Once you've seen and tried these new Audio-Technica microphones we think you'll welcome them. Not just because they cost so little...but because they do so much. Available now from your Audio-Technica Professional Products dealer.

audio-technica. *Great sound. right from the start!*

AUDIO-TECHNICA U.S., INC., Dept. 29SA, 33 Shiawassee Avenue, Fairlawn, Ohio 44313 • In Canada: Superior Electronics, Inc.

CIRCLE 93 ON READER SERVICE CARD

ONE OF TEAC'S BEST IDEAS WASN'T A TAPE RECORDER.

It was a market.

1970 First 4-Channel Tape Recorder with Sync for less than $1,000 (TCA-40)

1972 First Mass Produced 4-Channel Tape Recorders with Sync. (A-3340 & A-2340)

First Studio Quality 8x4 Audio Mixer for under $2,000. (Model 10)

1973 First Studio Quality Recorder/Reproducer to provide 8-Tracks on Half-inch tape. (Series 70)

1974 First Mass Produced 6x4 Audio Mixer for less than $300. (Model 2)

1975 First Studio Quality Mass Produced 8x4 Audio Mixer. (Model 5)

1976 First Studio Quality Mass Produced 8-Track Recorder/Reproducer for less than $3,000. (Model 80-8)

1977 First Studio Quality Mass Produced 16-Track Recorder/Reproducer to use One-inch Tape and cost less than $16,000. (Model 90-16)

1979

When we introduced our first multitrack tape recorder in 1970, we were so far ahead of everyone else that many people thought it was a quad machine.

But the customers we built it for knew exactly what it was: a four-channel tape recorder with sync for overdubbing that cost less than $1,000.

Since then, TEAC has continued to develop new products with price/performance breakthroughs as big as the market we discovered.

In fact, multitrack products—including our TASCAM Series—make up one of the most innovative and successful lines in the history of this business judging by the number of dealers who became wealthy selling it, and the number of competitors it spawned.

Getting to the market meant breaking a lot of rules and killing a lot of sacred cows. We put eight tracks on half-inch tape, for one example. And 16 tracks on one-inch tape, for another.

Doing things like that required a profound understanding of our customers' needs and their goals. But still it wasn't easy. We invested huge amounts of time, money and manpower to develop the market.

We created software to demonstrate how the products work. We developed consumer awareness through innovative sales programs using the latest videotape techniques. We even made consumer sales easier through our unique Finance America credit program.

Today, the power of the market is being recognized at last.

As profitable as it is, though, the business may not be for every dealer. It requires commitment, skill and imagination. It could be *your* best idea.

TEAC®
First. Because they last.

TASCAM SERIES BY TEAC®
A new generation of recording instruments for a new generation of recording artists.

TEAC Corporation of America • 7733 Telegraph Road • Montebello, California 90640 • In Canada TEAC is distributed by White Electronic Development Corporation (1966) Ltd.

VOL. 2 NO. 1

SERVING THE CREATIVE AUDIO AND MUSIC ELECTRONICS INDUSTRY

SOUND ARTS

MERCHANDISING JOURNAL

FEB. 1979

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Trade Show Topics
Post-Xmas Blues

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SOUND ARTS
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A LETTER FROM THE PUBLISHER

It's hard to believe we are starting our second year of publishing SOUND ARTS MERCHANDISING JOURNAL. One of the best things to have happened to us last year was the appointment of Judith Morrison Lipton as Editor back in June. Ms. Lipton brought with her an editorial expertise that has made SOUND ARTS the most widely read educational journal for dealers in the new and burgeoning industry of creative electronics.

What we here at SOUND ARTS find most exciting about publishing this type of merchandising journal is the feeling of being part of what will continue to be tomorrow's industry.

Having just returned from the Consumer Electronics Show and having noted first hand the apparent slackening of the hi-fi industry, I think the time for high-end creative audio is now. The song seems to sound the same in the musical instrument industry. The only noticable excitement seems to be centered around musical instrument *electronics*.

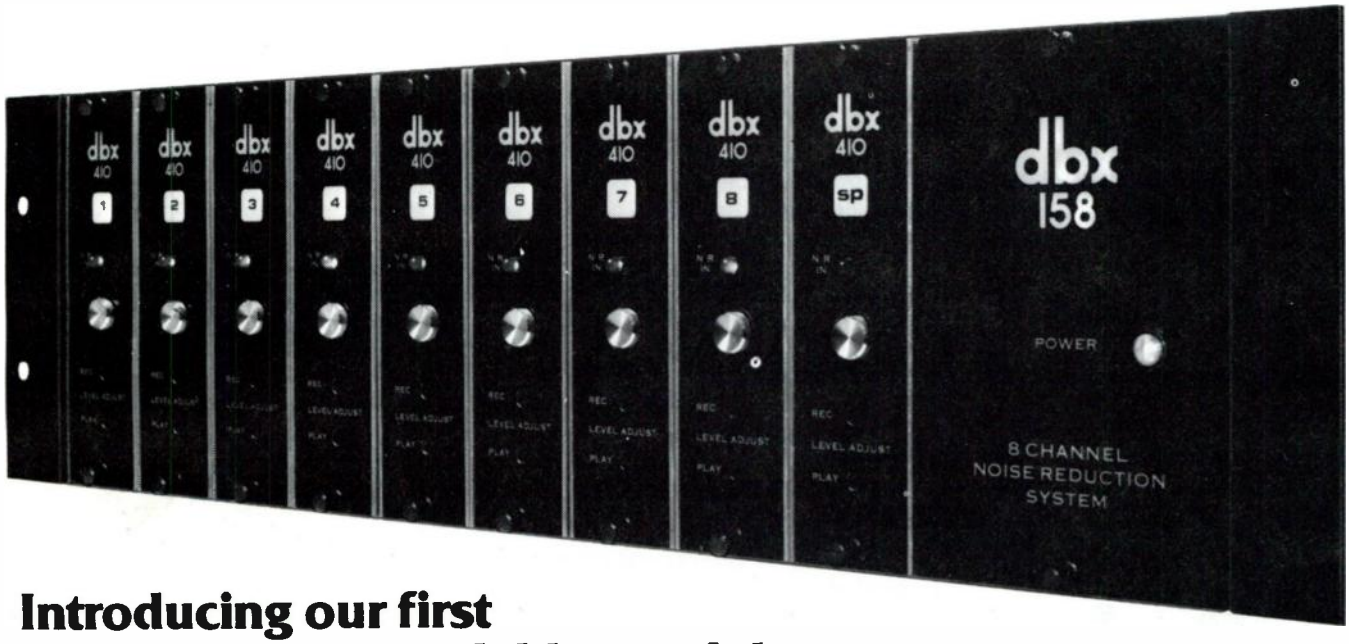
In publishing SOUND ARTS throughout this last year, we've discovered that we are in the manufacturing industry. We have proven that a trade magazine can be manufactured as an exciting visual and editorial package—and need not be dry, boring or non-graphic.

Our research has shown that the type of salesmen attracted to this creative audio and music market are correspondingly attracted to the particular type of product we manufacture. They have responded this past year far beyond our greatest expectations. I would personally like to take this opportunity to thank them and those manufacturers and advertisers who have supported us this past year. I look forward to continued mutual growth in 1979.

Cordially,

Vincent P. Testa

dbx 158.
IT'LL GROW ALONG WITH YOU.



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

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

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

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

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

dbx

dbx, Incorporated
71 Chapel Street
Newton, Massachusetts
02195
617-964-3210

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

CIRCLE 90 ON READER SERVICE CARD

A LETTER FROM THE EDITOR

I note on my calendar a felicitous confluence of dates. Valentine's Day and the first anniversary of SOUND ARTS perk up this usually dreary month with self-congratulatory hearts and flowers. It's the love month, and we're generally starry-eyed over the even dozen SOUND ARTS issues that preceded this one.

I also note—this time in my trusty Webster's—that February represents the Roman festival of purification. While purification may be a noble enterprise, it's not quite our gig. However, some constructive catharsis seemed a valid substitute for outright purifying. And so we allowed some of our readers some time to discuss their problems as retailers.

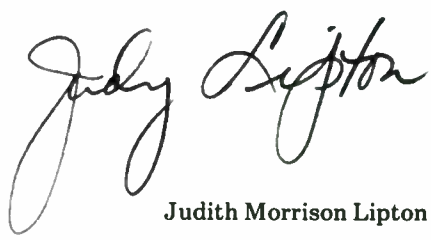
To be more explicit: For our anniversary celebration, we surveyed a number of retailers of variegated types to determine market changes over the past year. While we asked standard questions to elicit some standardized responses, we also produced some unsolicited comments which, however, worked into consensus opinions. You can read about the entire survey further on in these pages.

But for now, I'd like to address a concern that appeared unsolicited in almost every interview—that of the position of the manufacturer's representative. Negative comments on rep performance far outweighed positive comments. A composite comment was, "The reps don't know anything. My salesmen know more. I'd rather see a factory person." Strong language to be sure, but it points up, I think, a central and changing issue—the position of the rep in the modern marketplace. The rep is truly the middle man in the business. With the manufacturers placing more demands on the rep as far as educational abilities and the reps themselves making more provisions for those educational capabilities, the dealers are in turn demanding more knowledge on the part of the reps.

However, the complaint we came across over and over again was that the factory man knows more than the rep. That seems to me to be a truism, and actually a prerequisite for any manufacturer remaining in business. While it is certainly a plus for factory representatives to get out in the field (and many of them do, and that is appreciated by dealers), if the factory technical people are out in the field constantly, they become non-factory people; in fact they become reps without the sales responsibilities. I think the need here is for a definition of the representative's total responsibilities and of reasonable expectations of him. Things are obviously not as they should be, even in an imperfect world. But it seems unfair—especially on St. Valentine's Day—to set the rep up as the Christian martyr that St. Valentine was.

Beyond that, we'll end this note with a word of peace—and our favorite toast around the SOUND ARTS offices—amor, salud, dinero!

Regards,



Judith Morrison Lipton

TEAR HERE

TERMS:

A CONTINUING INDUSTRY GLOSSARY

RECORDING

By Larry Blakely

Cut: The term used for decreasing the level of an equalizer. When a portion of the frequency spectrum has been *decreased* in level with an equalizer, it has been cut.

Attenuate: To reduce in level; can be and is often used instead of "cut." However, attenuate is the term for a reduction in level and does not apply specifically to equalizers.

Two-Knob Equalizer: Means that there are two frequencies at which the equalizer can work (*i.e.*, boost or cut) at the same time. In other words, a typical two-knob equalizer would work at low frequencies (50 Hz to 100 Hz typically) and at high frequencies (10 kHz to 15 kHz typically). Two-knob equalizers can be either fixed frequency equalizers or selectable frequency equalizers (i.e., you can select the low and high frequencies at which you wish to boost or cut).

Switched Frequency Equalizers: Those equalizers that have selectable frequencies (*e.g.*, you switch a frequency selector switch from 100 Hz to 50 Hz). The 12-frequency three-knob equalizer described above is a fixed frequency equalizer.

Graphic Equalizer: An equalizer that will allow a number of different frequency ranges to be boosted or cut at the same time. Typically, graphic equalizers will offer ten to twelve frequency ranges that can be boosted or cut simultaneously. Normally, these different frequency ranges are positioned one octave apart (50 Hz, 100 Hz, 200 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, 16 kHz). A boost or cut of usually 10 dB can be done in each frequency range. Some graphic equalizers will offer a larger amount of boost and cut such as 12 dB.

Parametric Equalizer: An equalizer in which the exact frequency range can be tuned (like a radio dial). It is often found that fixed frequency equalizers which have a number of preselected frequency ranges that can be used will not equalize exactly where you want

ELECTRONIC MUSICAL INSTRUMENTS & ACCESSORIES

By Mike Beigel

Carrier Oscillator: The oscillator which produces the audio output in an FM synthesis system.

Modulation Index: The amount of modulation of the carrier VCO by the modulating VCO, as determined by the amplitude of the VCA. The modulation index is zero when there is no output from the VCA, and increases for increasing VCA output. As the index increases, more and more frequency (sideband) components are produced around the carrier frequency, and the sound becomes more complex.

Modulation Frequency Ratio: The ratio of the modulating oscillator frequency to the carrier oscillator frequency. This ratio determines important properties of the output audio spectrum: namely, the ratios of the FM-generated harmonics to the carrier frequency.

Harmonic Spectra: All the FM-generated overtones will be integer multiples of the carrier frequency or fundamental frequency. In an FM synthesis system, harmonic spectra are generated when the modulation frequency ratio is a rational number (ratio of two integers). A popular ratio is 1:1, where the carrier frequency equals the modulation frequency. Harmonic spectra are used to simulate familiar instrumental sounds (woodwind, brass, etc.).

Inharmonic Spectra: The FM generated overtones do not have an integer relationship to the carrier frequency. This occurs when the modulation index is an irrational number, like $1/\sqrt{2}$, etc. The resulting sounds are much more complex (bell-like sounds and drum-like sounds, for example) than sounds with harmonic spectra.

Dynamic Spectra: By varying the modulation index and the amplitude of the carrier oscillator using envelope-generators, dynamically varying audio spectra are created. Many of these resemble familiar instrumental sounds, though other new synthesized-sound classes have also been generated.

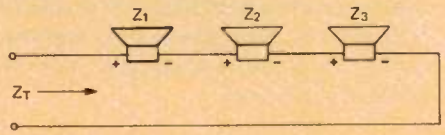
SOUND REINFORCEMENT

By Glen E. Meyer

Low-Impedance Speaker Systems: Low impedance systems usually employ speakers with nominal impedances of 4, 8, 16, or 45 ohms. Forty-five ohm speakers are generally used in intercom systems.

In series connections, speaker impedances add: $Z_T = Z_1 + Z_2 + Z_3 \ldots + Z_N$, where Z_T equals the total combined load impedance and Z_N equals the individual speaker impedances. If all of the speakers have the same impedance, the total impedance would simply equal the total number of speakers multiplied by the impedance of one of the speakers.

In-phase series connection is obtained, as illustrated, by connecting the positive terminal of one speaker to the negative terminal of the other.



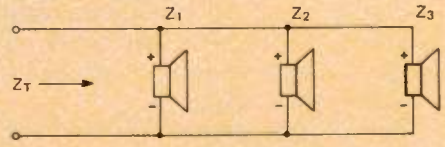
Series—connected speakers

In general, series connections should be used *only* with speakers of the same model and impedance. Otherwise, each speaker will affect the response of the others. Also, series connection is less reliable because failure of one speaker will disconnect the others.

In parallel connection, the combined impedances of like units is the impedance of one unit divided by the number of units; or, in unlike units, the total impedance will be:

$$Z_T = \frac{1}{1/Z_1 + 1/Z_2 + 1/Z_3 + \ldots 1/Z_N}$$

In-phase parallel connection is as illustrated, where all like terminals are connected:



Parallel—connected speakers

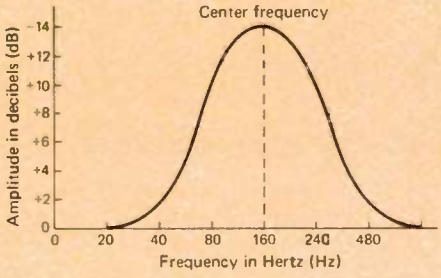
TERMS: (CONTINUED)

A CONTINUING INDUSTRY GLOSSARY

RECORDING

them to. A parametric equalizer will allow you to tune the audible frequency range (or a portion of the frequency range) to the exact frequency that you desire for your particular effect. Some such parametric equalizers will tune the entire frequency spectrum (20 Hz to 20 kHz). There are two-knob, three-knob and four-knob parametric equalizers available. In the case of a three-knob, the frequency spectrum is divided into three parts (low frequencies, mid frequencies, and high frequencies) and each frequency range is tunable. These are very flexible and unique in their operation.

Peaking Type Equalizer: Has a center frequency at which the maximum amount of boost or cut takes place. However, the frequencies around (on both sides) of this center frequency are also affected. If one were to look at a graph of the level and frequency response, it would look like the illustration below.



It can be seen that the shape of the peaking equalizer is close to a bell shape. Such peaking type of equalization is typically used in graphic equalizers and for mid-frequency equalizers.

Shelving Type Equalizer: Also has a frequency at which the maximum amount of boost or cut takes place. But the frequencies above or below this point are also affected by the same amount. There are two types of shelves: a high frequency shelf and a low frequency shelf.

In the next column we will look further into equalizers.

ELECTRONIC MUSICAL INSTRUMENTS & ACCESSORIES

Vocoder: A device which superimposes an intelligible speech signal onto a musical signal input. Human speech production can be modeled by a system consisting of a tone generator and a series of variable filters. The tone generator provides the basic sound source for speech (simulating the vocal cords) while the variable filters simulate the complex acoustic system formed by the mouth, nose, tongue and other parts of the human speech mechanism.

A vocoder substitutes a musical input signal for the tone generator and noise sources which provide the "raw" sound for speech synthesis. To provide a set of variable filters to modify this signal into recognizable speech/music, a system of filters, envelope followers and voltage controlled amplifiers is used.

First, the audio spectrum of the input speech signal is analyzed. This is done with a filter bank, which segments the audio spectrum into a number of frequency "bands"; and a set of envelope followers, which monitors the amount of signal in any "band" at any given time.

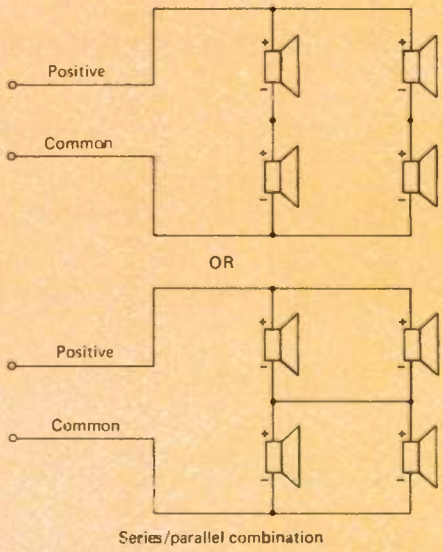
The envelope follower outputs become control voltages for voltage-controlled amplifiers connected to a second filter bank. This filter bank has the musical input signal connected to its input. By passing the musical signal through a filter bank and controlling the filter outputs congruently with the audio spectrum of the input "speech" signal, a speech-like musical output is obtained.

The sound quality of a vocoder depends on the number of filters in the filter-bank, the frequency range over which the filters are spread, and the accuracy of the envelope followers controlling the output filters. By changing input and output filter correspondences, very strange spectra can be produced. This requires a "patchable" filter matrix. Commercially available vocoders cover a wide range of prices and quality levels. See next month's issue for diagram.

SOUND REINFORCEMENT

For combination series and parallel, compute the impedance of each similarly wired group of speakers, and then considering each group as a single speaker, compute the total combined impedance.

Remember, the resultant impedance of the speakers connected in parallel, series, or series/parallel should be matched to the capabilities of the amplifier driving the speakers. Four 8-ohm speakers in series would have too high of an impedance (32-ohms) and these same four speakers connected in parallel (2-ohms) would probably present too great a load to the amplifier. The best combination, in this example, would be to connect the speakers in a series parallel combination which would give a combined impedance of 8 ohms.



