

SOUND & COMMUNICATIONS

LAB TEST
REPORT
dbx's 163X

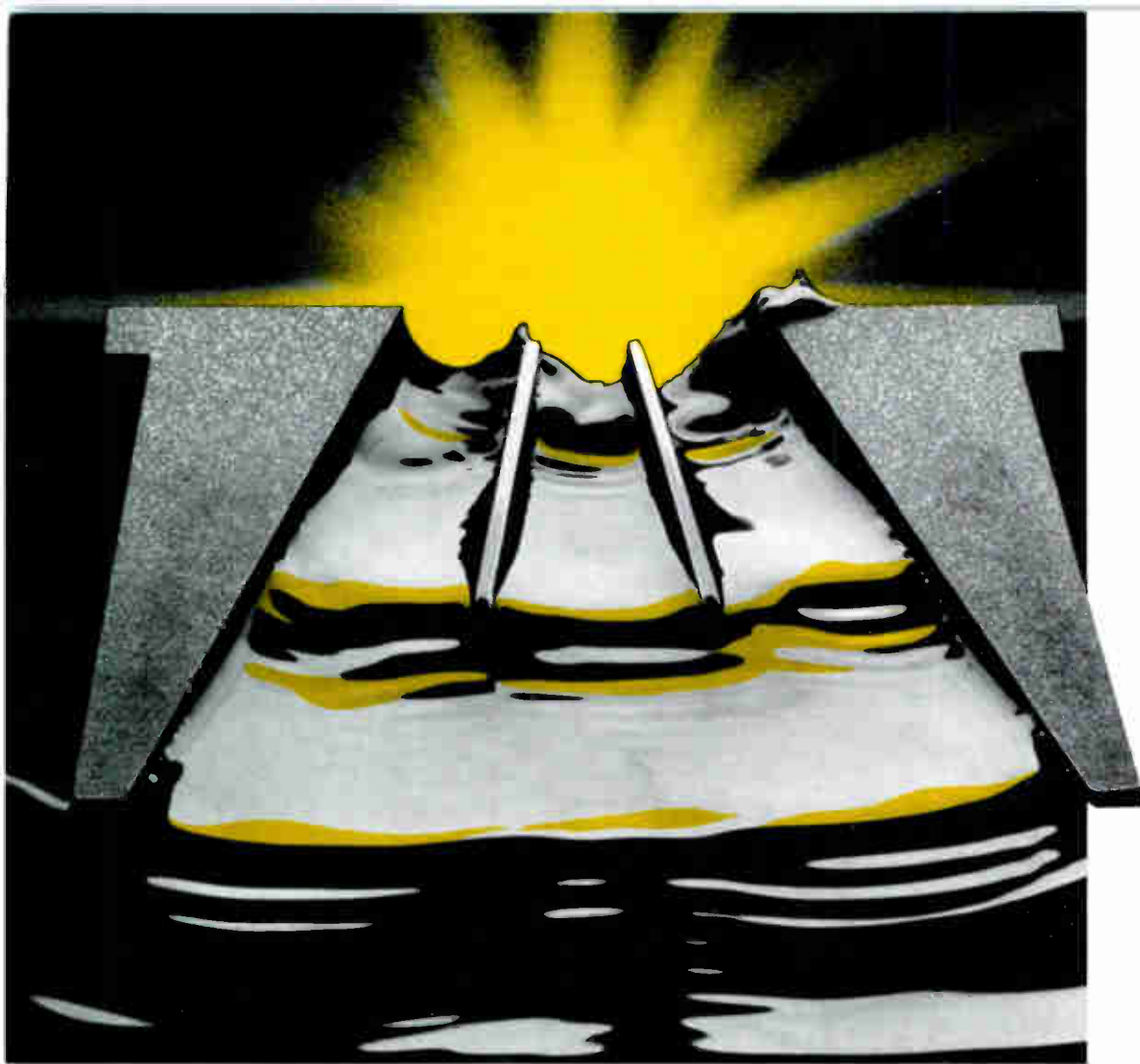
FOR CONTRACTORS, SYSTEM MANAGERS, AND SPECIFIERS

JANUARY 1986

A NEW CONCEPT IN BOARDROOM SOUND

**A/V SYSTEMS GUIDELINES
SIGHT & SOUND SECURITY**

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Cast into the throat of every **TransPlanar™ HP horn**, unique beamwidth control vanes represent a revolutionary advance in constant-directivity design. Until now, two-inch-throat designs were compromised by on-axis dropout. Intrigued with this curious problem, EV engineers applied principles of geometric optics to isolate the incoherent waveform responsible for this phenomenon. Instead of coursing down the horn in an organized fashion, this offending wave reflects off the walls of a two-inch throat, shadowing direct output and causing a loss in level. Ray analysis was used to predict this occurrence and determine the exact configuration of slotted waveguides which block the cancelling wave and eliminate on-axis dropout.

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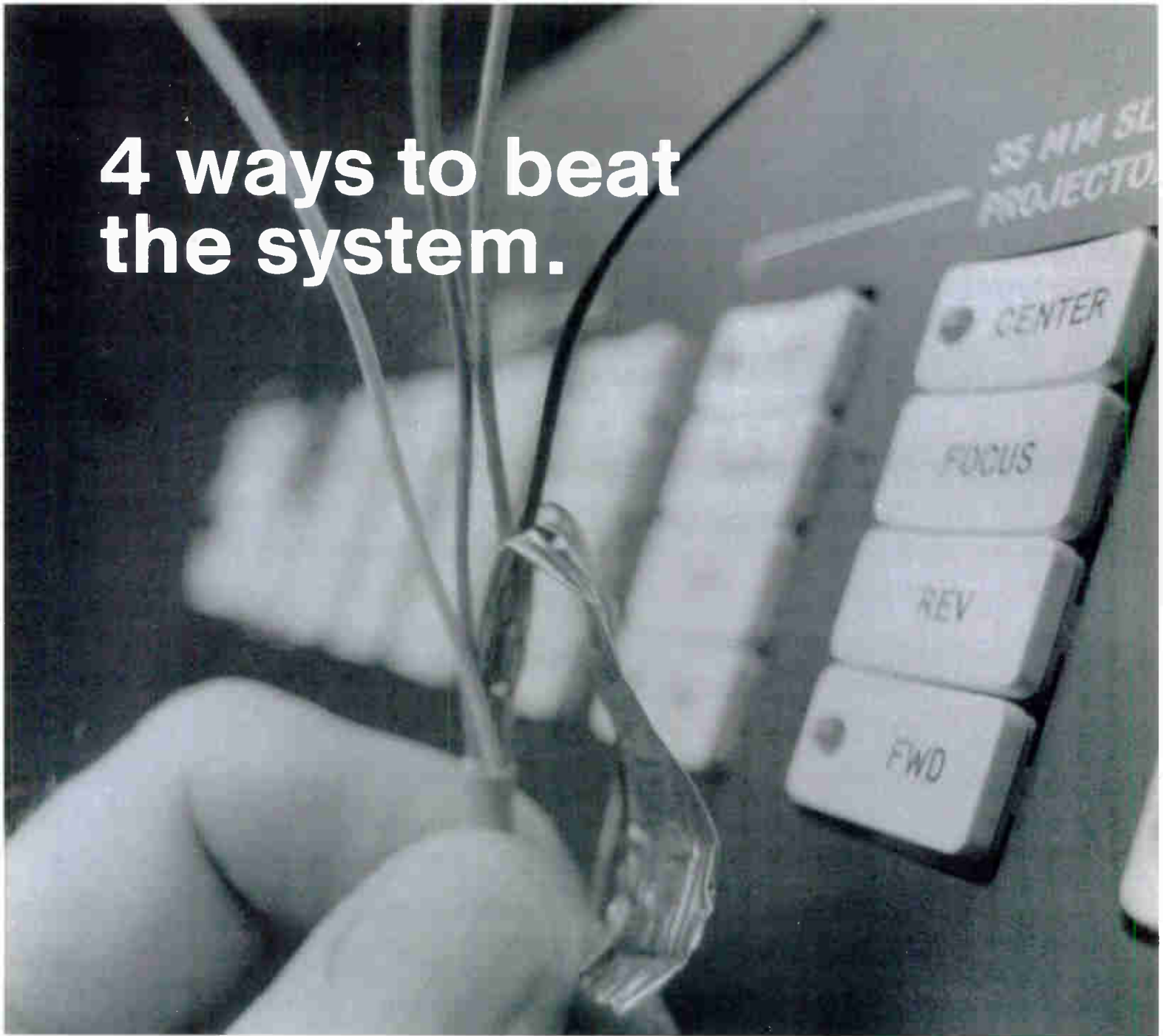
When Electro-Voice invented the constant-directivity horn in 1972, we really started something. Now we're making waves again . . . introducing second-generation CD design with the most uniform beamwidth control in the industry. To learn more about the new HP horn or the high-performance DH-1 and DH-2 two-inch-exit drivers designed especially for them, contact Pro Sound Marketing at Electro-Voice, 600 Cecil St., Buchanan, MI 49107. **We'll be glad to tell you why when the competition beams, we just smile.**

Reader Service #278



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The DL-64 is a system that everyone—from the chairman of the board to the installer—can finally feel comfortable with.

The right spec: When you specify FSR's DL-64 control, you add both simplicity and sophistication to your A/V control systems.

The DL-64 system can interface with any control system although it was designed especially to work with FSR's back-of-the-rack modules.

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Installer-friendly control modules

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Reader Service Inquiry

SOUND & COMMUNICATIONS

JANUARY 1986

Volume 32 # 1

FEATURES

A NEW CONCEPT IN BOARDROOM SYSTEMS

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Sound contractor Richard Feld discusses the evolution of a new design in boardroom sound systems. Based on a design by Christopher Jaffe, Technical Acoustic Instruments manufactures the ready-to-install system which offers electro-acoustical solutions to physical problems.

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"Hello. Can you hear me in the back? How's the picture?" These questions and similar ones are too often asked as a result of a poor A/V installation. Audio/Visual contractor John Timinsky discusses these problems and offers guidelines to installing better A/V systems. A sampling of products on the market and manufacturer's comments are on page 24.

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The first lab test of 1986 is on dbx's 163X compressor/limiter which features only two controls.

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ON THE COVER

On this month's cover of *Sound & Communications* is the corporate boardroom at Federated Stores. This boardroom, along with those at Mitsubishi, IBM, General Electric, and Utah International Corporation, has had a sound system installed which is based on a unique concept by Christopher Jaffe. Technical Acoustics Incorporated manufactures the Jaffe Boardroom system and assists in the specifications and installation as needed. Photo supplied by TAI. See Story on page 12.

combining **SOUND MERCHANDISING & MODERN COMMUNICATIONS**

FOUNDED 1955

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AUDIOCOM™

"The Intercom System"

INTRODUCING Phase 2

Now with two channel capability



Intercom technology takes a giant step forward as Telex advances to PHASE 2 of its popular Audiocom Intercom System. What's more, two channel capability and a full duplex audio system for both monaural and binaural systems is only a small part of the story! The new master station/power supply shown above features built-in IFB (interrupt feedback) and easy-to-use color coded line/channel buttons that can correspond with the same color of optional extension cables for convenient visual reference. The master station also features a brand new 20 kHz light signaling system, interlocking push-button channel switches, a listen/volume control, a mike on/off/signal control and a power on/off LED indicator.

Belt-pack headset station has special features

The new two-channel belt-pack intercom station allows the operator to selectively monitor one channel or both simultaneously. It has a mike on/off switch and separate listen/volume controls for each channel as well as a special carbon headset input and separate sidetone adjustments. There is also a rack mountable version of this unit available with all the same features. Additionally, Telex has developed an entirely new line of intercom headsets to accompany these exciting Phase 2 changes. And, they are lighter and more comfortable than ever before! The new offering consists of single/dual side units, monaural and binaural units, a super lightweight and a new headset.

ANNOUNCING complete compatibility!

Telex introduces the CCB-1 Clearcom/Telex interface unit. This new interface and others already in the line ends forever any problems in field compatibility between Telex and Clearcom, RTS or Telco.

For complete technical information and specifications write or call Telex today. Write Telex Communications, Inc., 9600 Aldrich Ave. So., Minneapolis, MN 55420. For quick information call toll free 800-328-3771. In Minnesota call 612-887-5550.

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TELEX COMMUNICATIONS, INC.

1986 WISH LIST

by Chris Foreman



The mic
that won't
cut you
off.

Introducing the Shure 838—a moderately priced condenser lavalier mic you can count on. Other lavalier mics break down so often that announcers wear a backup mic on the air. But with the 838 you get Shure reliability. Plus an adjustable four position mount, a side exit tie bar clasp that conceals its cable and reduces noise, and an easily replaceable 9V battery and cartridge.

Why buy two mics when one will do the job? Check out the new Shure 838.

SHURE

THE SOUND OF THE PROFESSIONALS...WORLDWIDE

For the Sound Contractor

Wish #1:

That the world realizes you are as important to the ultimate success of a project as the electrical or construction contractor.

Wish #2:

That religious facilities come to you with realistic budgets.

Wish #3:

That your manufacturers' quality control programs work.

Wish #4:

That you get a low-risk piece of the action in one or more of the sound and communications industry's new markets.

For the Interconnect

Wish #1:

That you are tough competition for your local BOC rather than the other way around.

Wish #2:

That you make an ally out of any competitor that seems too big and successful to compete with.

Wish #3:

That your manufacturers come up with some standards on their digital products.

Wish #4:

That your industry stops selling primarily on price and learns how to sell on value (and how to make a fair profit).

For the Manufacturer

Wish #1:

Rational and useful standards.

Wish #2:

An expanding market.

Wish #3:

That you learn how to listen to your customers.

Wish #4:

That you continue to innovate even when the only thing your customers seem to want is "a power amplifier (or some other such product) to compete with that new one from XYZ Manufacturing."

For the Consultant

Wish #1:

That you figure out how to get paid for your work.

For the Manufacturer's Representative

Wish #1:

That you get some respect.

For the AES, NSCA, NAMM and other trade organizations

Wish #1:

That you remember your purpose is to serve your members.

Wish #2:

That your members take an active part in bettering their trade organizations and don't just complain about the problems.

(continued on page 49)



Total communications control that's easy-to-use, easy-to-install, easy-to-maintain and impossible-to-beat.

NEW COMMUNITEL² Administrative Communication System

Now administrators in schools and other facilities can get information faster, issue instructions instantly, control emergencies more effectively. Bogen's COMMUNITEL 2 system gives them two-way voice communication with each other and with all staff members.

Heart of the system is a card cage containing plug-in microprocessor circuit cards which control all operations.

Modular design lets you start with just the facilities needed now, expand later if requirements grow. Up to 50 administrative and 400 staff stations can be included in a system.

Multiple conversation paths permit simultaneous conversations. Advanced technology makes COMMUNITEL 2 fast, versatile, dependable.

Emergency calls take priority over routine calls. They

are announced by a distinctive tone signal and the word "HELP" appearing on all digital displays, along with the number of the station originating the call.

Callback review. Administrators also can use their displays to review unanswered calls in the system's memory, return them in any order or automatically, in sequence.

Field-programmable features include architectural dialing (no directory needed), interconnect to outside telephone lines, emergency paging, six-zone paging, alarm signalling, executive priority (interrupt or join a conversation), and many more. You assign them to the desired phones.

Built-in diagnostic software simplifies maintenance.

For more details on these state-of-the-art, cost-effective, COMMUNITEL 2 systems, call or write the one to watch in communications:

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DAIMLER-BENZ PLANS TO BUY 50% AEG STOCK

Daimler-Benz of West Germany, manufacturer of Mercedes cars and trucks, is in the process of acquiring a majority control of AEG Corporation. Daimler said it plans to buy at least 50 percent of AEG stock for \$64 a share. This is over 20 percent higher than AEG shares over the past three months. Daimler-Benz is allowing autonomy and independence to be maintained by AEG after the takeover. AEG management will remain in tact, and spokesmen for both term the transaction amicable. According to Heinz Durr, management board chairman of AEG, "The management board of AEG Aktiengesellschaft welcomes the acquisition of a stake in AEG by Daimler-Benz Aktiengesellschaft and the further moves proposed. The proposals open up an extraordinarily interesting medium and long term prospects not only for the future development of AEG, but also for Daimler-Benz."

IAAM HELPS PASS FAIR LABOR STANDARDS AMENDMENT

President Reagan recently signed the Fair Labor Standards Amendment of 1985 into law. The International Association of Auditorium Managers (IAAM) was instrumental in passage of this law which will save publically owned stadiums, arenas, and other public assembly facilities millions of tax dollars. It gives these facilities the option of paying employees either compensatory time or cash at regular hourly rate for overtime hours worked. This decision protects the financial security of IAAM facilities sent into financial crisis after the Supreme Court decision in the Garcia vs. SAMTA ruling requiring overtime pay for overtime hours worked.

