

Lab Test: ART's IEQ Equalizer

SPECIAL
AES & IBMA
ISSUE

SOUND & COMMUNICATIONS

FOR CONTRACTORS, SYSTEM MANAGERS AND SPECIFIERS

OCTOBER 1987

0187 81870 9211047 1 10SC
00017872
HEAR SOUND & COMMUNICATION NS
21009 W WINFIELD RD CA 90290
TOPANGA

Sounds of York's Nightlife

Foreground Music Videos: A Year of Change



Large scale concert sound reinforcement has a smaller future.

**Manifold Technology™
delivers...twice the output
in half the space!**

Concert sound is getting smaller. System size, that is, not tour dollars! In fact, the high-level sound market is stronger than ever. But high transportation and setup costs are forcing lighter, smaller and more efficient speaker systems. While audiences demand better fidelity.

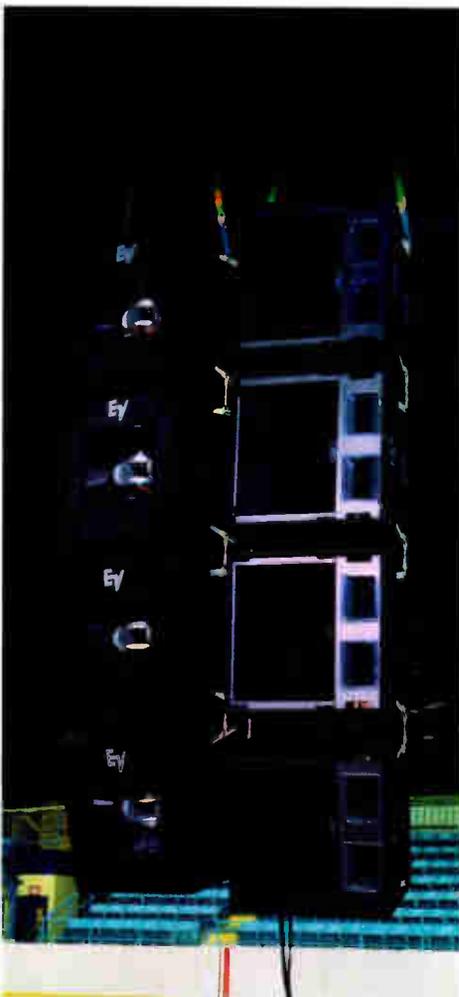
That's why we've made Manifold Technology *systems twice as loud in half the space*. The two-box, 4-way active MT-4 uses 4 (four!) drivers in each bandpass for unequaled acoustic output. Now, your system can be one quarter the size or four times as loud compared to other designs.

The MTA-42 Manifold Technology adapter combines four compression drivers without added distortion. And without the phase cancellations of Y-adapters! That's 4 supertweeter and 4 upper-midrange compression drivers on identical 60° x 40° constant-directivity horns. To complete the MTH-4 "high" box, four DL10X woofers use proprietary phase plugs to provide seamless vocals from 160-1600 Hz. The result is flawless 138-dB midbass at 1 meter!

The MTL-4 "low" box combines four 18-inch woofers in an ultra compact 36" x 36" x 30" cabinet. More efficient than horn-loaded subwoofers, Manifold Technology design prevents woofer "bottoming" even at 40 Hz with 1,600 watts input!

MT-4

Concert Sound System
50,000-Watt Array



High output plus high fidelity

To produce high-level sound, most concert systems aim many horns at the same seating area. Unfortunately, this approach causes peaky frequency response, decreased sensitivity and ragged coverage patterns. With four drivers on each horn, a large-scale MT-4 system has fewer independent sources. For fewer phase-cancellation problems. Frequency response is smoother, sensitivity increased, and coverage perfectly constant.

A flying system that's second to none

MT-4 cabinets are optionally equipped with a unique two-point flying system that allows true point-source arrays. Tilt angle adjustment is easy because track positions are pre-engineered for popular array configurations. Trial-and-error guesswork is a thing of the past. Nothing is as easy as an MT-4.

You don't have to wait for the system of the future. It's here now! For a free MT-4 brochure, see your EV Professional Audio Dealer or write: Electro-Voice, Inc., Dept. SC-4, 600 Cecil St., Buchanan, MI 49107.

Circle 201 on Reader Response Card

ElectroVoice®

a MARK IV company

If form follows function, *this* is the shape for purer sound and greater flexibility.

You're looking at the Bose® Acoustic Wave® Cannon system—a patented design that uses two columns of air—instead of a direct-radiating vibrating speaker cone—to *launch* low frequencies, resulting in purer sound. It's light in weight, delivers bass from 25 to 125 Hz with substantially reduced distortion, is easy to install, and can even be interlocked to form rigid arrays.

The Cannon system is part of the new Professional Wave™ systems from Bose. When combined with Bose 802™ Series II speakers and a WSC-1 system controller, the Cannon system becomes the foundation of a unique high-performance, extended bandwidth installed sound system. Its purer sound and greater flexibility make it the logical choice for your next application.

For more information, write Bose Corporation,
Dept. SC; The Mountain, Framingham, MA 01701.



The Bose Professional Wave sound system.

BOSE
Better sound through research.

Circle 210 on Reader Response Card

COLUMNS

- 10 Marketing and Sales**
Ken Jensen of Stentofon Corp. describes the company's DemoVan and how it has helped sales.
- 13 Ideas and Viewpoints**
Sound & Communications' book reviewer Ted Uzzle makes a plea for usable manuals.
- 14 Consultant's Comments**
This month Marc Beningson discusses why contractors should present design/build clients with a specification.

DEPARTMENTS

- 6 Editorial
- 7 Letters
- 8 Newsletter
- 54 Products
- 55 A Closer Look By Gary D. Davis
- 57 Datafile
- 58 Supplies • Services • Support
- 59 Ad Index
- 60 Book Review by Ted Uzzle
- 62 Faces and Places
- 62 Rep News
- 64 Job Report
- 71 Looking Back
- 74 Contractor Close-up
- 77 Classifieds
- 78 Technically Speaking

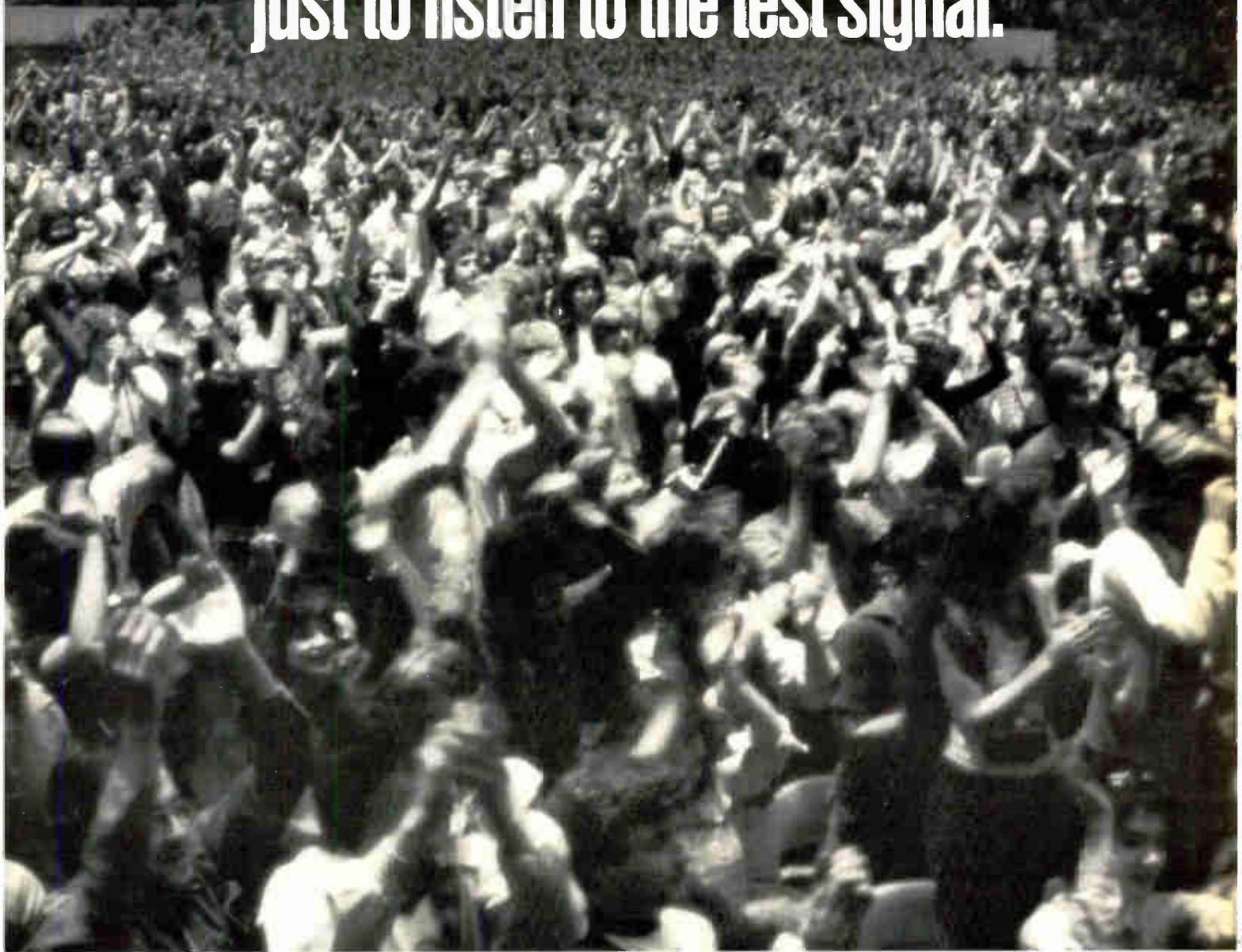
ON THE COVER

The dome of the Saint, a club that could pass for the largest planetarium in the east, consists of 630 speakers built by Entertech Assoc. and 52 separate channels of amplifications in 32 BGW separate amps. The sound system in the DJ booth (inset) includes three Technics SL1200 MK Turntables, two Sony CDS-3000 CD Controllers, two RG Pro 20 Dynamic Processors, two RCF 6000 Monitors, a Bozak Mixer and a Technics 1700 Reel to Reel Tape Deck.