Series/parallel combination

High-Impedance/Constant Voltage Systems: In speaker systems, anything over 32-ohms impedance could generally be considered high impedance.

Systems that require a high impedance speaker load permit much smaller diameter wire for a given power loss in the speaker lines.

We will continue our discussion of high impedance constant voltage systems in the next issue.

These are the "big guns" in "professional" power amplifiers. Each of these amplifiers has individual features and abounds with specifications to impress potential buyers and to satisfy the professional user but they are **not** created equal... especially in reliability under professional (rack mounted) conditions.

Some of these "big guns" have been talking about everybody else being "behind", others are talking about comparator LED's, while others depend mostly on their good looks. The Peavey CS-800 comes out on top when you consider the features, the specifications (which are as good or better than anybody's), total power output, and price per watt of professional power.

Some companies have recently "discovered" LED's and comparator circuitry that Peavey pioneered and has been using for years. These recent "converts" were most vocal in the past against LED's...that is, until they updated their "plain Jane" units. Some of the other companies spend a lot on cosmetics but not much on built-in forced air cooling and large numbers of output devices to enable reliable rack mounted operation under continuous professional use.

Each channel of the Peavey CS-800 features 10 output devices and 2 TO-3 drivers bolted to massive modular heatsinks that are forced cooled by a 2-speed fan, has special distortion detection circuitry and LED indicator (not simple overload), as well as a functional patch panel on the rear to facilitate the use of plug-in balanced transformer modules, electronic crossover modules and speaker equalization modules custom tailored to Peavey's SP-1 and SP-2 speaker systems.

In comparing pro amplifiers, one should apply the old commercial sound "dollar-per-watt" rule. The CS-800 is again "on top" at 81¢ per professional watt. The fact is...Peavey is not behind **anyone** in power, durability, features or performance.

Below are the respective published specifications of the "heavies" in pro amps. Check for yourself to see how we all stack up. You might be surprised.

PEAVEY

Peavey Electronics
711 A Street
Meridian, Miss. 39301

HOW DO THE "BIG GUNS" STACK UP?

	OUTPUT TRANSISTORS MFRS. MIN. RECC. LOAD POWER @		COOLING SYSTEM SPEAKER PROTECTION		CONSTRUCTION GENERAL	TURN ON DELAY	CIRCUITRY	T.I.M.	LIST PRICE	DOLLARS PER WATT
Peavey CS-800	800 W Total 400 Watts/Ch. @ 4 Ohms 260 Watts/Ch. @ 8 Ohms (Both Ch. driven)	20	2 Speed forced air cooling	Yes	Totally Plug-in Modular	None Required	Quasi Complimentary. All rugged NPN Silicon Outputs	Not given. No accepted Measurement standards Presently exist.	$649.50	**$0.81 per Watt** Based on 4 Ohms/Ch. min. load
Crown DC-300A	360 W Total 180 Watts @ 8 Ohms 4 Ohms Not Given	16	Conventional Passive Airflow Only	No	Hard Wired	None Required	Quasi Complimentary. All rugged NPN Silicon Outputs	Not given. No accepted Measurement standards Presently exist.	$919.00	**$2.55 per Watt** Based on 8 Ohms/Ch. min. load
BGW 750 B	720 W Total 360 Watts/Ch. @ 4 Ohms 225 Watts/Ch. @ 8 Ohms	20	2 Speed forced air cooling	Yes	Modular	Relay Circuit	Collector drive Complimentary using PNP & NPN Silicon	.02% No measurement details given.	$1099.00	**$1.53 per Watt** Based on 4 Ohms/Ch. min. load
Yamaha P 2200	700 W Total 350 Watts/Ch. @ 4 Ohms 200 Watts/Ch. @ 8 Ohms	12	Conventional Passive Airflow Only	No	Hard Wired	None Recuired	Emitter follower drive complimentary using PNP & NPN Silicon	Not given. No accepted Measurement standards Presently exist.	$1095.00	**$1.56 per Watt** Based on 4 Ohms/Ch. min. load

All above figures based on manufacturers' published specifications and minimum recommended load impedances as of 11/1/78

FORUM

Accept my congratulations on another fine issue of SOUND ARTS. The October 1978, Vol. 1, No. 9 issue is again another very educational journal.

We at Crown are very appreciative of the coverage given to the Crown D-75 power amp on page 49, and for coverage of dealer Ace Music, who is a franchised Crown dealer. In particular I was pleased to see the answer to the question "What is Real Time?" that appeared on page 14 in your Common Consumer Cuestion column.

While the entire tone of the article dealing with "What is Real Time?" expresses the immediacy of both human perception and electronic display, the emphasis is contradicted by a typographical error that appeared in the last paragraph. The sentence discussing the Crown RTA should read, "For instance, the Crown RTA-2 Real Time Analyzer responds in one-sixtieth of a second showing the user the amplitude and frequency response of an entire system in what, for all practical purposes, is real time." The sentence as it appeared indicated that response time as one-sixth of a second. A sixth of a second certainly cannot be misconstrued as real time.

I believe that the readership of SOUND ARTS would appreciate having clarification on this seeming contradiction. Please accept my apologies for the error and let me assure you of our continuing willingness to be of assistance.

Sincerely,
Murray A. Young
Marketing/Communications
Crown International

Please send an additional subscription to SOUND ARTS to another member of our staff. Incidentally—we are all enjoying your magazine tremendously. Keep up the good work.

Sincerely,
Robert J. Princiotto
Harmony Hut
Washington, D.C.

I would like a copy of your August '78 magazine if possible. I'm in the disco business, and part of my job includes repair and maintenance, and installation of sound systems. If you cannot supply the entire magazine, a reprint of the article entitled "Disco Sound Installation" would be good. Thank you.

Sincerely,
Robin D. Miller,
Alibi, Inc.
Mt. Pleasant, Michigan

Our company received its first issue of SOUND ARTS this month and were very impressed. Is it possible for you to send us the back issues? I believe there must be eight issues before the October issue. We would like to hear from you concerning this matter.

Alyce Armakar
Barath Acoustics, Inc.
Denver, Colorado

We would very much appreciate your sending us copies of SOUND ARTS, Vol. 1 number 1 through Vol. 1 number 6. We have found SOUND ARTS to be helpful in explaining terminology and the uses of various devices to customers in a non-technical manner. It has also assisted our staff in keeping abreast of the latest developments. Keep up the good work. Thanks for your help.

Thomas J. Wells
The Music Store, Inc.
Anchorage, Alaska

After reading Ralph Morris' article on loudspeakers in your December issue, I feel that there are some points that need clarification. Mr. Morris seems to have a rather low opinion of horn type loudspeakers. Although of course entitled to his opinion, Mr. Morris should not have presented it as fact. The facts of the matter are that horns have many very real advantages over direct radiator loudspeakers—primarily in areas of efficiency, pattern control, and projection ability.

A properly designed and constructed horn does not sound like "speaking through a tube." A horn is essentially an acoustical matching transformer that permits the driving mechanism to couple to the air it has to move in the most efficient manner, providing not only higher SPL, but also lower distortion and greater transient accuracy. Portable bass horns, which Mr. Morris considers to be an impossibility, are indeed very much of a reality, and are used quite effectively in a majority of the large touring systems in operation today. These bass horns are used in preference to direct radiator LF systems because their greater directivity provides a considerable increase in intelligibility and uniformity of coverage in the large, highly reverberant halls in which these systems are typically used. When such systems are operated outdoors, the projection ability and efficiency of the bass horns enable far greater throw distances than would be possible with direct radiator low ends.

At present, there are two schools of thought on this matter, and certainly there are some major sound companies that prefer direct radiator cabinets, feeling that their more compact size and relative ease of handling more than offset their acoustical deficiencies. The evaluation of professional PA systems is ultimately subjective—the many skilled practitioners in the field have tried a wide variety of approaches to the question of loudspeaker application, each with its own merits and drawbacks. There is no "perfect system" and there is no single approach to the problem. I hope in the near future you will be able to print the views of others in the field, perhaps creating a more balanced, if not entirely consistent, picture of the subject.

Bruce Howze
President
Community Light and Sound

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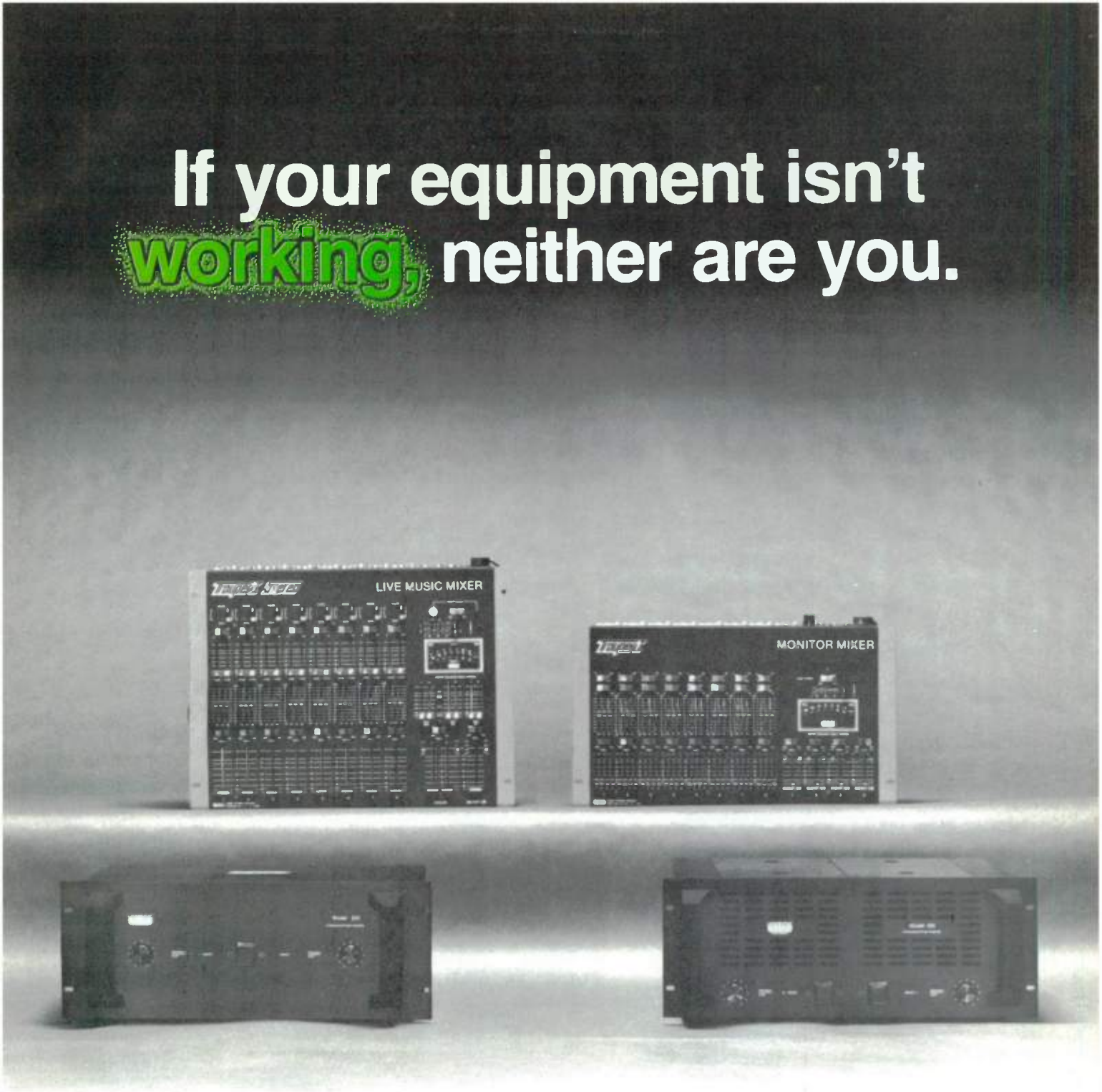

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CIRCLE 99 ON READER SERVICE CARD

TROUBLESHOOTERS' BULLETIN

QUALIFYING THE MICROPHONE CUSTOMER

(1)

Questions to ask:

1. What type of recorder are you looking for?

If phone plug cassette or phone plug reel-to-reel, use low impedance microphone with 1/4" phone plug.

If 3-pin plug reel-to-reel, use low impedance microphone and change 1/4" phone plug to 3-pin connector.

(2)

2. What will you be recording?

3. Where will you be recording?

Hard room: Highly reverberant. Use unidirectional microphone.

Non-hard room: Low reverberation. Omnidirectional microphone should provide good results. Unidirectional microphone will provide tighter, less reverberant sound.

Outside - open field. No reverbera-

(3)

tion. Recording will sound quite dry. Omnidirectional microphone will yield good results. Unidirectional microphone will suppress ambient background noise if this is a problem.

Outside - as in a stadium. Some reverberation because of seats. Characteristics similar to non-hard room.

4. What recording distance?

Hard room: Within one foot of sound source, use omnidirectional or unidirec-

tional microphone. The unidirectional will provide less reverberation and background noise. Beyond one foot from source, use a unidirectional.

Non-hard room: Use an omnidirectional microphone for reverberant quality or a unidirectional microphone for less reverberance and for background noise suppression.

5. How much cable will you need? In a low impedance application you can use up to several hundred feet with no high frequency degradation.

In a high impedance application use of more than 20 feet of cable will cause serious signal degradation. For this reason, in a high impedance application where use of a long cable cannot be avoided, it is advisable to use a low impedance microphone with an impedance matching transformer at the input.

BOB HERROLD
AUDIO-TECHNICA U.S. INC.

PROPER CASING

One of the best ways to prevent breakdowns is simply to ensure proper casing of the equipment. The customer should buy the casing when he buys the gear. Bands usually figure that "tomorrow" they'll have the bucks for the cases. But when "tomorrow" comes, the bucks for the cases go for fixing the gear.

BOB HEIL
HEIL SOUND

What exactly is "proximity effect" and what can I do about it?

All dynamic microphones have what is called proximity effect. This is a boost in the bass or low end response of the microphone when used in close proximity to the sound source. In other words, the closer you get to the mike the boomier it gets.

A lot of times this is a severe problem, especially with loud amps and vocalists who sing loud and eat the mike. Proper microphone technique can turn this all around for you. You can learn to use the microphones' response characteristics to give you more control over your sound.

In miking instrument amps the mike facing straight into the speaker cone can give you a boomy, muddy sound. Don't touch your tone controls or equalizers! Move the mike back or angle it a bit, experiment until you like what you hear, then make minor adjustment with the equalizers on your board, *if you have to.*

The same process may be used to get a good drum sound; mike placement is very important. Moving a mike closer or farther away from the heads has a lot to do with the reproduction tone through the P.A.

A vocalist can learn to use proximity effect to his advantage. Closing in on a mike during a mellow number can give your voice a good round tone, without touching the tone controls. On the other hand never get closer than 3-4 inches from the mike for rock and roll level tunes; it causes low end distortion and pure mud.

Know your microphone; they're all different and realizing its characteristics can help you improve your sound. Don't touch your tone controls unless you have to; too much equalization can cost you headroom and cause distortion. If you play a different room every night or from time to time, *do not* set your tone controls the same every time. Leave them flat till the best mike placement has been achieved.

Jerry Colmenero
CJ Sound
Corpus Christ, Texas

How can I avoid the feedback that I often get when I try to record live music at home?

The best way to make sure feedback is not a recording problem in your home studio is to place the speakers in front of your microphone(s). To complete the cure, use a uni-directional microphone to avoid any sound spillover that might result in unwanted feedback. If you're recording in the room and not amplifying the sound, you won't have to worry about the problem. But if you want to hear the true sound while you're recording, follow the hints listed above or use headphones to monitor.

Nick Morris
General Manager
Sony Professional Audio Products

Can echo tape loops designed for stage use be used for recording?

Sure they can be used. They are utilized in a recording session just as they're used in a live performance. Feeds to the tape can be taken from the echo unit directly, or bridged off the amp output or by placing a mic in front of the speaker. Just consider the echo unit as part of your instrument.

It is important however that you, and *all* the members of the band, hear the effect as much as you expect it to be in the final mix. You and the others will play in response to the loop sound only if it's present.

I give that warning before I mention that you can also record the guitar straight with no effect and add the effect later. For that matter, you can record it four ways and decide later which is best, assuming you've got an ample multitrack situation.

Your best bet is to discuss your desires with your recording engineer before the session. He'll have had a great deal of experience with all sorts of "loop echo" boxes and "loop effects." He might also suggest some very interesting alternatives.

As to possible problems...When was the last time you changed the tape in your unit? It does not last forever. As the tape wears, you'll hear more noise relative to guitar sound. In bad cases a bubbling can occur in the sound, and of course "highs" seem to disappear. The loss of highs makes the effect seem less loud than it is.

Be sure to use the correct type of tape. Follow the echo unit manufacturer's suggestions. It is also important to keep the record and/or playback heads clean. Even if they look good, a build up of lubricant from the tape can cause some of the same effects as head wear. A cotton swab and some head cleaner will take care of those problems.

If you have help in the recording process, ask about using a "wrong" tape in the device *just for the session.* You can get better noise results, but don't start experimenting yourself at the session. Experience can be brought to the recording studio far more cheaply than carried away from the studio.

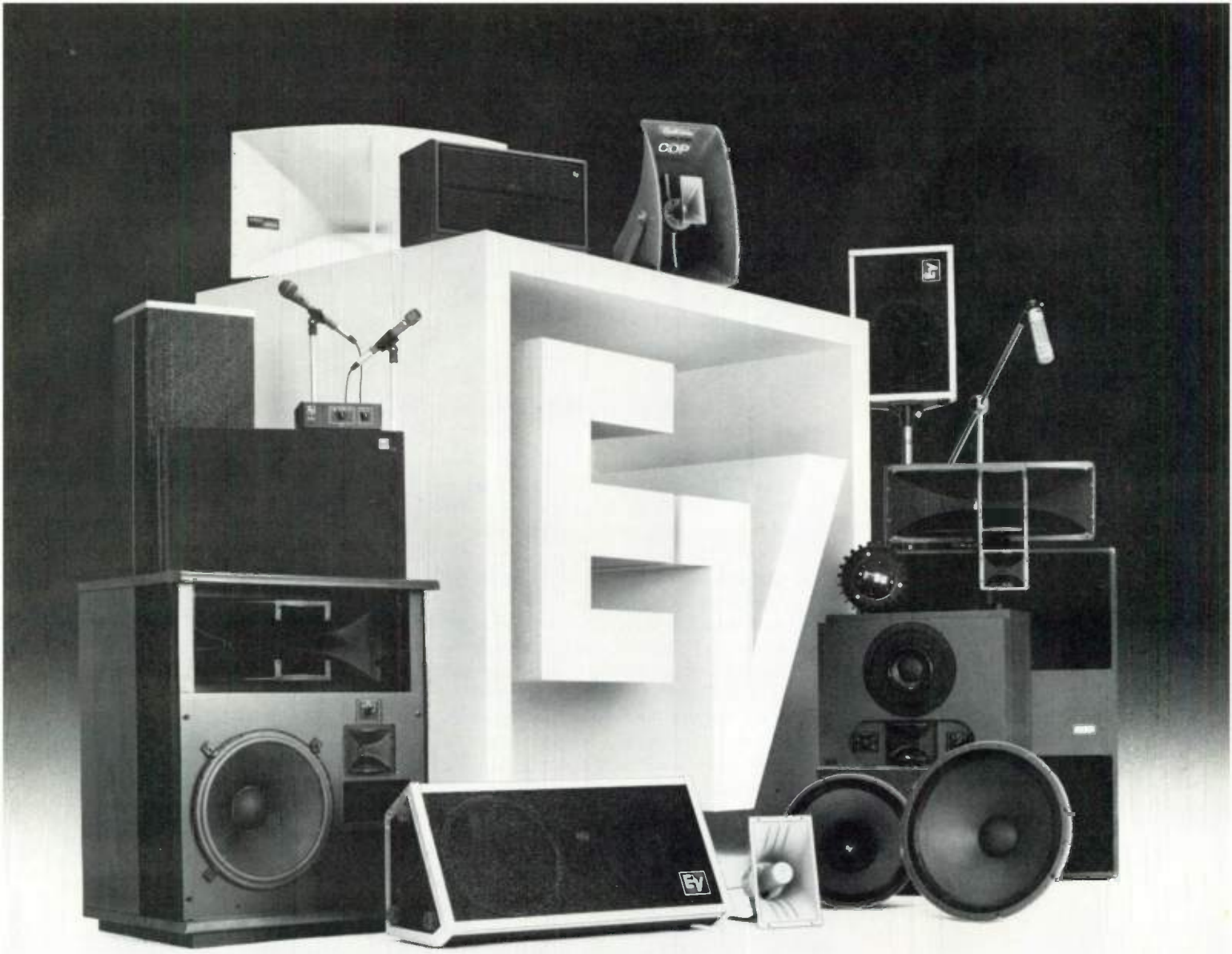
The right thing to do with loop echo devices is the same as the right thing to do with anything else. If it works it's good. If it works best it's best.