TIE/COMMUNICATIONS SELLS ASSETS OF MURA DIVISION

TIE/communications, Inc. has sold assets, including inventory, of its Mura Division to Bartex Export Corporation. Bartex, located in New York City, is a company affiliated with Adar Import and Distributing Corp. TIE will no longer market any products under the Mura name. According to Thomas L. Kelly, Jr., chairman and president of TIE, this sale constituted a major achievement in the compnay's efforts to consolidate operations, reduce operating costs, and focus even greater attention and resources on TIE's core business: the design, manufacture and marketing of telecommunications systems for the small and medium size business market.

NBT ACCUSED OF ILLEGAL MANUFACTURE OF EQUIPMENT

The U.S. Department of Justice was asked to investigate illegal telephone equipment manufacturing operations being conducted by Northwestern Bell Technologies (NBT), a subsidiary of Northwestern Bell Telephone. In a letter filed with the Justice Department, the North American Telecommunication Association (NATA) accused NBT of illegally designing, developing, and contracting for the fabrication of a product used to retrofit coin-operated pay telephones. NATA argued such an undertaking is in direct violation of Section II (D) (2) of the AT&T antitrust settlement, which prohibits the divested Bell Operating Companies from manufacturing "telecommunications products" and "customer premises equipment (CPE)."

INTERCONNECT '86 TO BE HELD IN SAN MATEO, CA.

The board of directors of the U.S. Telecommunications Suppliers Association (USTSA), after the success with Interconnect '85, have set the dates for the second show. Interconnect '86 will be held August 26-28, 1986 at the San Mateo Expo Center in San Mateo, CA. This announcement was made by USTSA managing director and Interconnect show manager Donald R. Pollock. "We saw the need for a west coast interconnect show, and the number of attendees (2,800) at Interconnect '85 substantiated that need. Interconnects have been voicing their interest in a show of this nature on the west coast for a long time," said Pollock. "We listened and the result was positive for all parties." USTSA found the San Mateo site adequate for the '85 show and he anticipates an even better response in '86 with even more exhibitors.

NEW NAME AND STRONGER MARKET CONCENTRATION FOR ADC

ADC Magnetic Controls Company of Minneapolis, MN, has changed its name to ADC Telecommunications to reflect more accurately the company's area of market concentration. The company sold its magnetic division in March of 1984. "It was decided that the magnetics business wasn't the area of business the company wanted to be in," said Lynne High, director of public relations. The strongest market for ADC is digital signal cross connect (DSX) equipment. ADC also participates in the access equipment market, which includes jack fields for accessing circuits. The company also manufactures test boards for maintenance and information lines.

30th ANNIVERSARY CELEBRATED AT THE 1985 IPMA CONVENTION

The International Planned Music Association celebrated its 30th anniversary at the IPMA convention on November 6-9 at the Buena Vista Palace Hotel in Orlando, FL. This year's program entitled "We are Family" was visited by more than 250 attendees and 15 associate exhibitors. The topics covered included competitive positioning, SCA agreements, account collection, new technology in the background and foreground industries, the foreground music explosion in relation to professional sound equipment, and sales force motivation and management. Among points raised at the convention was the development of alternative technologies to the FM SCA as they become more accessible in cost. A suggestion was made to IPMA to have a rotating group of manufacturers to supply a PA system for the meetings. It is hoped this will solve the comprehension problems found at this and other past conventions.

SOUNDOLIER RELOCATES TO LARGER HEADQUARTERS

Soundolier, Division of American Trading and Production Corporation, is expanding and relocating its divisional offices to the Intertech Center in Fenton, MO. These new headquarters nearly doubles the previous office space occupied since the company's founding in 1956. The new modern facilities combine the productivity-inducing qualities of premium work environment with high tech architecture. Its location is accessible to the interstate highway system. Manufacturing of Soundolier loudspeakers, baffles, attenuators, and audio components, as well as electronic equipment cabinets and consoles will continue in Crestwood, Festus, and Desoto, MO, as well as in Laurinburg, NC.

GETTING A FOOT IN THE DOOR

by Barry McKinnon

Through hard work and careful business practices you've managed to carve a comfortable niche in the marketplace for your company; regular and repeat business in an area of acknowledged expertise keeps the bills paid and your suppliers current. Yet, somehow as you look out at the vast untapped marketplaces at your doorstep, something in you stirs, you feel that you could handle new challenges and making more money. Not an uncommon state of mind for anyone who has been enjoying success in business, the horizons recede as they expand, thus presenting the businessman with a world without dead ends and cul-de-sac markets.

pulsively and should not be acted on without investigation.

The first step in the search for a new market should be a detailed look at what your current markets are and what makes you successful at servicing those markets. It can be quite an eye opener to discover that the reason for your achievements may not be quite what you expected. By carefully analyzing what you do well, you can get a much better idea of what areas you might be equally as effective in. For instance, if you already service the broadcast industry, a step into recording or A/V markets is not a big change. Many of the criteria for good customer service apply to all three.

ideal way to increase sales is to promote yourself into related fields that have similar requirements, such as community buildings or local arenas. By continuing to provide the same type of services that you are already good at, you can avoid the biggest pitfall of the "market-crazy" syndrome—a bad reputation from getting involved in something over your head and botching the job. The audio business is perhaps the best example of one job done badly ruining years of a hard-earned good reputation.

A truly successful market expansion will almost always be a result of evolution not revolution. In the same fashion the get-rich-quick schemes seldom work. Any attempt to take a new market by storm will often result in you getting egg on your face, if only because your customers-to-be in the new markets won't know you from a brick and likely won't be swayed from their current source without good reason. Quite often a successful contractor in one market will forget how long it took to establish his credibility and *new* market penetration will take time to achieve.

Another very effective method of expanding your market is creative application of the product lines you already sell. Often a completely untapped market can be discovered by observing who uses similar products that are supplied as part of a complete package. Many times, package systems utilize products that are priced

right and perform adequately, and many times that level of performance is not adequate for the end user. The example that comes to mind is a university's atmospheric physics department using acoustic sounding apparatus in scientific experiments, this equipment came with your average 60 watt thread-on compression driver. Both levels and power handling were inadequate for the task and after a brief phone conversation a large number of high power, high quality voice warning system drivers were sold to replace the smaller units. Since discovering this application for these devices, several additional sales for non-sound reinforcement applications have been found.

Discovering new markets requires some degree of creativity, and requires you to keep your eyes and ears open to who uses sound equipment, and where and for what, and where did they get it. If it sounds bad to you, maybe it sounds bad to someone else too. But they didn't know that something could be done about it. By observing applications for sound products in situations other than those areas you are usually involved in, you can get ideas for new sales programs as well as getting more ideas about the right *and* wrong ways to do jobs you don't have first hand experience with. If, for example, you happen to notice some sort of sound system at more than one location and you feel that this particular

(continued on page 49)

"A truly successful market expansion will almost always be a result of evolution not revolution. In the same fashion the get-rich-quick schemes seldom work."

The big question is: what are the other markets that could be handled successfully within the scope of available experience and expertise? And then once they have been identified, how do you locate them? It is these questions that many people have asked and obtained the wrong answers and set sail on the great receivership. It is a question that should not be answered quickly or im-

Yet possibly an attempt to exploit the sound reinforcement or club sound markets might not be as easy without some detailed looks at the important factors in these areas.

The simplest way to expand your market is to do more of what you do best. If your strong suit is sound systems for churches, providing design and installation and backup service, then the

You and your customers have wrestled with bulky microphones, sagging stands, and awkward cables long enough. Introducing Audio-Technica UniPoint™ cardioid Fixed-Charge condenser microphones. Perfect for the pulpit, podium, and a host of other applications. The slimmest cardioid microphones ever! Easy to mount, adjust, and use.

There are five basic UniPoint models to cover almost every application. For the podium, our double-gooseneck AT837 adjusts to any height or angle with just a touch. The AT857QM has similar dimen-

sions but wider range and plugs directly into any surface-mount XLRF-type connector. No sag. No slip. No stand noise.

To top off a standard desk or floor stand, our AT855 is ideal. A single fixed bend puts the microphone out where it's needed. The cable is hidden inside the tube, exiting just above the stand coupler for a neat, professional appearance.

With its adjustable wire guide to set the angle, the AT853 makes a great overhead microphone for choir or orchestra without showing itself. Light in weight, cardioid in pattern, and truly tiny, it suspends

on its own cable, with the electronics module high up and out of sight. Or use the included adapter on a floor or desk stand.

The AT859 is a wand mike with a difference: the *cardioid* pattern. About a foot long, it extends to 18" when you need extra reach. For interviews, talk shows, or to sneak up close in a news conference.

Because of their small diameter, all UniPoint microphones exhibit more uniform off-axis rejection than larger mikes. All can be powered from any 9-52VDC phantom power source, with a battery or an external power source as options. The AT853, AT855 and AT857QM also include a switchable low-cut filter.

Versatile, superb sound, and – above all – inconspicuous! The new Audio-Technica UniPoint cardioids are elegant solutions to some of your most common sound problems. To find out more, write for literature or call today.

The End of the "Klutzy" Cardioid!

AT859
shown with
AT8102 windscreen

AT837

AT855

AT853

AT853

AT857QM



audio-technica

1221 Commerce Dr., Stow, OH 44224
216/686-2600

Reader Service #275

A NEW CONCEPT IN

by Richard Feld –Tekcom

“As the public’s general awareness grows about the quality of audio, so will the need for better and more complex systems for our boardrooms and our theaters as well.”

As sound contractors, we are all familiar with the technologies of sound reinforcement and background music. However, what many of us may not be familiar with is using the same technologies in an unusual way—to solve physical or acoustical problems. First we will take a look at some background on sound systems in acoustical problem-solving applications and then at some recent developments in the new field of “Electronic Architecture.”

The earliest work in the area of Electronic Architecture was at RCA Laboratories whose early pioneering work was first demonstrated in the late Forties. For example, *An Outdoor Electronic Orchestra Shell with Synthetic Hall Acoustics* was used with the Camden County Symphony Orchestra on July 14, 1949 in the Haddon Heights Dell, Haddon Heights, NJ. Later, in the early Fifties, an undocumented experiment took place at the Academy of Music in Philadelphia. The stairwells were used as reverberation chambers, excited by loudspeakers reproducing the live sound pickup of the orchestra.

The sound was then allowed to re-enter the hall, hence enhancing the reverberation of the hall. Both of these experiment/demonstrations were performed by John Volkman.

There was interest in using “Active-Acoustics” as an alternative to “Passive-Acoustics” by researchers since the first Bell Labs’ Philadelphia/Washington D.C. “stereophonic reproduction” experiments with the Philadelphia Orchestra in 1934. However, it was not until the late Fifties, from practical necessity, that “Active-Acoustics” slowly began its recognition as a viable alternative to “Passive-Acoustics.” It was at this time that a “new generation” of concert halls were being constructed—some of which were saved by electronic solutions.

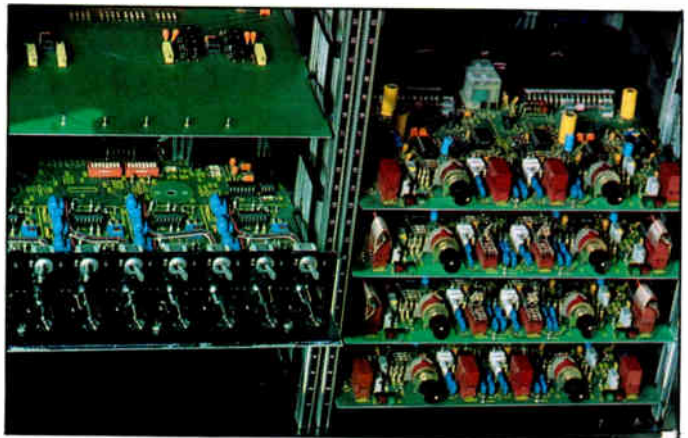
The first concert hall to use “Active-Acoustics” for traditionally “passive presentations” was the Royal Festival Hall in London whose design began in 1948. When the hall was finally completed and acoustic measurements performed, its 1.5 second reverberation time fell short of the intended 1.7 second reverb time—just enough on

the dry side to draw complaints from much of the musical community. The solution was what is now known as “Assisted Resonance,” conceived by Parkin and Morgan of Britain’s Building Research Station.

“Assisted Resonance” (AR) at the Royal Festival Hall saved the owners from removing 1,000 seats and raising the roof 12-feet. Clearly a great deal of money was saved and the hall’s original aesthetics were not altered during the 1964 renovation of the hall with this new electronic solution. The AR system has been covered in depth in many previous articles. However, it basically consists of a multiplicity of “sound-system channels” (usually over 100), each covering a different frequency-range. When the gain of the system is raised closer to the point of feedback, the reverberation time in that frequency-range is also raised. Theoretically, the point at 6 dB below feedback is where the reverberation time may be doubled. Over the years there have been a number of room reverberation schemes devised, although the AR approach has been the most accepted.



Federated Store Boardroom.



TAI Electronics Enclosure.

BOARDROOM SOUND

We have all heard various versions of the story behind New York's Philharmonic Hall (now known as Avery Fisher Hall). Actually what took place is not germane to this article, but the background research that took place before, during and even after the hall's completion is of interest here. Bolt, Beranek and Newman, the acoustical consultants of record for the Philharmonic Hall, conducted many surveys and experiments which were outlined in great part in *Music, Acoustics, and Architecture*, by Beranek. Other research and experimentation by BBN's workers contributed greatly to our understanding of concert hall acoustics, as well as some concepts critical to the entire concept of Electronic Architecture.

Jaffe Acoustics, acoustical consultants from Norwalk, CT, began using Electronic Architecture techniques in the mid-Sixties. They have been specifying the AR system from the beginning. However, it was when they were studying the acoustics of the Dinkenspiel Auditorium at Stanford University that Jaffe was able, for the first time, to try an electronic system of "simulated-reflections." The Dinkenspiel and other successful Electronic Architecture projects, including the 1969 NY Philharmonic Union Concert Tour, Merryweather Post Pavillion, Revinia Pavillion, Forum at Ontario Place, and the St. Louis Arch Gateway Concerts, were all the beginning of ERES (Electronic Reflected Energy System).

From these early projects, Jaffe

developed the ERES technology to the point where it has become critical to the operation and success of many concert halls and pavillions including the Laurie Auditorium in San Antonio, TX; Place des Arts in Montreal, Canada; Hult Center for the Performing Arts in Eugene, OR; Riverbend Pavillion in Cincinnati, OH; and the Circle Theater in Indianapolis, IN. Although these electronic techniques are no substitute for properly designed Passive Acoustics, it is often the only solution—and at times even expands the capabilities of facilities. It could not have been said any better than by Hans Fantel who wrote of Jaffe's methods in *The New York Times'* Entertainment column (July 18, 1982), "But as a way of locking the barn after the horse is stolen, it is so effective that it almost puts back the horse."

Better Sound Comes To The Top

Good acoustics is not what one generally associates with when thinking of corporate boardrooms. But in today's computerized information age when meetings take place almost robotically, good acoustics affords the possibility of efficient communication within the conference room itself. Good boardroom acoustics also greatly enhances the quality of transmitted audio for teleconferencing.

Poor conference room acoustics can degrade the working environment to such a degree that productivity decreases—something that no company can live with. Human stresses

can be attributed to several basic common acoustical problems, prevalent in many conference and boardrooms today. When one must project his voice loudly, to overcome the distances encountered in long boardroom tables, physical and psychological stresses are provoked. Likewise, physical and psychological stresses are provoked when one must strain throughout a meeting to hear properly. Also, secondary problems may arise due to individuals who habitually speak at low levels, or even more frequently, many senior board members have some degree of hearing difficulty.

Based on the technologies Jaffe developed for concert hall ERES, they developed a "Boardroom Sound Reinforcement System," and were granted patent #3,992,586 in 1976. In this age of high-tech/high-touch, Jaffe's boardroom system was revolutionary—no equipment on the table at all! After dealing with the business of "hiding" electronic equipment in many concert halls, auditoriums, and churches for over a decade, the boardroom was another challenge in "invisible sound."

Jaffe's boardroom system is based upon modules which consist of two loudspeakers operating in anti-phase, such that there is a cancellation-zone in between the loudspeakers where a microphone is then placed. The loudspeakers in a module do not reproduce any sound pick up from its microphone; the loudspeakers only reproduce signals from microphones in the other modules. This technique allows for a stable system since the micro-



Utah International Corporation Boardroom.