FEATURES

- 18 WHAT BRAND OF EARS DO YOU WEAR? Part II**
By Jesse Klapholz
In order for users to choose the right brand for their ears, Jesse Klapholz gives an explanation of the workings of the inner ear.
- 23 THE ELEVENTH COMMANDMENT—THOU SHALT NOT EXPOSE ANY MICROPHONES TO VIEW, Part II**
By Ron Streicher
Ron Streicher further discusses mic techniques for installation in the church market.
- 26 THE SOUNDS OF NEW YORK'S NIGHTLIFE**
By Greg Prince
While you're attending the AES convention and you get an urge to move your feet to the beat, you can check out the sound systems at these New York hot spots.
- 32 FOREGROUND MUSIC VIDEOS: A YEAR OF CHANGE**
By Loren Greenwood
From retail to financial institutions, foreground music videos are sweeping the country in a variety of new markets.
- 38 THE BIG APPLE SHINES FOR AES**
By Debra A. Pagan
To make the most of your time, this article gives you a run down on the seminars and special events at AES.
- 43 SUNNY CALIFORNIA WELCOMES IBMA**
By Debra A. Pagan
Seminars, beaches, and a golf tournament await those who attend the IBMA. To help you decide where to spend your time, *Sound & Communications* has put together a schedule of the business and the fun side of the IBMA Convention.
- 48 INSTALLATION PROFILE: THE SEAPORT EXPERIENCE**
The sound system to one of New York's newest tourist attractions is examined.
- 52 LAB TEST REPORT: ART'S IEQ INTELLIGENT/PROGRAMMABLE EQUALIZER**
By Jesse Klapholz and Richard Feld
This month, ART's new Intelligent/Programmable EQ is put to the test.

Our Real-Time Analyzer is so revolutionary, people are paying millions just to listen to the test signal.



Unlike any other test instrument, the new dbx RTA-1 lets you measure frequency response with the music itself as the test signal. In real time. In real situations. In depth, in detail, and with remarkable certainty.



In other words, the dbx RTA-1 is capable of telling you virtually anything about the frequency response of any hall, system, or piece of equipment you want to measure. Even if several thousand people happen to be listening.

Of course, the RTA-1 has other features too (would you expect any less from the makers of the world's leading signal-processing systems?). You can store up to 16 curves in its

memory, and recall them for comparisons, inversions or other manipulations. You can hold peaks, isolate any one of its 1/3-octave bands, and average performance signals over any period of time. You can even measure the old-fashioned way, using the RTA-1's stereo pink-noise generators.

We should also point out the RTA-1's compatibility with equalizers, PCs, color monitors and printers; its flexible micro-computer architecture (complete with user-friendly menus and Help function); its two microphone inputs, six line inputs, built-in preamps and phantom power supplies.

Call 1-800-525-7000 x D251 for an analysis of our real-time analyzer, including an Engineer's Information Packet. In the meantime, you can sit back and enjoy our test signal.

The Industry's Buzzing

A lot is happening this month in this industry and related markets—more it seems than ever before. This is partly because the IBMA and AES shows are overlapping and also because the NSCA/ERA regionals are taking place in some very important territories in the United States.

The Background/Foreground industry has seen some serious changes in this past year. It was a year that saw the merger of Muzak and Yesco, and a time when “the video wall” started to grow in popularity.

The AES promises to be a big event in New York with attendance expected to surpass 10,000. The editors of *SOUND & COMMUNICATIONS*, along with the editors of our sister publications, *MUSIC & SOUND OUTPUT* and *POST* magazines, are doing something very special and unique during the show. It's called **CROSSTALK... A TV SYMPOSIUM** on the AES. A panel of experts will meet each night in front of a live audience of AES attendees to discuss various industry technical subjects. The attendees will be given the opportunity to ask questions of the panelists.

The proceedings will be videotaped, edited and then aired in the exhibitor hotel rooms on a continuous basis. Each evening, a program will be produced in front of a “live” audience and broadcast starting at 11:30 p.m. Although the format is different, insofar as this is more like a DAVID SUSSKIND or TED KOPPEL type program, our involvement in specialized television for conventions is not new for us. The NSCA-TV show has been extremely well received by the professional sound contracting community as has the NAMM-TV and CES-TV shows for their related attendees.

We believe that **CROSSTALK** will be a valuable exchange of ideas and opinions by professionals in the professional audio industry... your peers. We hope you catch it. Finally, we look forward to seeing many of you at the upcoming NSCA/ERA regionals in St. Louis, Chicago, Los Angeles (ERA), and San Jose.

Have a great, very busy, and productive October.



Vincent P. Testa
Editorial Director/Publisher

SOUND & COMMUNICATIONS

Editorial Director/Publisher
Vincent P. Testa

Managing Editor
Debra A. Pagan

Technical Editor
Jesse Klapholz

Assistant Editor
Fran Avnet

Contributing Editors
Marc Benington, Gary D. Davis,
Ted Uzzle

Consulting Editors
Jerome J. Brookman, Chris Foreman

Technical Council
Dr. Mort Altshuler, *Professor Audiology, Hahneman University, Chief of Audiology, V.A. Hospital, Phila. PA*; Mike Biegel, *EPD Technology Corporation*; C. Leroy James, *Rees Associates, Inc.*; Richard N. Jamieson, *Jamieson and Associates, Inc.*; Russell Johnson, *Artec Consultants, Inc.*; Brian Murphy, *The Wilke Organization*; Richard Negus, *Purcell Noppe Associates, Inc.*; William Parry, *Maryland Sound Industries, Inc.*; Daniel Queen, *Daniel Queen Associates*; Jon Sank, *Cross Country Consultants*; William R. Thornton, *Phd, PE*

Art Director
Andrew Elias

Assistant Art Director
Karen Waibel

Staff Artist
Gerard Caramannello

Typesetting
Leo Ancona, George Proper

Circulation Director
Deborah A. Droge

Advertising Director
Thomas Soevyn

West Coast Advertising Sales
Stuart Smith
(818) 769-6481

Vice President/Editorial
Judith Morrison

Editorial and Sales Office
Sound & Communications
25 Willowdale Avenue
Port Washington, New York 11050
(516) 767-2500



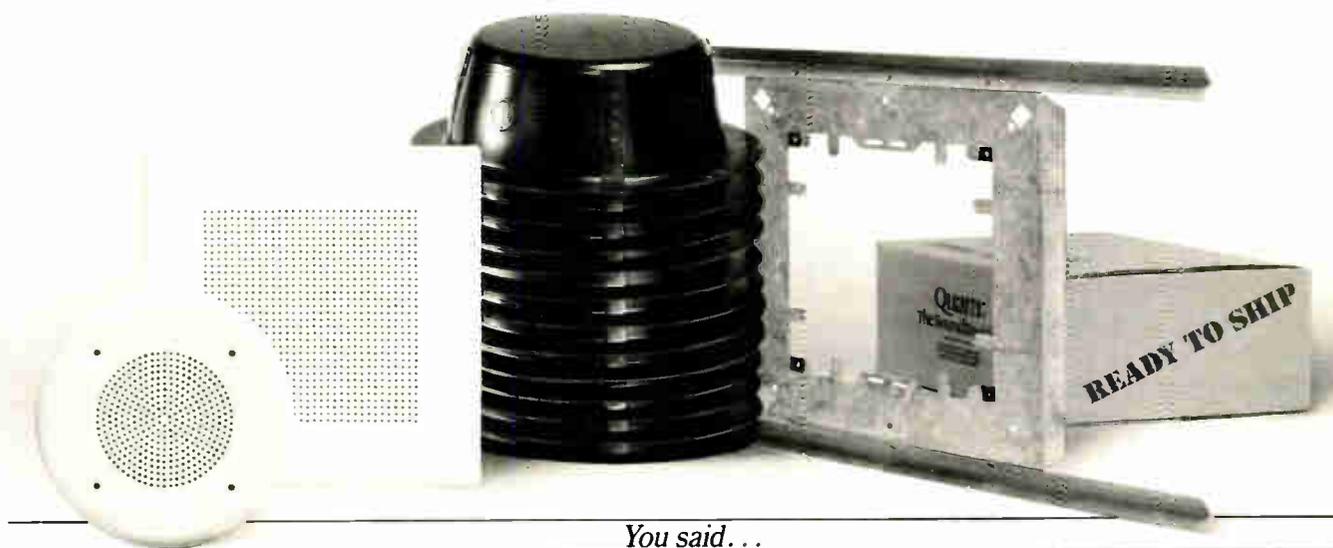
Sound & Communications • Music & Sound Output
The Music & Sound Buyer's Guide • Post
NSCA-TV News • NAMM-TV News • CES-TV News
The Music & Sound Retailer
Home Entertainment

YOU KNOW US FOR SPEAKERS.



THE FACT IS, WE'RE LISTENERS.

Speakers started our business more than 50 years ago. Listening keeps us prospering today. Developing products and services you need. Continually introducing improved techniques. Providing you with the tools to be a leader in your market.



You said . . .

"GIVE ME BAFFLES THAT REALLY LAST."

Quam's do. The tile-matching, white powdered-epoxy finish of our full-range series of 8" and 4" baffles provides durability far superior to enamel or lacquer. They stand up to handling during shipping and installation, and maintain their fresh look.

"BACKBOXES TAKE UP TOO MUCH SPACE."

Not Quam ERD-8 backboxes. The unique, drawn design of these lightweight backbox enclosures means they nest for storage and transit—taking up one-fifth the space of traditional high-hats. More important to your customer, the one-piece, leak-proof construction of the ERD-8 backboxes results in problem-free air pletum installations with better audio response.

"MOUNTING ASSEMBLIES ON CEILING TILES TAKES TOO MUCH TIME."

The design of the Quam SSB-2 Speaker Support Bridge saves you substantial time. It eliminates the need to cut a close-tolerance round hole in the ceiling tile. Locking tabs on the bridge's center plate prevent movement during installation. And the SSB-2 accepts most of the industry's popular round or square baffles, with or without backboxes.

"I NEED IT, WHEN I NEED IT."

Quam's toll-free order line and factory inventory of over 100,000 products means you get exactly the products you want—even complete sound masking assemblies—shipped within 24 hours of receipt of your order.

So while speakers started it all, listening keeps us—and you—prospering. And we'll continue to listen—and respond to what we hear—while we refine and enhance our current products and create new ones to meet your evolving needs.

Quam: The Sound Decision Since 1930

Quam-Nichols Company • 234 East Marquette Road • Chicago, Illinois 60637 • (312) 488-5800

World Radio History

Circle 211 on Reader Response Card

FORMER McMARTIN INDUSTRIES PRESIDENT BECOMES A CONSULTANT

Ray McMartin, former president of McMartin Industries of Gunnison, Colorado, has been retained as an independent consultant for Television Technology Corp. (TTC) of Broomfield, Colorado. McMartin, who has over 35 years of experience in the broadcast industry, will assist TTC in the divestiture of the Ampro-Scully product lines of cartridge players, reel-to-reel tape recorders and broadcast control consoles.

According to McMartin, the Ampro-Scully lines are well regarded and the book value has been written down so low that TTC is only looking for a fraction of the roughly \$1.8 million cost of the inventory alone. "I have always had a good on-going relationship with TTC and I thought it would be a good idea to assist them in this endeavor," said McMartin. "I'm enjoying the management and business type of work I'm doing for TTC and would eventually like to develop it into a career," he indicated.

FIRST CINEMA INFRARED LISTENING SYSTEM INSTALLED IN U.S. IS SENNHEISER'S

Sennheiser Electronic Corp. has announced the installation of its Infrared Listening System in the Samuel Goldwyn Theatre at the Academy of Motion Picture Arts and Sciences in Los Angeles. According to a company spokesperson, "This is the first time—both in terms of a cinema theatre and Sennheiser—where an infrared listening system has been installed. It is the only one of its kind in the country."