Ed Rehm
Chief Engineer
The Ken Nordine Group

What is phantom powering?

Phantom powering is a technique by which dc operating voltage is fed to a condenser microphone without the use of special multi-conductor cables. The positve side of the operating voltage is fed *equally* through the two signal leads, while the negative side is carried by the shield. Because both signal leads carry the same dc potential (and because professional balanced-output dynamic microphones have no circuit path between the signal leads and ground), a professional dynamic microphone may be connected to a phantom-powered console, mixer, or tape recorder input without any deleterious effects on the microphone's performance.

Geoffrey M. Langdon
Technical Manager
AKG Acoustics



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CIRCLE 94 ON READER SERVICE CARD

By Craig Anderton

As promised last month, it's time to look at specific features and functions available on commercially available delay devices (flangers, solid-state echo units, harmony synthesizer, delay lines, etc.). The following information will, I hope, allow you to properly apply this new breed of effect to maximum advantage.

INPUT CONTROLS

Many delay line (DL) devices have some form of input control that determines how much level goes into the delaying stages of the unit. In order to obtain the best signal-to-nosie ratio possible, this control should be set for the *maximum* possible level, consistent with low distortion at the output. Often, a clipping indicator will be included that flashes when you exceed a maximum allowable level; this is very helpful for obtaining optimum results. However, if you plug an instrument into a DL that includes a clipping indicator and you can't make the indicator flash under any circumstances, then you are not providing enough level for the unit. This requires the addition of a preamp between the output of the instrument and the DL to increase the signal level going into the DL. This problem is particularly likely to occur if the DL is designed for studio signal levels, but is being fed with low level inputs such as those coming from a microphone or guitar. Remember that the setting of the input control is critical to getting the best possible sound—don't overlook it.

By the way, in some units the control we just discussed will be labelled *output* if there is no control specifically designated as an input level control. In this case, adjust again for maximum level consistent with low distortion.

DELAY CONTROLS

In analog DLs, this will usually be a potentiometer type control that offers a continuously variable delay. With digital DLs, the delay will generally be switch selected. Whichever type you use, expect the performance to fall off as you increase the delay time. This decrease in performance shows up as greater noise, lower frequency response, increased distortion, and lowered dynamic range. These problems are more pronounced with analog DLs than with digital DLs.

As a result, if you set a DL up and the delay control is at maximum, you are effectively showing off the unit at its very worst. Longer delays are not necessarily what the musician is looking for; flanging effects, for example, only require short amounts of delay. So, the best thing to do when evaluating a delay unit is to check out its performance at both the minimum, and maximum, delay positions. This will give the most realistic idea of what type of performance to expect.

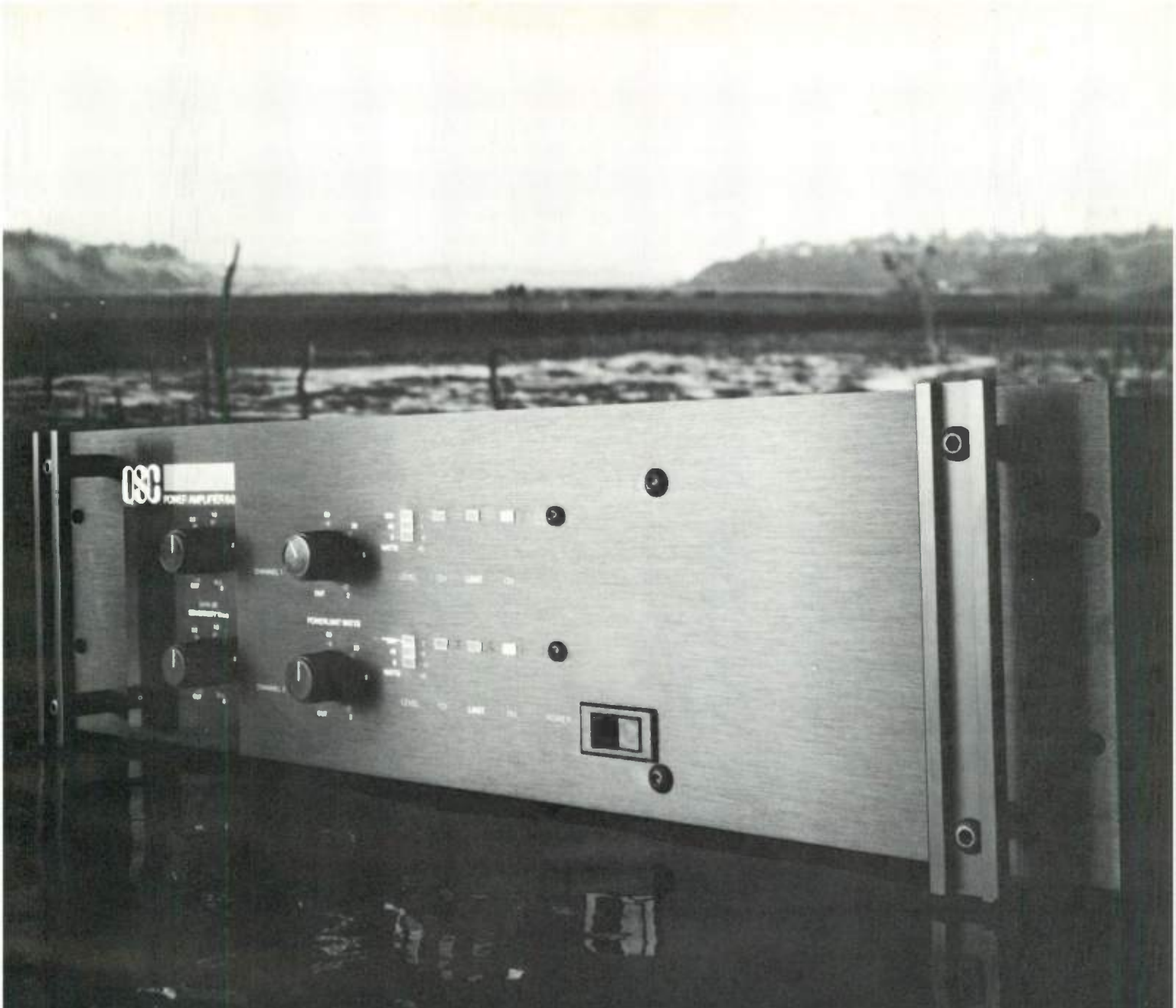
COMPANDERS

Some units advertise the fact that they use "companders" to improve performance. A compander system is basically a simplified version of the type of noise reduction used in many recording studios (*e.g.*, dbx). What this system does is *reduce* (compress) the dynamic range of the signal going into the delay line to fit in the delay line's restricted dynamic range, and then *expand* the dynamic range of the signal at the output of the DL—restoring the signal to normal, while reducing some of the noise produced by the DL. However, a companding system should also have some *pre-emphasis/de-emphasis* built-in for best results. This boosts the treble going in, and cuts the treble coming out, to minimize the appearance of noise along with your signal.

If all that is too technical to follow, the bottom line is this: A companded DL will usually give superior noise performance compared to a DL that does not include compansion . . . unless it is *very* poorly designed. Some people may feel that the process of compansion degrades the quality of the signal; however, delay lines are sufficiently lo-fi devices to begin with (with the exception of some real high-ticket jobs) that the small amount of signal deterioration caused by compansion isn't really noticeable.

NOISE GATES

When you're not playing through a DL, you'll hear a bit (possibly a lot) of background noise. By adding an external noise gate after the DL, you can set the noise gate so that when a signal drops below the level of the



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CIRCLE 95 ON READER SERVICE CARD

noise, the output shuts off . . . thus shutting off the noise at the same time. While this adds an unnaturalness to the instrument's decay characteristics, if the noise isn't too bad to begin with, the unnaturalness isn't too bad either. In any event, most musicians would gladly trade off a bit of strangeness in the decay for a lack of noise.

Some DLs have built-in noise gates, which can help clean up the act of the device and improve the sound. But there is one caution that should be added about DLs that include compansion and noise gating; these features may be included to make a great design even better . . . or they may be there to cover up an otherwise poor design. As a result, when comparing DLs, listen carefully to the amount of noise present when the instrument is *playing* (and to be fair, both units should, be set for the same amount of delay). This takes the noise gate effect out of the circuit so you can judge how much background noise there really is. Next, check out the decay characteristics of the noise gate by, for example, striking a note on a guitar, then immediately muting the string. If the noise gate shuts off when you stop the string, you're in good shape. If there is a swish of background noise that decays off into nothing when you stop the string, then this noise gate decay time might become noticeable under performance conditions.

RECIRCULATION/RECYCLE/ FEEDBACK CONTROLS

These are different names for a control that adds quite a lot of flexibility to a unit, by taking some of the output and feeding it back to the input of the device. With a flanger, this results in a "tubular," metallic type of sound; with a delay line, the result is repeating echoes. This is similar to the recirculation control in a tape echo unit. (See my column in the December issue of SOUND ARTS.) Unfortunately, using this control will increase the level of noise since we're not only feeding back the output signal, but also the output noise of the device. Another problem is that with some units, turning this control all the way up will result in feedback—just like the sound you get with a tape echo unit that's feeding back on itself.

Another variation on the recirculation control is a phase switch (sometimes labelled *odd/even harmonics*). This control changes the electrical phase of the fed back signal, and with a flanger offers two distinctly different sounds. While not indispensable, it does increase the versatility of the unit, and I find both types of feedback to be useful. Positive phase accents the even harmonics; negative phase accents the odd harmonics.

BLEND CONTROL

Delay units and flangers generally offer a blend control to allow balancing between modified and unmodified sounds. First, listen to the unmodified sound; it should be clean and free of noise. Then, check out the modified sound, which should exhibit some of the noise and other problems we alluded to earlier. The action of the pot should be smooth; the middle of the

pot rotation should correspond to a sound that's balanced between modified and unmodified sounds.

Some units have a jack for taking out the delayed sound, so that you can obtain stereo effects or add further processing to the delayed sound. This is not at all difficult to add from a manufacturing standpoint, and is very nice to have.

MODULATION CONTROLS

Flangers usually have an internal sweep effect that continuously sweeps the range of the flanger, from low to high. Some delay lines will also have this feature. What you're looking for here is a smooth sweeping action, free of asymmetrical behavior and irregularities. Controls typically include *speed* (for varying the rate of the sweep), and *range* (for varying the range of the sweep, *i.e.*, from how low, to how high, it sweeps).

One of the more interesting modulation controls I've seen is on the A/DA rack mounted delay line, called a "delay randomizer." This introduces a modulation that changes the rate of delay in a random manner, thus producing an animated type of doubling and delay effect.

Another possible type of modulation is envelope control, where the sweep of the unit corresponds to the intensity of the input signal. This is more critical to adjust than a standard oscillator sweep, but yields an effect that is precisely synched to the player's playing and often sounds more interesting and lively than a fixed frequency sweep.

CHECKING FOR CLOCK FEEDTHROUGH

As mentioned last issue, delay lines include a clock that determines the delay—the lower the clock frequency, the longer the delay. As a result, in some solid-state echo units, very low frequency clocks are used to give long delay times. But, this clock signal can show up as an audio signal in the output at long delay times, albeit at a fairly reduced level. To check for this, set the unit under test for the longest possible delay, play, and see if you can hear the clock in the background. If you can't, great! If you can, determine whether it's acceptably low or too high to cope with.

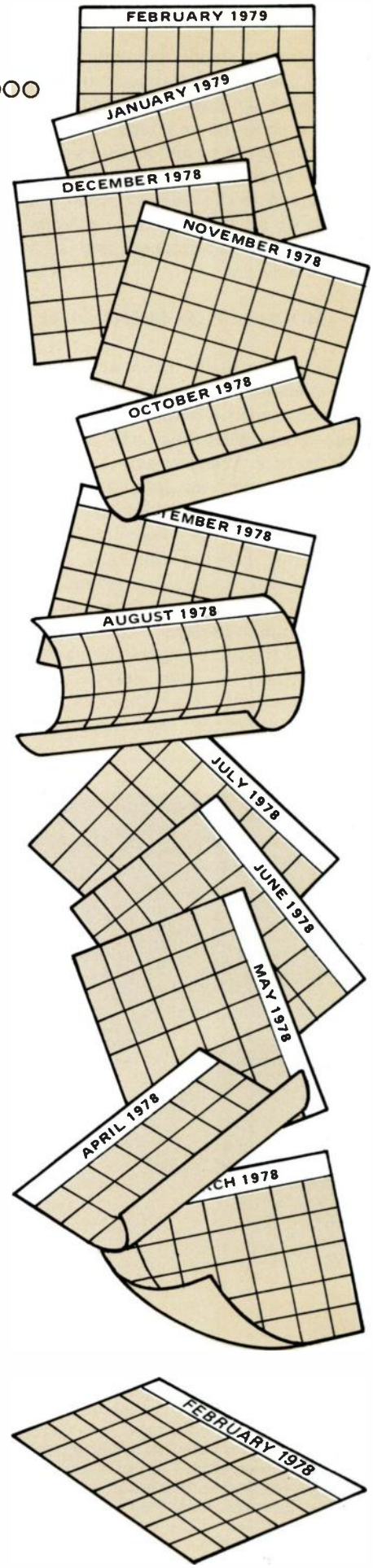
SUMMARY

I hope the preceding has given an understanding of what types of controls and limitations you'll find on solid-state delay units. While it's impossible to cover all possible controls used by all manufacturers, we've managed to cover quite a lot. Delay lines produce sounds that are much desired by musicians, but in order to sell them this effect, a good demonstration is mandatory. By keeping the above tips in mind, you should be able to understand and appreciate the differences between competing units. Your next step is to pass that information along to your customers so that they can make the most informed purchasing decisions possible.

ONE YEAR LATER...

The State of the Market:

A Survey of Retailers



For our first anniversary, we thought we'd go back to our roots—that is, to the retailers of creative audio and electronic instruments who spearhead this market—and talk about what the last year has meant in the marketplace. Our methodology was admittedly freewheeling. Our survey took place during the last two weeks of December, and consisted of telephone interviews with retailers from all regions of the country. Interviewees ranged from small one-store operations to large multi-store operations, from some of the biggest retailers to some of the smallest. They included creative audio dealers, musical instrument dealers, and sound reinforcement people, and some hi-fi stores who are also becoming involved in creative audio.

We asked a series of standard questions about the market, but left room for discussion on points the interviewee wished to discuss. Thus, some opinions were solicited, and some were not. Yet, it was surprising to see the consensus that emerged.

The first unsolicited opinion that emerged almost unanimously was the growth of disco sales in the past year. In the early days of rock, the dancing may have been done in the street, but today dancing is being done more and more in Studio 54's all across the country, with the mirror balls blazing and the club disc jockey spinning platters that in the quality and complexity of their studio production represent a new professionalism that the old stand-up-and-play rock bands have had trouble duplicating.

In cities like Charlotte, North Carolina and Albuquerque, New Mexico, disco fever was just beginning to spread from its strongholds on the east and west coasts. Melvin Cohen of Reliable Music in Charlotte found that "live music was dying out a little, but disco was coming in." And, added Melvin, "We're taking advantage of it," and so they have, not only by stocking the portable disco sound units but also by going one step better and actually doing disco sound installation. Installing disco systems was a nationwide trend which many of the more progressive sound reinforcement dealers were quick to seize upon. Albuquerque's Doug Blakely of Blakely Pro Audio seconded the motion. "We never expected disco to catch on the way it has in this town. Whereas before, we had almost no disco-type speaker systems, now, in our speakers, we are leaning more towards disco than we are to live band application."

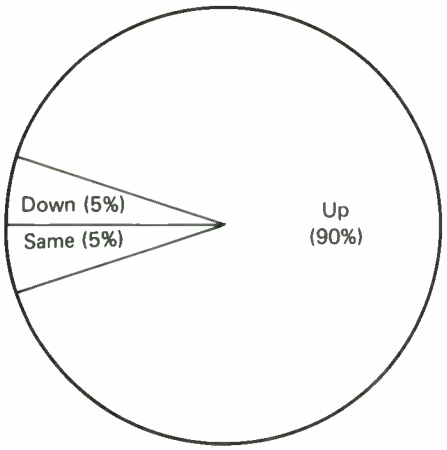
In the areas where it was already entrenched, disco made even more headway. Richard Couture of Grice Electronics, a five-store operation covering southern Alabama and northwest Florida, says that Grice has swung wholeheartedly into both the sale and installation of disco sound equipment and lighting. One of the bigger projects that the store took on this year was the design and setup of a discotheque in Orlando. In Kansas City, according to Bob Bratton of Superior Sounds, disco triumphed. Live music fell off 50 percent, but disco systems were up over 100 percent.

Several of the heartland dealers were looking to the east and west coasts for what was rumored to be a resurgence of live music. Not so, according to Wilfred Schwartz, president of The Federated Group, six stores located in or near Los Angeles. Says Schwartz about disco's demise, "The reports of its death are greatly exaggerated." However, shifts in the market may be worth attention. As Ken Breitzke of Just Music says, "Disco in Chicago has definitely grown, but some clubs are thinking of going back to live bands. For example, an area with one

Research for this article was done by Dennis Broe.

live band and four discos now has three discos and two live bands." On the East Coast, Long Island continued to remain a hotbed for live music and Marvin Welkowitz of Quantum Audio says he did very well, thank you, in the sale of quality sound reinforcement systems to the Island's prosperous bands. "The bands here have to spend more money in order to compete. On Long Island and in Westchester County the pay scale is higher than in other areas of the country and so the bands can afford more exotic sound systems."