Natomas Company Boardroom.

phone is not in the direct field of the loudspeakers. Thus, there is a sufficient amount of gain-before-feedback due to the geometrical relationship of the talker/microphone/loudspeaker/listener. Additionally, the reverberation times in these type rooms is usually on the dry side, especially in the vicinity of the acoustical ceiling; this helps even further by ensuring that there is not much in the way of reverberant energy to be amplified. The only physical requirement is that a maximum noise level of NC25 should be measured in the room.

verse-square law. So the electronics in the mainframe are set up to compensate for the 6 dB drop-off by increasing the gain at a rate of 6 dB as the distance from the source is doubled. This is, of course, field-adjustable to compensate for any reverberant energy that may contribute to the level.

Signal delay is also incorporated to take advantage of the well known "Haas-effect" or "auditory fusion-zone." This simulates the early-field reflections one would normally hear, but a lot more efficiently (no absorption or diffraction from architectural

filtering is also employed for extra system stability.

The first boardroom installation specified by Jaffe was the General Electric Corporate Headquarters in Fairfield, CT. After the highly successful installation at GE, the boardrooms of prestigious corporations soon followed suit, including Federated Stores, IBM, Natomas Company, Utah International Corporation, and Mitsubishi Corporation in New York. Because of the need for this technology to be brought to the marketplace Technical Acoustics Incorporated, a wholly owned subsidiary of Bozak, Inc., was formed. TAI, which licenses the technology of Jaffe, manufactures ready-to-install boardroom systems, and directly supports those interested in specifying or installing the "Jaffe Boardroom System" with complete design specifications on a project-by-project basis.

TAI currently manufactures a mainframe that houses individual cards that perform the various I/O, mixing/matrixing, filtering, delay, and amplification functions. They also manufacture two different configurations of the ceiling loudspeaker/microphone module. The notch-filter cards, that are included with the system, feature two sets of four filters each. Each card has dip-switches so that the notch-filters may be assigned to any part of the circuit, or disabled if necessary (for example, A/V playback). Other options that the mainframe can accommodate include A/V inputs, recording outputs, teleconferencing interface, link-ups of multiple spaces, hard-of-hearing loops, and translation system interface.

Recently, GE renovated their boardroom and decided to update the original Jaffe Boardroom System. This time, instead of a custom-wired installation, a TAI mainframe and modules were installed which incorporated teleconferencing features. This is a true testimonial when a client orders the same system after ten years of use!

"Hot-Ceiling"

A further development of the boardroom system is what TAI calls the "Conference Ceiling." The Conference Ceiling evolved around the necessity to provide a system for boardrooms with irregular layouts, for example a large square table. This system differs in that the modules use only one loudspeaker, and are installed

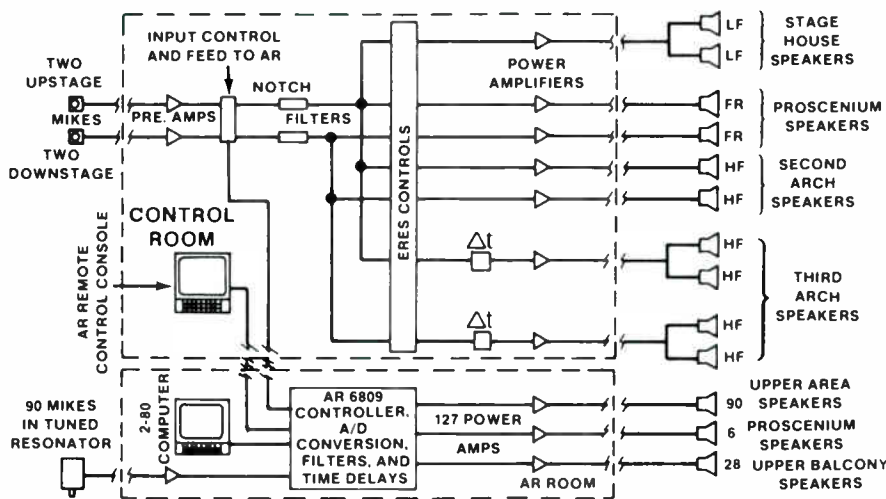


Figure 1: Equipment locations of ERES/AR systems in Silva Hall.

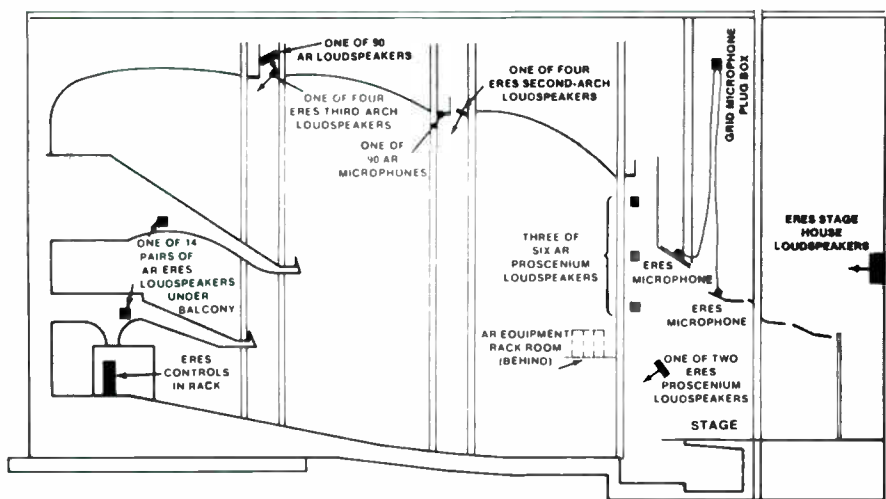


Figure 2: Block diagram of Electronic Reflected Energy System, and Assisted Resonance (AR) System.

That is what might be called the physical-alignment part of the system. Now, for the electronic side of the story. Everybody knows that when the distance from a source is doubled, its SPL drops by 6 dB—that is, the in-

materials). Because of the incremental delay introduced to the signal, the source is never colored by the loudspeaker. In addition to the gain afforded by the cancellation-zone microphone placement, narrowband notch-

such that they are geometrically and electronically balanced in pairs.

A Conference Ceiling system was recently specified by the author for the Health Services Corp. in Princeton, NJ. Their boardroom presented some unique features starting with the large square-shaped boardroom table with 26 seats, ending with the three rows of "audience" seating that must be capable of two-way communication. For this project, the capability was added to mute the audience microphones during formal presentations and then open them for full duplex communication when desired.

ted hardware of conventional systems. The Jaffe/TAI system offers the consultant or contractor the opportunity to show a client a system that is totally invisible, not only visually but operationally as well. Jaffe/TAI Boardroom System has proven itself as an effective approach in providing a "perfect" acoustic environment for corporate executives to work in. Articulation of consonants is maintained at a high level, while eliminating the need and stress/inhibition of talking into a microphone.

There are ergonomic advantages for the consultant and contractor as well.

ture of one system. The specifier of the project may now design the system from various plug-in components within a mainframe system—no more custom engineered relay schemes, etc. The actual installation is also easy as it entails only installing ceiling modules and wiring them to a factory-wired mainframe. There is no pre-installation fabrication of the system required by the installer. Any system may be installed, tweaked, and tuned in a matter of a couple of days. As an aside, in most cases the Jaffe/TAI Boardroom System is a more economical approach than using conventional microphones, signal processing, and amplifiers.



Figure 3: Basic channel for reflected energy system, which show the components that simulate D.I.F.T.

From an ergonomic point of view, the Jaffe/TAI Boardroom System offers a unique alternative to the massive array of microphones and the associa-

A typical corporate person who wishes to "do something about the sound" in the boardroom may have his requirements fulfilled easily by the architec-

Electronic Architecture For Musical Applications

Backtracking a little, the boardroom systems grew out of Jaffe's ERES concert hall work. But before we talk about ERES, a short review of the pertinent acoustical parameters involved is in order. There are two discrete parts or "fields" following the onset of a sound emitted in a room: A) the early-sound-field, and B) the late-sound-field. The early-field is usually

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considered to be 30 to 60 milliseconds in duration, starting immediately after the initial-time-delay-gap. The initial time-delay gap (ITD) may be defined as the difference, usually measured in milliseconds, between the direct sound from the source and the first reflection. In the early-field, we hear a number of individual reflections which will ultimately play a major role in our perception of the hall's acoustics. It is in the early-field that we perceive characteristics that include the size of the hall, definition, spatial imaging of the source(s), intimacy, and ambience.

Subsequent to the early-arrivals, the later reflection's density, (as observed

in the time-domain) increases as time squared, so the density of reflections becomes extremely high after a short time. Therefore, we are primarily concerned with the statistical properties of the late-field and not its detailed structure. Specific reverberation times for various room volumes and presentations are well-documented in the literature. A cursory look at these reverberation times will reveal the conflicting optimum times dictated by the application encountered in almost any performance space today.

Balancing the levels of energy between the early- and late-field is basically how a hall's liveness characteristics are controlled. This

ratio is also a principal factor in the perceived clarity and warmth of sound. The tolerable range of balance between early and reverberant energy is narrow; a dramatic change in perceived acoustical quality is a result of a minute change in this critical energy balance. And most interestingly for us soundmen, this energy balance remains unaffected no matter how much level or equalization is applied to a sound system; what is required is an alteration in the time or space domains.

In an oversimplified statement, we can say that a hall's acoustical parameters are structured in terms of its components in the early- and late-field, and the balance between the two. The main parameters of a room's sound field can be identified as direction, intensity, frequency, and time, or as we prefer in today's world of "acronyms-for-audio"—DIFT. Understanding the concepts of DIFT, as applied to electroacoustic techniques in halls, one may fully exploit many possibilities not previously obtainable.

ERES, or the more encompassing "Acoustical Field Management Systems," as TAI calls it, takes electroacoustical control over DIFT's parameter. DIRECTION is controlled by the type of loudspeaker and its physical placement. INTENSITY is controlled by the overall gain of the system. FREQUENCY is controlled by equalization. And TIME is controlled by the spatial placement of transducers and additional signal-delay.

More on the early-field now. Because we are able to distinguish them individually to an extent, the precise timing, intensity, and direction of the early reflections are critical in our aural perception. The subjective effect of the early-field's reflections gives listeners an acoustical sense of their physical setting. The length of the initial-time-delay-gap is the first 'link' in the acoustic functions of a space, and psychoacoustically establishes the size of the hall. Using "Acoustical Field Management Systems" a hall's acoustical environment can be modified and controlled by electroacoustically changing the DIFT parameters.

Often Electronic Architecture is an economic alternative to implementing more costly physical changes such as moving or modifying walls and ceilings, or even changing surface ma-

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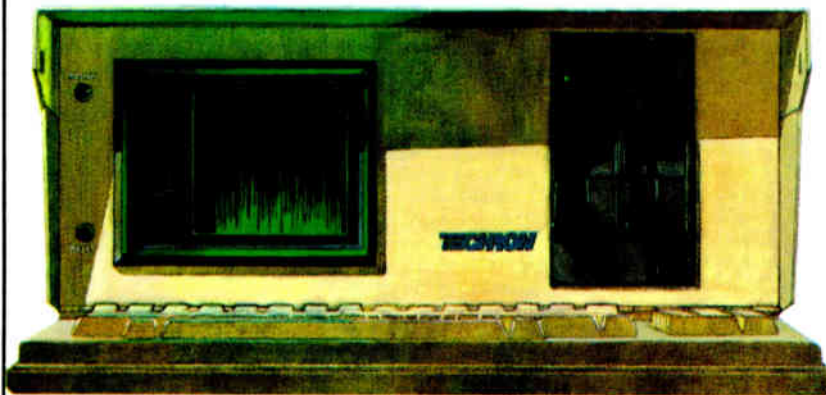
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terials. Electronic Architecture can be called upon to allow more freedom in the artistic-architectural design of a space, allowing for large rooms to sound like small intimate ones. However, one of the more perplexing situations where Electronic Architecture may be used is when the uses of a space have direct conflicts in its acoustical requirements. Besides the obvious multipurpose space applications, houses of worship require short reverberation times and dense "packets" of early reflections to ensure intelligibility and presence. On the other hand, instruments, such as the organ, require longer reverberation times and late-arriving, low-frequency reflections to provide fullness and warmth. These opposing acoustical criteria may be easily accommodated by "Acoustical Field Management Systems."

The implementation of these Electronic Architecture methods is similar to the boardroom systems in that they both use the same mainframe and modules, although configured differently. The loudspeaker/ microphone modules are, of course, replaced
(continued on page 48)

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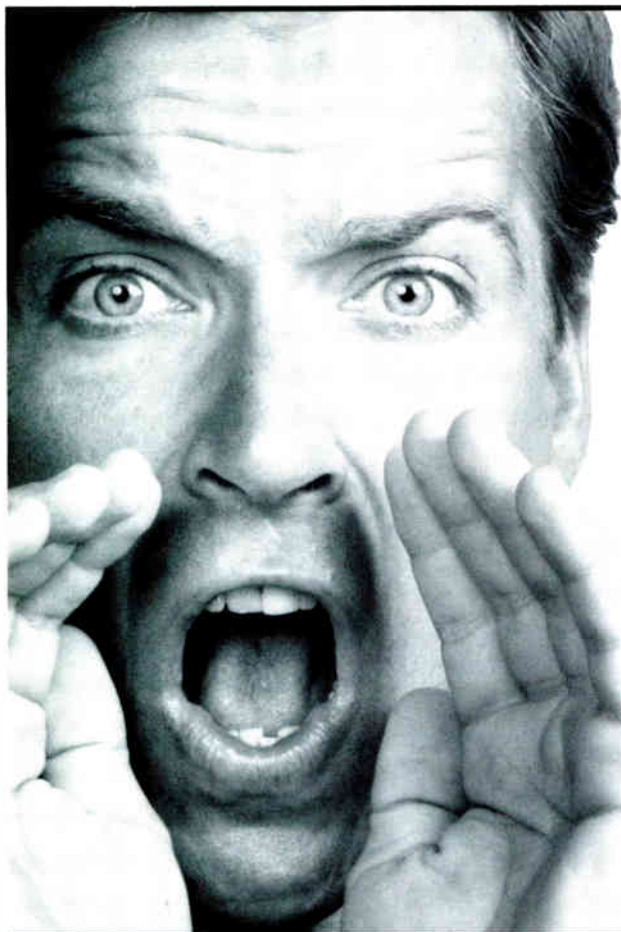
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by John Timinsky –Miami Audio Visual

“Hello, hello. Can you folks hear me in the back? How’s the picture?”



Conference room at Gould Electronics

STEM GUIDELINES

Too often, these questions are asked in poorly designed conference rooms. To remedy some of the problems which contribute to poor audio/visual systems, I will try to explain some of the major considerations which should be made when designing and installing an audio/visual system. Since the discussion of a well thought out design of a conference area would be too broad, we will limit these guidelines to the areas of the most important senses, audio and visual. However, before the audio/visual system can be designed other elements must be evaluated.

The most important element in designing a conference room is a clear and concise evaluation of the customer's needs. These can be broken down into the three basic categories of corporate, hotel, and international/multi-lingual requirements.

The corporate needs consist of areas located inside a company's confines, used exclusively by their personnel. The uses of the conference areas are usually easy to determine, since often only one type of user will occupy the room.

Hotel conference rooms are almost always intended to be utilized by outside groups, requiring a greater variation of facilities to be used. These areas

are of a more complicated nature in determining the exact needs of equipment and technology.

The international conference room is one consisting of possibly the most complicated arrangement of equipment. It is usually intended for meetings using multi-lingual audio-visual equipment. Further complicating the design is the often required multi-translation equipment and formal delegate voting facilities.

To achieve maximum efficiency in any audio/visual system design, it is always important to clearly define the client's usage requirements. This in turn helps the designer to take a group of unrelated components and combine them into a functional, effective, operational system that correctly integrates equipment and technology.

A good sound system is one the audience is unaware of. The efficient sound system is one of flat frequency response and devoid of peaks. To achieve this, careful and precise installation is necessary. The selection and placement of the speakers, amplifiers, and microphones should be done with extreme care and consideration.

The audio mixer can be selected either for stereo or mono operation; however, the mixer should be able to accept different termination impedances and input sensitivities. It is important to



Podium with controls and monitor.



Amphitheater control room rack at Bonaventure.



80-channel automatic mic mixing system at Bonaventure

have sufficient inputs into the mixer for present needs, as well as the addition of more equipment in the future. As a convenient feature, connection can be provided for recording the meeting either at the mixer or in the conference room.

The amplifier should always be selected according to stereo or mono operation relative to the speakers' power handling capacity, then allowed adequate headroom. It is not unusual to find multi-speaker bi-amplified, tri-amplified, or multi-channelled sound systems installed in today's centers.

Wherever possible use balanced line components. An unbalanced audio line can produce many dBs of hum. Most audio/visual equipment is available in balanced line configuration. If not, a high to low impedance audio transformer may be fitted to reduce the chance of outside in-

terference.