In related news, Sennheiser has announced the re-location of the company's headquarters and staff to Old Lyme, Connecticut. The move from the company's Manhattan offices took place in August. The new location, provides the company with some 15,000 square feet of space.

ORGANIZATIONAL CHANGE EFFECTED AT BOZAK/TAI

William J. Kieltyka, director of marketing of Bozak/Technical Acoustics International (TAI) wants to set the record straight: Bozak and TAI has been one company since last December. "People are still confused over our company's identity," he said. "We are manufacturing and providing all our engineering and marketing support out of our New Britain, Connecticut location. Ownership of product and patents is consolidated under a single corporation rather than the two previous entities," Kieltyka said.

SOUNDTRACS MIXES WELL WITH CHINESE CULTURE

In conjunction with their Chinese distributor based in Hong Kong, Tom Lee Music Co., Soundtracs recently displayed their full range of mixing consoles in a fully working environment. This included the CP6800 for commercial recording and video/film post production, the PC Series for MIDI based automation, the MRX for 16 track recording and the MX/MC Series for sound reinforcement. Additionally, the FM/FMX/FME consoles, which are available in a flexible fully modular concept for eight track recording, sound reinforcement, installation and broadcast, will make its debut in China.

Concurrent with BITV, which took place on August 25 through the 29, Tom Lee and Soundtracs did a series of seminars to explain all aspects of recording and post production to a select audience of Chinese engineers and end users. The seminar, for which work started in April of this year, included a detailed explanation and techniques translated into Chinese for the audience.

WIREWORKS SUPPLIED WIRES FOR PAN AMERICAN GAMES

Wireworks Corp. was designated the "Official Cable Supplier for the Opening and Closing Ceremonies of the Pan American Games," recently held in Indianapolis, IN. Laurence Estrin, technical director of the ceremonies, selected Wireworks because of his actual past experience with Wireworks products when he chose Wireworks to supply the audio cabling assemblies for the July 4 Liberty Weekend festivities. Other installations that featured Wireworks cable include Walt Disney World in Florida, Radio City Music Hall and Carnegie Hall in New York.

PIRELLI PRODUCES UNDERWATER FIBER OPTIC CABLE

Pirelli Cable Corp.'s Communications Division has produced a fiber optic underwater cable treated with Hydroget, a new proprietary compound that prevents fiber deterioration due to hydrogen absorption. Hydroget combines chemically to inactivate any free hydrogen generated by other cable components over the lifespan of the cable. The product is the first fiber optic underwater cable to be manufactured by Pirelli Cable in the United States.

The core, containing six single mode fibers in a loose tube buffer construction was produced at Pirelli's new fiber optic cable facility in Lexington, SC. It was jacketed with a lead sheath and two layers of steel wires at the company's power plant in Abbeville, SC. The fully-enclosed cable is designed to withstand swift river currents and other hazards of a river-bend installation, as well as a range of temperature variations.

US JVC CORP ESTABLISHES JVC PROFESSIONAL PRODUCTS COMPANY

Hiroshi Sana, president of US JVC Corp has announced the formation of JVC Professional Products Company, a division of US JVC Corp. Directing the new company will be Shinzo Nakao, president; Daniel D. Roberts, vice president; and Masaaki Ariga, vice president. The new company will have three operating divisions: Sales and Marketing, Administration, Engineering and Service. Daniel D. Roberts will be the general manager of sales and marketing and his assistant will be Masaaki Ariga. Sanae Kiyota will head up Administration. Juan Martinez will be general manager of the Engineering and Service Division.

The new company will provide video dealers, closed circuit video (CCV) dealers, computer image (CI) dealers and pro cam representatives with service and support before, during and after the sale. Furthermore, JVC's Sales and Marketing Division has increased its staff. The new company is headquartered in Elmwood, NJ, and started operations this month.

JAPANESE FIRMS ANNOUNCE PARTICIPATION IN TELECOM '87

Twenty six Japanese telecommunication and electronic firms and organizations will participate in the world's largest telecommunication exhibition, scheduled for October 20-27 in Geneva, according to the Japanese Executive Council for Telecom '87 which is composed of Japanese exhibitors and concerned authorities. "Harmony" will be the national theme and will represent the Japanese tradition and will symbolize the country's industry attitude to contribute toward better harmonization among different systems and countries.

by Ken Jensen
President, Stentofon Communications, Inc.

Putting the Show on the Road for Dealers

When it comes to selling sound or communications equipment, nothing beats a hands-on demonstration of the product to the sales prospect. This is particularly true in the case of intercom systems. No matter how many brochures or pictures they see, the sales prospects cannot really appreciate the features and benefits of modern intercom systems without hearing the sound and handling the equipment.

Although demonstration kits are available to dealers from most intercom manufacturers, they don't provide the answers to many dealers questions. How many demo-kits should he stock? Which type of system, duplex or simplex? How much time and attention will the prospects give to the dealer in setting up and demonstrating a system at their place of business. Does the dealer feel qualified and comfortable in making such demonstrations?

Trade shows also provide a means for intercom suppliers to demonstrate their products, but not under the best conditions. There is a limited amount of time that visitors will spend in any one exhibit booth, and there are too

many other activities going on that distract their attention. The sales follow-up potential is also diminished, because dealers are normally not participating in the presentations.

One solution to the demonstration problem would be for the intercom systems supplier to put his "show on the road", and that is what Stentofon Communications had done in their "Demo-Van for Dealers" program. The program promises to be a more effective marketing strategy for intercom sales because it is designed to promote the dealer as well as the products by making visits to the dealer's marketing area and conducting professional demonstrations to his customers and sales prospects.

I originated the idea for putting the Stentofon show on the road. My previous experience as an independent rep for different lines of sound and communications products taught me the value of demonstrations and the importance of involving local dealers and contractors in any marketing program. I also learned that a company could not expect independent dealers to stock the amount of equipment and

conduct the type of presentations necessary for effective demonstrations. This led to the concept of the company providing the equipment and conducting the presentations, with the dealer as the local sponsor. The result was the "Demo-Van For Dealers" marketing program.

The van itself is 32 feet long and 8 feet wide and was custom designed and built to provide a full range of equipment demonstrations and application presentations. A custom equipped truck was purchased to transport the van to dealer locations throughout the country. The truck is equipped with a self-contained generator to power the van's intercom systems, lighting and air conditioning/heating system.

The carpeted interior of the van has been insulated, decorated and designed to maximize the comfort and attentiveness of visitors. The rear of the van, where visitors enter, contains a full-line display of operating wall stations plus recessed shelves of literature. The front of the van is fitted with demonstration counters, a rear screen slide projector, a "chalk talk" board and a VCR with a 27-inch color TV monitor.

The van can seat up to six attendees at individual demo-stations, three on each side of a center aisle. Each demonstration is equipped with comfortable pedestal chairs and a compact demo-desk. Receptacles at each demo-desk allow the attendee to plug in a variety of intercom stations. The pedestal chairs swivel a full 180 degrees to allow convenient viewing of presentations at both the front and rear of the van.

A complete line of intercom systems and products are on display for demonstration, including: PAMEX MPC: which is a hands free system that includes a compact, 52 station central exchange cabinet plus operating models of various desk and wall stations; Stentofon micom operates up to

(continued on page 46)



Professional presentations and "hands-on" demonstrations combined with a comfortable environment encourage participation from customers and prospects.

A Good User Manual is Hard to Find

In the sound business we all depend on user manuals every day. Those who manufacture sound products depend on the manuals they write for the correct use and protection of their products. Those who design and install depend on the manuals they collate to prevent call-backs. Those who use sound products depend on the manuals they are supplied to derive the most benefit from the products.

Unfortunately, our manuals break down more often than do our products. There are specific reasons this should be so. Individualistic and iconoclastic inventors of the Gyro Gear-loose type may assume all users can derive in an instant everything it took them months to put into a schematic. They may be contemptuous of those who cannot. Or, they may simply not have the communications and verbal skills necessary to create a good manual.

Users of technical sound products may not take the trouble to master the grand organizing principles of the manuals, and during a failure or fault will thus not know where to look for the answers to specific questions. Besides, there is an immutable Law of Nature that all manuals disappear forever from the installation site eight minutes after the system is turned over to the customer. This, at least, cannot be blamed on the producers or dealers of the equipment.

"Average" quality manuals will suffice where there is little competition. They're good enough when innovation and novelty are slow in coming, and slow to be accepted. They're good enough where the target reader is experienced, a career-user of the product.

None of the above is true of the sound business. Our industry is ferociously competitive, and there often isn't enough real difference between competing products to see a glimmer of daylight between them. Superb manuals are successful tools for differentiating one supplier from another. Even if your technical specifications

are the same as your competitor's, a better manual means your product will perform better in actual field use. Even if your product features are the same, a better manual means your features will be used more, and more successfully. Even if your product reliability is no better, a manual that helps users to quickly clear faults themselves, will mean your product has less down-time.

If you want to introduce innovation to the sound business, you need manuals that sell the features, functions, and benefits of your innovations to the user, as an incentive to him to master new ideas and methods. Your manual also needs to teach him what he's doing, why he's doing it, and how to do it correctly. Otherwise your innovation will collect dust. Or, worse, be misused to the detriment of the concept. Good manuals are an absolutely essential element of good innovation.

One of the facts of life in the sound business today, whether musical sound or speech reinforcement or telephone systems, is that system users are mostly transients who do it for only a short while, to be replaced by others, who will themselves do it for only a short while. This circumstance makes good manuals an indispensable element of successful sound equipment, and successful sound systems.

Virtually every one of our intuitive ideas about the manuals we write or use, is wrong.

User manuals are not literature, they are not works of art. They cannot be effectively created by newly-minted English-majors who prettify technical documentation. Works of art demand consumers who are involved, independent, and resourceful. Good manuals are tools meant for the dependent and error-prone user, too bored to read carefully until there is trouble, and then too panic-ridden to read carefully. Art is an embellishment whose cost should be minimized; tools are an investment whose return-on-investment must be understood and

maximized.

User manuals are not just engineering reference material. The technicians who created the device understand it thoroughly. They need reference materials to extend their memories. When they write manuals, they write reference manuals, organized for finding small bits when you already know the big picture.

Usually, no one document organized in one way, meets all the needs of any single user, much less the needs of the galaxy of users who will use the product or system. This means multiple instruction books. Or, an instruction book supplemented by satellite pamphlets that can be assembled into a document customized for a particular system, or user. Or, a printed piece that refers to a periodic seminar or a videotape also available.

The most consistent, and consistently usable manuals need not be written by one person at one time. Manuals written by different persons, at different times, need not be disorganized. In fact, multiple technical writers working on a single document are forced to confront and deal with their organizational needs. They are *more* likely than single authors to produce well-organized documents.

Quality manuals that serve their purposes bear no relation to prettiness or illiterate-proofing. A chaotically-organized manual printed as a typescript, with freehand doodles, is no less effective than a chaotically-organized manual that is typeset, with illustrations produced by a commercial artist. A chaotically-organized manual with a sixth-grade vocabulary, is no more effective than a chaotically-organized manual written by William F. Buckley. A highly-technical but inappropriately-designed manual cannot be simply "dumbed-down" into a manual useful for the unwashed masses.