Disco has had an effect on the pro and semi-pro recording and the electronic musical instrument fields as well. Almost across the board the dealers reported that the spending pattern in all areas was that the customer



Retailers Reporting Change in Sales Figures in Past Year

was willing to spend more money for higher quality equipment. As Dan Haubrich of Arnold and Morgan in Garland, Texas said, "This year the customer is more refined and sophisticated and the less intelligent buyers are dropping off."

The bands that are doing home recording are competing against the more sophisticated disco studio productions where the use of electronic attachments is everywhere apparent, and so those bands know that they must have their acts together as far as equipment is concerned.

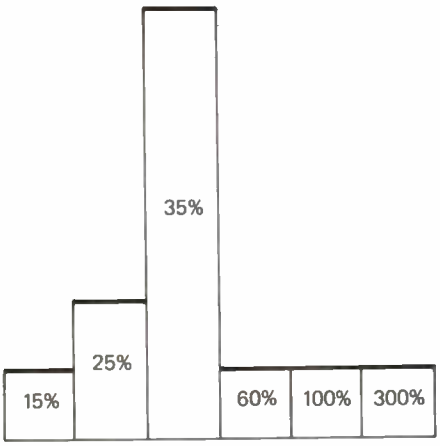
The other key word in 1978 was *recession* and this may become an even more important word in 1979. '78 was an expansion year with most dealers reporting that sales were up, one by as much as 300 percent and most by about 30 percent. Says Schwartz of The Federated Group, "The recession hasn't hit the sound industry yet. People are giving up other expenses, but they aren't giving up sound." Don Rosinsky of Dirty Don's P.A. Palace in Atlanta echoes this statement. "The customers are indifferent to what they read in the newspapers. Who cares about the forecasts for a recession as long as people are spending now and saying that it's going to happen to the next guy?"

The only effect in 1978 the forecasted recession has had is, in some cases, that of limiting product availability. Says Joe Hibbs of Parker music in Houston, "None of the manufacturers ship very quickly anymore. No one has large warehouses full of equipment sitting around these days because they don't know what will happen."

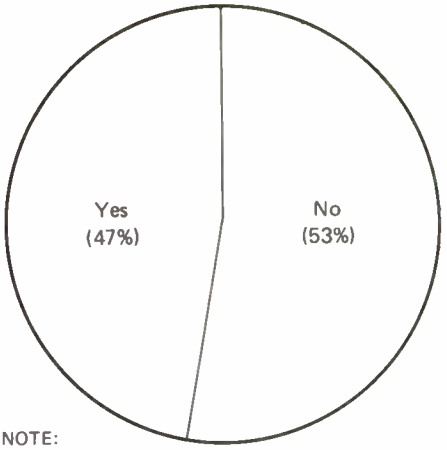
1978 ended with some dealers predicting that the recession will hit these industries in 1979. Said one, " '79 is going to be a very tough year." Yet, just as many dealers seemed oblivious to the forecast and over half of the dealers had plans for expanding by either moving to a new location with increased space or by increasing the area of their present location. However, only one dealer, Schwartz of The Federated Group, announced plans for opening a new store.

To turn a profit in 1978, at least in the sound reinforcement area, the bigger dealers swung more and more into sound installation, and in many cases they expanded their activities to cover sound setups outside of the music field.

While the value of advertising was a point of dissension, the status of co-op advertising was not. Most dealers agreed they could use more. Sound reinforcement suppliers received the most bad marks for lack of co-op ad money, but there was an across the board lack of same perceived by



Percent Of Increase Of Those Whose Sales Increased During Past Year



NOTE:
Particular items mentioned: transducers, compression drivers, transformers, speakers, equalizers.

Backordering Problems on Inventory?

retailers. A sample comment was, "Out of 30 companies I deal with, I get co-op ads out of only three. I do $100,000 worth of sales with a company and I can't get ten cents out of them for an ad."

Which brings up the entire question of dealer-manufacturer relations, which from what we've seen could be better. Factory technical people came in for almost unanimous good marks, the only complaint being that dealers don't see enough of them. Reps came in for almost unanimously bad marks, with most retailers making disparaging remarks, such as, "Reps are only order takers." One retailer, however, did say, "Reps are getting better and smarter all the time."

The value of sales training provided by the manufacturer can be seen as relative to the perception by the dealer of the representatives. Sample comments: "Sales training is only valuable when we go to the factory." "It's helpful when the factory people come in." "I would rather see the money put into co-op advertising." "My salesmen know more than the reps." "We educate the manufacturers." "Sales training is a need; there's been no more help this year than there was last year."

Basic complaints against manufacturers could also be seen in the dealers' perception of the availability of promotional aids from manufacturers. Dealers reported a decline in availability. "They leave it all up to us."

Back-ordering problems came in for the same basic distrust. While the retailers' perception of their own back-ordering problems ranged from "consistent" to "spotty," almost all of those interviewed placed the blame on the manufacturers' poor planning.

Cause of the blame ranged from incompetence ("They always make more of the dogs than the hot items") to misplaced frugality ("They aren't spending the money for scarce parts").

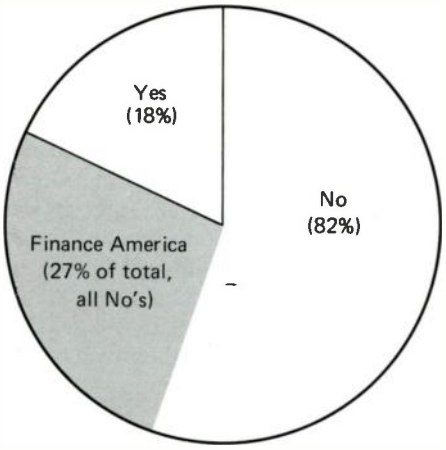
Within the retailer's own bailiwick, some changes were evident. Several operations mentioned the growth of church sales, with the retailer either just moving into that market, or expanding his involvement in it.

As far as sales techniques, more retailers seem to be using their own on-premises or near-premises recording studios for use in demonstration. ("They go into the studio, my technician takes them around, and bingo—that's really the only way to sell this equipment.")

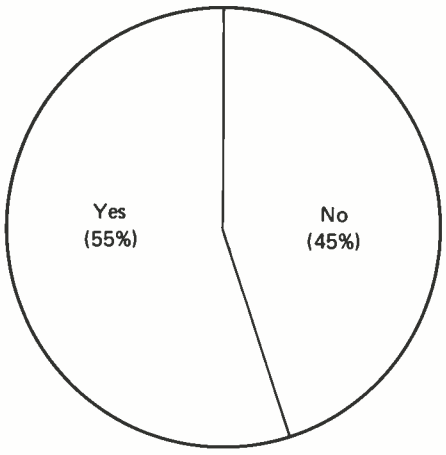
The customer is seen as increasingly knowledgeable, and this has led to some changes in the types of purchase. With the extra knowledge, general state of the economy, and some impetus from the growth of disco, all retailers reported some changes in consumer buying habits. Sample comments were, "We're selling higher priced guitars." "There are no more wall to wall amps. The musician is tired of lugging them around." "This industry has gone berserk. A year and a half ago we were selling 4-track, now we're selling 32 tracks." "Neumann mikes are going for $900; last year that would have been impossible."

There is also a general consensus that there are now more sales in signal processing equipment. Digital delays are surpassing sales of analog delays. Equalizers are in heavy demand. "Soon there will be more delay purchases than people to use them," said one interviewee.

Financing for customers, however, is still the problem it has always been in this business, although its relative



Does the Store Do Its Own Financing?



Expansion of Store Within Past Year, or Planned for this Year.

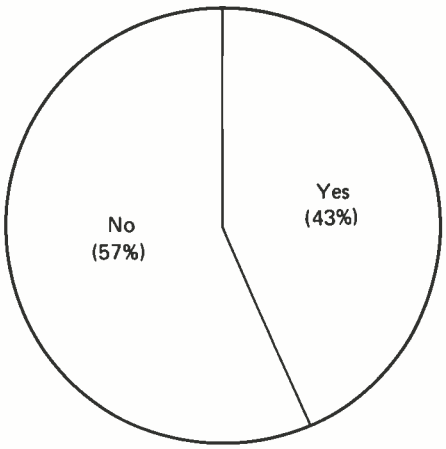
state ranged from "Finance companies have made more money available," to "Credit is harder to get," depending on the area contacted, apparently.

There is no doubt that Teac's FinanceAmerica arrangement has been a boon to retailers, with most retailers contacted mentioning it. As one retailer said, there is one drawback, in that the musician has to present his W-2 form—therefore giving evidence of being a professional musician. For other types of customers, and other types of equipment, financing is a problem. One dealer who provides his own financing has cut back from 18 months with 25 percent down to three months with 50 percent down. Others are providing a service in helping the customer fill out the application for outside lending agencies. ("They sometimes have more credit than they think.") Although, as another storeowner said, "I tell 70 percent of my customers they'll be turned down by the finance agency. Even with some of them who I think will get credit, the agency is asking for co-signers."

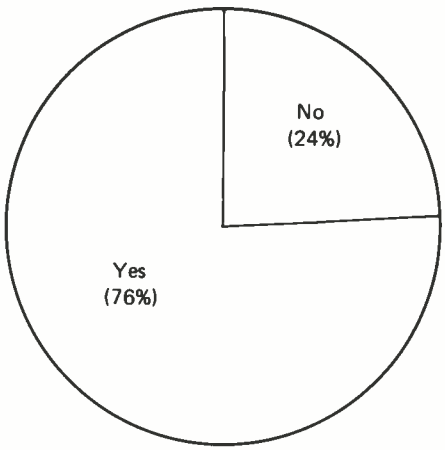
As non-statistical as are the perceptions of the retailers on the general state of the market, the ability to quantify seems decreased even more when the internal workings of a retail operation are discussed. Part of the problem is the varied equipment sold by readers of SOUND ARTS. In trying to quantify the amount of the average sale, we found no retailers who could do that easily, since a sale can range, as one retailer said, from a guitar pick to a $90,000 sound system. The same was true with the average time spent with a customer, which would range from a low of five minutes (guitar picks, presumably) to a high of 30 hours.

The basic lesson of our survey is that there is much more to do—and we will be doing much more. A generally optimistic tone is abroad in this market, within creative audio, sound reinforcement and electronic musical instruments. Disco has been the big surprise of the year and those dealers who responded to a need in the market are reaping the benefits. A careful watch of that market will continue those benefits (as several dealers reported, discos in urban areas are returning to live music on some nights, or offering live music in combination with recorded music.)

Customers are getting more sophisticated, spending more—but are also expecting more, with questions on reliability of equipment and availabil-



Do You Receive Co-Op Advertising Funds?



Do You Need Co-Op Advertising Funds?

ity of service becoming more common. Average sales are increasing in dollar amounts. Relationships among retailers, reps and factories can use some long hard concern on the part of all. But, generally, one year after the inception of SOUND ARTS there's a big happy smile abroad in the land.

Hot sound vs. hot air.

Lathes–Disk Cutting	Microphone Mixers	Microphones	Mixer/Consoles–Portable	Noise Reducers	Open Reel Recorders 1
Scully 31.1%	Shure 45.6%	Neumann 18.3%	Tascam 16.4%	dbx 48.8%	Ampex 27.8%
Neumann 29.1%	Ampex 11.4%	Shure 17.5%	Teac 9.6%	Dolby 47.8%	Scully 17.5%
Presto 18.6%	Tapco 4.5%	AKG 15.4%	Shure 8.9%	Burwen 6%	3M 7.4%
Westrex 4.7%	Custom 4.2%	Electro-Voice 14.6%	Custom 7.7%	Kepex 6%	MCI 6.8%
Fairchild 4.3%	Sony 3.6%	Sennheiser 8.7%	Ampex 5.0%	Other 2.2%	Teac 6.7%
Rek-O-Kut 4.0%	Teac 3.6%	Sony 7.9%	Sony 2.8%		Tascam 6.0%
Other 8.2%	Altec 2.4%	Beyer 5.1%	Tapco 2.8%		Other 27.8%
	Voice Mix 2.4%	RCA 4.0%	Interface 1.4%		
	Tascam 2.2%	Altec 1.1%	Yamaha 1.2%		1) Fewer than 16 tracks.
	Other 20.1%	Other 7.4%	Other 44.2%		

U.S. EQUIPMENT BRAND USAGE SURVEY

It's the sound!

Open Reel Recorders 2	Phono Cartridges	Speakers–Monitor	Synthesizers	Turntables	Video Tape Recorders
MCI 36.4%	Shure 49%	JBL 34.4%	ARP 43.4%	Technics 27.2%	Sony 56.9%
Ampex 26.5%	Stanton 26.8%	Altec 20.5%	Moog 25.3%	Thorens 12.6%	JVC 11.2%
3M 15.7%	Ortofon 3.1%	Auratone 10.7%	Oberheim 3.1%	Dual 6.8%	Ampex 9.9%
Scully 9.1%	Audio-Technica 2.9%	Electro-Voice 7.8%	EML 2.7%	Philips 5.2%	Panasonic 9.9%
Studer 6%	Pickering 2.7%	KLH 2.4%	Korg 2.5%	QRK 4.9%	JVC 4.0%
Stephens 3.8%	AKG 1.7%	Westlake Audio 1.8%	Syn-Aire 2.3%	Garrard 4.7%	RCA 2.9%
Other 2.5%	Empire 1.6%	Advent 1.3%	Yamaha 2%	Rek-O-Kut 4.3%	Other 5.2%
	Micro Acoustics 1.4%	Big Red Mastering Labs 1.3%	Cat 1.5%	Sony 4.1%	
2) 16 or more tracks.	Other 10.8%	Klipsch 1%	Roland 1.5%	Pioneer 3.1%	
		Other 18.8%	Other 15.7%	Other 27.1%	

Billboard 1978-1979 International Recording Equipment & Studio Directory

Recording studios choose a synthesizer because it has the best sound, not the lowest price. And in *Billboard's International Recording Equipment and Studio Directory 1978-79*, their choice is clear. If you want great sound, the choice is ARP.

ARP

45 Hartwell Avenue
Lexington, Massachusetts 02173

CIRCLE 96 ON READER SERVICE CARD

ONE YEAR LATER...

The State of the Market:

Cameo Discusses Creative Audio

For our first anniversary issue, it seemed fitting to present in print the CES-CAMEO Seminar on Creative Audio which took place at the January Consumer Electronics Show. It's fitting becaue last year, at SOUND ARTS' birth, there was not yet a Cameo, nor a CES seminar on creative audio, although there have since been two such seminars. The event itself seemed, then, indicative of the way the status of the industry has grown.

The logistics of getting a January event into the February issue of a magazine such as SOUND ARTS had much to do with air couriers and the extreme togetherness of the CES Press Office—to whom we are grateful.

Participants in the January CES-Cameo seminar were David Schulman, Executive Director of Cameo; Ken Sacks, formerly with TEAC; Ron Wilkerson, MXR; Joe Bauer, Swallen's (the Ohio retail chain); and Walt Stinson of Listen Up in Colorado.

—Editor

Schulman: Cameo was formed to focus on a market which has been known by many labels in the past, one of them *semi-pro*. We think *semi-pro* has now been redefined as *creative audio*, because customers interested in this equipment consider themselves not *semi* anything. They are what they are. The specific industry segment that Cameo is interested in is that segment where the music industry on the one hand and the electronics industry on the other hand seem to come together to focus on the recorder or the sound reinforcement person.

Without any further ado, I'd like to call on Ken Sacks to give you some of his perspectives of what he sees in this market.

Sacks: Thank you, David.

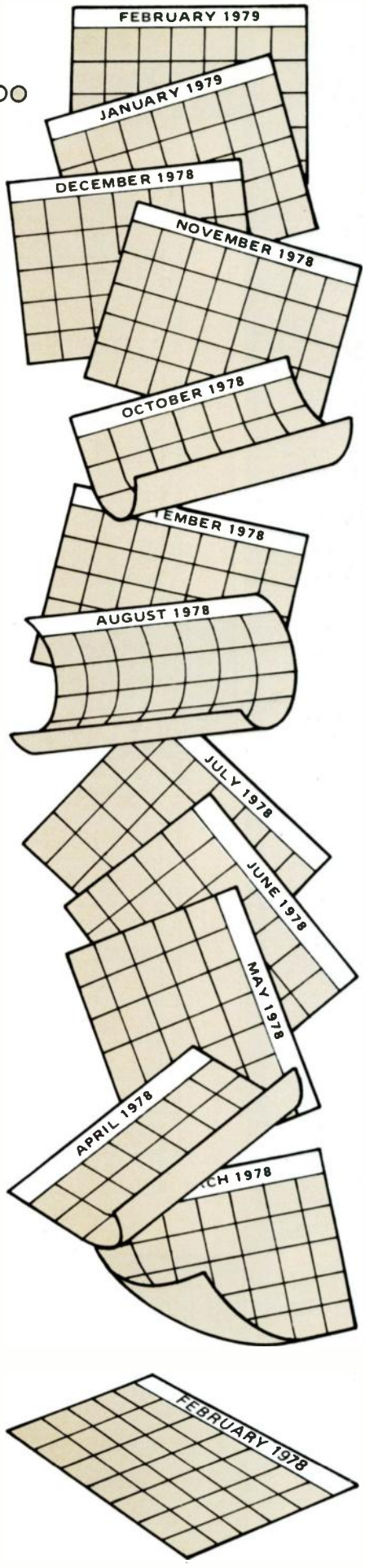
I think if we can start to define the parameters of pro audio, the kinship to audio can be drawn from that. An incentive for dealers is profit, because that's what we're all here for—very selfishly so—and profitability can only be realized in a marketplace for so long; then it has to change, shift, or be added to. I'll call that diversification. The incentive then, in profit, comes in two forms. With pro audio equipment, sales and service are equally important. As a matter of fact, technical expertise is a demand. That means that there is time invested and there's also a great deal of personnel to consider. The sales then, and, in fact more importantly, the service are both profit centers.

Schulman: Walt, can we hear some of your perceptions?

Stinson: I'm with Listen Up in Denver, and we have two home audio stores. Just recently, we began construction on a pro audio facility. I think it would be helpful if I trace the steps that we went through in getting into this field and eventually reaching the decision to open up a separate pro shop altogether.

First, I would like to say that I agree with Ken, the market is very large and there is a lot of potential there. Initially, we got into it by doing live recording in the Denver area, and we started using a mobile recording truck. We didn't have any pro-audio in our shop at all. this was about five years ago. Then we began to do institutional work. We began bringing in some lines, but still we didn't have anything on display in the store. We were selling to broadcast studios and PA companies. Then we began doing some disco and PA installations. We did about 50 large disco and PA installations.

By this time, our sales volume was worked up to the point where we were already stocking some lines, some pro lines. I'm sure most of you are stocking some lines that are in the gray area: they can be sold as either pro or home. We were in the same situation; we began displaying some of those products in more of a pro environment. We started a pro room in the shop that was specifically devoted to pro audio



equipment. And we began talking more to non-institutional users—people into creative recording, musicians, walk-in trade ... the kind of walk-in trade that most audio stores get.

We had to shift our advertising around a little bit and orient some of it to professional users, musicians specifically. When we started doing that, we started getting some traffic that was not hi-fi traffic.