In the event a multi-room conference facility is encountered, cabling should be connected from room to room via a balanced audio line panel terminated with 3 pin XLR type jacks. Video cables terminated to a BNC type patch panel in each room will add greater flexibility to the center. With the increased popularity of computers to display graphics and text in meetings, it is good practice to provide modular type telephone jacks throughout the facility that are connected to a termination panel located in an audio/visual control room. Modular type connectors can be called to the telephone panel for connection to telco lines, which will allow computers to communicate via a modem.

To eliminate audio, video, and telephone connectors placed on numerous blank cover plates that

detract from the aesthetics of a meeting room, an "exhibitor" panel should be constructed. A typical exhibitor panel would be fabricated of one-eighth-inch aluminum with four 3 pin XLR audio jacks, four BNC type video connectors (RF or amphenol PL 259s may also be used depending on customer's needs), one telephone modular jack, and one 20 amp AC outlet. Multi-pin remote control sockets to control room lights and projectors may be added to the panel. Exhibitor panel connectors will be terminated to patch panels located in the projection or control room area allowing easy interconnection of audio/visual equipment. Since these panels have connectors on each end, signals may flow either from or to the meeting room. It is also necessary to remember to adhere to the N.E.C., U.L., and local building codes when designing



Video projector lift in the Gould Auditorium.



Audio-video console at Bonaventure Conference Center.



A typical exhibitor panel.

and constructing exhibitor panels. The client should be consulted as to the finish of the panel.

Correct design and placement of exhibitor panels can eliminate audio and video cables from cluttering the meeting area and greatly increase the facility's flexibility and aesthetics.

Another important element of a well-designed conference room is the visual. The visual can be broken down into three categories: projection, video, and lighting.

Projection screens and projection systems are the single most influential items, impacting the intended room's design. Careful consideration must be given to widths and depths of projection rooms and control booths to allow optimum placement of equipment and operators in these areas. Ray Wadsworth P.E. states, "Designing spaces for proper viewing of projected images, whether front screen or rear, is best done by fitting the room around the system rather than by fitting the system into a given space."

Before attempting to determine a projection screen's size it is important to know what kinds of media (formats) will be projected. Every format has its own aspect ratio. The projection screen must be carefully fitted to the projected media's height and width. Seating dimensions can be directly related to a screen's width. Good practice is to locate a viewer no closer than two times image width and no farther than six times the image width. This is known as the "Six Rule." The width of a viewing sector is determined by the viewing angle set forth by the screens' manufacturer. The ultimate width of a viewing sector is a trade-off between optimum viewing area and space economy.

In selecting a projection screen type, note the differences between front and rear projection screens. Front projection screens can cover a 50- to 100-degree viewing sector producing a very bright and sharp image in a darkened room. Rear projection screens allow brilliant images to be shown in normal room light covering a 40- to 50-degree viewing sector. With the rear screen projectors located behind the screen, projected light beams do not cross the room, shadows are not cast by people lecturing to the audience and the facilities windows need not be light tight.

A front projection screen installed directly in front of a rear screen adds to the flexibility of a conference room

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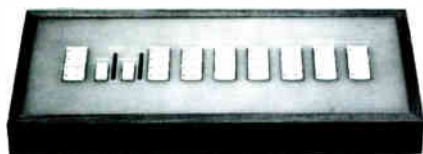
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FROM THE MARKETPLACE

William Fitzsimmons, president of FSR, Inc., Cedar Grove, NJ:

"We've heard clients say over and over that they don't want to see huge cables coming out of the consolettes, and they want modern engraved panels that are simple to operate. Our DL-64 System satisfies all these needs and more. We see an increase in the use of our boardroom control systems, and we credit this to the fact that higher levels of management are becoming more comfortable with properly designed control panels. All of this is underscored by the fact that the products are totally reliable and customized for each installation."

"From a contractor's point of view, this system is a dream come true," said Janice Sandri, vice president of FSR. "He now gets a custom package with standard pricing and delivery. And the remote consolette or lectern panel installs with only four wires. The DL-64 System relieves the contractor of the burdens of panel fabrication, bulky multi-conductor cable and connectors, hours of field installation and supervision."



FSR Inc. offers the DL-64 digital control system which features lectern and consolette panels with engraved key switches and LED lamps, up to 64 modern key switches with lamp feedback, four wires between rack and each remote, up to three analog bargraph displays, and a software package standard for all installations.

The DL-64 is designed so when a button is pushed on the remote panel, the switch closure is encoded and transmitted over the data lines to the DL-64 rack unit. This unit decodes the transmission and provides a switch closure at the corresponding DLI switch card. The actual control of the pieces of A/V hardware (video projectors, tape decks, and lighting) is accomplished as before, with standard FSR modules. Each module has a switch input and provides a lamp feedback signal.



A.R. "Doc" Taylor, president of MacKenzie Laboratories, Inc., Arcadia, CA:

"We're very positive about the industry and that our segment is growing. The most noticeable trend today is that video communications is coming more and more into play. And it's the person who's conducting the meeting who is controlling the video. As far as screens are concerned, larger boardrooms are using large screen projection, while smaller rooms are using video monitors."

MacKenzie offers Z-MAC Modular A/V Control Systems which consist of modular sub-assemblies integrated like building blocks. Master Panels contain Command Modules made up of push-buttons and rocker switches. Commands from the panels arrive at the rack-mounted Equipment Control Modules via low-voltage interconnect cables. Low voltage cables from the rack are connected to the audio/visual equipment being controlled.

Mario Maltese, president of TSI, Mineola, NY: "1985 was a very good year for TSI and the audio/visual industry, and we expect 1986 to be even better. TSI provides audio/visual systems to corporations in boardrooms, conference rooms and training centers, TSI's profits generally follow corporate profits. When corporations do well, so does TSI. As more corporations install permanent audio/visual facilities, we're finding the corporate attitude shifting. No longer are audio/visual systems looked upon as a luxury, but a necessity for clear communication."

TSI's Vice President, Garani Srinivasan, said, "I see a definite trend toward linking computers through video projectors to display computer graphics. I also expect audio teleconferencing to expand and command a

larger portion of the market. Video teleconferencing, on a large scale, is still several years away due to high costs. But he said audio teleconferencing is quite affordable."

TSI recently introduced its Audio Monitoring and Volume Indicator Panel (MVI Series), an instrument approach to sound system monitoring for use in projection booths, control rooms, studios, and TV broadcast facilities.

The MVI has up to three channels, each with a high impedance input, and accepts 70 volt, 25 volt, and 8 ohm power amplifier sources, as well as line level sources.

The MVI's visual bar display offers a 40 dB window and monitors volume independently of the amplifier loudspeaker section. When field adjusted, the MVI can sample the volume of distributed loudspeakers in other rooms.



For aural monitoring, all channels are mixed into a two-way, bi-amplified (10 watts low frequency, 5 watts high frequency) loudspeaker system. The typical sound pressure level is 95 dB-SPL at one meter from the panel. A front panel headphone jack is fed from its own 2 watt amplifier.

TSI has also introduced Syscon, a completely prepackaged control system ready to install. Both engineering and wiring are part of the package.

Syscon includes a card cage containing all necessary plug-in control cards for an audio/visual system. Also included are punch blocks, power relays, L.E.D. status indicators and a system power supply. Installation is easy using simple punch block terminations.

MORE PRODUCT

Panasonic's Audio Visual Systems Group recently introduced the PT-101 video/data projection system. The system features adjustable focus

lengths for small screens (PT-101/72) that are 50 to 85-inches diagonal; and for larger screens (PT-101/120) that are 85 to 120-inches diagonal. With optional interface the PT-101 can talk to the IBM PC or any of the compatible computers. The system's picture features 400 peak lumens with Panasonic's liquid-cooled CRT design; and a horizontal resolution of 800 lines (RGB).

The PT-101 can also be used overseas where NTSC, SECAM, PAL and NTSC 4.43 are used. An optional carrying cart for inter-office use adds to the system's flexibility.

Studer Revox offers two audio recorders for A/V applications, the PR99 MKII and the B77.

The PR99 MKII features a real time counter, autolocate, zero locate, and loop functions. A special version of the PR99 offers auto reverse.

The B77 is available in a variety of formats and speeds from 15/16 to 15 ips. According to Studer Revox, this unit is easy to set up and use.

Both the PR99 MKII and the B77 offer die cast chassis, full logic controls, servo capstan motors, and feature Swiss-German engineering.

Sharp offers a full line of A/V products from two-projector slide/sync recorders to a 10-watt "classroom" recorder with two-speaker system to high-performance dynamic microphones.

Last year Sharp introduced a new Professional Series of Recorders featuring the RD-685AV and the RD-680AV. Both recorders' speaker systems include a separate woofer and tweeter for better sound clarity. Features also include full auto stop and built in PA system, and an all-metal tape transport.

The RD-685AV also offers a flexible sync system for producing and presenting both slide/sync and dissolve shows. The unit is compatible with external programming units and has a program stop ability. The RD-680AV and the RD-685AV have a suggested list prices of \$225 and \$299 respectively.

Sound & Communications recognizes that this is just a representation of the wide variety of products which are available in the audio/video industry. Manufacturers of A/V products not represented here are welcome to submit them for publication in future issues of Sound & Communications.

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by allowing projection from the meeting area.

Today video equipment is making a tremendous impact on audio/visual conference rooms. Three systems are presently being used in the United States for industrial type applications; three-quarter-inch U-matic, one-half-inch VHS, and one-half-inch Beta. Corporate clients usually used the three-quarter-inch U-matic. Hotels may use all three formats. International clients use multi-standard equipment, (PAL, NTSC, and Secam) in one or all of the formats.

Television monitors strategically placed will function sufficiently in small meeting rooms. These monitors can be purchased with RGB TTL connectors allowing the monitor to reproduce computer generated images.

Video projectors can be used instead of multi-monitors to produce images up to 25-feet in width. Video projectors can be front rear screen projected. Floor or ceiling mounted video projectors are increasingly popular for viewing computer generated displays and are available with several input specifications: for example, RGB TTL, RBG Sync or green, composite

video and automatic selecting multi-standard units. All video equipment inputs and outputs should be brought out on to patching panels. This will

“After narrowing down the needs of the specific type of conference room and by maintaining these basic guidelines, a properly designed plan should result. Always keep the senses of audio and visual in their proper perspective and utilize the elements that enhance those senses most effectively.”

allow easy interface with other equipment and connection to exhibitor panels.

Most designers think of the audio

and projection requirements in advance, but not as many also give lighting the consideration it requires.

In any meeting room, light can be used to create audience moods as a tool to dramatically assist a speaker. Lighting in these rooms should be variable and controllable. Avoid placing lights where they will illuminate the projection screens. The audience area lights should be on one system and the speaker and stage area another. Lighting instruments intended to illuminate the stage area should be controllable by barn doors or framing shutters. Ideally, stage lighting instruments should be located in properly positioned and designed slots in the ceiling and on each side of the stage. Remember to match color temperatures of all the room lamps to avoid “color shifts” when photographing or video taping.

After narrowing down the needs of the specific type conference room and by maintaining these basic guidelines, a properly designed plan should result. Always keep the senses of audio and visual in their proper perspective and utilize the elements that enhance those senses most effectively.

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It used to be when one thought of security, one envisioned alarms, guards, and sentry dogs. But within the last decade, the security market entered into an era of sight and sound electronic security systems. Closed-circuit television (CCTV) and video intercom both have made a strong impact on the market, which to some manufacturers is only a "scratch on the surface of their products' potential."

CCTV was the first to hit the U.S. market. In recognizing the product's potential, many people jumped on the CCTV bandwagon in anticipation of great profits. But many of those who jumped on were inexperienced and unknowledgeable to the marketing and performance of CCTV. Bad installations and sales, in addition to poor servicing, resulted in a bad image of

CCTV in the marketplace. But many of these "get rich quick" dealers have dropped out of the market and with the addition of more sophisticated systems the future is brighter for CCTV.

Video intercom, the newcomer to the market, is, as many manufacturers have reported, on the verge of a huge success. Realizing the future need of security systems, particularly in the single home and multi-residential markets, manufacturers are gearing up to offer high quality, attractive, easy to install systems. Jim Morrison, the national sales manager for Aiphone in Bellevue, WA, said, "We predict that five years from now home security systems, including intercoms, will be as commonplace as microwaves are now in new homes."

Sound & Communications interviewed several manufacturers



STUART WEISS

from the CCTV and video intercom industries and shares their views here on the present status of as well as the future of sight and sound electronic security.

"Video intercom is a fast growing industry," Morrison said, "which five years ago was almost unheard of. Voice identification is no longer sufficient, you almost have to have visual identification. And video intercom is the answer."

Improved technology and increased production has made newer systems less expensive than the older ones. Because of this, according to Morrison, it will be one of Aiphone's major thrusts this year to penetrate the residential/home market. Aiphone said that it sees a real need for video intercom in the home in the 1980s because of the advent of latchkey children and the increased population of senior citizens, two groups which are very vulnerable.

In reaction to this new market approach, Aiphone is offering what Morrison calls "our new concept in video intercom."

"The traditional video intercom had an outside station and an inside station which featured a monitor with a telephone," he said. "Our new concept of video intercom offers a choice of video only, video and intercom, or intercom only. Single family residents or multiple family dwellings can mix and match which kind of system they want. For example, intercom only in the children's bedroom and garage, and video and intercom in at the front door."

Aiphone's new VB video entry security system is designed for apartments with two to 60 units. At the outside entry door, a vandal-resistant polycarbonate door station houses a miniature wide-angle TV camera and a speaker-type intercom.

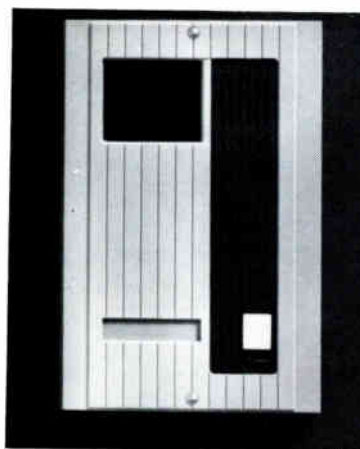
Inside each apartment, video monitor units with an instant-on four-inch flat TV screen give a clear picture of the caller. The accompanying handset-type intercom features a volume control and door release button. Up to two video monitors and two intercoms may be used in each apartment.

When an outside call button is pushed, a lamp automatically illuminates the caller with a soft, unobtrusive light, and the TV camera turns on. A chime sounds inside the apartment, and the caller's image is immediately displayed. The resident can pick up the intercom to speak to the

caller, and can unlock the front door with the door release button. Optional features include directory illumination and electric door release.

"This system offers complete communications privacy. There is no possibility of interruption or monitoring by another apartment station," said Hiko Shinoda, Aiphone president.

The new MB Series video for homes is a stand-alone system that can also be integrated with Aiphone's compatible IC-2AD voice intercom system. It is designed to provide positive visual identification of the caller at a fraction of the cost of a CCTV system.



Aiphone's MB Series

The MB monitor units feature a new, four-inch flat screen for clear viewing, and an optional door release button. Two types of door stations—one diecast, the other polycarbonate plastic—house a miniature TV camera under a weather and vandal-resistant shield. An illuminator light and door release are available options.

Integrated with the IC-2AD telephone intercom, the system can accommodate up to three intercom/video monitor stations, one video door station and an optional audio-only door station for a second entrance. If more than three inside stations are required, the video can be combined with Aiphone's TBF and TBH intercom system.

But the home/residential market, although the largest in terms of sales, is certainly not the only market for video intercoms.

"I did about 75 seminars last year in about every state in the U.S. at which about 15 to 50 people attended. And I would say from their reports, we sell these (video intercoms) just about every place," Morrison said. "People want these systems in any place where voice identification isn't enough and visual identification is necessary—like movie theater offices, banks, high-tech industries, and hospitals."

Has video intercom had any affect on the CCTV market as far as taking over some of the market dollars?

"Six month ago I probably would have said video intercom wouldn't affect the CCTV market, but now we have the MB series which is capable of connecting with a CCTV camera for surveillance! Yet, I don't see it affecting applications that you would want multiple CCTV cameras, such as factories," Morrison said.

Paso's intercommunication division, Elvox, manufactures the 5000 Series of video intercoms. This series includes the 5400, a six-inch screen wall recessed monitor; the 5401, a 4.5-inch screen wall surface monitor; and the 5402, a desk monitor with a six-inch screen. All the units, which incorporate a handset, power supply, video splitters, and accessories, are manufactured and designed for Elvox in Italy.

Paso also offers a digital variation of the systems, which requires no coaxial cable. According to David Moore, sales manager at Paso, in Pelham, NY, the digital system is ideal for retrofits or any situation in which the coaxial cable can't be pulled.