Coinciding with this Ideas & Viewpoints column is a book review also by Ted Uzzle on How to Write a Usable User Manual on page 60. ■

by Marc L. Beningson

Design/Build Projects

Specifications have been the topic for many preceding columns this year. The placement of sound system specifications in construction documents has

“...A specification is basically a ‘recipe’ for a sound system design.”

been discussed recently, because it has some significance to how a sound contractor performs his work. For the most part, specifications are prepared only by

sound system designers and acoustical consultants for their clients—a project architect or a facility owner. Meanwhile, most sound contractors do the majority of their work directly for owners, on a design/build basis, and seem to have no need for drawing up any kind of specifications. However, even a sound contractor should prepare some sort of specification to protect both his own company and his customer.

As we have discussed before, a specification is basically a “recipe” for a sound system design. It identifies the equipment to be used, the way components are to be in-

tegrated into a complete system, the procedures to be followed for installation, testing, and acceptance, project coordination instructions, and design details. The consultant uses a specification to identify exactly his design intent in a written format. In addition to serving as the basis for the contractor's work, the specification is also the consultant's product, and as such it spells out for his client exactly what the owner will receive. By examining the specification, an owner can be sure that what he is receiving is what he wants, thereby reducing (if not eliminating) false expectations. The specification can be modified or changed before it becomes a contract for installation with an associated price. This is the aspect of specification preparation that should be important to sound contractors.

By presenting design/build clients with a specification, a contractor can show the client exactly what is intended to be provided, not just in terms of equipment and installation, but also service, warranty, documentation, and training. Before the first piece of equipment is ordered, the client can be shown what the system will be like.

This specification need not be as detailed as that drawn up by a consultant. After all, there is no need to discuss bidding, qualifications and submittals, although there should be some indication of progress reports to the owner. There is also no need for acceptance testing and to some extent shop drawings, but there should be a provision for proving to the owner that the system is complete and

operational, without the participation of outside parties. Paragraphs dealing with substitutions should not be required if the specification lists equipment that the contractor is prepared to deliver. A lot less verbiage is necessary.

The specification should simply and clearly show the design, the equipment to be used, and the appearance of any devices or assemblies that will be visible. Simple sketches and cutsheets would be helpful, as would a basic block diagram of the system. Show enough details to convince the client not only that the system is perfect for his needs, but also that you know what you are doing as a sound system designer and installer. Don't show so many details, though, the owner will suspect any problems if field conditions require a change in strategy. Consultants do not usually have this privilege.

It would not be outrageous to demand a reasonable partial payment at the time the specification is presented to the owner. This fee would be the equivalent of a design fee and would either prevent the owner from giving your design to a less capable competitor, or make it worth your while even if he did.

The question remains, though, do you as a contractor have the resources to put together a reasonable design and to prepare a suitable specification? Even if you have the knowledge, do you have the time and capability to prepare legitimate specifications? If you suspect that you do not, next month's column will discuss a number of ways that you may attain that capability.



Seeing is believing

Look at what's available now!
The new AN-1000 has been adapted to fit the Tektronix half-rack.

That empty space next to your waveform monitor can be put to use. It can house an AN-1400, an unbelievably powerful small speaker.

Mosfet output. DC servo offset control and electro-acoustic signal processing are all combined with the acoustically tuned enclosure, producing quality sound that you have to hear to believe.



Anchor Audio, Inc. • 913 W 223rd St. • Torrance, California 90502 • 213-533-5984 • 1 800-ANCHOR-1



Microphones

In the studio, over the air or up on stage, there's a Fostex RP mic specifically designed for the job at hand. RP stands for regulated phase, a transducer technology which has been awarded over 20 international patents to date. These mics have the warmth of condensers, the ruggedness of dynamics and a sound as transparent as it gets.



Headphones

These are more outstanding examples of RP Technology. Model T-20 has become almost legendary among studio musicians, producers and engineers. Its flat response at any listening level and its comfortable design help you listen longer without fatigue. And the sound is so clear and well-defined, critical listening is enjoyable.



Speaker Systems

You're up & going with Fostex PA systems. Modular designs let you control the sound according to the needs of the event. Stack them, gang them. From a simple portable PA to an entire rig, look to Fostex speaker systems to help you solve your sound problems.



Powered Mixers

Model MP-800 has 8 inputs and delivers 180 W per channel and Model MP-1200 has 12 inputs and delivers 250 W per channel. These rugged, road worthy stereo mixers have quiet running fans, digital echo, normalled connections at all critical patch points, stereo graphics on the mains and super monitoring flexibility. The best at any price.

Complete PA Systems

Look to Fostex for any and all of your PA needs. Complete systems or individual components. High quality sound from input to output.

World Radio History

Fostex
Pro Sound Division

15431 Blackburn Ave., Norwalk, CA 90650
(213) 921-1112

© 1987 Fostex Corporation of America

ANOTHER VIEWPOINT ON THE NEW AUDIO CYCLOPEDIA

Dear Editor:

Since receiving my copy of the *Handbook for Sound Engineers* several weeks ago, I've entertained the idea of writing a letter to somebody expressing my disappointment in it; Dennis Bohn's letter in *Sound & Communications* magazine (July, 1987) concerning that very subject prompted me to go ahead with my plans.

When I first heard that a new *Audio Cyclopedia* was in the works, I was excited about the possible outcome of this admittedly enormous project. As a part-time recording teacher and frequent lecturer, I'm always on the lookout for a single text I can wholeheartedly recommend to students, but after reading through various sections of particular personal interest, I realized that this would not be the book to suggest as a solid 'single-volume library.' Indeed, it is so filled with errors and misinformation that I recommend that students not purchase it at all. Rather than attempt to re-teach the biased and erroneous ideas a student may pick up from this book, an instructor's time may be better spent either re-editing and rewriting portions of the book or simply compiling accurate, objective information from alternate sources.

Above and beyond the items Mr. Bohn has already pointed out, I must add that the part entitled *Electro-acoustic Devices* is thus far the most personally disturbing; the microphone theory section contains the most thinly-veiled advertisement being sold as objective information I've ever encountered; and the applications section is filled with examples of miking techniques even a first-year acoustics student would recognize as incorrect.

In all fairness to the authors, I do acknowledge the immensity of this type of undertaking, and indeed several chapters are exceptionally well written. I can't, however, talk myself into excusing glaring errors and prejudices simply by telling myself that this book's authorship was a difficult task.

Steve Hebrock
Engineering Manager
Audio-Technica U.S., Inc.

WRIGLEY FIELD SOUND SYSTEM CRITICIZED

Dear Editor:

This letter is in regard to your May edition of *Sound & Communications* and in particular the story on Wrigley Field's sound system update by John Parris Frantz.

It stated early in the article that the owners of the Chicago Cubs (The Tribune Co.) "...made an updated sound system a major priority among other improvements." The article also stated that the big winners "won the job with their suggestions of high technology at a reasonable price."

As designers of state-of-the-art stadium sound systems and in charge of audio in one of the finest sounding stadiums in the country, we were surprised to see that Mr. Gand and Mr. Brown (the project's big winners) chose to continue the pattern of making large arenas and stadium sound—in a word—"obsolete."

"High technology" in deed. Sound

contractors who continue to use antiquated technology, such as these gentlemen did (regardless of the budget situation), perpetuate poor sounding stadiums all over the country.

Another point here is that I can't imagine anymore of an imposition to the residents near Wrigley Field than the horrendous parking and pedestrian problems in the area on game days... the audio bleed of a single point source system into the adjoining neighborhoods would be minimal in its intrusion into Wrigley's neighbors' lives.

Aside from a single point source solution, these gentlemen could have easily specified more modern components (again-despite budget restrictions) in the distributed installation to provide wider frequency response and greater signal coverage within the stadium.

These gentlemen's use of delays on separate speaker circuits sounds as if they would create worse echo situa-

(continued on page 76)

HOW BRIGHT IS YOUR PRESENT STROBE?

FARADAY'S NEW STROBE AVERAGES 3.0 CANDELA PER U.L. STANDARD 1638



STAND ALONE STROBES



BELL/CHIME STROBES



HORN STROBES

- U.L. LISTED • CSFM LISTED
- BSA APPROVED • 12, 24 VDC; 120 VAC
- CUSTOM LETTERING AVAILABLE
- WHITE, YELLOW, BLUE, RED LENS
- LOW CURRENT DRAIN

FARADAY

805 SOUTH MAUMEE STREET
TECUMSEH, MICHIGAN 49286
517-423-2111

THE ONE SOURCE FOR YOUR SIGNALING NEEDS.

Circle 233 on Reader Response Card

THE WINNING HAND

THE NEW 900 SERIES PLUG-IN MODULES

Toa introduces 7 new fabulous hi-tech modules that perform wonders when incorporated into Sound Reinforcement Systems utilizing 900 Series amplifiers. The new additions to the 900 Series plug-in modules offer Voice Gate, Variable Muting, Mic and Aux Compressor features and allow the sound contractor or specifying engineer to choose from a total of 36 modules in six different categories. These modules have been designed with Toa's "install and forget" philosophy. They utilize thoroughly modern surface mount technology, provide ease of installation and increased reliability.