The market continued to grow for us very strongly over this four or five year period to the point where we felt we had to separate out the sales staff. Prior to this point, we had the same salesmen selling home and pro audio equipment. I feel very strongly that once this sales volume grows, and once the businessman recognizes the profit potential and has the capital to invest in the creative audio market, he should try to develop some specialized salesmen, because it makes the equipment much easier to sell. It's a different sort of equipment, a bit more complicated in nature, and it takes a well informed salesman to sell it.

Most audio stores and most music stores are ill equipped to cope with this market that is developing. This market is coming together half way between the music dealer and the sophisticated hi-fi dealer. I personally believe that the hi-fi dealer is in a better position to take advantage of this developing market than the music dealer is for a couple of reasons. For one thing, it's a more sophisticated market. We have more overlap in our product lines than the music dealer. More importantly, the products themsleves are more sophisticated and require a higher level of service and a higher level of product knowledge than most music dealers are capable of providing. So that gives the advanced and sophisticated audio retailer an opportunity. If you recognize this market, and if you go after it, you can develop it simply because you're used to dealing with more complex problems, you're used to servicing mroe complex products, and those are very strong selling points that are very much in the minds of the people who are buying this equipment. We found that the profitability on this line of equipment is less than what we had come to expect on home audio, but that's somewhat compensated by the fact that the productivity per man is higher. We get a higher sales volume out of our salesmen in the pro division than we do in the home division; and although the margins are about six to seven percent lower than what we are used to getting in our home division, it's not unusual for a salesman to have a $60,000 to $80,00 month, which is about double what you'd expect out of a really top flight home hi-fi salesman.

Schulman: Joe, what has your experience been in terms of identifying the customers and then reaching them?

Bauer: Well, we have a different setup. We have such a large flow of traffic in the store and we are so diversified that we're exposing products to a lot of people—walk-in trade. A lot of our traffic is also due to word of mouth. We have made contacts in the field as well—through some seminars and that type of thing where we've invited people from various media such as advertising agencies and broadcast people, as well as churches and schools.

Schulman: Ron, do you have anything to add from your perspective?

Wilkerson: I think the biggest problem that a lot of the hi-fi retailers seem to have is in identifying the market and identifying the guy who's coming into the store to buy some of the products. He may be vastly different. He may be the kind of guy who is used to coming into the music store and buying products. But in this particular instance, he's looking for products manufactured by manufacturers that you are currently dealing with. If you are buying cassette decks, generally, that manufacturer may be offering multitracks and recorders as well. Musical instrument retailers, however, are dealing with different kinds of manufacturers who may not even be involved in anything nearly at that level of sophistication. So certainly, just from the basic contacts you have as a hi-fi retailer, you have many more opportunities than the music retailer to take advantage of this market place.

Sacks: This market, as well as the hi-fi market, has many segments to it. There is an institutional market, there is a commercial market, there is an industrial market and, in fact, there is a professional consumer market which is the largest or the most vast. The other market segments that we're talking about can even stretch to audio-visual.

Question: Are manufacturers concentrating more on hi-fi stores instead of musical instrument dealers because that business is more profitable?

Sacks: This market has become extremely lucrative for the very reason that you've just named, that is the profitability of the dealer in general, no matter what product or service he sells. I don't think it's such a great emphasis on the manufacturer's part to put it in any one form of distribution, as long as he gains his distribution credibly and profitably for the dealers that are carrying the line.

Wherever you have a market which is receptive prior to the dealers' awareness, there is going to be a large build-up of that market and a deprivation. I think that when the dealers catch up, they have an explosive situation on their hands of few dealers with dramatic amounts of customers. Customers are then going to cross state lines to find somebody who is a specialist.

Wilkerson: Probably a most important aspect is the service you are giving the consumer. MXR is a company that started out in the music business and that crossed over into this more or less gray area of pro-sound or semi-professional sound. We also of course are in the audio business as well, strictly hi-fi. We see, coming from a musical background, that the audience buying this kind if equipment for semi-professional or professional sound recording is very influenced—not necessarily by price—but by the kind of treatment they get from a retailer. A retailer who has worked with them over a considerable period, a retailer who provides a certain amount of education and who they go to as an authority. They ask, "How do I integrate this piece of equipment into my setup? How can I better this kind of setup? I have this problem." The retailer who takes the time to sit with the individual or actually go out into the field with him is a retailer who is going to become really successful.

In answer to the question of whether the manufacturer is trying to put these lines in one area or another: Speaking for my company, we're hoping for it to seek its own level. We aren't really pushing it one way or another. As I've said earlier, music dealers are suited for certain aspects of it, but they aren't too use to carrying multi-track recorders. They feel very strange about that. We aren't trying to put it in one any specific area of hi-fi or music, but we are hoping for each of the industries to make the effort. The dealers who do that are going to be most successful.

Schulman: I wonder if any of you care to venture your own perceptions as to how you see this particular segment of the market in 1979?

Stinson: Well, if any of you have

studied business, you already know that there's a classical growth curve that looks like an S. Well, we're still right at the start of it. So, I am very optimistic about the pro audio business. I don't think it's going to be affected a great deal by economic fluctuations, because I feel that it's an untapped giant sitting there. This business dovetails very nicely with home audio in the sense that it isn't subject to the same business cycle. It has its own business cycle. Therefore, when your home audio business is down, that doesn't necessarily mean that your pro audio business is going to be down. Could be, very likely, that your pro audio business might be up and that the business cycles might be out of phase, which ties in with what Ken said about diversification. It's smart to diversify, it helps make a business more stable and I think in '79 we're going to see a very strong market for pro audio equipment.

Bauer: I think that the projection for '79 is only limited by the amount of time and effort each one of us puts in it. It's not limited by the economy so much.

Wilkerson: I don't think there's any question that the market will grow in this next year. It's due to the large number of musicians, obviously, who are going to be involved in the purchase of semi-pro, home recording kinds of equipment. As we see in the music business, musicians don't very closely follow economic indicators. They want the equipment and they buy it. Certainly, with the increase in the amount of home recording equipment, the improvement in the existing equipment, the larger offering of different types of mixers, outboard signal processors, power amplifiers, recorders, the musician is more stimulated than he ever has been, the market is more stimulated and I think regardless of what happens in the economy in this next year the market will continue to grow.

Sacks: I expect to see a dramatic growth because of greater dealer commitment. Where there was a lack of awareness before, there is now greater awareness.

Question: What vehicle in advertising or promotion has been most successful in creating a greater awareness in a given market?

Sacks: There have been direct mail campaigns. Additionally, there have been adjacent promotions because of the type of customer we're dealing with. Tour-guide-type promotions, studio installations, as an example. One dealer could and has taken invitees to various third-party installations for credibility, saying "Here's what we've done and here are the people who say that are profitable because of us." So I think it really runs the gamut.

Wilkerson: This is a creative market and you are dealing with creative people; you have to approach it creatively with perhaps unorthodox methods of advertising or publicizing your products. You're not going to get the guy into the store by giving away a refrigerator.

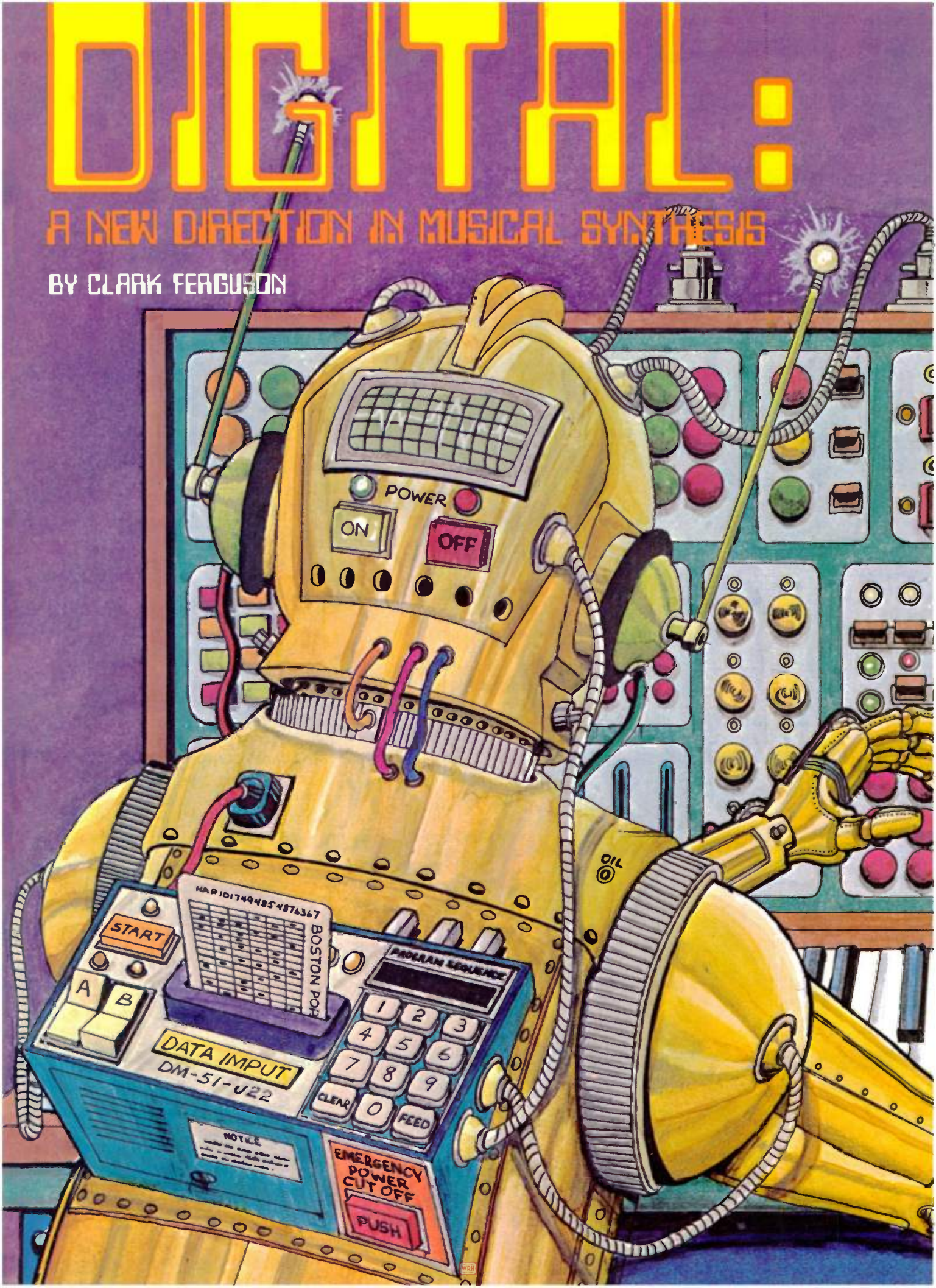
Bauer: Basically, there's no limitation. We have done some things on a local basis to make ourselves more visible. We've done a sound-fair-type presentation under a tent which was very successful. You can't just go out and say, well, I'm interested in a man age 18-34 as you can in hi-fi.

Schulman: I'd like to thank each one of our panelists for giving us some real insight and for some very valuable information. With that, it's a good time to go into 1979, and thank you all for your attention.

DIGITAL:

A NEW DIRECTION IN MUSICAL SYNTHESIS

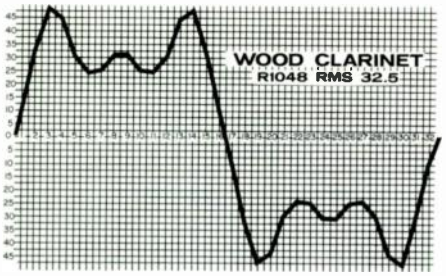
BY CLARK FERGUSON



Most people involved in the sound arts are already aware of some of the impact the age of digital technology has had upon the creative audio and music world. Trade periodicals carry advertisements and reports on digital time delay devices, reverb systems employing digital signal processing, and now, the most recent advancement, digital recording. Few would question the improvement of these new digital devices over their analog predecessors. But what does "digital" mean (particularly versus "analog")? What are the advantages to the dealer and consumer?

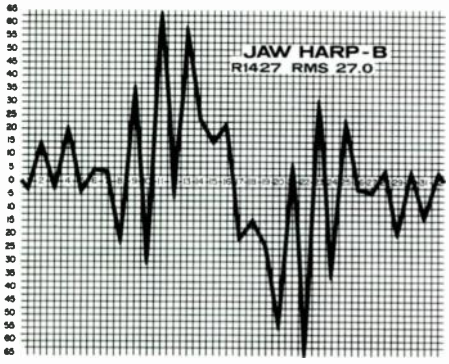
The term "digital" by itself, means numbers. Using numbers provides a means of communicating with the physical world. Once communication has been established, categorizing and controlling can result. It is human nature to categorize; the language is full of examples: hot, cold, short, tall, fast, slow, etc. These labels are abstracts that do not exist in the real physical world. A problem exists in being specific: "How hot?" or "How tall?" Several people might disagree as to what constitutes "hot" water. However, water at 93 degrees centigrade is specific. Water temperature has been divided into units of degrees centigrade, and the number "93" has been applied for the purpose of communication. In addition to being specific, another problem arises—accuracy. Some job applications require greater accuracy than others, and the degree of accuracy required may still be a matter of opinion. If in reality the temperature is 93.13256478, do we carry it out to 93.13256, 93.13, or just leave it at 93? These are some of the problems faced when attempting to apply abstract numbers to parameters in the real world. The connection with digital musical synthesis is about to surface.

What terminology comes to your mind when you contemplate the word "synthesizer"? People familiar with these electric keyboards would probably mention voltage-controlled oscillators, voltage-controlled filters, and their associated hardware. Instead of a dissertation on these devices, it shall be assumed that the reader has some degree of understanding of their operation. Almost everybody would agree that the secret of these devices lies in their control. "Control" is the key word. Accuracy and predictability of control is the key problem. How many times have you



witnessed a customer in a music store walk up to a synthesizer, juggle the slidepots, presumably with the intention of creating a jaw harp, but end up with a kazoo? This example is not cited a a joke, or a slam at customers or specific synthesizers, but rather as an attempt to illustrate an industry problem. Synthesizer companies have made attempts to solve this problem which have met with varying degrees of success. Probably the most classic and successful solution has been the "overlay" patch diagram. A card with holes corresponding to the slidepots and/or knobs is placed over the front panel. Desired settings or positions of critical controls are printed on the card. The musician matches the controls to the markings and frequently the intended results are achieved. Unfortunately, in the reality of the retail situation, these helpful physical aids are often forgotten, misplaced, or ignored by customers and/or salespeople. Presets are another solution to control, but they impose obvious limitations as an exclusive means of control.

At this point, the physical controls themselves should be examined. Herein lies the understanding of analog versus digital. A slidepot, for example, can be placed in one of two states—completely at one end of its travel or completely at the other. However, it is probably most frequently employed in one of the positions in between. One of the characteristics inherent in variable controls is that there are an infinite number of possible positions in between. Such controls excel at sliding and gradual change effects, but have difficulty in returning rapidly to specific effects. This is the nature of analog devices—they are infinitely variable and ideal for certain applications.



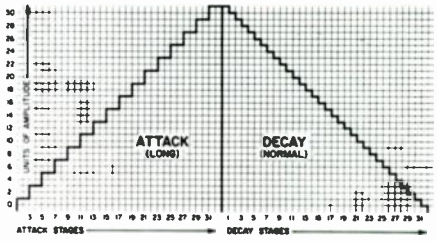
For comparison, another commo linear device is the ruler. For convenience of communication, this device has been "digitized" into units (inches or centimeters). Theoretically, there are an infinite number of possible positions on the ruler (even if it were the same length as the slidepot). The difference lies in the ability to communicate the positions and thereby categorize and control them. Again, in the real world there will be an infinite number of positions possible on the ruler. The job application will have to dictate the extent of accuracy or resolution required (2 inches or 2.00001325, etc. inches).

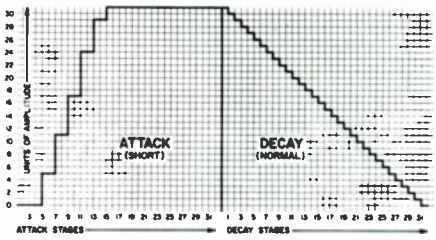
For proper perspective of the complete picture, a wide-angle view of synthesis in in order. What is it that the controls control? Or, what is it that a synthesizer is supposed to do? This subject could be open for debate, but for purposes here it shall be limited to the creation or generation of sounds. Additionally, and at the risk of incurring the wrath of Stockhausen buffs, options beyond diatonic keyboard-oriented music shall be filtered out for the purpose of relating to the commercial market.

To begin simply, any given sound that can be created has its own distinctive waveshape. If the synthesist is to control the sound, it would follow that some form of control (the magic word again) must be exercised over the waveshape. Acoustic instruments gain their control by means of varying materials of construction, and the shape and size of those materials. Everyone is familiar with the results: pianos, guitars, drums, bells, violins, oboes, flutes, pipe organs, etc. At this point in history, the techniques of both construction and performance have become highly refined.

In the early sixties, a highly creative inventor devised a system of electronic music synthesis what was to become so popular that his name is commonly misused as a generic term. Musicians were looking for new sounds, and some were looking for new ways to make old sounds. The timing was right and the analog technology of the time was expanding from discrete components to operational amplifier devices. Other synthesizer companies appeared. Competition brought out refinement in construction and performance. The recording industry made everyone familiar with the results. This was voltage-controlled analog synthesis.

In the early seventies, with the advent of the digital explosion of computers, calculators, digital clocks and watches, and video games, another highly creative inventor pioneered a system of electronic music synthesis. The timing has been right and digital technology is in the middle of expanding at a staggering rate. Not only have discrete components been grouped into common packages, but entire systems such as a calculator have been placed on a flat wafer the size of a pencil eraser. What this has meant to the industry has been the ability to gain increased accuracy and high function density in a small, reliable, and economical package. In articles, theoreticians have predicted and proclaimed digital synthesis as the ultimate musical instrument system of the future. As is usually the case in the history of the development of systems, it is not the lack of concepts that holds back the advancement, but the lack of hardware. The digital hardware arrived in the late sixties.





Awareness of the results of digital synthesis is not yet as widespread as the result of the analog. The sounds are new and the record industry has yet to become saturated with them. Doubtless, others will join the digital race. Consumers and retailers should

Clark Ferguson is Marketing Director of Rocky Mount Instruments.

make mental preparation so as to become leaders and not followers. A little understanding of the workings of the system should indicate some inherent merits.

As touched on briefly earlier, to control the sound is to control the waveshape. The method of control or hardware employed in the process is unimportant as long as the end results are desirable. Digital synthesis employs methods and hardware totally foreign to analog synthesis. For example, analog synthesis utilizes voltage-controlled oscillators and filters to generate, shape and control the waveforms while digital systems employ neither of these devices. A digital system such as found in the RMI KC-II breaks the desired waveform down into byte-size chunks (computer people, pardon the pun) for purposes of control. Those already familiar with the hardware of analog systems may at first be uncomfortable with a digital system. Upon further knowledge, however, this feeling usually dissolves. A detailed analysis follows.