"Applications for video intercoms are branching out from tenant/multi-residences to industrial applications," Moore said. "The big dollars and the big business are still in the multi-resident installations in large urban areas. This is because people are drawn to the city and downtown areas where buildings from industry are being converted into apartments and

office space, particularly in Chicago, New York, and the newly converted areas on Boston's waterfront.

"Noticeably, in the west and southwest where the cities are more spread out and fairly newer, these systems are not as popular," Moore added.

Noting that the aesthetics of the system are very important particularly to the specifiers, Moore said, "Typically these units go into high-end buildings which are naturally concerned about looks. The Italian industrial design is renown worldwide for its 'sleek design.'"

Paso's video intercom was recently installed in the Astor Terrace condominiums on New York's upper East Side. "These people are paying a quarter of a million dollars minimum for a condo, therefore they wanted *total security*—something very functional and very attractive," Moore said.

Design and aesthetics, particularly in the video intercom segment of the security market, are growing in importance. Recently, Siedle Intercom of Wynnewood, PA, introduced a new video intercom which not only features advanced technology, according to Siedle President Earl Zausmer, but "looks Buck Rogers."

"Customers were saying, 'I'm paying you a lot of money, but our unit is very mediocre looking,'" he said. With the new system, according to Zausmer, clients just see the system and say, "I've got to have it."

"We sold 82 units the first month it was out," Zausmer said. "The looks and versatility make the unit more expensive, but it's selling. People are paying more because the new system looks good."

The new unit features a liquid crystal flat screen and is about three-inches deep from front to back approximately the size of a Trimline phone. A Saticom™ auto iris in the camera adjusts to the light and allows the camera to see in dark areas. Unlike most systems, the camera has no preheat, so the unit is off when not in use. Options include solid brass buttons, engraved and filled with black. The new unit can also be hooked up to CCTV cameras for surveillance.

"I don't see technology going much further," Zausmer said. "It's all in the design now."

Like Siedle and Paso, Elbex America in Carson, CA, also recognizes the

intercoms, but views the market a little differently.

"When we developed our Video Interphone, we paid close attention to price, quality, and aesthetics," Cameron Cotril, senior engineering manager, said. "Once people realized that the system worked as well as it looked, orders dramatically increased. I think today we're just scratching the surface of the potential of the product."

Elbex America offers the Video Interphone System in single family and multi-residential units. Both systems have full audio and video communica-

tions to up to two entries and both can be activated from the front entry panel or from the inside monitor. Cotril said Elbex is working on a more sophisticated system which will work with up to five entries. In addition, both systems are in a standby state when not in use, although the image tubes are kept heated. And both the multi-residential and single family units feature the no-response capability in which a resident can visually screen who's at the door without answering the call.

(continued on page 37)

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dbx 163X COMPRESSOR/LIMITER

by Charles Bilello

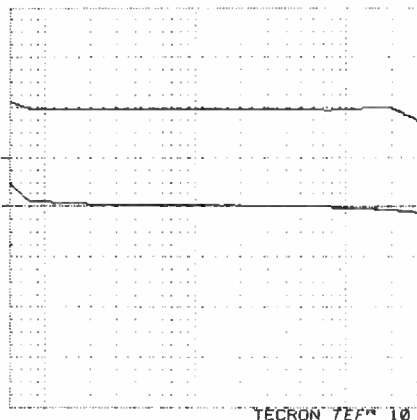
Compressor/limiters have been valuable tools and, at the same time, sources of confusion and the victims of misuse ever since their inception. Many people do not fully understand the concept of compression and are totally befuddled by all of the knobs: attack time, release time, threshold, output level and so on. The complexity may cause people not to use a compressor where some compression might make a marked improvement. On the other hand, the same complexity can cause a degradation in the final sound when the compressor is improperly set up.

dbx simplified the compressor/limiter in the dbx 163 and continues the effort with the 163X. The dbx 163X Compressor/Limiter is about as uncomplicated a compressor as you can find. It has only two front panel controls and only one of them is likely to be used most of the time. The unit is one rack space high 1.75 inches and on-half-rack width. It is supplied with rack mounting hardware for a single unit or for mounting two units side by side. The rear of the unit has one input and one output connector, both one-quarter-inch phone jacks, and a one-quarter-inch tip, ring, sleeve jack for stereo strapping. A push button switch places the unit in either master or slave mode for stereo operation. Also on the rear is a slide switch that selects either 110 or 220 volt operation. This switch, although flush with the case, is easily moved. Having it set in the 220 volt position when plugging it into 110 volts should cause no major catastrophes. However, plugging the unit

into 220 volts with the switch set for 110 volts could set off your smoke detector.

The front panel contains a "Power" LED and a second LED to indicate when the unit is in the stereo slave mode. A 12 LED horizontal bar display shows the amount of compression (from 2 to 30 dB) that is being applied. A slider below the bar display controls the amount of compression while a "Level Set" thumb knob controls output level.

Figure 1



Magnitude (upper curve) and phase (lower curve) of dbx 163X, 3 dB and 45 degrees per/division vertical, 0 to 31,699 Hz logarithmic horizontal, 7 Hz resolution.

Also provided on the front panel is another one-quarter-inch jack input. This input, marked "Hi-Z," is intended for plugging musical instruments

(guitars, synthesizers, etc.) directly into the 163X. The rear panel input is disconnected when a plug is inserted into the front panel jack. Actually, this jack should more properly be labeled "Hi-Gain." Both inputs are high impedance (391 kilohms). The only difference between the two inputs is that the front panel input can provide anywhere from 0 to 20 dB of gain relative to the rear panel input. The amount of gain is determined by a recessed screwdriver pot on the rear of the unit.

Figure 1 shows the magnitude and phase response of the 163X from 0 to 31.7 kHz. The maximum input level that the unit was capable of handling was +19 dBm. The maximum available input power (L_{AIP}) from the 22 ohm output was +28 dBm. The output is designed to drive loads of 600 ohms or higher. The gain adjust pot for the front panel input was found to provide exactly 20 dB of gain just as the manual indicated. Also, the front panel "Level Set" pot provided an operating range of 31 dB, as marked, and was well calibrated to its markings. I found it very refreshing to have controls operate exactly as marked or indicated in the operator's manual.

Compressors operate at unity gain until the incoming signal level exceeds a preset threshold level. As the incoming signal level increases beyond the threshold, the gain of the compressor is reduced. The amount of gain reduction is dependent upon the compression ratio. The compression ratio is an indicator of the compressor's operation. It is the ratio of input level change to output level change. For ex-



ample, if the input level increases by 8 dB and the corresponding change in output level is 4 dB, then the compression ratio is 8:4 or, more commonly 2:1.

Figure 2 shows some typical compression characteristics. The line marked "1:1" is a linear, or no compression, characteristic. What goes in is what comes out. The line marked "2:1" is mold compression. Here the dynamic range of the signal is reduced by a factor of 2. The "20:1" line is a higher compression ratio. Ratios this high are more commonly called "limiting." With a limiting characteristic, the signal is allowed to reach a preset level (the threshold) but no higher.

These first two compression characteristics feature a "hard" knee. The compression begins abruptly when the signal reaches the threshold level. This type of compression characteristic can, under some circumstances, sound quite unnatural. A singer, for example, may begin to sing louder and, upon reaching the threshold level, suddenly sound "squashed" as the compression kicks in and holds the level down. The 163X compressor/limiter uses what dbx calls an "OverEasy" compression characteristic. This is a so called "soft" compression characteristic which comes into play gradually as indicated in **Figure 2**. There is still a threshold, but the compression ratio

increases with increasing level and will provide a more pleasing sound in the example above.

The compression characteristics of the 163X are shown in **Figure 3**. The line marked "L" is the compression that occurs with the slider at the far left. The lines marked "LC," "C," "RC," and "R" are the resulting compression with the slider set to left-center, center, right-center, and right respectively. The "Linear" line is included for reference. All of the curves in **Figure 3** (with the exception of linear) were taken by increasing the input level to the unit up to its maximum (at the right side of the graph). The slider appears to be varying the threshold. This is not the case.

Figure 4 shows the time response of the 163X compression for five slider settings. This figure shows output level versus time where the left most slider setting is the lower curve and the curves above are made with the slider set progressively further right. The right most slider setting is the upper curve. The slider positions used are the same as for **Figure 3**. Notice that as the slider is moved to the right, the output level increases.

The 163X operates, essentially, with a fixed threshold. The slider, when moved to the right, adds gain to the signal and brings it up to, or closer to, the threshold as desired. When the

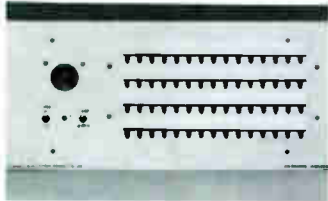
signal reaches the threshold level, the soft compression begins. The lower curve in **Figure 4** shows no compression at all. The next curve up shows a barely perceptible amount of compression. The middle curve shows that the signal level is greater than the threshold and compression is applied. At the far right side of the middle curve, the signal is at full amplitude and uncompressed. At the second vertical grid line, the compression is in effect and has reached its final level. The compression process has taken approximately 94 msec.

Figure 5 shows the effect of the level set control in amplitude versus time. Here, the slider was set fully right and the level set control was set, bottom curve to top, at -20, -10, 0, and +10. Notice how the curves have almost reversed positions with those of **Figure 4**. The level set control sets the output level that the 163X tries to maintain. When set to -20 with the slider all the way to the right, a lot of compression is needed to keep a hot signal level down.

The key to the simplicity of the 163X is in the actions of the slider and level set controls. They combine to determine the equivalent threshold and output level of the unit. Setting up the unit for use is as easy as one, two, three. First, with a signal applied, move the slider all the way to the right.



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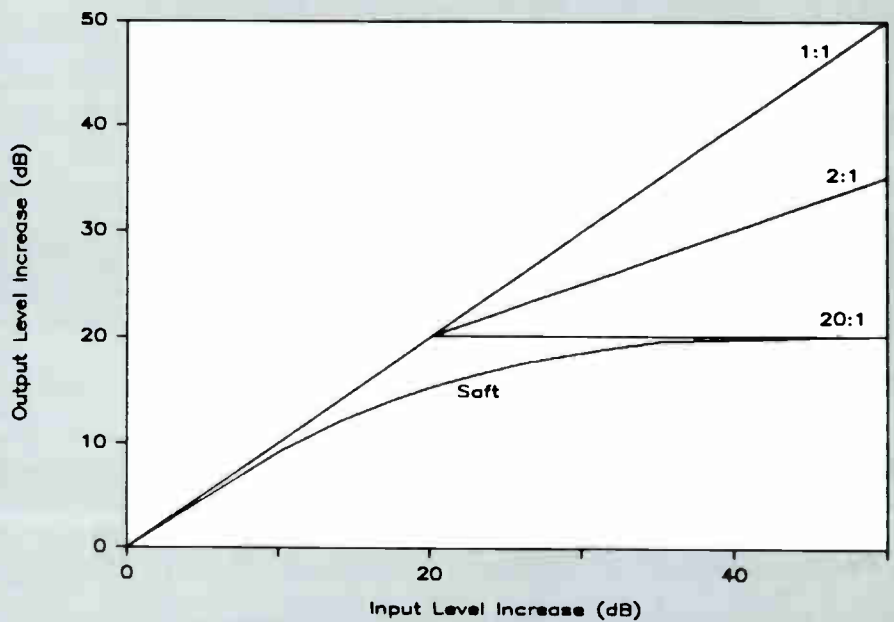
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Figure 2

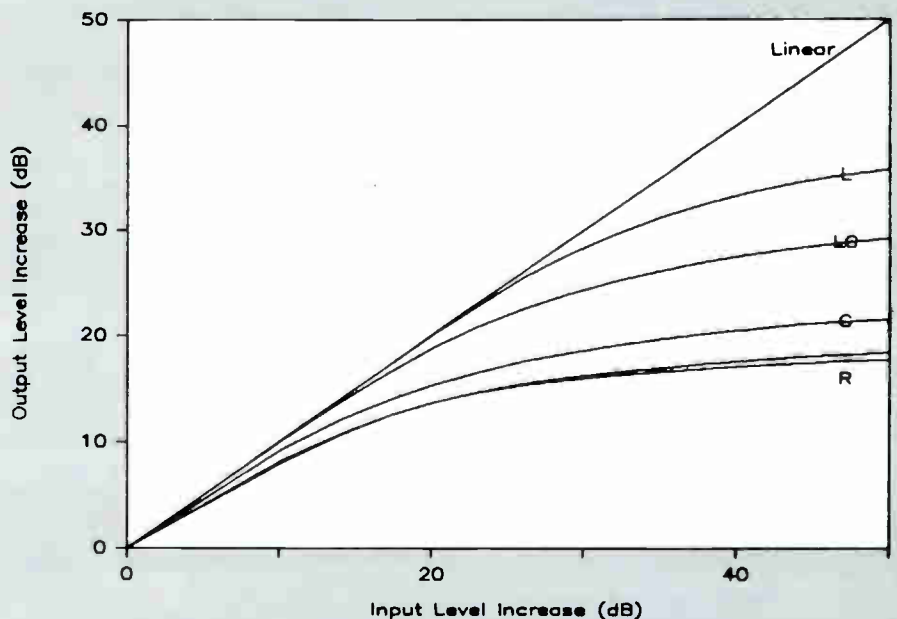


Typical compression characteristics, output level increase as a function of input level increase.

Second, adjust the level set control for the desired output level. Third, adjust the slider for the appropriate amount of compression. That's all there is to it. If you adjust the level set control such that the 163X provides the same output level with the slider to the right as it does with the slider to the left, then the slider may be used freely to vary compression only.

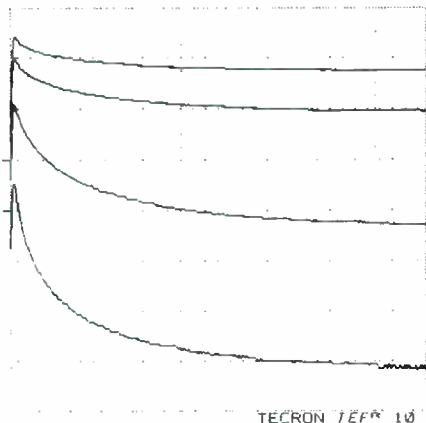
Judging from the manual, dbx has apparently aimed the 163X at musicians and/or the less technically inclined. The manual talks about "adding punch" and "fattening kick drums." This is fine. The simplicity of the 163X makes it ideal for those who are more artistic than they are technical. But the 163X is just as useful for the technical types. While the complexity

Figure 3



Compression characteristics of dbx 163X for five slider positions (see text), output level increase as a function of input level increase.

Figure 4

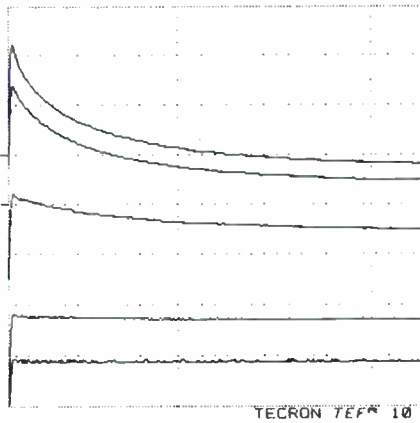


Effect of dbx 163X slider for five positions (see text), 3 dB/division vertical, 0 to 107 msec linear horizontal, 20 msec resolution.

of full featured compressors translates into versatility in the hands of a knowledgeable and experienced operator, it would sure be nice, when mixing a live show, to reach for one control to adjust a compressor instead of fumbling around with three or four.

The manual also provides some suggested applications including "preventing PA overload." In this application,

Figure 5



Effect of dbx 163X level set for four positions (see text), 3 dB/division vertical, 0 to 107 msec linear horizontal, 20 msec resolution.

I would prefer a compressor with a hard knee for this application. With the compressor set for a limiting ratio, the PA system will operate linearly up to its maximum capabilities and then be prevented from blowing up. In order to get similar protection with a soft knee, the compression must begin at much lower levels. This can greatly reduce the dynamics of louder sounds.

Where the desire is to apply some reduction to the dynamic range of a singer, instrument, or an entire mix, or to "fatten a kick drum," the soft knee is ideal.

dbx has traded some, but not all, of the versatility of full featured compressor/limiters in the design of the 163X. The trade off was, I think, a good one. In situations where time is limited, especially live performances, the simplicity of the 163X could be a lifesaver. Those who would otherwise be hesitant to use a compressor may now find the courage. Be careful however, the 163X may be just as easily misused as any other compressor. The most important instruction provided by dbx in the 163X manual is: "Educate your ear—and then use it to guide you." I couldn't agree more.