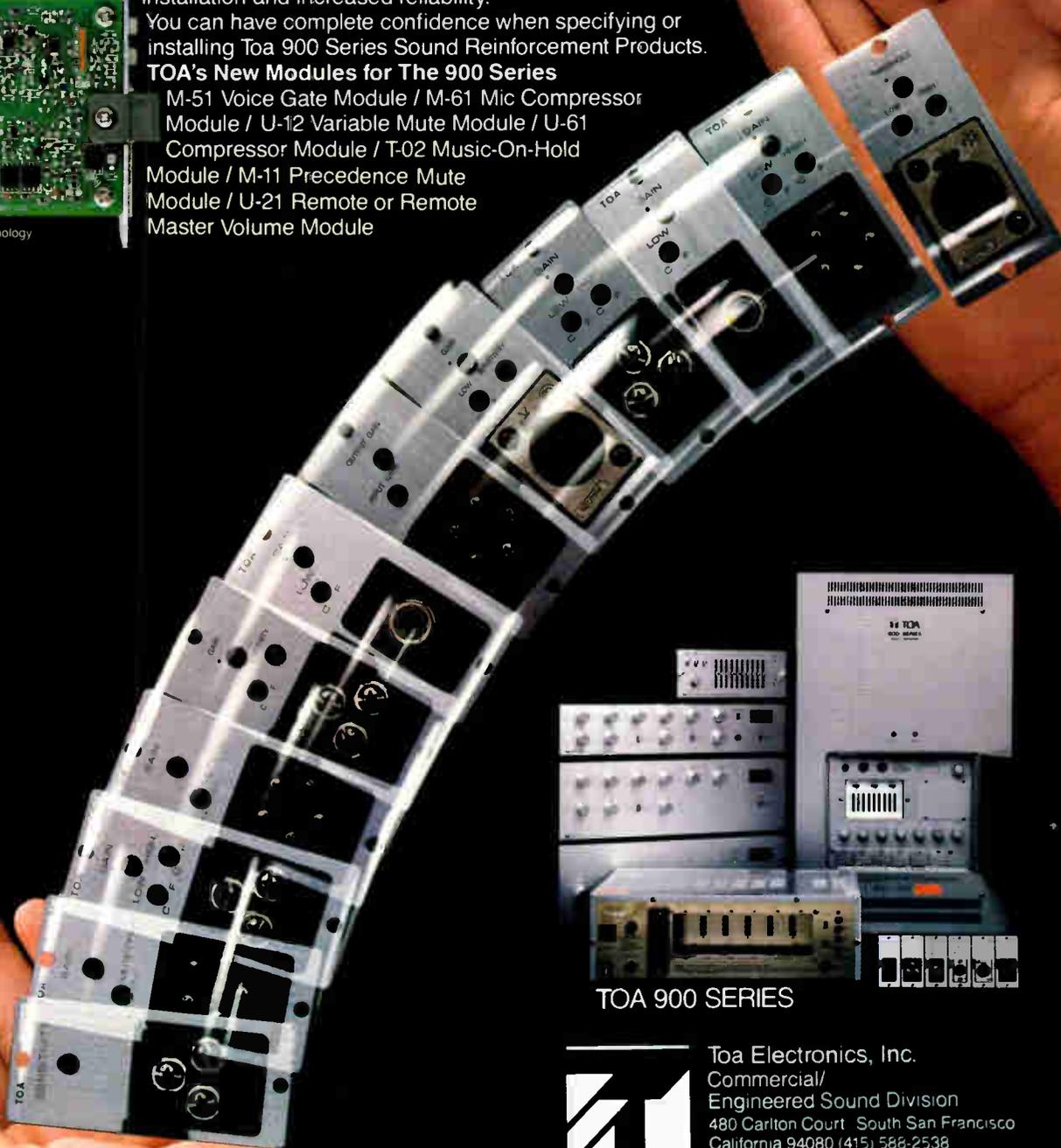
You can have complete confidence when specifying or installing Toa 900 Series Sound Reinforcement Products.

TOA's New Modules for The 900 Series

M-51 Voice Gate Module / M-61 Mic Compressor Module / U-12 Variable Mute Module / U-61 Compressor Module / T-02 Music-On-Hold Module / M-11 Precedence Mute Module / U-21 Remote or Remote Master Volume Module



Surface Mount Technology



TOA 900 SERIES



Toa Electronics, Inc.
Commercial/
Engineered Sound Division
480 Carlton Court - South San Francisco
California 94080 (415) 588-2538

Toa Canada (403) 489-5511 Edmonton, AB
(416) 624-2317 Toronto — Toa U.K. 0277
233882 Essex — Toa Europe 049 259609
Hamburg — Toa Japan 0737 71-2222

What Brand of Ears Do You Wear?

How the ear reacts with sound fields and headphones, with a review of real-ear, and coupler-based measurements. Do we have all the questions answered?

Part I of this article discussed how to evaluate the myriad of choices in headphones and headsets and questioned whether we can really compare headphones' performance at all.

A perfect headphone would be one that delivered constant sound pressure at the ear canal at all frequencies when driven by a constant power source—regardless of the physiological characteristics of the wearer. This sounds plausible—as can be evidenced by the many “digital-ready” and “state-of-the-art” headphones. Unfortunately, as was eluded to in part one of “What Brand of Ears do You Wear?,” the interaction of the human anatomy is more personal than the term ‘subjectivity’ alone, and headphones really cannot be perfect in our disposable “one size fits all” world.

Characterizing the hearing/cognition system as complex, is a simple understatement. Suffice to say that it is a dynamic system and controlled by the most powerful computer in the world. If we can agree on this much, how can we settle for static measurements on a static test fixture? If we advocate the use of headphones as reference monitoring devices, then what is the reference?

The Ear

Depending on which religion or science one believes indicates the beginning of this story. As far as Biology 101 is concerned, the development of

the human ear began in lower forms of animal life for the purpose of sensing body movement. It is further believed that after animal life emerged from the water, the terrestrial animal grew outer and middle ears for the purpose of better focusing sound and matching impedances from the air to the fluids of the inner ear.

Regardless of one's religious convictions, we all subscribe to the doctrine that the outer ear primarily consists of a ‘canal’ opened at one end, and terminated at the other end by the tympanic membrane, the cleverly arranged malleus, incus, and stapes; and the whole business is called the middle ear. The outer ear connects to the outside world with the auricle or pinna, most commonly used nowadays as a support mechanism for flashy accoutrements. Physiologically speaking, the pinnae, and head contribute diffraction, time/phase, and baffle effects upon the spectrum arriving at the eardrum.

The main effect, or artifact, of the outer ear is the resonance that occurs around 3 kHz. This corresponds to the proportional relationship of the size of the canal to wavelength. This resonance also corresponds to the main region of information in speech. Further resonances are created by changes in the cross-sectional area of the canal, and the actual termination at its ‘closed-end.’ Mathematical approximations are further complicated since the ear-canal is not necessarily

a rigid-wall in respect to the entire audio range.

Due to the differences in impedance of the inner and outer ear, there is a loss of some 15-30 dB that must be made up. The effect of the greater area of the tympanic membrane, in proportion to the stapes to which it is connected to, is an increase of the force-per-unit-area by a factor of 17. These two parts are connected via the ossicular chain which is a lever-like mechanism that further increases the mechanical gain. This all adds up to a pressure gain of approximately 28 dB.

Measurements

Basically, there are two methods of testing earphones: by means of ‘artificially’ representing the acoustical equivalent of the ear in a mechanical test fixture, such as with an artificial ear or coupler; and with various probe techniques while the earphone resides on an able and willing motionless volunteer. The definitive ear's size, shape, elasticity, etc., are not easily determined, or a reference of these established, let alone effects of the pinna duplicated with uniformity. Obviously, the anatomical differences make the whole business a much more difficult affair to manageably reduce to a reference. Therefore, the practice of “real-ear testing of earphones” quickly became popular in the early days of experimental research, both at

by Jesse Klapholz

WHAT'S BLACK AND GREEN AND HEARD ALL OVER?

AKG's D 300 Series Microphones are the accepted standard for many professional entertainers. They're built rugged, for dependable studio quality on-the-road. And sometimes the look and feel of a mic is just as important as its performance, especially in performance.

So AKG has introduced its best mics in a special high-tech, non-reflective black finish that's perfect for the demands of stage, video and film.

From the D 112 kick drum mic to the C 410 headset mic there will be no more lens flare or burnout on-camera. No more smudgy fingerprints in closeups. No more competing with your own mic for the attention of the crowd . . . all this with the same great AKG sound.

The AKG non-reflectives. You couldn't be heard any better.



77 Selleck Street
Stamford, CT 06902

Bell and the Harvard University Labs.

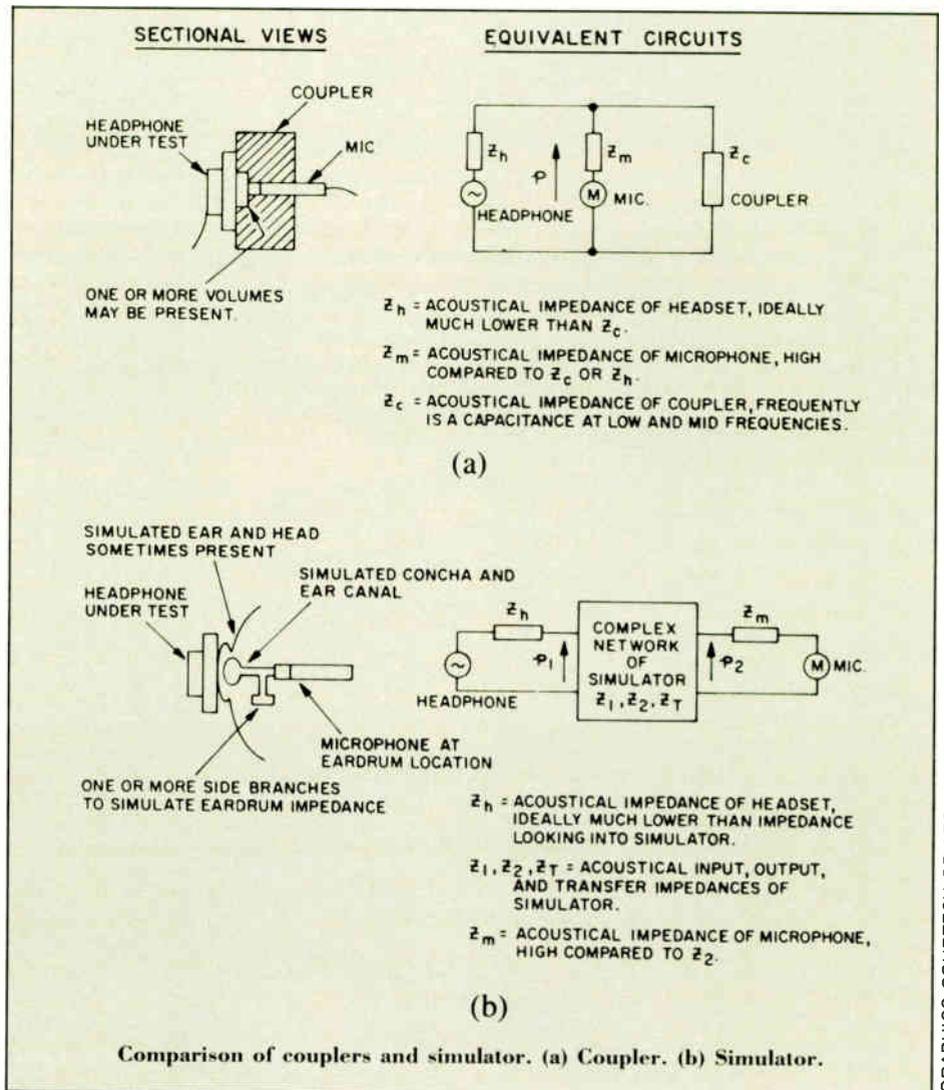
The real-ear tests have several methods all of which measure the sound pressure level at various locations including at the eardrum, at the entrance of the ear canal, and just under the ear cushion of the earphone in comparison to the level produced in a free field. The ear drum pressure method entails introducing a potentially-damaging microphone into the human anatomy by placing the subject's head in a clamp; and the skilled manipulation of the test mic by means of lead screws into the ear canal just until a 'tingling' sensation is acknowledged to the operator, then the mic is just slightly backed out.

No matter which real-ear method is used, a correlation among many subjects is required. Subjectivity is used in some tests, and repeatability is even further complicated. Correction curves have been 'established' for most of the methods, but these do change over long periods of time. These complexities and difficulties established the need for artificially simulating the human ear. However, this is no easy task as time has concurred.