DIGITAL WAVEFORM GENERATION

One of the basic differences between analog and digital systems in synthesizer applications is that of initial waveshape generation. Analog systems generally employ oscillators to create waveforms inherently rich in harmonics. The assumption is that once all the harmonics are present, one merely removes the unwanted ones, and those remaining will have the desired sound. The usual hardware for such removal is the voltage-controlled low-pass filter. A low-pass filter inclusively removes those harmonics below a certain point. The point is moveable to obtain varying harmonic contents. What should be noted is that the harmonics are removed inclusively rather than selectively. As a result, a wide variety of certain types of sounds are available, but by no means are all possible waveshapes obtainable by this method. Other methods less commonly applied are pulse-width modulation, frequency modulation, and ring modulation. Since these methods employ two pieces of infinitely-variable hardware being multiplied, the resulting possibilities are infinitely-variable squared. Although a wide and interesting variety of waveforms can result, the ability to accurately and rapidly control the results with any degree of predictability is severely limited. Sweeping effects that start at some abstract point, tear through an infinite number of timbres, and end up at some other abstract point are more common.

Digital systems, on the other hand, are not infinitely-variable, but rather have a finite number of possible variables. That finite number, of course, may be staggeringly high, so high as to appear infinite. The secret to digital systems lies in the language—binary. Binary is a two-state system of counting. One of the main benefits of this two-state system is that it fits the available hardware with greater ease and accuracy than does the analog. Electronic circuits are easier to handle in the "on" or "off" state rather than the infinitely-variable because critical calibrations and their associated trimpots can generally be eliminated. Components do not require elaborate and expensive temperature compensation to maintain linear results. Numbers are more easily stored and processed, which is the name of the game in computers. Chart 1 is an example of how four simple binary (on/off) circuits can be coded to count up to the number fifteen, starting at zero.

	eight's	four's	two's	one's
0.	—	—	—	—
1.	—	—	—	X
2.	—	—	X	—
3.	—	—	X	X
4.	—	X	—	—
5.	—	X	—	X
6.	—	X	X	—
7.	—	X	X	X
8.	X	—	—	—
9.	X	—	—	X
10.	X	—	X	—
11.	X	—	X	X
12.	X	X	—	—
13.	X	X	—	X
14.	X	X	X	—
15.	X	X	X	X

Chart 1

By specifying the addition of combinations of one, two, four, and eight, numbers up through fifteen can be reached. Adding more columns of values to be added allows higher numbers to be reached. The numbers can go as high as the finances allow and infinite resolution is theoretically attainable. However, in reality, not all situations require infinite resolution. For example, when dealing in the audio spectrum, one needs to remember that the end result is being heard by human beings. Certain numbers involving frequency response, for example, will never need to be attained. As a result, the system can be given a finite amount of resolution for the purpose of easier and more accurate control. Now that a language has been established to handle numbers, these numbers can be used to describe waveshapes.

A digital system starts right out to generate the final desired waveshape, rather than starting with a "mother tone" and a chain of modifiers. Waveforms are plotted on an amplitude-versus-time graph. Points of intersection on this grid are assigned binary code numbers representing the waveform. A simple timbre would be that of a wood clarinet. The jaw harp, for instance, is much more complex harmonically. Even these most complex waveshapes can be "frozen" for accurate reconstruction at a later date. By reading out the entire group of numbers and translating them into relative voltages at a rate of 440 times per second, for example, a tone of middle "A" can be generated. This tone will exhibit all timbre quality inherent in the waveshape. Timbre can remain stable regardless of frequency (pitch). KC-II stores up to 38 individual waveshapes in a permanent memory for use independently or mixed in groups. So that even these sounds can never become obsolete, additional waveshapes can be programmed (up to four at a time) via a photo-electric card reader.

DIGITAL ENVELOPE GENERATION

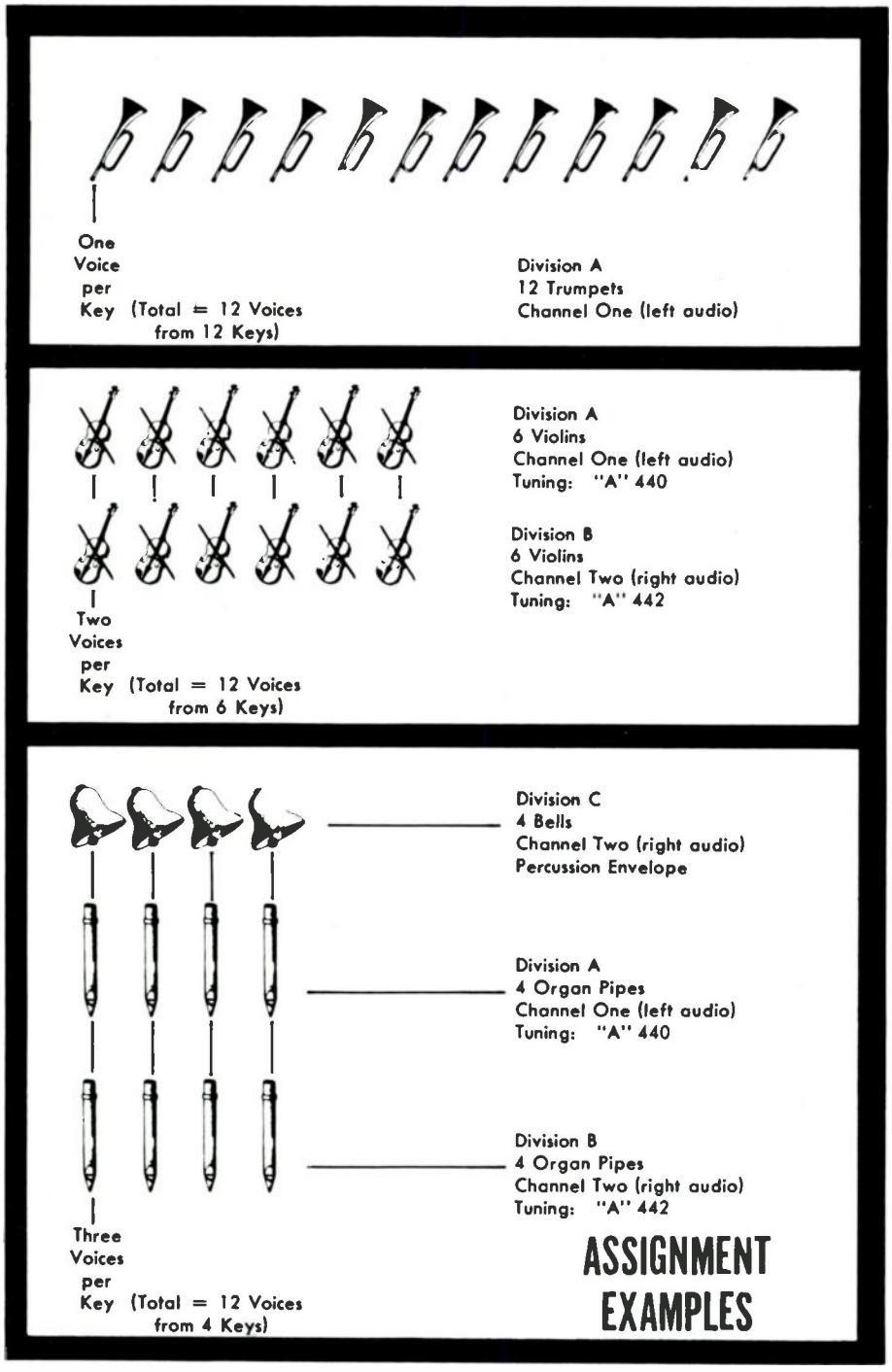
For a musical note to be complete, it must have a beginning and an ending. The envelope generation system handles the attack and decay of each note.

As attack and decay stages are "clocked," amplitude values rise and fall in precise sequence, creating envelope curves. Several independent curves including an abrupt gating can be selected in combinations. Envelope

timing can occur from two sources: variable rate pedal, or key frequency (scaled attack/decay: high notes speak quickly, low notes speak slowly —twelve independent rates possible simultaneously). Clocking sources can switch automatically while crossing from attack to decay ramps or upon key release. Also, clocking can be stopped on specific voices to create "drones" while other voices are free to play. Envelopes can be mixed to obtain more complex curves or even envelope timbral changes. Those familiar with the traditional A.D.S.R. devices will find the digital system of envelope generation offers total independent polyphony and expanded creative possibilities.

NATURAL NOISES IN ACOUSTIC INSTRUMENTS

A degree of serendipity is involved in digital musical synthesis. A close look at the waveform and envelope graphs will show the lines to be created in little steps (in reality the steps are much smaller than is convenient to show on paper), rather than smooth lines. To the musical ear, these little steps add certain subtle noises to the notes played. Although these steps are inherent in the digital process, it so happens that very similar subtle noises are found in almost all acoustic instruments, the squeak of round-wrapped guitar strings, the "chiff" of flutes and organ pipes, valve noises, air noises, even the noises of a well-rosined bow on a close-miked cello. Musicians have become accustomed to hearing these noises integrated with the sounds of acoustic instruments. Remove these noises and the resulting sound will be unnatural—too perfect or sterile. Better synthesists who play analog sytems have long realized that the oscillator produces a perfectly smooth waveform, devoid of inherent noises. When creating orchestral sounds such as flutes, these musicians invariably crank in noise generators to gain the necessary realism.



POLYPHONIC VOICE ASSIGNMENT

In a digital system it is not necessary to have voices hard-wired to each key. For example, KC-II's twelve voice system can be switched into several modes of keying. Contrasting timbres, envelopes, and pitch modulation can be set up among three divisions (A, B, & C). The twelve voices can all be assigned to division "A", split six and six between "A" and "B" or "A" and "C", or split four, four, and four among "A", "B", and "C". In this manner, multiple voices can sound from a single key such as alto recorder and harpsichord, or bells and organ. Finally, even a four note chord can result in twelve voices—a rich and fat sound. Those familiar with analog synthesis to date will find the sounds of digital synthesis quite a sonic departure.

When companies first began marketing analog synthesizers, many musicians and retailers put up resistance, mostly due to lack of familiarity. Electronic organ manufacturers experienced similar hesitation when introducing their wares to those familiar with pipes. Now, the job is in your lap—digital synthesis has arrived and its merits have been discovered. Creative retailers will see the opportunity to inform their regular customers. Innovative musicians will seize the opportunity to explore new techniques and effects. The technology of the future is here now, and the hardware works. Check it out.

Take Your Pick

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

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

For further information write or call:

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

CIRCLE 91 ON READER SERVICE CARD

TARGETING THE RETAIL AD CAMPAIGN

By Henry Collins

Every retailer in the creative audio market knows that advertising is vital in reaching and informing potential customers and repeat buyers. On the other hand, designing an advertising and marketing program tailored to meet the individual needs of the retailer can become quite involved.

In approaching the problem of advertising to the professional and creative audio markets, we must first make a very clear distinction of the target audience. Although there are some occasions where there are overlaps in sales between hi-fi and creative audio buyers, these are random and too few to denote any trends. Any cross market sales between the hi-fi and creative audio markets are due primarily to changes in the marketing philosophy of a few hi-fi manufacturers. Therefore, we should avoid the mistake of assuming that advertising campaigns that have proven successful in the hi-fi market can be adopted and used as a catch for creative audio buyers.

A hi-fi product is generally viewed as a mass appeal item. This helps to explain why mass media advertising is commonly used in hi-fi ad campaigns.

On the other hand, the same individual who might drop $400 on a direct-drive turntable couldn't care less about a $200 guitar amplifier. Remember, in hi-fi we're talking to people who are interested in recreating music. The creative audio market is primarily interested in creating its own. This is not to say that the creative audio market doesn't buy hi-fi. What we are saying is that the creative audio market speaks its own language and has likes and dislikes apart from that of hi-fi buffs. And as a result, different advertising techniques must be used.

Henry Collins is a New York based advertising copywriter. This article was written with the help of Marvin Welkowitz, President of Quantum Audio, the New York professional sound retail outlet.

ESTABLISHING AN ADVERTISING BUDGET

It is important that some dollar amount be arrived at before embarking on any type of advertising endeavor. The reason for this is simple. In order for advertising to be effective it must be consistent. Advertising has to be viewed as an ongoing expense and not a one-shot effort. It may be far more beneficial to buy a quarter-page ad and run it eight times than to sink your money into one two-page spread. This is one of the reasons it is important to project your spending over a period of months.

One cannot use an arbitrary monthly dollar figure as an advertising budget. First of all, you don't know what that amount will buy you. To help arrive at a realistic figure, you must first research the media at your disposal. Let's say, for instance, that there's a weekly entertainment magazine in your area which features editorial on live music. Let's suppose that with a minimum frequency of five insertions, a quarter-page black and white ad costs $300. We're now talking about spending $1,500 in media alone over a period of about two months. On the other hand, your local jazz hot spot features a monthly playbill where a full page ad costs only $300. So now the same $1,500 that bought you a back seat in five issues of the entertainment weekly can buy you a box seat in a jazz playbill for five months.

There's no standing rule or formula for determining how much you should spend on advertising. An individual just opening a store will initially spend more money on advertising than someone who has been in business for several years. The thing to do is to first research your media alternatives and then establish an advertising budget, say for a period of about four months. This will allow you enough time to monitor your results and to make some determination on the effectiveness of the advertising medium you've selected.

SELECTING THE RIGHT MEDIA

The professional and creative audio market is made up of an upwardly mobile group of buyers, many of whom are involved in music professionally, either full-time or part-time. You can't guarantee finding them sitting in front of a TV or listening to a radio. As professional musicians, a good many of them are gigging at night. This means that for many of them, prime time is time to sleep. So if you want to reach the creative audio buyer, you have to catch him in his natural element.

Print is an effective medium in reaching the professional and creative audio market, especially publications which appeal to their musical interests. Many of these publications have national circulation and a cpm (cost per thousand) which may be out of reach for most retailers. Though many of these publications offer a large percentage of creative audio buyers on a national level, it may not be cost effective for a retailer to advertise in them to reach a local market.

Playbills and concert programs are another effective print medium to consider. To get the most out of this form of advertising, the ads should be coordinated so that they appear during those performances of acts which have

the greatest appeal among your target audience. This obviously implies that you have done your homework beforehand. It would seem that any selection of media is dependent upon how well and how much the retailer knows about his market. So before any real effort is made to select or buy media, the retailer should thoroughly research his market and come up with a consumer profile. Once this is done, he can then compare this information with the reader and/or listener demographics of the advertising medium in question.

Radio and TV can also be used effectively in seeking new business. However, radio and TV are far more difficult to monitor than print. Program selection is also far more complex. Commercials would have to run at very strategic hours, hopefully during programming that has a high appeal to your potential customers, so as to create a "selling environment." These programs might take the form of jazz or rock concerts, talk shows featuring guest artists, or movie specials. Remember too that TV and radio deliver far more viewers and listeners at any given time than print could; expect to pay a higher cpm. Also don't forget production costs. Filming a TV commercial or taping a radio spot can be rather expensive. Even the cost of producing a 15 second spot can sometimes get out of hand.

Apart from selecting the right advertising medium, presentation is also of great importance. Sometimes it's better to spend on graphics than to go for size in a print ad. An attractive quarter-page ad with photography can be far more effective than a full-page all-type ad. Never compromise on production costs. It's always better to give the publication final art, camera-ready and ready to run. If you are going to feature product photography in the ad, make sure the photograph is pre-screened (a velox) and then pasted down in position on the ad. This eliminates any room for error. Screen sizes and mechanical requirements for your ad can be easily obtained from the publication's rate card. If you have any questions regarding your ad, don't hesitate to speak to someone in the production department of the publication in question.

CREATING AN EFFECTIVE AD

With a little time and research, there's absolutely no reason why you can't create a professional-looking retail ad. The amount of time that one can devote to such a project will vary from store to store. It is important however that enough time and attention be spent during the early planning stages. This will eliminate costly revisions later on during final production. All copy should be carefully proofread before it is sent to the typesetter. Never proofread your own copy. Typeset copy should also be proofed for errors, as typesetters do sometimes make mistakes.

If you are going to feature product photography, contact the promotion department of that manufacturer. Most manufacturers are very cooperative when it comes to promoting their products. You should have little trouble in securing glossy photos.

The design and layout of an attractive print ad is an art. An art that not many retailers possess. If you are creating an ad for the first time, it is worth your time and money to enlist the services of a freelance art director. Don't hesitate to discuss your copy concept with the art director, as they do sometimes have a way with words. Before securing any outside help, make sure you have collected all the material to be featured in the ad beforehand. This will prevent any costly delays.

In approaching the design and cost of a print ad, consider the following. A properly designed institutional ad can be used again and again with good results. Stay away from price wars, sales days or anything that would make the ad dated. Leave that for your point-of-purchase or in-store advertising. Points you want to stress in your ads are service, any expertise you or your staff might have in the field, and any well known product lines that you might carry. An effective ad should communicate and create credibility to potential customers. You can do this by informing and educating your customers. Talk about new product innovations, specs, anything that might arouse curiosity. Don't be afraid to make a coupon offering. It's one sure way to see if a particular ad is pulling.

When securing estimates for the production cost of an ad, always consider the frequency, or the number of times you intend to run the ad. For example, if the media cost is $300 per insertion, and the one time production expense (art director, typesetting, veloxes, etc.) is $200; if the ad runs five times, the production cost is actually $40 per insertion. So if you plan to run an ad a good many times, it would pay to invest in good production.

POINT-OF-PURCHASE ADVERTISING

No ad campaign is complete without in-store advertising. After all, the selling doesn't stop once the customer gets inside the store. This is the point at which you make your final impression on the customer. In-store advertising can consist of wall banners, window decals and product displays. The important thing to remember is that all in-store advertising should be well coordinated — everything should have its place. One item of great importance is a literature rack for spec sheets and product information. Sometimes you can avoid the necessity of displaying a particular product if literature on it is made readily available to the consumer. When it comes to displays, the ones that are the most effective are those that make use of cut-aways and see-through views to explain or demonstrate a particular product feature. It's also important that dealers make an extra effort to attend trade shows in order to keep abreast of new product developments and to establish a close working rapport with manufacturers and manufacturers' reps.

Another useful tool to consider as part of an in-store effort is a questionnaire. Many times a retailer might find himself in a situation where he has to ask and answer a barrage of questions before he can sell a particular piece of equipment. In a high volume, high traffic retail store, a salesman can't afford to spend a lot of time on each purchase. If customers were to fill out a brief questionnaire while waiting for a salesman, the salesman, upon receiving the questionnaire, could quickly address himself to the needs of the consumer with minimum time wasted on routine questions. The information gathered from the questionnaire can also be used for market survey studies or in creating a mailing list for a direct mail effort. The information obtained from the questionnaire can also be used to speed up the writing of sales tickets, *e.g.*, the customer name, address, etc. As an incentive to get customers to fill out the questionnaire, a retailer might want to inform customers that their names are being entered on a mailing list so that they can receive new product bulletins. Obviously, it would be to the retailer's advantage to do occasional mailings as

part of an ongoing advertising effort. Many times mailings of this type have been instrumental in attracting repeat buyers.

Contests and giveaways can also be incorporated as part of an in-store promotion effort. These types of promotions are used as traffic builders to attract a large number of impulse buyers. However, the time and energy that would go into the design and execution of a contest may prove to be too costly for some retailers. On the other hand, a simple giveaway promotion might be ideal for a grand-opening or to introduce a newly acquired product line. Giveaways can also be used as liquidators for moving old inventory. In this regard, tee-shirts and records can work well as sales incentives. Another advantage in a giveaway promotion is the fact that a retailer can design it around a particular product or product line he might want to move without any hard sell.