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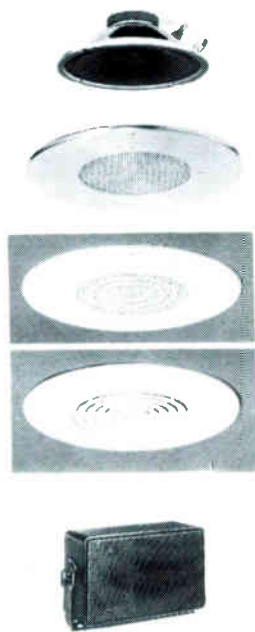
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The Editor

Sound & Communications
220 Westbury Ave.,
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SECURITY

(continued from page 31)

"For video intercom the market demand has been very good. It has really taken off since Elbex's introduction of its Video Interphone a couple of years ago," Cotril said. "Based on the response to the product, the market was essentially untapped."

The single family unit is designed to be expandable within the living area with up to five handsets and/or monitors, each with the ability to control the entry units.

According to the company, the multi-residential system can service from two to an infinite number of units.

As a company which manufactures both video intercom and CCTV, Cotril said that there is very little competition between the products. "They service completely different areas of the market. Video intercom is geared more to the home builder, building construction, and the alarm people. CCTV is aimed more at factories and businesses for surveillance purpose. Although much of our experience and technology in CCTV contributed to the development of our Video Interphone, there is very little overlap between the two. It's like dealing with two separate companies."

"It's difficult to predict what will happen five years from now. I think the video intercom monitors will have

flat screen technology and color. At the present time the price is prohibitive for color. But I think Japan will develop the color liquid crystal technology which will not only be practical but mandatory," Cotril said.

Elbex America also offers a full line of CCTV products with its most sophisticated introductions being the EX-915 camera and the 2025 switcher. According to Cotril, the camera takes a new approach in terms of design. "It simplifies things by integrating a number of basic building blocks into a single piece of hardware," Cotril said. "Typically if you want a camera that pans, tilts, and has a zoom lens, you have to get the camera, then order a separate lens and a separate pan and tilt unit. In addition, it takes two or three sets of cable running to the control room which connects to three different control units. Our EX-915 integrates all these functions into one. Aside from the power cable, there is only one other cable running to the control room. And a video switcher controls the zoom lens and pan/tilt features. This system is also simpler to install, simpler to maintain, and costs less in a typical application."

"At present, the CCTV market is a little soft," Cotril said. "In the last five years a lot of little companies have come and gone. Most were inexperienced and a lot of installations were done where it was not what the customer needed or wanted. These com-

panies broke a lot of basic rules, like what types of cameras are required for what types of installations. And there was a lot of fierce competition among dealers. Many were in over their heads. They didn't give the right answers to questions or explain the whys and whats. They gave a lot of people the impression that these systems would never break down. Naturally, this created a lot of ill will toward CCTV. The industry has been going through a shake-out which it is just beginning to come out of now."

"CCTV in the future will see higher levels of integration with easier to install units," Cotril said. "And a lot of cameras will be using a single chip. We probably won't be the first on the block with this new technology, but we will be a major factor because we're going to do it right."

Another company which offers both video intercom and CCTV is Crest Electronics in Los Angeles, CA.

Crest's video intercom is called Entravision. The system offers door entry, door strike release, multi-location, internal activation, and a no-response feature which allows the user to see who's calling without having to respond to the call.

"Condominiums and multi-unit businesses are the biggest buyers of video intercoms as far as dollars are concerned," said Dennis Castelli, national sales manager of Crest.

(continued on page 47)

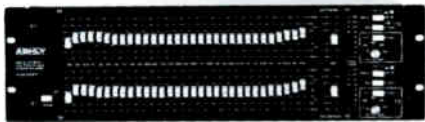


KATL video intercom outside camera unit from Siedle.



Siedle's M0501 monitor flat screen (left), HT411 intercom handset video (right).

PRODUCTS IN REVIEW



ASHLY AUDIO DEBUTS STEREO 31-BAND GRAPHIC EQ

Ashly Audio has announced the release of its GQ231 graphic equalizer, a stereo 31 band, utilizing ISO standard one-third-octave frequency division from 20 Hz to 20 kHz. The range of cut or boost is selectable to either 6 dB or 15 dB, and a tunable high pass filter on each channel offers a range of 8 Hz to 200 Hz.

According to company spokesman Bob French, "Ashly is targeting the upscale equalization market with our GQ-series of graphics. We are offering a combination of features and performance simply not possible in less expensive products, and yet our price range is extremely competitive to units of comparable value."

French added that all three models in the GQ-series are available for immediate delivery.

□ Contact: Ashly Audio, Inc., 100 Fernwood Ave., Rochester, NY 15621; (716) 544-5191.

Reader Service #45



FANE UPDATES & ADDS NEW MODELS SPEAKER SERIES

The Fane Classic Series Loudspeakers have been upgraded in specifications and enlarged in its product range.

The new models in the Classic Series are the Classic 8/50, a durable, high efficiency eight-inch 50 watt loudspeaker, which is suitable for most installation applications, small monitors and small powerful guitar amplifiers. The Class 12/150C has been made obsolete; replaced by the new model, the Classic 12/150. This new model features a 2.5-inch diameter

glass fiber coil, a large ferrite magnet system providing high efficiency power levels of up to 150 watts RMS. The Classic 12/150 is suitable for applications of musical instruments, mid bass for live sound reinforcement and mid-range devices for recorded music.

□ Contact: Fane America, P.O. Box 2344, Fort Worth, TX 76113; (817) 336-5114.

Reader Service #46



AIPHONE INTRODUCES PRIVATE INTERCOM SYSTEM

A completely private telephone-type intercom, expandable to 90 stations with three talkpaths and with a wiring distance of up to 1.8 miles, is now available from Aiphone Corp.

The Aiphone YAZ system eliminates all crosstalk and eavesdropping, according to Hiko Shinoda, president of the company. The YAZ system can also be used in schools, hospitals, offices, factories, banks, and other places where privacy, long wiring distance, and a large number of stations are required, he said.

"The YAZ is a self-contained system that offers microprocessor features without the added cost of a central exchange unit," Shinoda said. Approximate cost for a typical 30-unit is about \$230 per station.

Optional adaptors also can be added to allow paging with or without talk-back, zone paging, background music, and fingertip control at each station of

external devices such as lights and gates.

□ Contact: Aiphone Corp., P.O. Box 90075, Bellevue, WA 98009; (206) 455-0510.

Reader Service #47

SOUNDOLIER DEBUTS VISUAL NURSE CALL SYSTEM

Soundolier has introduced its Visual Nurse Call System which features solid state components, decorative styling, quick connect terminations, and remote stations on standard one gang wall plates.

Soundolier's Master Control Consoles are available in either desk or recessed wall versions. Visual annunciator panels are available in modules of 10 lamp indicators. Up to four visual annunciator panels may be installed in the master consoles allowing assembly of up to 40 room indicator lamp assemblies. Since all indicator lamps are LED, long life and low current drain are assured.

Single and dual bedside stations are assembled to one gang stainless steel wall plates thus requiring one gang E.O. wall boxes for the entire system, regardless of system configuration.

Corridor and Zone lights are wired and assembled to one gang stainless steel wall plates with injection molded translucent lenses. Corridor lights are available with one, two, or three lamps. Zone lights have two indicator lamps. Incandescent lamps are used for all Corridor and Zone light assemblies for maximum light intensity.

A 24 VDC power supply and separate audio visual control module complete the component modules needed for a complete system installation.

□ Contact: Soundolier, 9380 Watson Industrial Park, St. Louis, MO 63126; (314) 962-9870.

Reader Service #48



SONY PROFESSIONAL'S FIRST DUAL CHANNEL POWER AMP

Sony Professional Audio Division has announced its first power amplifier.
(continued on page 39)

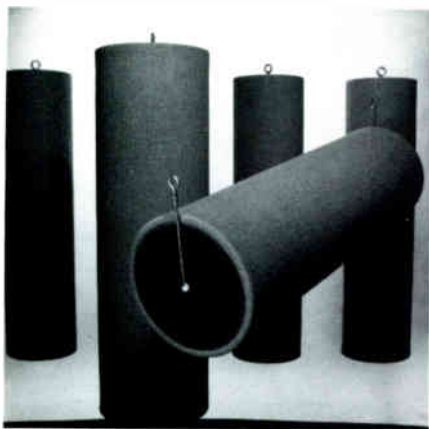
PRODUCTS IN REVIEW

a closer look

by gary d. davis

ASC ACOUSTIC TREATMENT SYSTEM

Acoustic Sciences Corporation (ASC) has developed a line of "Tube Traps," tube-shaped acoustic devices designed to absorb low frequencies, primarily below 400 Hz. Intended to be placed in the corners of a room, they convert pressure gradients into velocity gradients, and then absorb the moving air particles with a passive, acoustic R-C filter. The filter consists of a complex absorptive surface (the "R") and the volume of air in the tube (the "C") which are carefully tuned to absorb maximum acoustic power at low frequencies. The three-foot long by 11-inch diameter tube exhibits 15 sabin absorption from 80 to 300 Hz, although its broad peak provides effective absorption from 400 Hz down to 40 Hz. The nine-inch diameter tube exhibits 10 sabin maximum absorption, and is good down to about 60 Hz.



Other tubes are available that go down to 10 Hz, and there are half-tubes, for side wall mounting, which go down to 200 Hz and reduce L-R crosstalk and tweeter sidehash without sacrificing liveness.

To avoid absorbing too much high frequency energy, a suspended limp mass in the frontal half of the tube acts as a high frequency choke, reflecting highs back into the room, while transmitting lows into the tube for absorption. By rotating the tube, the effect of the HF choke can be reduced, thus pro-

viding 5 to 10 sabin of additional absorption across the mid and high frequency portion spectrum. (To avoid creating a "honky" resonance as the choke in the tube faces the corner, this should be done only when the surfaces in the corner are somewhat absorptive.)

The ASC tube trap claims numerous benefits for the control room or other critical listening environments. It reduces the room "Q" by four, and damps standing wave room resonances. By placing tube in the corners behind loudspeakers, the first reflection at low frequencies is all but eliminated. This, in return, eliminates a significant source of phase shift (up to 15 degrees) so that imaging is improved, as well as amplitude distortion (up to 25 percent) so that comb-filtering is reduced.

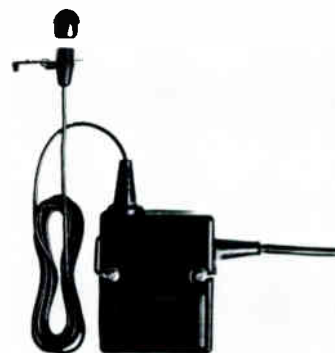
Multiple three-foot tubes may be stacked to completely occupy a corner, and hardware also permits tubes to be suspended horizontally along ceiling-wall boundaries. These tubes are thought to be the only commercially available, easily installed, broadband, low frequency absorption/diffusion devices on the market. They are lightweight, portable, and sturdy.

The ASC Tube Trap is not a Helmholtz resonator, nor a diaphragmatic device, so it effectively absorbs a wide band of frequencies. Each Tube Trap is said to make a measurable, audible difference in the room acoustics. Not only are they claimed to clean up low-end "muddiness," they also are said to reduce articulation loss and thereby improve intelligibility of speech. They have strong potential for the classroom, the board or conference room, and are being evaluated for use in hard-of-hearing classrooms where the improved articulation is especially important. Symphony orchestra evaluation of tube traps between tympani or string bass and the shell, and on the floor in front of these instruments, has shown a noticeably "cleaner" sound, and the musicians claim they can better hear themselves (and each other) for staying in tune.

When used in high-fidelity equipment dealers' listening rooms, the tubes made it possible to hear significant differences between average and top-of-the-line audiophile loudspeakers (improving high-end sales). ASC seems to have an interesting product that bears your closer look.

Contact: Acoustic Sciences Corporation, P.O. Box 11156, Eugene, OR 97440; (800) ASC-TUBE or (503) 343-9727.

Reader Service #57



EV MINIATURE, OMNI, ELECTRET LAVALIER MIC

According to Jim Long, pro sound marketing services manager at Electro-Voice, the frequency response of EV's new RE98 miniature, omnidirectional, electret lavalier microphone is carefully tailored to provide full-range, well balanced sound for both broadcast and sound reinforcement applications.

"The RE98 doesn't have the limited dynamic range typical of electret lavalier microphones powered by low-voltage batteries," Long said. "Instead, it's 10 dB greater in sensitivity than conventional electret lavaliers and will accept 20 dB greater input SPL before overload. Superior signal-to-noise ratio and headroom mean the dual-powered RE98 can be used in recording and sound reinforcement applications where other miniature electrets would fail. It's excellent, for example, for stereo spaced-omni recording, binaural recording or close mik-

(continued on page 42)

(continued from page 36)

fier, designed for ruggedness, versatility, and audio quality. The dual channel amplifier, TA-N7050, was introduced at the Audio Engineering Society's Conference last October.

With a maximum power rating of 45 watts per channel RMS into 8 ohms or 70 watts per channel RMS into 4 ohms, the TA-N7050 is intended for critical monitoring in audio production. Other applications include sound reinforcement and audio conferencing.

In designing the TA-N7050, Sony said its engineers made tonal accuracy a primary goal. Frequency response is said to have been held flat to within +/- 0.1 dB from 20 Hz to 20 kHz. Harmonic distortion is said to be less than 0.1 percent and S/N is rated at 114 dB.

A bridging circuit for high power applications allows monaural operation of 150 watts RMS into an 8 ohm load, while automatic short circuit protection puts the amp down in the event of a dangerous short at the output. LED indicators on the front panel alert the operator to three conditions: overload, signal presence, and signal clipping.

The amp will be available in January 1986 at a price of \$730.

□ Contact: Sony Professional Audio Products, Sony Drive, Park Ridge, NJ 07656; (201) 930-6432.

Reader Service #49



PASO ANNOUNCES THE HANDLERS MIC SERIES

Paso Sound Products, Inc. has announced the introduction of "The Handlers" Series of unidirectional dynamic microphones.

Paso said that it has used its 50 years of experience in microphone manufac-

turing to take microphone technology a step ahead. Handling noise has been virtually eliminated, according to the company, through the use of a unique doubly redundant anti-shock suspension system. The front to back rejection ratio greater than 21 dB combined with a tailored frequency response provides a microphone with "Sharp" unidirectional characteristics, high intelligibility and drastic reduction in acoustic feedback. All models are packed into die-cast zinc alloy enclosure which is velvetized and electroplated with a finish that is non-reflective and scratch and stain resistant.

□ Contact: Paso Sound Products, Inc., 14 First St., Pelham, NY 10803; (914) 738-4800.

Reader Service #52

ART DEBUTS TWO DIGITAL REVERB SYSTEMS

Applied Research & Technology has introduced its high definition, 16-bit digital reverberation system, the DR1.



Features include superior algorithms, full function remote control, full 14 kHz bandwidth, 100 user presets, 30 factory presets, MIDI, and much more.



ART also announced the introduction of the new DR2a digital reverberation system at \$795 pro retail. The DR2a replaces the DR2 and offers completely new front panel graphics with easy access to all second page functions and improved performance via our newest software. The DR2a is also software updateable.

□ Contact: Applied Research & Technology Inc., 215 Tremont St., Rochester, NY 14608; (716) 436-2720.

Reader Service #53

NEED WIRELESS MICS



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800 523-2824 CA
714 863-1529

EDCOR 16782 Hale Ave. Irvine, CA 92714

Reader Service #273



New Commercial Sound Product Catalog From Dukane Corp.

The Communications Systems Division of Dukane Corporation has announced a new 14-page Sound Products Catalog detailing information on Dukane amplification equipment, background music, paging, and sound masking systems.

Dukane's catalog (Form #10090-H-85) describes a full line of amplifiers, receivers, equalizers, microphones, speakers, and speaker assemblies, PA horns and additional components designed to provide exceptional sound quality.

Contact: Dukane Corporation, 2900 Dukane Dr., St. Charles, IL 60174; (312) 584-2300.



Switchcraft Announces Revised Short Form Product Catalog

Switchcraft, Inc. has announced the release of their revised short form catalog. The 84-page catalog, in two-colors, provides part numbers, dimensions, drawings, and ratings for the entire Switchcraft product line. It contains three indexes for easy use and makes references to other Switchcraft

catalogs and bulletins where additional technical information is required.

Contact: Switchcraft, Inc., 5555 North Elston Ave., Chicago, IL 60630; (312) 792-2700.

New Brochure Details

Viking's Acoustical Enclosures

Viking Acoustical Corporation has just published a brochure which promotes and explains its extensive line of Silencers. The 10-page, all color brochure lays out Silencers into various categories. Instead of showing every single Silencer, the brochure breaks the line into four main product categories: desktop silencers, floor-standing silencers, silencers for printers with attachments, and silencer cubes.