Artificial Ears

The design goals for artificial ears are to provide the earphone with the same acoustic impedance as the average normal ear, simulate the phone/ear leakage, and provide a means for measuring the characteristics of the earphone with direct reference to the human ear. As early as 1932, ear simulators were used to measure the acoustic characteristics of earphones, specifically the one developed at Bell Labs for the purpose of telephone intelligibility measurements.

The Bell artificial ear was able to simu-

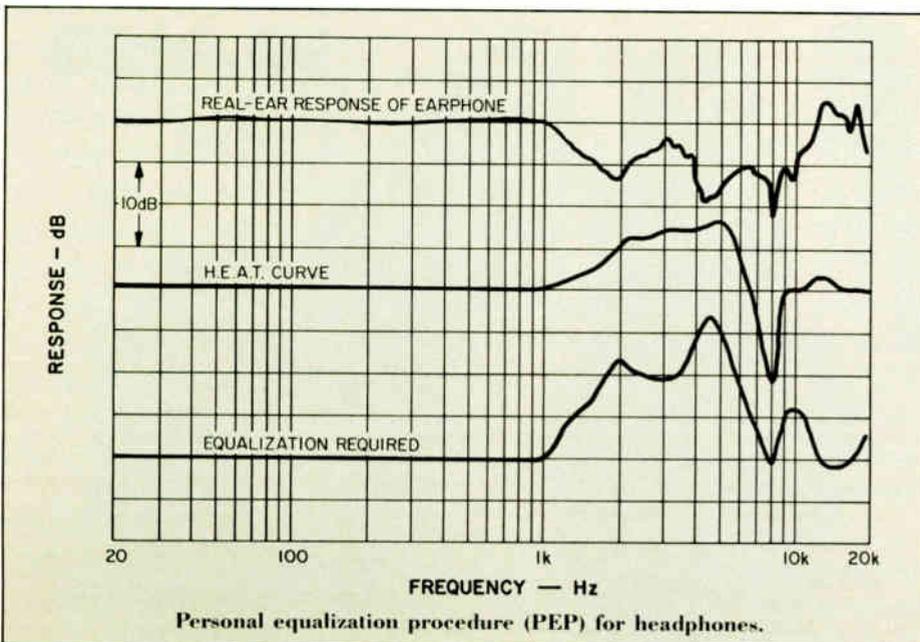


late the shape and acoustic load of the ear, and used a 'pinna' made of soft molded rubber such that it provided a seal with the earphone like a human ear does (other shapes and textures could be molded as well). It also provided for ad-

justable air leak, resistance, and mass. While their test fixture corresponded well with real-ear tests, it was a complicated device that could not be easily duplicated by many labs. Therefore, this approach swayed researchers to another type of test fixture for the purpose of standardized measurements—the 'coupler.'

Various couplers were devised for use in measurements of hearing-aids, intra-concha (in-ear) phones, supra-aural (on-ear) phones, and telephones. For the measurement of supra-aural devices, the "six-cubic centimeter coupler" was developed. This volume is equal to the median ear canal. The shape was arrived at by reasoning that the longitudinal and transversal modes would cancel each other out, such that it is virtually free from resonance effects up to approximately 6 kHz.

However, the problem is not quite so easily solved. Air leaks, and pressure differences need to be closely monitored and controlled. Also, standing waves do become a problem at the high-frequencies. Not to be outdone, Olson was working on a ribbon receiver and reported measurement results out to 10 kHz. His meas-



urement apparatus included the introduction of hydrogen into the coupler while measuring the high-frequency response to eliminate standing waves, and sealing the tubes for low-frequency measurements.

As circum-aural headphones were introduced, the need for an appropriate test fixture culminated in the 'flat-plate' coupler, a flat-plate with a flush-mounted microphone. Koss developed his own version which included a cavity in front of the microphone recessed below the plate surface.

In culmination of these years of ongoing efforts to corroborate headphone calibration to the performance on human ears, research refocused towards ear simulators. Of the most widely recognized work was that of Zwislocki at the University of Syracuse, and Mahlon Burkhard at Knowles Electronics. Zwislocki has become a household word, in acoustical homes that is, referring to an ear simulator design that separates into several sections that may be used in different combinations depending on the particular measurement requirements.

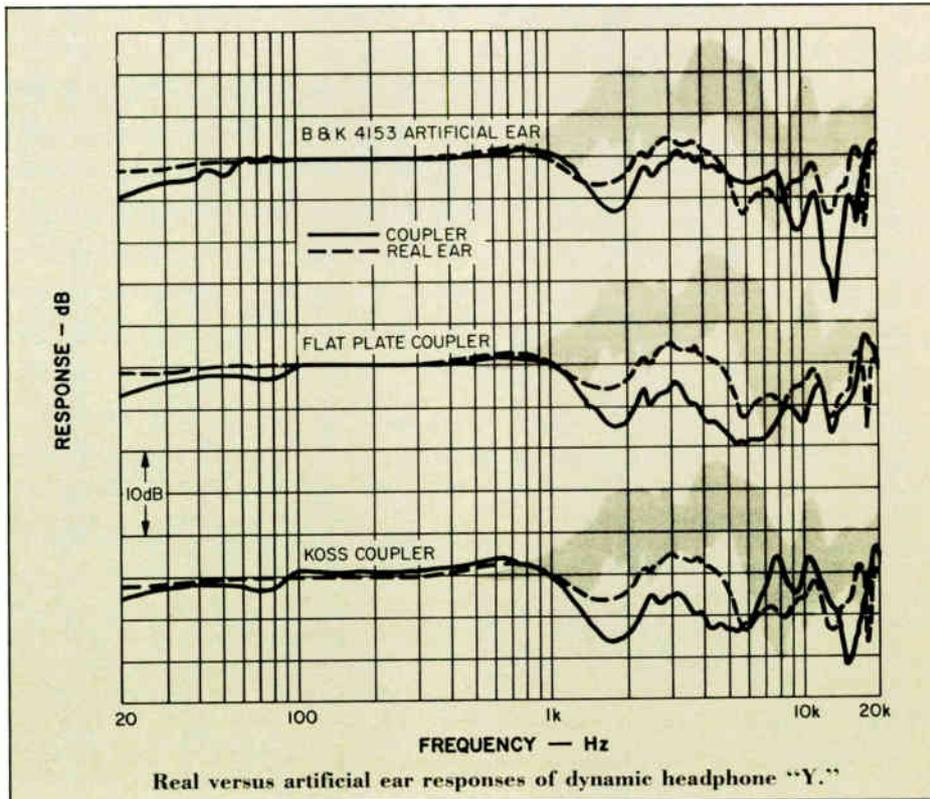
A 'real' ear simulator was introduced in 1975, called KEMAR (Knowles Electronics Manikin for Acoustic Research). The field-to-eardrum transfer function for KEMAR agrees within a couple of decibels to those published for real ears by Shaw's work in the comparisons of sound pressure levels in free-field versus the eardrum. Consequently, this device rapidly found a home in many labs since it facilitated simple measurements of phones, and consistent correlation to real-ear measurements, as well as applications to sound-field/ear investigations.

haustive and conclusive to-date. He gathered a number of "volunteers" and collected reams of stereophone measurement data. This data concluded the necessity of "...observing the frequency characteristics of the sound in the concha that would be obtained with an ideal loudspeaker-room system."

To sound 'flat,' the headphone electro-

zation from the HEAT Curves which he called PEP (personal equalization procedure). The results provide headphone response equivalent in 'presence' to loud-speaker systems.

Beyond the scope of this article are the matters relating to the lack of psycho-acoustic cues due to varying direct/reverberant sound field proportions, and

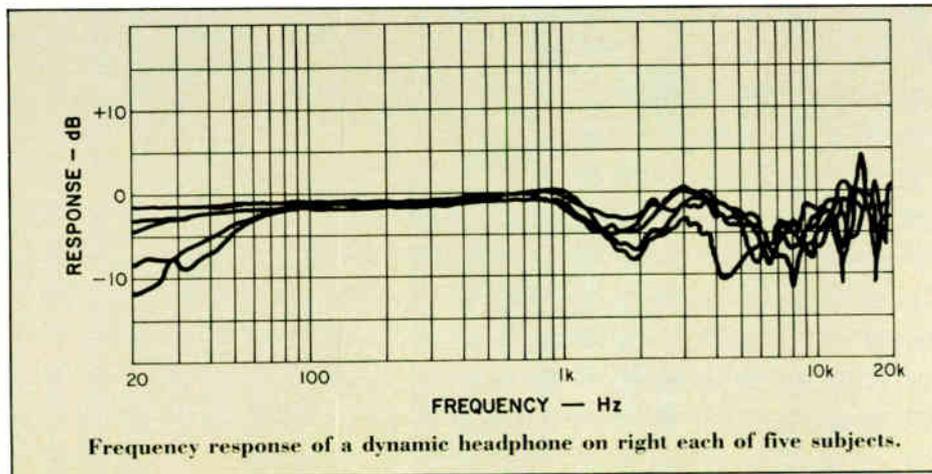


acoustic transfer characteristics—subsequently dubbed HEAT Curves—must follow a curve plotted as the difference in the ear/torso and direct response to a reference system. Sank generalized the

other related effects introduced by head movement in relation to the sound source (for more on this see Theile). Hopefully, the direct specification and comparison of headphones will be simplified when a standard is finally agreed upon. Furthermore, Sank's proposed PEP using HEAT will certainly find a useful place in professional applications as it is easily implemented yielding dramatic results. Anyway, the exact performance of headphones for you depends on the brand of ears you are wearing.

Bibliography

- Beranek, Leo L., *Acoustic Measurements*, (Wiley, New York, 1949).
- Burkhard, Mahlon D., "Measuring the Constants of Ear Simulators," *J Audio Eng. Soc.*, vol. 25, p. 1008 (1977 December).
- Sank, Jon R., "Improved Real-Ear Tests for Stereophones," *J Audio Eng. Soc.*, vol. 28, p.206 (1980 April).
- Theile, Gunther, "On the Standardization of the Frequency Response of High-Quality Studio Headphones," *J Audio Eng. Soc.*, vol. 34, p. 956 (1986 December).



The Heat Curve

Recognizing all of the foregoing described problems, *Audio Magazine* sponsored work by Jon Sank concerning headphone evaluation. While other work had already been done in regards to hi-fi comparisons, Sank's work is the most ex-

HAAT Curves as a boost in the 2-5 kHz region, a trend toward a dip in the 8 kHz region, and miscellaneous peaks and dips above 8 kHz, which average out to a requirement for uniform response from 10 kHz to 20 kHz. Sank's research postulated the use of specially adapted equali-

WHAT TO LOOK FOR WHEN YOU LISTEN TO A POWER AMPLIFIER.

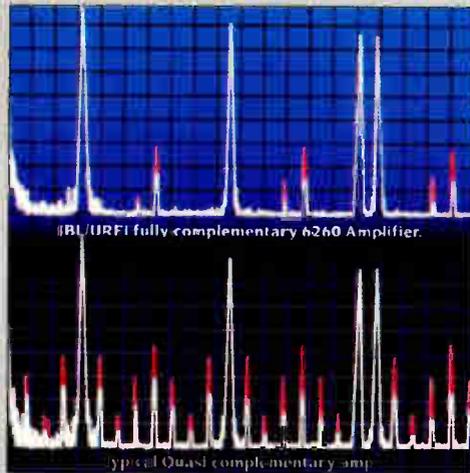
When it comes to evaluating amplified sound, seeing is believing.