Wall posters can also be used as an effective selling tool in an in-store promotion. In particular are posters of popular musicians and bands who are noted for their use of a product brand or line that the retailer is currently pushing. Aside from the fact that these posters make good image builders, they can also brighten up an otherwise static decor.

PUBLIC RELATIONS

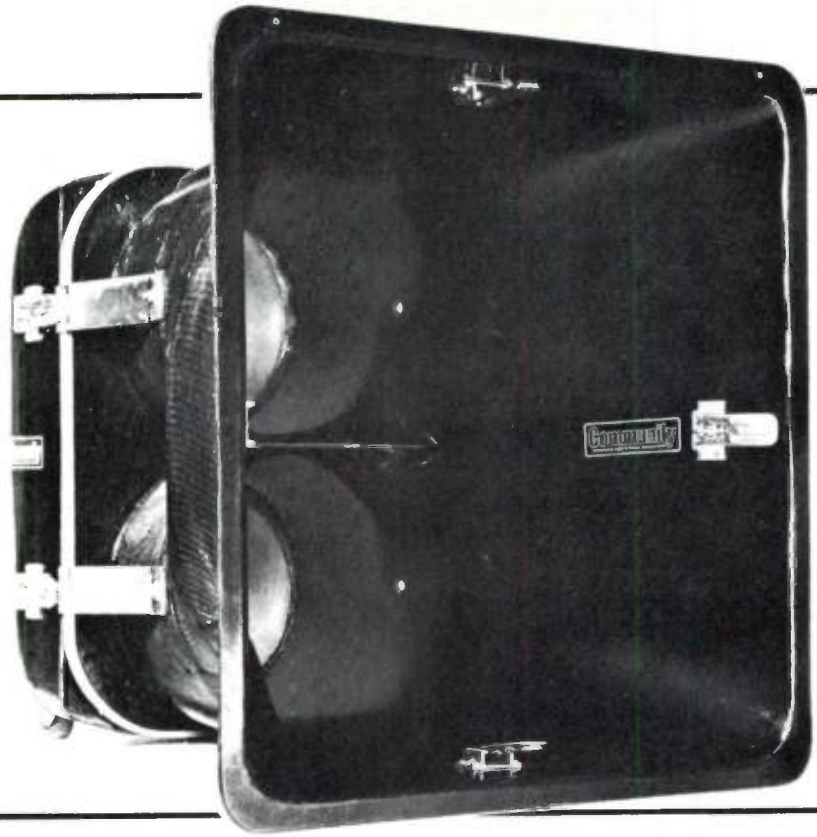
When it comes to reaching the creative and professional audio market, one promotional medium that can't be overlooked is word-of-mouth advertising. In this particular industry, word of mouth is looked upon as one of the most powerful and highly regarded forms of advertising that money can't buy. In this tightly knit market group, word of mouth can literally make or break a product overnight. Personal endorsements from well-known artists and musicians of a particular product have been instrumental in the overnight success of an otherwise unknown brand name in this industry.

In order to capitalize on word-of-mouth advertising, a retailer must first earn the respect of consumers. This is a process that takes quite a bit of time and requires a considerable amount of patience. One way a dealer can build consumer confidence is by educating and informing them through the use of seminars. A dealer might arrange to have a sales rep come in to discuss his product line and answer any questions that customers might have. Naturally such an effort would have to take place during the store's slow periods. However, it's important too that these seminars be scheduled at prime hours in order to get a maximum turnout by customers. Remember too that a seminar is an effective way in which a dealer's enthusiasm and knowledge of his product lines can be communicated to customers. However, any insincerity or indifference that a dealer might have about a particular product will be immediately read by customers. A dealer should avoid the common practice of denigrating a competitive line. This is a tactic used by many inexperienced hi-fi salesmen and without success. The primary purpose of the seminars is to let customers approach you and your sales staff on a personal level. Many consumers have admitted that seminars that they have attended have helped them in making purchase decisions.

MONITORING AN AD CAMPAIGN

Needless to say, it is important that a retailer carefully monitor his ad effort. This is particularly important if he is running ads in several publications at the same time. One easy way to keep tabs on your advertising is to ask customers how they heard about the store. This information can be recorded on the sales ticket for review at a later date. Coupon ads are a fast and easy way to test the pull of a particular publication, especially one that you might be advertising in for the first time.

Once a retailer has been advertising for a number of months, this naturally puts him in a position to weigh the results in a much more comprehensive manner. He should keep accurate records of when ads ran and what the sales were for that period. He should also look for any increase in sales for a particular product or product line. A retailer might find that certain products sell better when advertised in one publication as opposed to another. After all this information has been carefully digested, a retailer will find that he is in a far better position to design further promotions with very specific advertising objectives.

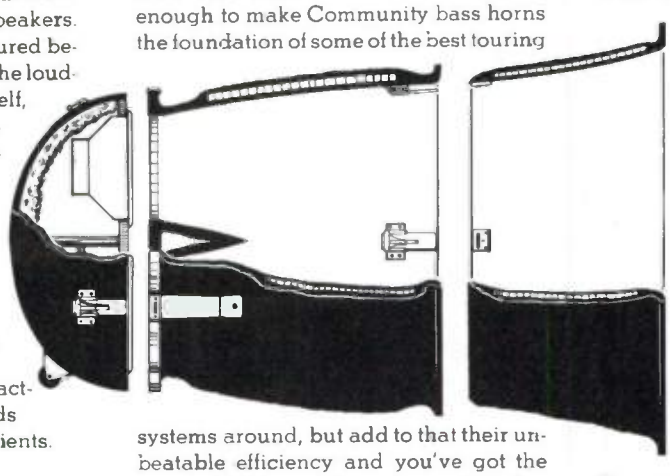


LEVIATHAN BASS HORN

This is the legendary Leviathan, our fiberglass bass horn for two 15" loudspeakers. It comes in three sections as pictured below: the back pod which houses the loudspeakers, the 48 Hz flare horn itself, and the optional extension for increased frequency range, projection and efficiency.

Not shown are our other bass horns: the FRC/B, designed to provide true horn performance in the smallest possible package, and the aptly named BLT, or Bass Long Throw, which does exactly that over several hundred yards with the closest attention to transients.

Like everything else that we make, our Levi, FRC/B and BLT are rock solid, portable, and built to last. That's reason enough to make Community bass horns the foundation of some of the best touring systems around, but add to that their unbeatable efficiency and you've got the bottom line for a full spectrum of professional applications.



What does efficiency mean? Because of our design criteria any Community bass horn's output is typically 4-6 dB above its wooden competitor's. To you, the professional sound person, this means that you need fewer bass horns to fulfill your requirements and, consequently, less drivers and electronics to power them. In addition, our bass horns weigh thirty to forty percent less than the old wooden horns meaning an additional savings in reduced installation and freight charges.

Need a couple of bass horns? See your Community dealer. You might only need one.

SPECIFICATIONS	EXTENDED LEVIATHAN	BLT	FRC/B
Flare Rate	48 Hz	52 Hz	66 Hz
Operating Range	from 50 Hz	from 60 Hz	from 75 Hz
Driver	Two 15"	One 15"	One 15"
Size (HEIGHT/WIDTH/DEPTH)	43¼"/69¼"/64"	44"/44"/56"	30½"/40"/44"
Weight (less drivers)	175 LB	90 LB	65 LB

Community

COMMUNITY LIGHT & SOUND, INCORPORATED ▫ 5701 GRAYS AVENUE, PHILA, PA 19143 ▫ (215) 727-0900

CIRCLE 88 ON READER SERVICE CARD

The SOUND SH

The one thing most home recordists want above all else is a noise reduction unit. The **dbx** 155 is a mirror-image compressor/expander that will provide upwards of 30 dB broad band tape noise reduction, plus a 10 dB increase in recorder headroom. All four channels independently switch from record to bypass to play modes, and each channel is printed on a separate circuit board. In the event of a failure (however unlikely), the other three channels remain in operation, and the boards can be changed by the user.

In the record mode the incoming signal is compressed by a 2:1 ratio that is linear in decibels over a 100 decibel range. When you switch to playback, the circuit does a little flip-flop and provides a 1:2 expansion ratio. Unlike other systems in the same price range, the dbx 155 measures the true RMS output of

the incoming signal, thus assuring proper encode/decode tracking and accurate transient response, regardless of phase shifts in the transmission or storage (tape) medium.

New to the dbx line is a remote control (the 3BX-R) for the 3BX three-band dynamic range expander. When the 3BX's remote function is selected, the 3BX-R assumes command of the entire music system, offering volume control, fade control and volume mute. In addition to duplicating the 3BX main controls, expansion and transition level, the 3BX-R offers a release time control and a high frequency transition level control. Upward and downward expansion are displayed on six LED's, two for each frequency band. The 3BX-R is powered by the 3BX, and plugs into a 12-pin socket on the 3BX's rear panel. It comes with 25 feet of cable. The suggested retail price is $149.

CIRCLE 10 ON READER SERVICE CARD

Being a bass player myself, I am always interested in new basses that come out. Personally, I don't want a bass with umpteen dozen knobs and switches when I'm performing; I find playing, singing, and leaping around quite enough to keep my mind occupied on stage without having to wonder what this or that switch is going to do, or where in fact that switch *is*. (Although I can't deny that the souped-up electronically injected basses are far superior technically, all music is not a matter of having endless tonal possibilities at one's disposal . . . thank God!). For those reasons, I was particularly pleased to see that the new **Yamaha** basses were in no way akin to the Frankenstein monsters that have been brought to life in recent years.

The Yamaha BB-1200 Bass has a body made of alder, and a laminated rock maple and mahogany body that is integral with the neck; thus the heel of the neck is smooth and easy to work with. The fingerboard is made of ebony, a wood that is not often used for bass fingerboards, but which has a very close grain and hard playing surface. The oval inlays are real mother-of-pearl, not plastic, and they, too, are hard and resistant to wear. The tuning machines are manufactured by Yamaha; they are 28:1 gear ratio and can be adjusted to the desired tension. The bridge plate has slots in the plate that provide increased stability for the saddles.

The single-coil pickups are placed on the body to allow a smooth response throughout the entire range. In an effort to eliminate a lot of the RF interference that is inherent in any high-impedance pickup, Yamaha has put high-density shielding on all internal wiring, and

DOPPE

By Charlie Lawing

completely separated the Volume and Tone controls. This last innovation not only helps reduce noise and outside interference, it means that the tone doesn't change when the volume changes. For those of you who may be interested, I'll go ahead and add that the pick-ups are wired in series and are diametrically phased to further reduce noise and increase output.

Two less expensive models with standard bolt-on necks are also available from Yamaha; they are the BB-800 and the BB-1000. All three instruments are long scale (86 cm) and have a full three-octave neck (low E to high E . . . at long last!). Only the bottom of the line BB-800 does not have a real ivory nut and an ebony fretboard. A choice of two finishes is available for each model.

This Yamaha thing is growing on me!

CIRCLE 11 ON READER SERVICE CARD

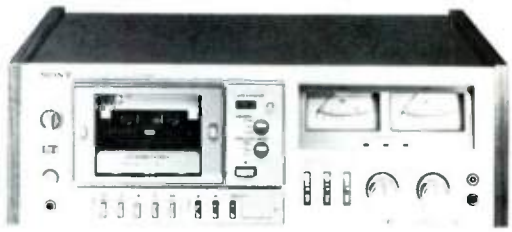
English Musical Instruments is expanding its dealer network in the United States. Their electric guitar models feature an all laminated neck and body. The trus rod has been fitted. The natural finish body is available in mahogany, walnut and Indian rosewood. The ebony fingerboard is available with either 20, 22 or 24 frets. Several different types of bridge saddles are available. The width of the body at the widest point is 14-1/8", the depth of the body at the center point is 1¾", thickness of the neck is ¾" and the overall length is 38¼".

CIRCLE 12 ON READER SERVICE CARD

The new **Sony** auto-reverse cassette deck (Model TC-K96R) features a new record/playback head, among other things. The Roto-Bilateral record/playback head allows one precision head to record and play back in either direction of tape travel, while maintaining head alignment and reducing noise and distortion. The motor is a new design, too, one that exhibits uniform torque and precise speed. The advantage of this is a reduction of wow and flutter in the unit.

The Sony TC-K96R can be programmed for several automatic operations: one-direction record and play, bi-direction record and play, automatic rewind, and continuous repeat record and play. Furthermore, the entire deck can be remote-controlled up to 16 feet away by removing the front panel. Thin cables connect the panel to the deck.

The logic-controlled tape transport allows accurate mode-to-mode switching without



going through the "stop" position, and three choices of tape bias/equalization make the deck compatible with all tape formulations.

The Sony TC-K96R is a two-motor, three-head (one record, two erase) deck with a single capstan drive for each direction. The signal-to-noise ratio with the Dolby off, using ferri-chrome tape, is 59 dB. Frequency response is 30 Hz to 16 kHz plus or minus 3 dB. Total harmonic distortion measures 1.3%. Suggested retail price of the unit is $620.

CIRCLE 13 ON READER SERVICE CARD

It seems that one of the big problems that speaker designers are faced with is overcoming audio wave phase shifts that arise from musical transients caused by crossover networks. **Technics** has developed a means of isolating and measuring the phase shift in a speaker as well as the technology to compensate for phase deviations. Technics uses a bucket brigade device to measure the finite time it takes a sound wave to travel from speaker to microphone. Thus they are very happy to publish waveform and square wave results in their ads.

The model SB-7070 is a 4-way speaker system. For accurate and solid bass reproduction, there is a 13¾" cone type woofer that handles frequencies up to 350 Hz. The midrange, 350 Hz to 1 kHz, is carried by a 6¼" cone type speaker. A 4" cone mid-high speaker covers the frequency range from 1 kHz to 4 kHz, but it actually will extend up to 10 kHz. Finally, a soft-dome tweeter is employed to reproduce the 4 kHz to 25 kHz range with clarity and definition. The SB-7070 is capable of handling 150 watts of music over a 32 Hz to 25 kHz frequency range. Just in case the audiophile gets a little overenthused, the SB-7070 is equipped with four thermal relays that shut down the input when the heat builds up to the danger level. These relays can be reset at the push of a button; no fuses are used.

CIRCLE 14 ON READER SERVICE CARD

Those of you who are already familiar with the **Furman Sound EQ** will immediately recognize the new PQ-6 parametric equalizer/preamp as a stereo version of the Furman PQ-3, the only change being a redesigned front panel. It is a significant change, however, because it increases the application of the unit, making it suitable for a number of uses.

First of all, just in case you are a little uncertain as to the difference between a parametric EQ system as opposed to a graphic EQ, here is a reminder: The parametric EQ has three continuously variable frequency controls that *overlap* each other; the graphic EQ controls don't have overlapping frequency controls. Instead, the slider controls on a graphic are broken down in octaves (31.2 Hz, 62.5 Hz, 125 Hz, 250 Hz, 500 Hz, 1 K, etc.). Each slider can boost or cut that frequency, but they do not overlap. A parametric is thus more flexible, as you can tune in to *exactly* the frequency you want to boost or cut.

On the Furman PQ-6, the bass frequency range is 25-500 Hz, the midrange 150-2500 Hz, and the treble range is 600-10,000 Hz. Thus it is possible with a parametric to attenuate frequencies that are closer together than one octave, as well as those that are octaves apart. The end result of all this is a more lifelike sound, if nothing else, and a wide variety of possible attenuations on instruments, voices, and stereo playback systems.

For instance, you might use the PQ-6 to preamp a guitar. In this situation you could use a stereo power amp, or a "regular" guitar amp, or both. One channel of the Furman could be run direct into the board, for that matter, and by using an A-B footswitch, the player could easily move from one EQ to a completely different one. Or, in the event that the user is a multi-instrumentalist, the convenience should be obvious: one EQ for a guitar, the other for an electric piano!

Other uses of the Furman PQ-6 might include a sound system application (for

suppression of feedback), or general purpose equalization in the recording studio or broadcast station, or even for room equalization in the home living room. Increasingly, audio consumers enjoy listening to their *system*, not just the music being played through it. In fact, a lot of stereo buffs tailor their album collection around the quality of the recording, rather than the material itself. Direct-to-disc albums are big favorites in audiophile circles, because they have the cleanest signal available on vinyl; hence they make great "test" albums that reveal the reproduction quality of a system. So the Furman PQ-6 should be of interest to both musician and listener alike, and if you're lucky enough to find the guy who plays several instruments, loves his stereo system, and has a home recording studio, then how can you miss, right?

The Furman product has been well received at Strings and Things by all kinds of musicians. We usually keep one on display with a BGW power amp and couple of cabinets, and there are few tastes we cannot satisfy when it comes to "EQ-ing" an instrument. Each band on the Furman can be boosted up to 20 dB or cut to cancellation. Bandwidth controls on each of the three bands govern the extent to which surrounding frequencies are affected. Each bandwidth control will boost from 1/3 to 4 octaves, and cut anywhere from 1/10 to 1 octave; thus you can really zero in on the desired frequency. Of course, a bypass switch lets you use the preamp by itself if desired. The signal-to-noise ratio is very good: 109 dB in the bypass mode, 99 dB with the EQ in and set flat. Distortion is also minimal: .015% in bypass; .025% with EQ in and set flat.

The PQ-6 is housed in a steel chassis with black anodized aluminum front panel, mounts in a standard rack enclosure (19"), and weighs seven pounds.

CIRCLE 15 ON READER SERVICE CARD

With the introduction of **Teac**'s Model 124 Syncaset, the advantages of cassettes are taken a step further, especially for the user who records his own music-making.

The 124 is a 4-track, 2-channel, 2-head unit, driven by a servo-controlled DC motor and equipped with Dolby noise reduction circuitry. Other specifications are more than adequate: wow and flutter of 0.07%, overall frequency response of 30 Hz to 16 kHz, and a 55 dB signal-to-noise ratio without Dolby.

The thing that makes the Syncaset unique is the inclusion of several features previously not found on Teac cassettes: Simul-Sync, tape and mic mixing, and a cross-feed switch. All of this makes it possible for the recordist to record on the left channel first, then go back to the beginning and record on the right channel while listening to the left. This is of tremendous value to the musician or songwriter who either wants to practice soloing against a set of chord changes, or record a vocal with guitar or piano accompaniment. Taken to somewhat of an extreme, it is possible that someone would want to record two instruments, say a bass guitar and a piano, and add a vocal part by singing along with the tape. At any rate, it is easy to see how useful these features would be to any musician.

Other features of the Model 124 Syncaset include memory, mic input, record level controls, VU meters, bias and EQ switches, input selector switch, a damped cassette eject and a removable cassette window that allows easy maintenance.

Teac units are some of the most sensibly priced on the market, and the suggested retail tag of $449 for the 124 Syncaset is no exception. When the unit becomes available in April, it should be an easy one to sell.

CIRCLE 16 ON READER SERVICE CARD

By Curt Seifert

DEALER DOSSIER

Advanced Audio Engineering
Iowa City, Iowa

One thing becomes apparent when you first speak to Mark Mathieu, founder, president and all-around main man of Advanced Audio Engineering—located in of all places, Iowa City, Iowa. The man talks a million miles an hour.

But if you can keep up with the 33-year-old's quantum leaps, you soon notice he knows what he is talking about. And what he's talking about is sound, whether it be professional reinforcement or recording equipment, home stereo or plain (and not so plain) old musical instruments.