With the brochure, customers will be able to select one of these general Silencer styles, and then talk to their Viking dealer for the model they need. The printer's size, model, and paper-assist devices, like paper feeders, will determine the Silencer they need.

Viking form-fits every Silencer to every possible variation. This tight sonic chamber, along with the special foam inside the cabinet, allow Silencers to kill up to 90 percent of a printer's noise. The foam is a professional acoustic material known as Sonex. This is the same foam used in the pro audio market to control studio sound, and in industrial plants to kill heavy equipment noise.

Contact: Viking Acoustical Corporation, Airlake Industrial Park, Lakeville, MN 55044, 1 (800)328-8385 or (612) 469-3405.

Siedle Intercom Systems Catalog Features Latest Models

A new catalog, now available from Siedle Intercom/USA, provides photos, system diagrams, and specifications for some of today's intercom systems. The 30-page, full color catalog shows intercom systems for apartments, residences, professional offices, and industrial applications. It includes the modular Vario two-wire system which uses any two wires for doorbell, intercom and door release for operation. Systems can include from one to 2,000 residential units. The latest development in video intercom technology, the Siedle Flat Screen four-inch monitor, is also shown.

Contact: Intercom/USA, 1 Wynnewood Road, Wynnewood, PA 19096; (800) 874-3353.

SKINTOP

Liquid Tight Strain Relief Cord Connectors



New Brochure From Olflex Features Cable Connectors

A four-page, color brochure on new Skintop® Liquid-Tight, Strain Relief Cord Connectors is available from Olflex® Wire & Cable, Inc.

The brochure covers the construction, applications, and specifications for the four basic types of patented Skintop Strain Relief Cable Connectors, which safeguard cable entry through the walls of equipment enclosures.

The Connectors are liquid-tight to a depth of 150 feet; work at temperature ranges from -22°F to 212°F (302°F for short periods). They are flame resistant and environmentally protected against salt water, gasoline, alcohol, oil, grease, weak acids, and other such contaminants.

Contact: Olflex Wire and Cable, Inc., Accessory Division, Dept. A58, 30 Plymouth St., Fairfield, NJ 07006; 1-800-225-1336, in NJ call 201-575-1101

1986 VIZ Power Supply & Test Equipment Catalog Released

VIZ Test Equipment, a division of VIZ Manufacturing Company, announced the release of their new 19-page, power supply and test equipment catalog. A guide to the manufacturer's full line of test equipment includes laboratory and industrial DC power supplies, isolated AC power sources, frequency counters, analog meters, signal generators, testers, digital meters, and wattmeters.

Contact: VIZ Equipment, 335 East Price St., Philadelphia, PA 19144; (212) 844-2626; 1-(800) 523-3696.

BOOK REVIEW

by Ted Uzzle

Affiliating Acoustics and Architecture

Izenour, George C., *Theater Design*, McGraw-Hill, 1977, xxxiii + 631 pp., \$196.

Burriss-Meyer, Harold, and Edward Cole, *Theatres and Auditoriums*, 2nd edition with 1975 supplement, Krieger Publishing, 1975, vii + 470 pp., \$38.50.

Most contractors complain about architects, but nobody does anything about them.

The fact is, architects themselves tell horror stories about acoustical consultants and sound contractors. You have an often-disappointed expectation that architects will understand the rudiments of sound and acoustics, but how much have you informed yourself about architecture? How much easier will it be to work with architects if you have some understanding of their work, and of what is important to them?

Wouldn't you prefer to work with an architect who understands your needs? Unfortunately, the architect is more likely to hire you than you are to hire him, and he has just as strong a preference for sound and acoustics specialists who understand his needs.

The two books reviewed here are by authors respected equally among architects and acousticians, and the books show a synthesis of architecture and acoustics working together in theaters, much as Beranek's *Music, Acoustics, and Architecture* shows them working together in concert halls. These books have much to teach about theater acoustics, and an enormous amount to offer on theater architecture.

Professor Burriss-Meyer (who died recently) and Professor Cole have produced a large book one can hold in the hands to read, although you will need sturdy arms to read it for any length of time. Profusely illustrated with plans, diagrams, and photographs, it shows a cross-section of the best theaters since World War II.

The book opens with a lengthy table of visual, auditory, performance, and audience requirements for a variety of places of public performance, from open-air pageants to the movie pic-

tures in a neighborhood theater. Bubble diagrams and other sketches show the architectural solutions that meet all these needs logically and practicably.

The following chapters deal with the technical factors the architect must master. Audience traffic, seeing and hearing conditions, and front service rooms for the comfort and safety of the audience, are all described in detail, with examples. Later in the book, the authors take up acting areas and backstage areas, as they are required by different types of theaters.

Then, the book comes to theater machinery and how it works with the architecture. There are chapters on power, heat, air-conditioning, and plumbing; on stage machinery, both on the stage and above it, in the flies; on sound and intercom equipment, and on lighting. The chapter on sound and intercom equipment deals primarily with front-end equipment: mixing consoles and effects playback equipment. This chapter is rather

the planning stage. There is a wonderful discussion on the psychology of minima (What is the smallest we can get away with? The least? Who is the lowest bidder?) and the contradictory way it becomes the psychology of maxima during theater dedication ceremonies (How is it the biggest? The best? What does it have no other theater has?). Many theater sound designers will recognize this phenomenon, and appreciate the advice for dealing with it.

For this second edition the authors added a portfolio entitled "Theatres 1964-1975," with a commentary detailing the changes in that decade, and some of the new approaches being used since the completion of the main part of the book.

* * *

Next we turn to the granddaddy of books on theater design. George Izenour is professor emeritus of Theater Design and Technology at the Yale School of Drama. He has pro-

"Wouldn't you prefer to work with an architect who understands your needs? Unfortunately, the architect is more likely to hire you than you are to hire him, and he has just as strong a preference for sound and acoustics specialists who understand his needs."

duced. There's not a slide pot in sight, but only the older fist-sized knobs of consoles adapted from broadcast designs. The authors must not have foreseen the giant mixing boards of today, with dozens and sometimes hundreds of controls.

The concluding chapter, "Over-all Considerations," contains a summary of the theater as a place of human activity, rather than the monument to civic, collegiate, or architectural pride it is sometimes assumed to be during

duced the monumental, definitive treatise on theater history, design theory, and design technique.

Professor Izenour's *Theater Design* is filled with detailed, isometric views of theaters from antiquity to the present, drawn to uniform scale and virtually all drawn especially for this book. Many of them are on fold-out pages somewhat larger than a B-sized drafting sheet.

Izenour conceives the theater as a
(continued on page 48)

CLOSER LOOK

(continued from page 38)

ing of instruments.”

The RE98's diminutive size and non-reflecting black finish can be used for applications on television talk shows or news programs where, in on-camera use, an unobtrusive microphone is required.

Comment: In the last few years there have been several new miniature microphones of interest. The EV RE98 is one of them. We spoke with EV's Joe Katowich to learn more

The RE98 has a dynamic range of 117 dB, and has a fairly low 1 percent distortion when the capsule is blasted with 141 dB SPL. Its sensitivity is -45 dBm, and it produces 4.36 millivolts output per pascal at 1 kHz. Reasonably quiet, it has an EIN of -24 dBm rereferenced to 0 dB SPL.

The RE98's frequency response is provided in a plot, but is said to extend from 80 Hz to 15 kHz, with a presence rise from 4 kHz to 8 kHz, falling back to nominal sensitivity at 14 kHz, and falling off steeply above 15 kHz. Those who are familiar with the EV CO90 will recognize this capsule as being about the same, although the

electronics are different. This type of contour is generally good for voice pickup, since it improves intelligibility, although it can add desired “crispness” and presence to instruments, as well. Don't expect any bass build-up when talking close; omni's don't have proximity effect, nor would it be desirable for a lavalier (which is usually off-axis from the mouth and nearer the resonant chest cavity).

The impedance converter/buffer amp/battery package accepts a 9 V “transistor radio” battery, although the mic can also be powered by 18 through 50 V phantom supplies (hence the “dual-powered” reference in the press release).

It would seem that a mic of this small size and high performance would lend itself to a number of applications, going beyond the suggested TV talk shows or news programs cited in the release. In fact, the RE98 is ideal for close-miking of instruments; it can even handle the SPL inside a kick drum. Because they are small and quiet, a pair of RE98s should be a good choice for binaural or spaced, omnidirectional stereo recording work.

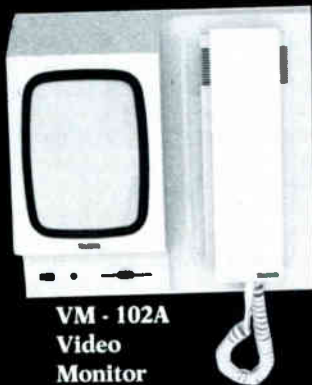
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IF YOU'RE LOOKING FOR SECURITY, THE SEARCH STOPS HERE

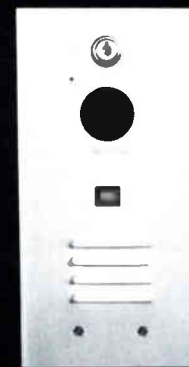
with a TekTone video intercom system that combines safety and discretion with private, two-way communication, hands-free reply at the entrance panel and controlled entry.



VM - 102A
Video
Monitor



VM - 320 Entrance Panel
for high-rise and town
house applications.



VM - 600 Entrance
Panel for single
residence use.

TekTone

Sound & Signal Mfg., Inc.

1331 South Killian Drive
Lake Park, Florida 33403
305/844-2383

Reader Service #225



ANSCO OFFERS RANGE OF NEW CABLES & ACCESSORIES

ANSCO (American National Supply Corporation) has announced expansion of its cable manufacturing operation, providing a range of new cables and cable accessories.

Under the expanded operations, ANSCO now offers triple the number of cable types previously available. The new range includes: Unshielded EIA, Shielded EIA, Double Shielded EIA, Teflon Coated EIA, Shielded Extended Distance EIA, Extra Extended Distance EIA, Double Shielded Extended Distance EIA, Teflon Coated Extended Distance EIA.

A full line of Coax and Parallel Interface Cables is still offered. Discount prices apply for any type of bulk cabling. ANSCO also provides a variety of telephone type networking accessories.

Contact: Cable Department, ANSCO, 1243 West 134th St., Gardena, CA 90247; 1-800-421-1270. In CA call 1-800-821-3308.

Reader Service #41



TEKTRONIX INTRODUCES TWO SPECTRUM ANALYZERS

Tektronix has introduced the new 492A and 492AP spectrum analyzers with an advanced, intelligent marker system, according to the company.

Features include intelligent signal processing for sorting continuous wave (CS), pulse, and other signals, dot marker frequency accuracy of one part in 10⁵, an occupied bandwidth function which marks and measures the occupied bandwidth at a user determined level below the displayed peak of a desired (marked) signal—automatically after each sweep, optional 75 ohm input impedance adds versatility for IF measurements, CATV and local area network applications, help-mode—an operator's "manual-in-memory" which assists the operator with explanations of a signal processing functions and front panel controls, a Mate/Ciil language option provides an extension to the standard GPIB codes and formats.

The 492A/492AP offer optional built-in preselection. The preselector eliminates harmonic mixing products and images and increases dynamic range for microwave measurements, according to the company. These products have non-volatile memory to store nine front panel settings and nine waveforms which simplifies subsequent set-up and aids in field measurements.

Contact: Tektronix, Inc., P.O. Box 1700, Beaverton, OR 97005; 1 (800) 547-1512. In OR, call 1 (800) 452-1877.

Reader Service #42



ATLAS SOUND INTRODUCES MIC BOOM ACCESSORY

Atlas Sound has introduced a new microphone boom accessory, combining professional appearance and one-knob control for operation.

Model BB-77 is designed to estab-

lish and maintain close microphone to sound source proximity while locating the vertical stand and its base at a distance. This design features screw mount installation to any 5/8-inch to 27 threaded microphone or desk stand. The die-cast universal swivel allows orientation of the accessory at any angle from vertical to horizontal, while a partial turn of the single oversized knob locks the boom securely in the desired position. The BB-77 boom arm is 34-inches long, heavy chrome plated cold-rolled steel with a tapered integral counterweight of gloamed black baked epoxy.

Contact: Atlas Sound, 10 Pomeroy Rd., Parsippany, NJ 07054; (201) 887-7800.

Reader Service #43



ONEAC POWER CONDITIONER ELIMINATES DISTURBANCES

Oneac Corporation has introduced the CM1101, a new, power conditioner designed to reduce failures in "smart" telephones and peripherals by eliminating electrical power disturbances.

The CM1101 is designed to protect those telephones and peripherals, usually found in a business environment, where reliability is critical.

The CM1101 may be purchased with a standard plug and receptacle (\$129) or with a twist lock configuration (\$139). The unit has an input/output rating of 120 Volts and may be used with a load of up to 1 amp. The conditioner operates quietly, with a greater than 85 percent efficiency according to the company. Oneac offers a full five year warranty and a 45 day return guarantee.

Contact: Oneac Corporation, 2207 Lakeside Dr., Bannockburn, IL 60015; (312) 295-2800.

Reader Service #44

FACES AND PLACES

Bogen Names Cash Senior Project Engineer

Bogen, has announced the addition of Dennis Cash to its engineering department.

Senior project engineer Cash primarily will be involved in the development of products for the commercial sound and pro sound audio fields. He comes to Bogen from TOA Electronics, Inc., where he was technical services manager and did applications engineering. Previously he was chief engineer at AB Systems Design, Inc.

Cash studied engineering at Central Virginia College and the University of Virginia, and is a member of the Audio Engineering Society.



DENNIS CASH



ENOS YODER

Crown Names Yoder Engineering Group Manager

Crown International, Inc. has announced the appointment of Enos Yoder to engineering group manager. Yoder is responsible for managing the overall direction, cost, and time of assigned engineering projects. Yoder's responsibilities will also include defining products from cooperative efforts with marketing relating to the concepts of the function to be performed and keeping the projects moving toward corporate and departmental goals.

Yoder, who has an Associate Degree in Electrical Engineering from ITT Technical Institute, Fort Wayne, IN, has been with Crown for 12 years.

Wilkinson and Hershner Promoted to Regional Sales

Shure Brothers Incorporated has named two new regional sales managers, Joanne Wilkinson and Alan G. Hershner. Wilkinson will oversee

Shure sales efforts in the central states region and Hershner the western states region.

Wilkinson has been with Shure since 1975, most recently holding the position of Shure telemarketing manager. Hershner began as Shure's professional product marketing coordinator in 1984, joining the company with a strong background in retail sales management.



JOANNE WILKINSON



ALAN G. HERSHNER

Squire Named VP Marketing at Soundcraftsmen, Inc.

Soundcraftsmen, Inc. has announced the appointment of Marvin H. Squire as executive vice president/director of marketing.

Squire started in retail sales for Soundcraftsmen over 20 years ago, then moved to Empire Scientific as vice president of marketing, and in 1975 formed Rocky Mountain Rep company, Centennial Marketing, along with Tom Fuller.

"My first priority is to expand and build a much larger dealer base, to capitalize on Soundcraftsmen's hard-hitting Dealer Sales Incentive Plan and 1986's Million Dollar ad campaign—with the enthusiastic support of our well-established rep network, I intend to make this a 15 million dollar company within three years," Squire said.

Spriggs Named Altec Lansing District Manager In Ohio Area

Gayle Campbell, national sales manager for Altec Lansing Corporation, has named Jerry Spriggs to the position of district manager for the Ohio Valley area. In his new position, Spriggs will provide liaison to the factory for Altec's industrial and profes-

sional sound contractors and theater equipment dealers, and represent Altec Lansing to acoustical consultants, architects, and engineers. His area of responsibility includes Michigan, Indiana, Ohio, Kentucky, West Virginia, western Pennsylvania, and western New York.

Spriggs is a graduate of Michigan State University, with a B.S. degree and graduate study. Before joining Altec Lansing, Spriggs was proprietor and chief engineer of Spriggs Sound Systems in Lansing, MI.



JERRY SPRIGGS



DEE G. TATUM

IMC Promotes Tatum to Distributor & International Sales Manager

Dee G. Tatum has been promoted to the distributor and international sales manager for International Music Company. The announcement was made by Jerry Freed, president of IMC. Freed said, "In assuming his new responsibilities, Dee Tatum will be working closely with all of the worldwide IMC exclusive distributors to assure that they meet their annual sales goals and marketing objectives in each country. Furthermore, Tatum's responsibilities will include the marketing of IMC distributor products such as Black Diamond and Proline accessories."

Dee Tatum joined IMC in 1980, starting in the warehouse, and has since held several key positions.