In fact, when engineers judge the sound quality of an amplifier, they often rely on *two* precision instruments: the human ear, and the industry-standard Transient Intermodulation Distortion Test, because when measuring sound with T.I.M. what you see is what you get.

And what you see can be eye-opening. Amplifiers that seem to square off evenly spec. for spec., often perform very differently under the scrutiny of T.I.M. Pushed to their limits, many produce brittle, edgy or distorted sound especially during high frequency passages and sharp transients.

Many manufacturers deal with distortion by using massive amounts of feedback through a single overall feedback loop, placing greater demands on the amplifier and producing an inferior sound.

When we built our new JBL/UREI Amplifiers, we committed ourselves to designing the industry's purest-



Red spikes in the TIM Spectrum reveal the dramatic differences in distortion output.

sounding amps that would not only score highest marks on the T.I.M. Test, but deliver the truest amplified sound ever heard.

Instead of sloppily force-feeding massive amounts of

output signal back into input stages, and congesting it all into one circuit loop, we've established operating points at *each* gain stage. This allows signal purity to be maintained along the entire circuit. And permits optimized use of the type and amount of feedback for each individual gain stage.

In a simple analogy, the new JBL/UREI Amplifiers do each signal track right the first time, so that you don't have to fix it in the mix. The result is sound far cleaner than typical quasi-complementary and fully-complementary output stages only. And far more pleasing to the ear.

Put JBL/UREI's remarkable new Amplifiers to the test at your local JBL/UREI dealer today. We're confident you'll think it's the finest amplified sound you've ever heard. Or seen.

For an informative Technical Paper on the unique design philosophy behind the new JBL/UREI Amplifiers, please write to:

JBL Professional
8500 Balboa Boulevard
Northridge, CA 91329

JBL UREI
ELECTRONIC
PRODUCTS

Available in Canada through Global Marketing

Circle 213 on Reader Response Card



Any sound engineer or contractor who has worked with a religious facility—no matter what denomination—soon comes to the realization that the final authority over any project comes from a committee whose expertise has little to do with sound. And one thing every committee will tell you is that, of course, they want the sound to be perfect. . . they just don't want to see microphones everywhere; sometimes, they don't want to see them at all! Frequently, this also applies to loudspeakers, but this is another subject altogether.)

With respect to the minister, this problem is easily solved with body-mounted microphones — frequently used in a wireless (RF) system — as they provide both good pickup and mobility.

Part I of this article discussed the general considerations, coincident techniques, placement and near-coincident techniques of microphones in a religious facility. Part II will discuss other considerations and answer questions brought up in Part I of the September issue.

Visual Considerations

Small microphones, discretely placed on a single stand or suspended from above, will minimize any visual distraction. The use of a "stereo bar" ¹ will allow positioning two microphones together on a single stand. When extra height is needed, a tall microphone stand may be used, ² or the microphones may be suspended from above by their cables and positioned with the aid of monofilament line. Use of a single-point stereo microphone will further reduce the visibility of the system. Also remember that black or dark grey microphones and stands are less visible than those with shiny finishes. Where your budget will allow the added cost, some modular microphone systems provide special cables, extension tubes and other accessories which are useful in reducing the visibility of the microphones. ³

A bit of caution is needed, however, when considering "lavalier" microphones for this purpose: most of these are omnidirectional, and therefore are unusable for coincident techniques. Even those which have a directional polar pattern are often specially equalized to compensate for "chest cavity" resonance, and are therefore not suited to free-field use.

Camouflage techniques may also be employed to minimize the visual distractions of the microphones. Microphones and cables may be painted to match the background. Religious ornaments or paraphernalia frequently can be used to hide microphones, as can basic architectural objects such as walls, tables,

BY RON STREICHER

screens, etc. Be careful, however, not to impede the polar response of the microphone in the process.

Spaced Microphone Techniques

The next logical step is to increase the spacing between the microphones; two or three microphones (or more) can be suspended from above for this technique. Most often, omnidirectional microphones are employed, although use of cardioid mics will, again, increase gain before feedback in reinforcement situations. [Fig. 6] (As stated earlier, however, lavalier microphones are usually equalized for "chest cavity" resonance, and are not suitable for this purpose.) This technique lends itself best to larger ensembles, and is not appropriate for small groups or soloists.

It is important, however, to remember that since the spacing between the microphones results in time (i.e. phase) as well as intensity differences between the pickups, several factors must be considered: 1) in stereo, the position of a sound source relative to the microphones will affect the stereo imaging, such that distant elements will provide ambiguous or negligible directional information, while closer ones will change radically with even small changes in their location within the overall soundfield; 2) unless a center channel microphone is employed, the definition and clarity of the central region of the sound source will be ambiguous in the stereo perspective; 3) low frequency comb-filtering effects will be evident, and these will be dependent on the frequency (i.e. wavelength) and spacing between the microphones and the elements of the sound source; 4) monaural compatibility will therefore suffer as a result of these comb-filter effects.

Pressure Boundary Microphones

Recently, the implementation of pickups placed directly on or near a "boundary surface" has given rise to several new types of microphones. The most well known of these is Crown's "Pressure Zone Microphone" PZM, ⁴ although several other manufacturers are also offering microphones using this principle. ⁵

The greatest advantage of these microphones is their very "low" profile when placed on a floor, table, wall, or similar large boundary surface. (I emphasize large since the low-frequency response of any boundary-mounted microphone shelves dramatically as the size of the boundary surface is reduced.) Their greatest disadvantage, however, comes from their generally "hemi-omnidirectional" pickup pattern which results in poor rejection

The Eleventh Commandment

PART TWO

Thou shalt not expose any microphones to view

of unwanted sounds and low gain before feedback. Some elaborate mounting configurations (and a few newer models) of this type offer some improvement in directional characteristics, although often at the sacrifice of erratic frequency response.

Using these, as with any microphones, requires careful selection and placement. There are simply no "miracle microphones," despite what the manufacturers' advertising departments may claim.

Accent Microphones

When a soloist or other performer(s) must be given a special "accent," the use of "spot" microphones is called for. Adding these into the mix must be given careful consideration, however, to keep everything in perspective (pun intended).

An omnidirectional microphone will generally best suit a soloist: it will not exhibit "proximity effect" from close placement; it is also less susceptible to breath blasting than a directional microphone; and it offers the soloist some ability to move with respect to the microphone, without a major change of quality or loss of pickup due to off-axis response.

Placement of the microphone into

the overall stereo perspective is also important. Listen to the position of the soloist in the basic stereo image without the solo microphone turned on, and then use the panpot to superimpose the signal from the solo microphone onto the same position; if this is not done, the image of the soloist will tend to "wander" in the mix.

The gain of any spot microphone should be just sufficient to add the emphasis required; it should not overpower the mix, or be appreciably louder than the natural perspective. Use of several accent microphones logically leads into the subject of multi-microphone techniques, which are not within the scope of this article.

Conclusions

This brief article cannot possibly cover all aspects of microphone pickups and placement, but merely provides an introduction to the many options available. It is recommended that further reading and, better yet, practical experimentation be done, so that when you face a new or unusual situation, you will have the background to reach into your "bag of tricks" and come up with the ap-

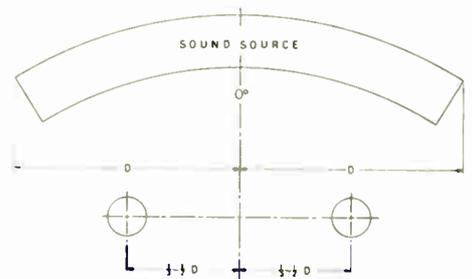


Figure 6
Spaced omnidirectional pair

propriate solution.

The complexity of live performances, coupled with the added restriction inherent in the decorum of a sacred setting, demand that careful attention be paid to selection and placement of microphones in a religious facility. Thus, it is imperative that the sound engineer/consultant be prepared to draw upon as many tools and techniques as he possibly can. As stated earlier, there are no "magic" answers; unlike the slogan on the bumper sticker, there is not only "ONE WAY" to reach "sonic perfection." Every situation is different, and the solution to today's problem might be the cause of tomorrow's.

References and Recommended Readings

Recording Techniques, by Ron Streicher, MIX Magazine, Vol. 9, No. 8, pp. 50 ff, 1985 August

Stereophonic Techniques, an anthology published by the Audio Engineering Society, New York, NY, 1986

The Microphone Handbook by John Eargle, Elar Publishing, New York, NY, 1982

1. A good, versatile and inexpensive stereo bar is the AKG KM-235/1.
2. Fifteen-foot high aluminum stands are available from Audio Engineering Associates, Beyer, and Shure.
3. The AKG, Neumann, and Schoeps series are particularly good examples.
4. PZM is a registered trademark of Crown International, Inc.
5. Other manufacturers of "boundary-type" microphones include Beyer, Schoeps, Sennheiser, and Shure Brothers.

Figure reference 6: Ron Streicher and Wes Dooley, "Basic Stereo Microphone Perspectives—A Review," J Audio Eng. Soc., vol. 22, no. 7/8, p. 553 figure 11 (1985 July/August; last months figures from the same article).

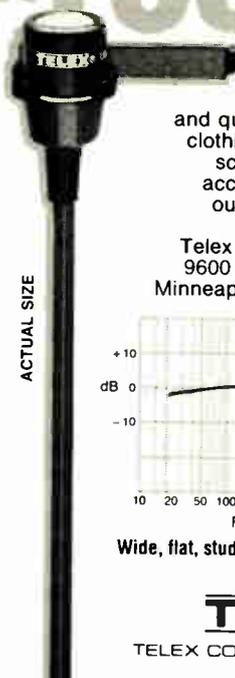
Ron Streicher began working at Pacific Audio-Visual Enterprises in 1972, where he serves as an independent audio consultant and recording engineer.

The Telex LM-100 miniature lapel mic system

TINY but TOUGH!

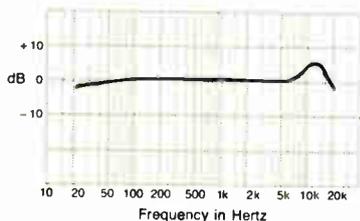
The LM-100 is an omnidirectional condenser microphone system which includes the tiny LM-101 microphone and Telex PS-10 in-line phantom power supply. This microphone was designed for day-in and day-out professional use under the most adverse conditions. In environmental testing, the LM-100 performed perfectly in extremes such as below zero temperatures, snowy television interviews and on location in the boiling heat of a desert Hollywood movie set.