SOUND ARTS caught Mathieu in the living room of his Iowa City home, slightly disarrayed in the wake of a recent installation of new bookcases, over "chickey-chickey" sandwiches, delicious kosher dill spears, hard boiled eggs and German white wine.

How do you evaluate new equipment?

Mathieu: One of the big problems you have in evaluating equipment is the assumptions you have about your customers. You're forced into a mold by virtue of what your customers want or expect. One of the things I look for is an excuse to sell people what they really need. I wish it didn't have to be that way, but one thing has become apparent to me. The customer, on the average, presumes he has credentials greater than yours or knows more than you do. Since he has control of the money, he's in the driver's seat—the customer is always right, etc., etc. Or maybe he's a professional in the field. Because of this, he feels you, as a professional salesman, really aren't the aid you could be to him. I've never found any level of retailing where the customer always puts trust in you. There just isn't a large enough percentage of the clientele that basically believes you know what you're doing or is really very interested in taking your advice. That makes it kind of tough. The implication is that the customer is working with less knowledge than you are, if only by virtue of time. He does not know what products are on the market. If something hasn't yet been advertised, for example. Some products may have been around for 10 years, some only since yesterday. The reason you know about the new product is because it's your business to get advance information. The customer is always working with yesterday's news, yesterday's evaluation, etc., etc. Since that's what he's working with, he comes to you asking for yesterday's solution to the problem. Assuming, of course, that you're in the fortunate position where people are mainly coming to you, instead of you running out and grabbing them. Fortunately, that's the way it's always been at Advanced Audio.

What instigated the beginning of Advanced Audio?

Mathieu: I got into this business as a logical step, relative to my simple curiosity about how all the stuff worked and why people made bad tapes and bad music. I first got interested in the whole thing at age 22; that was 1967. Anything I did, I did with my head or my mouth. And I'm still doing it with my mouth to this day. Advanced Audio actually got started in 1971. That's when we filed the first tax return and that's what America calls starting your business.

How many people work for you?

Mathieu: There are positions for 21 people at Advanced Audio. They go unfilled. The highest we've ever been

able to get is 19. We are currently running around 15 people. The last three hired come, respectively, from San Jose, Calif., Buffalo, N.Y. and, strangely enough, Iowa City, Iowa. The personnel have backgrounds everywhere from Ph.D. candidates to semi-menial tasks.

Are most of your employees technically trained in electronics?

Mathieu: Absolutely not.

Then how do you train them?

Mathieu: That's a good question. What I'm looking for now is people with ears on their heads, and, I hate to use the word *correct* because there's no *correct* personality, but who have the type of personality or attitude which enables them to be successful in this field in particular, or maybe in any field. The personality requirements I'm looking for have nothing to do with absolute training in audio. There's probably only a half dozen people working for me who have degrees in anything relating to electronics.

What's special about the Iowa market? What are its advantages and disadvantages?

Mathieu: The advantages are, there's only room for one or two operations like Advanced Audio. Advanced Audio has one. We are the only professional supplier, in the broadest sense, doing everything. There are people selling some tape, selling some installation equipment, as far as permanent installations of sound reinforcement gear. We do it all. Contrary to what many people seem to think, there aren't any farmers out here smoking corn silk. They're shooting every advanced idea in musical technology and art. They're as degenerate and as advanced as anybody anywhere when it comes to art, especially music. There's no such thing as a "farmer" anymore, unless it's a corporate farmer. There's no such thing as a "farm state" anymore, so much as an agri-business state. And that includes heavy manufacturing. Just like for the kids growing up in Pittsburgh and Pittsfield, Mass. The point is the market is there. And because it is there, from the first days I was in business I did as heavy duty a sound system as I'm doing today.

You've given a pretty heavy list of advantages, or seeming advantages. What are the disadvantages?

Mathieu: Timing. Communications, ways to advertise, dissemination of information, are extremely limited when the population density is as thin as it is here.

Speaking of advertising, how do you do it effectively?

Mathieu: Tried to do it statewide, but that was a failure. We tried to do it heavily, locally, to build a base for the business—to blow up my immediate market—but that was also an absolute failure. I have to assume, then, that with a limited number of people in the state of Iowa and a limited number of people in my local area, you have to find a different way to go about it. Perhaps I wasn't ready, and perhaps the professional audio business isn't ready, to conceive of radio and television as the logical media to communicate with the potential customers.

Who's your average customer?

Mathieu: It has to go by time periods. The average customer is characterized by the types of equipment being sold at points in time. At a point in time at the absolute mid-seventies—1973, four, five, six—the average customer was a person in a professional rock band, within or outside the state of Iowa, certainly outside of Iowa City, Iowa, who is doing weeklong gigs in live music rock and roll

clubs for large amounts of money. Those gigs necessitate the ownership of a first class sound reinforcement system and first class performing equipment. The necessity for the sound system is because the job is there to be done and it does take that to be effective. The necessity for first class equipment is so that they can imitate, or emulate, the people they are desirous of displacing in the business. Advanced Audio just diversified and touched every market. As our time came in every market, we were there and ready to roll. We were ready to roll through diversification, rather than trying to push things where things should not have been pushed, or where it would have been chancey.

So in terms of this diversification, it would be difficult for you to characterize this "average customer?"

Mathieu: That's what's peculiar about Advanced Audio. What is hopeful, what is good for the business overall, is that where we started is where we're ending up—trying to do professional audio equipment. We were diversifying to try and cover bases. Now we're trying to divest ourselves, or rid ourselves, of this diversification and get right back to concentrating on professional audio, where we started.

How about some "ball park" percentages of where the business is going right now?

Mathieu: The business was maybe never less than 40 to 50 percent professional. Now it's going 40, 50, 60, 70.... It's getting increasingly hard to differentiate. Our average customer now is certainly what we always wanted and tried to find. That is the professional audio customer, whether he be the professional musician, recordist or major institutions, in terms of recording and audio-visual gear.

So you would say then that you do try to cater toward pros?

Mathieu: Yes. And now we see as extremely important, that one part of the professional thing we call the bidding market. It consists of major institutions that are acquiring heavy duty audio gear, whether it be broadcast supply, studio supply, whatever. We see this as an ever-expanding market, as facilities need to be expanded with educational institutions or audio-visual applications and commercial things for training purposes. As that expands and as educational programs expand, more people are aware of the technology that's involved in the arts.

Speaking of professionals, have you supplied any big name acts?

Mathieu: I don't think any of them can spell Iowa, compared to Ohio and Idaho.

What I've always taken pride in is that bands that are on their way up respected us. And I hope, then, that they used us as something they measure other stores by. For instance, War. At one point in time when they were absolutely stone broke, but knew they were going to make it—circa '72, '73. They liked what they saw and liked what they did. They had and used ideas, concepts, and probably took them along with them. That kind of thing is what's been good for me. As far as coming up with people that have dealt with us, they only thing to say is that the people who get to Iowa have nobody else to deal with. So they attempt to deal with Advanced Audio.

You said earlier your market was returning more and more to where you started—professional audio equipment. What's the cost of your average installation?

Mathieu: I would like to think that $5,000 buys almost anything anybody would want; that you could somehow or other get some kind of a multi-track home recording setup for $5,000; you can get a PA for $5,000; that the musician will come to own—whether he be a bass player with a professional stack with one or two instruments or a keyboard player—what he needs for $5,000. The elementary package of discotheque audio equipment goes for about $5,000. You can take that number and then start talking in multiples of $5,000. A minimal $10-$15,000 for an eight-track professional recording studio. The heavy duty discotheque with $10,000 worth of equipment.

You've already alluded to the fact that the company is split, offering different services and equipment to different customers. Could you explain how it works?

Mathieu: Advanced Audio opened a retail storefront in 1973. In 1974 we moved into what we determined was a large building. It certainly was the only building we had offered to us at the time. Over a period of time, we found ourselves purveying three basic kinds of equipment and two kinds of service out of that building. A straightforward music store, straightforward high fidelity component sales, straightforward professional audio, straightforward electronics servicing and straightforward equipment rentals. Two services, three areas. Between 1974, when we got established and found ourselves operating in those areas, and the next three years or so, we opened three more stores. As might be expected, a straightforward music store, a straightforward hi-fi store and a straightforward professional servicing organization. At this point in time, the physical environment of the service organization is larger than the physical environment of the other three branches. That's a hint to the world out there of what's possible to do with service, if you don't blow it. And I know. Advanced Audio has blown it in the past. I know how to do it wrong. The hi-fi store was pretty much a natural off-shoot, so we got that out of the main building. Another music store is a natural thing. We went out to penetrate another market that was there to be penetrated, using a separate location to obtain franchises that were previously unavailable at the first location. We had to move to a virgin market in order to obtain those franchises. The main building has then come down to the professional equipment and a music store.

What, then, is the square footage alloted to each branch or product?

Mathieu: The standard music store is somewhere in the area of about 2,000 square feet. The hi-fi store, being a separate physical location—rather largish—out there at 1,600 to 2,000

square feet. The service shop is 1,500-1,600 square feet, but two stories.

You do have another location outside of Iowa City, right?

Mathieu: Yes, that's in Ames, Iowa, the other university town in Iowa. The smart money goes where the 18-to-35-year-old male market is. And a very good place to find that is in your major university oriented towns. Ames is the home of Iowa State University. Iowa City is the home of the University of Iowa, the Big Ten school. The main store, the original 1974 location, was once the entire Advanced Audio. From its first retail opening in the little hole-in-the-wall storefront to a major independent building, all occurred in one year. That building is still the original store with the corporate offices, but no warehousing, no hi-fi any more, etc.

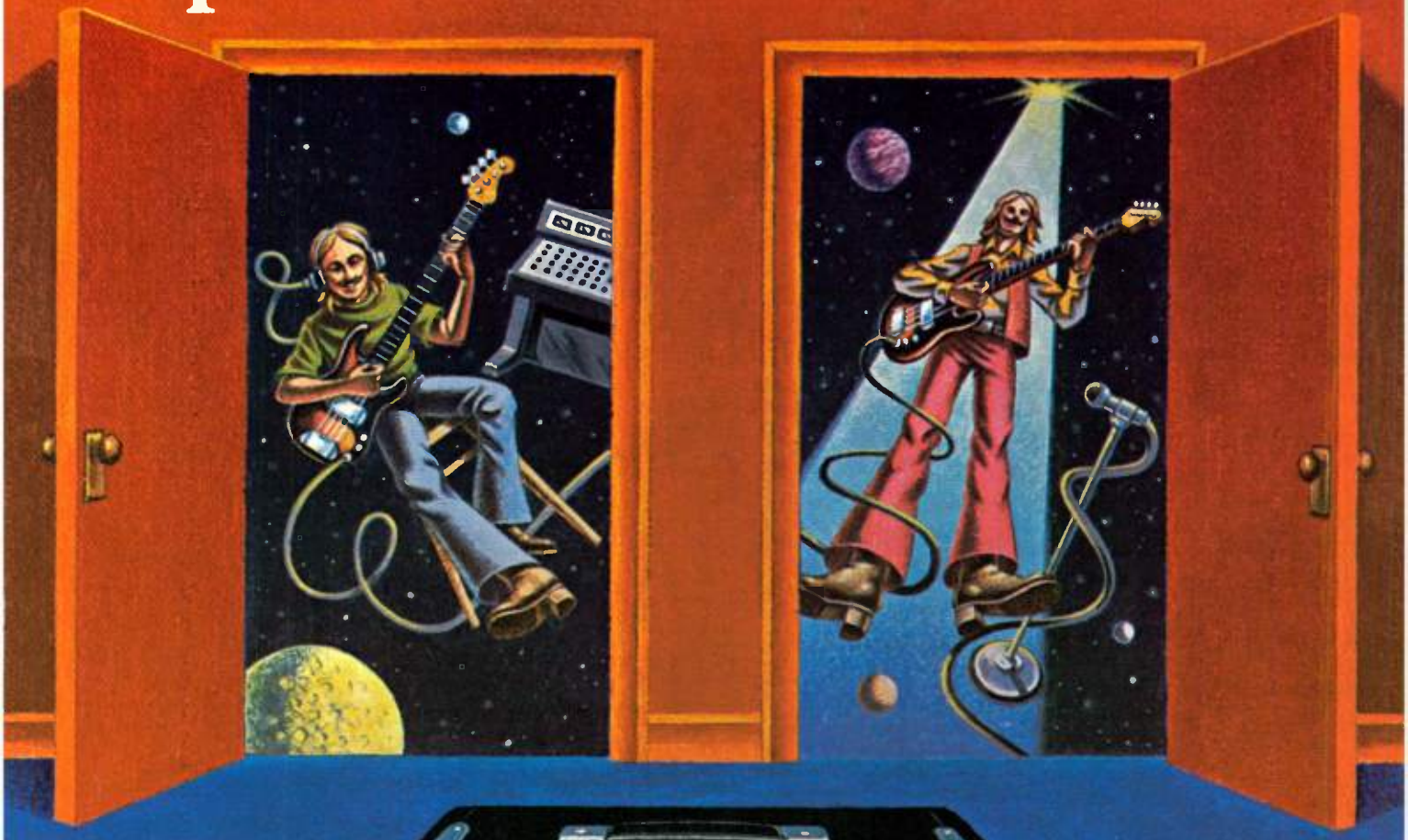
You do warehouse?

Mathieu: We warehouse virtually everything. We have two warehousing areas, which are independent of the areas just described. They are multi-storied and well-filled-up with used equipment that never gets sold. It never gets sold because we're so busy and so hot that we never really have time to merchandise the stuff that we take in on trade.

What you need, then, is a used equipment store.

Mathieu: We do, but we're so scared of having too many locations right now that we're not even entertaining the idea. But that's exactly what's needed and could be very successful. Even in a small marketing area like Iowa City, a used equipment store could be successful. But back to the main store. Throwing around a couple

What do you call the one amp that opens both doors to the stars?



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For the past three years we've been telling you about the benefits of using graphic equalizers; now we've made it even easier to appreciate them. Introducing the MXR Dual Fifteen and Thirty-One Band Equalizers. Two equalizers designed with the imagination and understanding to solve your toughest equalization problems. Designed for use in either studios or sound reinforcement situations, our new eqs offer features not previously available at any price.

The Dual Fifteen Band Eq features two channels of equalization with the bands set two-thirds of an octave apart. By breaking the frequencies down further than conventional octave equalizers, you now have the flexibility to contour your music with much greater selectivity. As most musical information occurs in the midrange, this is where you need even more definition, and the Dual Fifteen Band Eq gives you six bands of contour in this area rather than the usual four. In addition, each channel has its own level control.

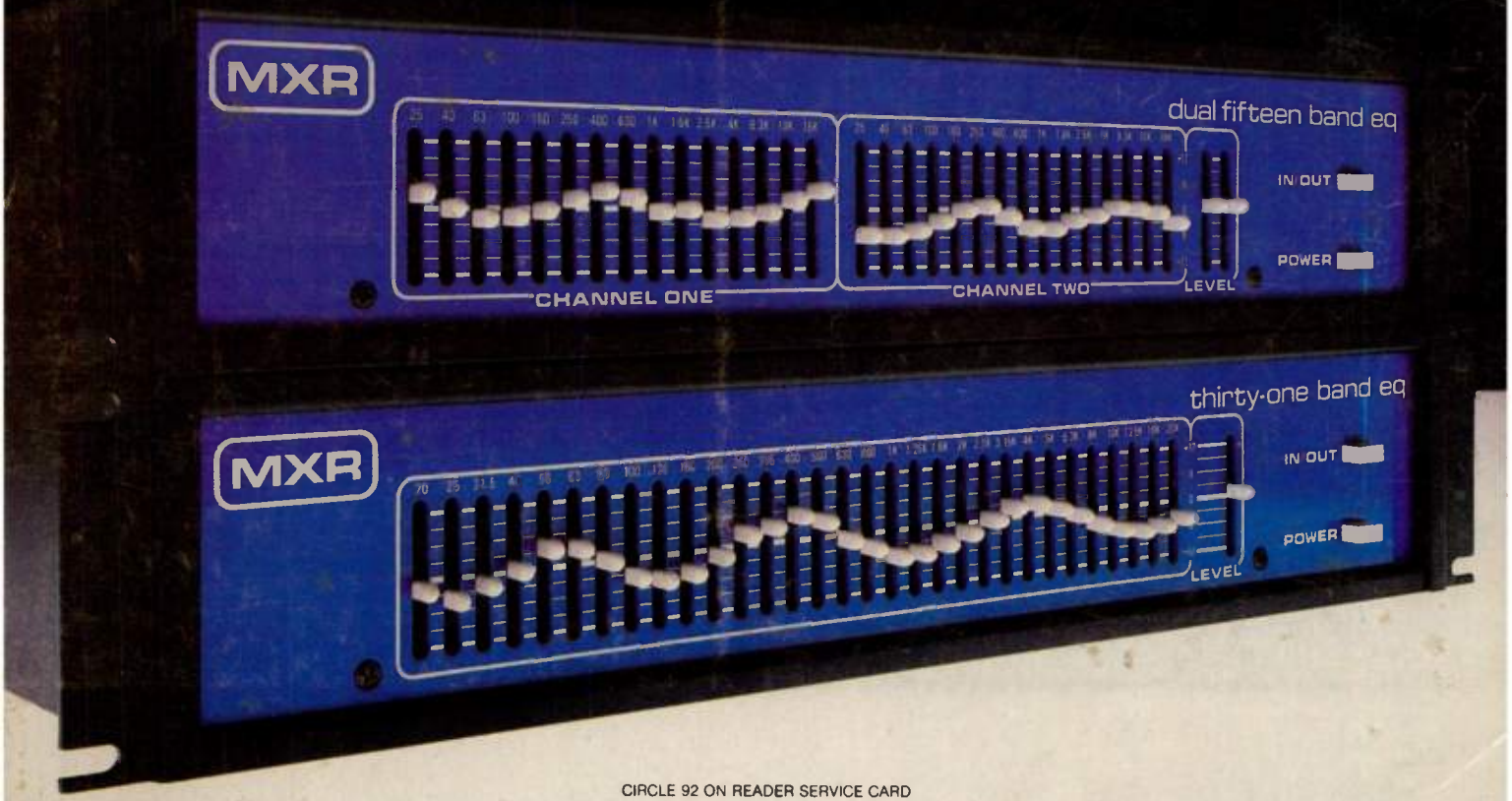
The Thirty-One Band Eq divides the frequency spectrum even further. A single channel unit, the Thirty-One Band features frequency bands set one-third of an octave apart, generally regarded to be the optimum amount of resolution.

When used in conjunction with any PA system, our equalizers can make a bad environment sound good, and a good performance sound great. Unlike parametric equalizers, the frequency response change is immediate and easily visible, so that when you shape a response curve you know what it's going to sound like.

Both units feature a range of −12 to +12 decibels on each band, standard 19" rack mount, and the rugged construction you always get with an MXR product. Both units also feature phone plug input/output connections, (the Thrity-One Band also features Cannon type XLRs), high slew rate (7V/microsecond), and incredibly low noise (better than −90 dBM). But not only do we offer great specifications, we produce great ideas... you wouldn't expect any less from us.

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

MXR Professional Products Group



CIRCLE 92 ON READER SERVICE CARD