Larsen Joins Audio Group Sales Staff in Seattle

Terry Larsen has been added to the sales staff of Audio Group. According to Jim Thimmes, Seattle sales manager, she will be responsible for the downtown Seattle territory.

Larsen comes to Audio Group from Total Sound Inc., a San Francisco business music company where she was the sales leader.

REP NEWS

Eastern Acoustic Works, Inc., a manufacturer of professional loudspeaker products, has announced the appointment of three new independent field sales representatives. According to **Frank Loyko** (EAW's vice president-marketing), "This is the first step in our expansion program to broaden EAW's market base. Throughout the first quarter of 1986 we will be moving very strongly into some of the more geographically distant markets."

Pro Tech Marketing (13031 San Antonio Dr., Suite 2, Norwalk, CA 90650; (213) 929-8868) has been appointed to represent EAW in the southwest market. Pro Tech's principals are **Bob Prideux** and **Hector Martinez**, and will cover California, Arizona, and Nevada.

Fleetwood Marketing (320 Mulberry St., Madison, IN 47250; (812) 265-6054) has been appointed to represent EAW in the midwest market. Fleetwood's principal is **Rick Parent** and will cover Michigan, Illinois, Wisconsin, Iowa, and Minnesota.

World Wide Electronics (6810 Pembroke Rd., Miramar, FL 33023; (305) 966-6622) has been appointed to represent EAW in Florida. World Wide's principal is **Bob Gale**.

Audio Engineering Associates, Pasadena, CA, has been appointed the exclusive dealer for all **Amek** series consoles in southern California, announced **Bob Owsinski**, vice president of sales and marketing for Amek.

"We are proud to be associated with a company that has such a fine technical reputation as well as a high degree of credibility in the southern California audio community. AEA has always been noted for selling only the best sounding, highest quality products, and in this regard we feel that they are the perfect company to represent us in this area," Owsinski said.

Also announced was AEA's appointment as a dealer for all **Total Audio Concepts (TAC)** products as well.

Red Acoustics, a manufacturer of sound reinforcement equipment, has announced that it recently added two reps. **Wired For Sound Ltd.** is covering the Australian market. **Peter Kemp** will be based in the Melbourne, Australia office. In Singapore,

San Mogan Electro Acoustics is covering that territory, according to **Ken Reed** of Red Acoustics.

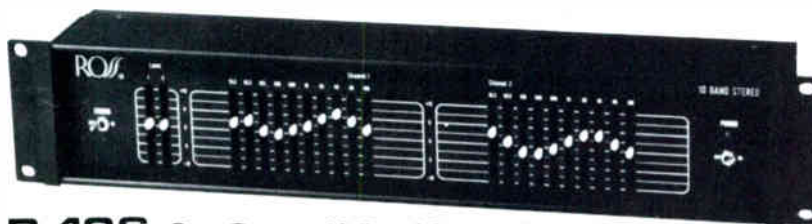
Artel Communications Corporation, a manufacturer of fiber optic communication systems, has added three new manufacturers' representatives for its broadcast video and audio product lines. The three Artel representatives are **Bradenco Corporation** of Dallas, TX; **Gold Coast Video** of Tarzana, CA; and **Midwest**

Corporation of Virginia Beach, VA, and Miami, FL.

EXR Corporation of Brighton, MI, has appointed **Sye Mitchell Sound** of Woodland Hills, CA, to be its new sales representative in southern California. Mitchell's rep firm has been established only five months and already has a very prestigious reputation of offering some of the finest names in professional audio equipment.

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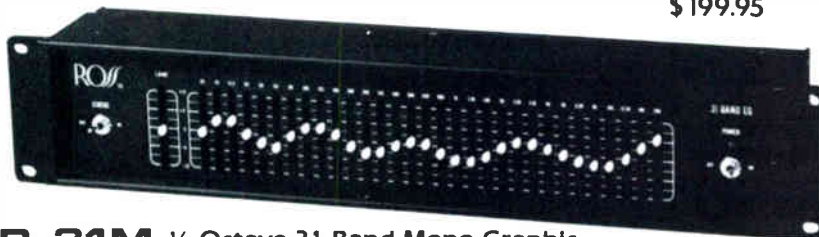
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Reader Service #268

DATE	EVENT/COMMENT	LOCATION	CONTACT
January 30-February 2	Healthcom '86 Premiere show of telecommunications and information systems vendors for the healthcare market.	Las Vegas Convention Center Las Vegas, NV	Lin Fish (312) 397-7878
February 3-5	Western Telecommunications Showcase For industry exhibitors and buyers.	Dallas, TX	Agnes Pavel (312) 782-8597
February 12-14	Cost Effective Telecommunications Management —Controlling voice & data costs in a deregulated environment.	Colony Square Hotel Atlanta, GA	Center for Advanced Professional Education (714) 261-0240
February 21-23	International Security Conference Sound, Signal, & Security.	Orlando, FL	(213) 826-6070
February 24-26	Cost Effective Telecommunications Management —Controlling voice & data costs in a deregulated environment.	Sheraton Centre Towers New York, NY	Center for Advanced Professional Education (714) 261-0240
February 25-27	NTCA Expo '86 For America's independent cooperative and commercial telephone systems.	Disneyland Hotel Exhibit Hall Anaheim, CA.	Susan Coughlin (202) 298-2343
March 4-7	International Conference of the Audio Engineering Society.	Montreux, Switzerland	AES (212) 661-2355 (212) 661-8528
March 5-7	Cost Effective Telecommunications Management —Controlling voice & data costs in a deregulated environment.	Sheraton Plaza La Reina Los Angeles, CA	Center for Advanced Professional Education (714) 261-0240
March 11-13	Southcon/86 Electronics exhibition & convention.	Orange County Convention Center Orlando, FL	J. Fossler (213) 772-2965
March 26-27	Sound Engineering Seminar Two day seminar in audio and acoustics by Synergetic Audio Concepts.	Red Lion/Jantzen Beach Portland, OR	Syn-Aud-Con (714) 728-0245
April 2-3	Sound Engineering Seminar Two day seminar in audio and acoustics by Synergetic Audio Concepts.	Holiday Inn Downtown Vancouver, B.C. Canada	Syn-Aud-Con (714) 728-0245
April 28-29	Sound Engineering Seminar Two day seminar in audio and acoustics by Synergetic Audio Concepts.	Aladdin Hotel Las Vegas, NV	Syn-Aud-Con (714) 728-0245

SECURITY

(continued from page 36)

Also popular, Castelli said, are multi-location units in which the user can switch from the camera covering the lobby to the camera covering the pool to the camera covering the garage.

Crest's CCTV system features multivision capabilities. This system comprises of one, two, or four cameras honing in on key coverage areas such as a door or a cash register and one monitor which shows the coverage on a split screen. A variation of this is the compression system in which each half or each quadrant on the monitor shows 100 percent of each camera's coverage—a view of a room or a lobby as opposed to just a view of the door. Crest also has systems that feature sequential switching in which the monitor switches from camera to camera.

Castelli said that there are two benefits to the compression and multivision systems. "First, with these systems a guard can see what's going on everywhere, at all times. And therefore, the multivision and compression systems are also preferred when the surveillance is being recorded on tape."

"These systems are being used everywhere from the stock exchange to donut shops to the government who had them installed on board the USS Wisconsin and the USS Iowa," Castelli said.

As for the future of CCTV, Castelli said he foresees an improvement in quality, a reduction in size of monitors and cameras, and an increased number of applications and features such as flat wall monitors.

"I still feel this industry is in its infancy," Castelli said. "We've come quite a long way in the past two years. And in the next two years, we'll accelerate another 100 percent."

According to Dennis Devuyt, national sales manager for Javelin Electronics Inc. in Torrance, CA, "The immediate future will bring a surge in chip cameras over tube cameras." The company recently introduced its moss chip solid state camera which features higher resolution.

"I think we're going to see an increase in solid state cameras as opposed to tube cameras mainly because the solid state cameras require less servicing."

Other new products Javelin offers include an omni matrix superswitch

system, the Omni 1000, and a new solid state color camera, the 3012A.

"I think this market has so much potential," said Devuyt, "and not many people are tapping the roots."

The two largest manufacturers of CCTV are Panasonic in Secaucus, NJ, and RCA in Lancaster, PA.

Joe Goetz, national sales manager for Panasonic, noted three trends which will affect the CCTV industry over the next five years. First, CCD (Charge Coupled Device) chip cameras will replace tube cameras. "There is going to be a trend toward CCD pickups, because of the longevity of the device. We have no idea when the pickup device will wear out, whereas tubes get spots and burn out much more easily."

Second, due to the chip's size, the camera will be much smaller, as well as the enclosures and holdings such as pan and tilt units. The chip also reduces the need to replace tubes, therefore servicing will be less often.

A third trend, Goetz noted, will be toward color cameras. "Color is coming on fast," Goetz said. Panasonic offers a color system, the WVCD110, which integrates an auto-white tracing circuit that adjusts the camera to the light of the room. "The system is very cost effective," Goetz said. "Our mini color system retails for \$1,495, which is only \$500 more than our mini black and white system. Two years ago a color system would have easily ran you \$3,000 or \$4,000."

The people in this industry have also changed Goetz noted. "They've become more professional. Now at the trade shows you see suits and ties, while five or 10 years ago it was shirts and pants—real tire kickers. The market place has also grown more knowledgeable. This is mostly due to the new relationship the consumer has with the VCR, he owns one!"

Panasonic offers the AG 6010 Time-Lapse Recorder featuring 24 and 72

hour time lapse which automatically goes out of the time lapse mode and into real time when it receives an alarm signal, according to Aaron Chesler, Panasonic's CCTV product specialist. The recorder also has a built in time/day generator which puts the time and the date right on the recording. "One unique feature about the recorder," Chesler said, "is that it uses standard VHS tape, and has the ability to use the recorder for employee training tapes during the day."

Although the recorder offers these unique abilities, Chesler said, it was designed as a time-lapse unit and all components are industrial grade.

"This industry is growing at a very fast rate," Goetz said. "It passed its infancy about five years ago."

Goetz said he would estimate the size of the marketplace to be about \$200,000,000. He added that less than five years ago it was under \$100,000,000, and in the next five years it should *double* in size again.

RCA offers a full line of CCTV products, including a full camera line which runs from economical half-inch cameras to ultra, low-light high-performance systems. According to Wade Hansen, communications manager, the company also manufactures switching equipment for surveillance.

Unlike Panasonic, one trend the company reported it hadn't been successful with is color cameras. "No matter how much the camera adjusts, once the environment reaches a certain darkness it can not differentiate colors. It's just like your eyes at night. So, we are finding it more practical to go with black and white," Hansen said.

Hansen also reported that RCA is in a mode of product development and will be introducing a new series of products at the International Security Conference in Florida in February.

"We see this as a growing industry," Hansen said, "one we are concentrating heavily on."

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BOOK REVIEW

(continued from page 41)

machine for seeing and hearing the performance on the stage, therefore his lengthy history of theater design is a history of sightlines and acoustics, as they have been written about since Vitruvius, and especially as they have been built. The first three chapters analyze this history in some detail.

The next three chapters touch on building codes, multi-use requirements of the modern government- or university-sponsored theater, and the programming of contemplated theaters. To an architect "programming" a building means deciding what will go on in there, and the failure to do this accurately and completely results in more failed theater designs than any other single fault.

With Chapter Seven we begin the meat of the book, an analysis of modern theaters, dozens of them, designed by Izenour and others. They are shown and described in detail, and here Izenour earns the price of the book: he writes candidly and completely about what went on in the minds and the discussions of the clients, the architects, and the consultants, that resulted in this building coming out this particular way. There

is a tendency of architects writing about buildings (and sound system designers writing about sound systems, and technical equipment man-

"Izenour makes a unique contribution to the literature of theater design by taking us through the entire design process by showing how he goes from a blank sheet of drafting paper through the finished building."

ufacturers writing about technical equipment) to present the finished result, without any description of design as a process. Why was this done this particular way? What alternatives

were considered? Why were they rejected? Izenour makes a unique contribution to the literature of theater design by taking us through the entire design process by showing how he goes from a blank sheet of drafting paper through the finished building.

Chapters on acoustics are contributed by Vern Knudsen and Robert B. Newman (the latter assisted by Schultz, Watters, and Kirkegaard, who were members of the Bolt, Berenak and Newman staff at that time).

To some readers of this book review, the idea of spending \$200 on a book will seem absurd. For some, it would doubtless be absurd. But those consultants and sound contractors, however, who are tired of being thought single-purpose functionaries, wheeled in to make a few technical additions to the design, will want to become true members of the design team whose contributions are welcomed from the preliminary conception through the final plans. In order to do this it is necessary to understand the work of the architect and the theater designer, and each of these two books is an excellent introduction. And in my opinion, professor Izenour's classic is more book for more money.

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BOARDROOM

(continued from page 18)

by discrete-microphones, and the loudspeakers used vary from very-directional to omni-directional, along with varying size and power outputs. Again TAI offers the entire system as "prepackaged solutions for sound."

As the public's general awareness grows about the quality of audio, so will the need for better and more complex systems for our boardrooms and our theaters as well. In teleconferencing the audio quality is certainly the most important parameter. When we have no control over the acoustics in the rooms involved, at least we should be aware of these electro-acoustical solutions to physical problems.

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IDEAS & VIEWPOINTS

(continued from page 6)

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* * *

All of us and *Sound & Communications* wish all of our readers a very happy and prosperous New Year!

SALES & MARKETING

(continued from page 10)

application could be better served with a different approach, it could be that the particular system in all cases is supplied by the same source and perhaps is installed by the electrician as part of the overall construction project. It could be that the end user is not even aware that it could be handled better by choosing a different method. They could, in fact, be quite eager to have any shortcomings you point out corrected.

The prime consideration in *any* market expansion is to be as successful at your new endeavors as you are at what you already do. This requires research and planning and a coherent approach to the new market. By planning a new approach to take advantage of your existing credibility in other areas, you can establish some solid basis to build a new market on. By effectively using experience in other areas to get people to listen to you in *new* areas you can establish a beachhead. It's similar to being able to get a job easier if you are currently employed than if you are out of work.

Above all, put aside pet desires when considering new markets. A lot of people would like to have a Ferrari dealership, but if you are in the audio business, a Ferrari dealership might be a little *too* diversified. The resultant scattering of cashflow could get you a ticket on the next sailing of the receivership.

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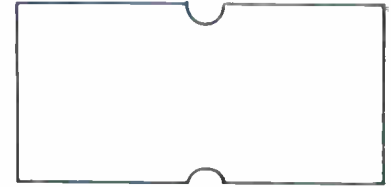
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SCORPION 26/16/2
w/16 monitor

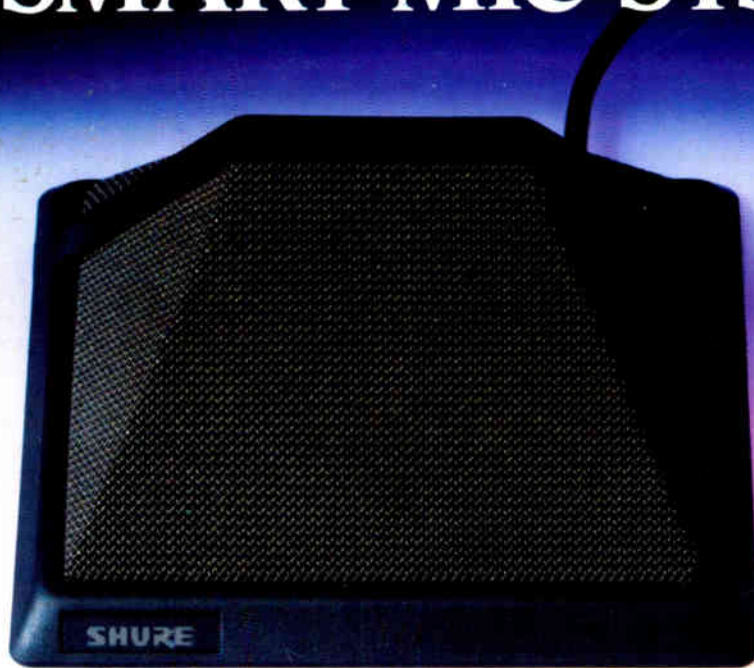
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At the heart of Shure's Automatic Microphone System (AMS) are revolutionary, angle-sensitive microphones that turn on automatically *only* when addressed within their own 120° "window of acceptance." In addition, each microphone continuously samples its own local acoustic environment, and compensates for changing room audio conditions—automatically.

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For more information on the revolutionary new Automatic Microphone System, call or write Shure Brothers Inc., 222 Hartrey Ave., Evanston, IL 60204, (312) 866-2553.

*Microphones and Intelligent Circuitry

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