The Telex lapel microphone has a non-glare black finish and is supplied with three styles of mounting clips. The microphone has a three foot cord terminated in a TA4F plug. This specially designed cord is extra supplied



and quiet to prevent irritating clothing noise. A foam wind screen is available as an accessory for extra windy, outdoor use. For detailed information write

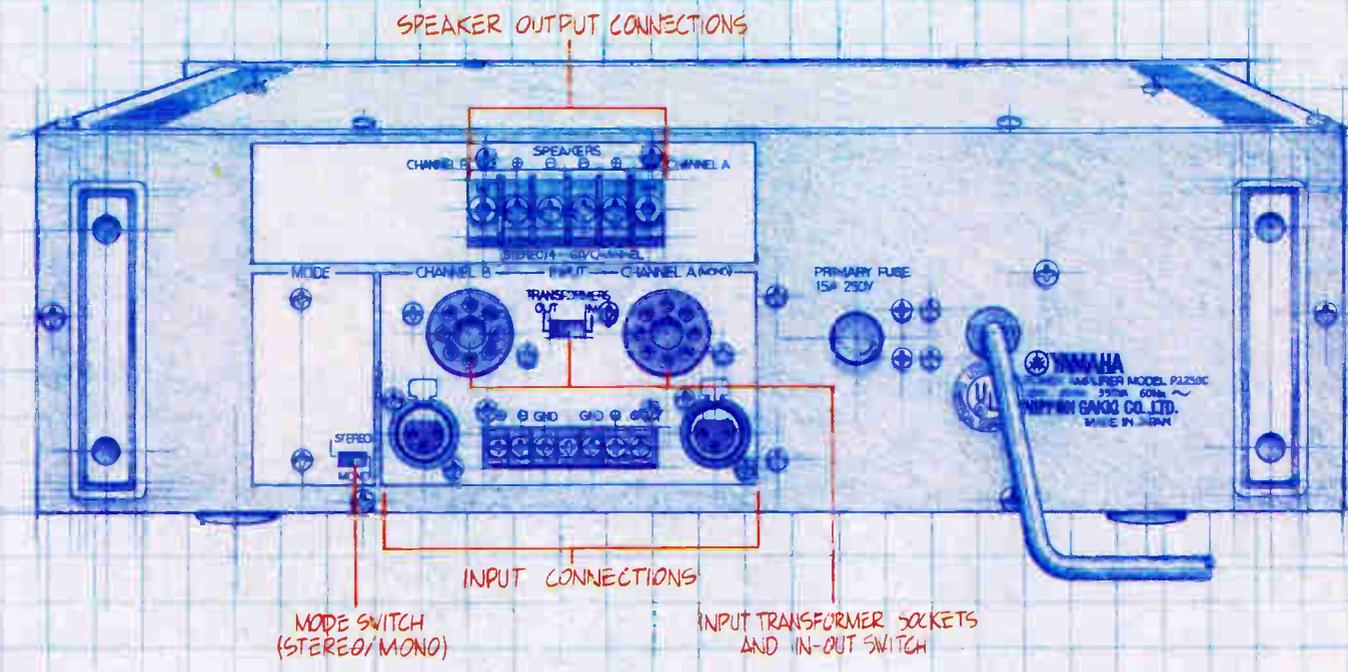
Telex Communications, Inc.,
9600 Aldrich Avenue South,
Minneapolis, Minnesota 55420.



Wide, flat, studio quality frequency response

TELEX®

TELEX COMMUNICATIONS, INC.



Yamaha has gone commercial.



70.7 AND 25 VOLT OUTPUT TRANSFORMERS

It had to happen. Our original P-Series professional power amplifiers were so popular that we went commercial. Taking all the performance, reliability, and features of those workhorse amps and adding features that commercial applications require.

Like calibrated input attenuators for easy, accurate sensitivity adjustment. Recessed control knobs and knob lock adaptors to prevent inadvertent setting changes. And both locking XLR and barrier-strip input connectors to ensure lasting connections.



5K OHM BRIDGING INPUT TRANSFORMER

That's on the outside. Inside these new P-Series II amplifiers you'll find the same features that made the P-Series famous in show business. Plus output protection. Electronically balanced and unbalanced inputs. And transformer options to make bridging and

distributed speaker systems easy to put together.

Add to that five different U.L.-approved models delivering from 75 to 250 watts per channel and you can see why the Yamaha P-Series II Power Amplifiers give you exactly what you need in commercial sound amplification.

The Yamaha P-Series II power amps. They're bound to make your next installation a commercial success.

Yamaha Music Corporation, Professional Audio Division, P.O. Box 6600, Buena Park, CA 90622. In Canada, Yamaha Canada Music Ltd., 135 Milner Avenue, Scarborough, Ontario M1S 3R1.



Circle 206 on Reader Response Card



The Cat Club alternates between live acts and recorded music. The club's sound system includes a UREI 537 EQ, an ADM 1024 Effectron, two McIntosh MC 220 Amps, and two Crown PS-2 Amps.



People can dance and stargaze underneath a 76-foot dome at the Saint. The sound system includes 23 BGW 750B Amps, five BGW 750C Amps, four UREI 539 EQs, and four Pioneer D-23 Crossover.



The Sounds of New York's Nightlife

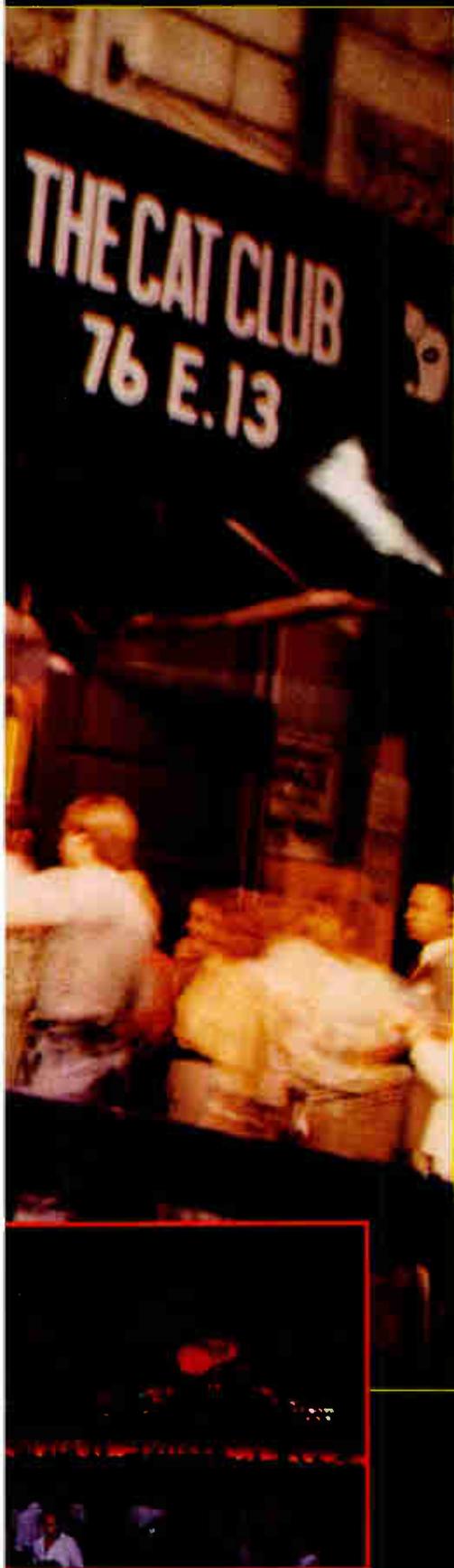
They love the nightlife in New York. Skyscrapers and that lady in the harbor notwithstanding, no tour of the city scene would be complete without taking in the crowded dance floors, hot lights and pulsating rhythms that the Big Apple's clubs and discos offer.

Seven-nights-a-week fever is rampant in New York and always spreading. The city that never sleeps—it's too busy staying on its toes—has enough bistros to satisfy a melting pot of styles and musical tastes.

To coincide with the Audio Engineering Society (AES) convention convening in Fun City, *Sound & Communications* thought it would be a good time to look at and listen to some of New York's more popular nightspots and how they go about bringing music to the dancing huddled masses.

by Greg Prince

Photographs by Russell Fine



In Pursuit of Good Sound

One place AES members can easily check out between meetings is Pursuits at the New York Hilton, which just happens to be the site of the convention. Pursuits has a little something for everyone, according to club director Diane Deering. On Calypso night, the Hilton plays home to Margaritaville; Mondays, it's back to the '50s; ladies' night comes Wednesdays; and TGIF Friday nights are very big. All of the sound is handled by Juliana's Sound Services, Inc., an international sound and video company specializing in hotel installations.

"We provide an ongoing marketing and promotional service," explained Juliana's vice president of operations Cheryl Pace. "With Pursuits, we sold, designed and installed the entire system and send technicians monthly for servicing. We also provide the DJs with video software and records."

Juliana's was called on by the Hilton in the early '80s to convert the hotel's supper club into a nightclub. "We redesigned it and then opened up the room which was possible with the elimination of dining," Pace said. "The size of the room is smaller than your usual club; you're catering to a completely different clientele in a hotel. Music programming is somewhat different because you're catering to so many different age groups. Generally, the people are 28 and up," she said.

Installing audio was a fairly easy task at Pursuits, which boasts a tri-amp system featuring McIntosh amps and a total of 18 JBL speakers. A DJ is always on duty so there is no concern about down time. However, video posed a small challenge. Initially, Juliana's tried using projectors with mirrors, but eventually opted for eight 46-inch Panasonic screens, giving an effect of reflection. "We had to go behind the glass to incorporate video into the room," Pace said. "In a freestanding operation, you wouldn't have to contend with something like that as a back wall of the dance floor."

Going Underground

Among the freestanding nightclubs in New York, few can match the Underground for longevity. In a field where a hot concept can go stone cold in six months, the Underground could be considered something of an institution, having been in business since 1980. General manager Maurice Brahm credits the club's success in great part to its sound system, designed and perfected by the late Richard Long. Long, said Brahm, had the midas touch for golden sound.

"I built Infinity in '75, the first major club of the time," Brahm said. "It was a large club, something like 12,000-13,000 square feet. With all those people, the floor would bounce and the turntable skipped. Nobody could figure out a solution. I called Richard and in 20 minutes he said, 'I fixed it.' He did it by using a series of rubber bands and the turntable never moved again," he said.

Music at the Underground is programmed by the DJs who generally play "whatever they feel like playing," said Brahm, though Friday nights have come to be thought of as reggae and calypso night with Saturday more of a top 40 and disco affair. Every other Saturday night WQHT-FM broadcasts live from the club, playing its own music. Otherwise, the Underground's own DJs don't take breaks.

Brahm pointed out that the system is pretty much self-sustaining. "Once in a while a kid will kick in a speaker, but we ordinarily get everything checked out every



Maurice Brahm is the Underground's general manager. The club's six rack, 18 amp system, consists of seven BGW 750 Amps, four Crown D150 Amps, two Crown PS A-2 Amps, an RG Dynamics Expander, and two White 1/3 Octave Equalizers.

AES convention goers can dance to the beat at Pursuits. The DJs equipment consists of two Technics SL-1200 Turntables, a UREI 1620 Mixer, a Tascam 122 Tape Recorder, and a Teac X-100R Reel to Reel Tape Deck.

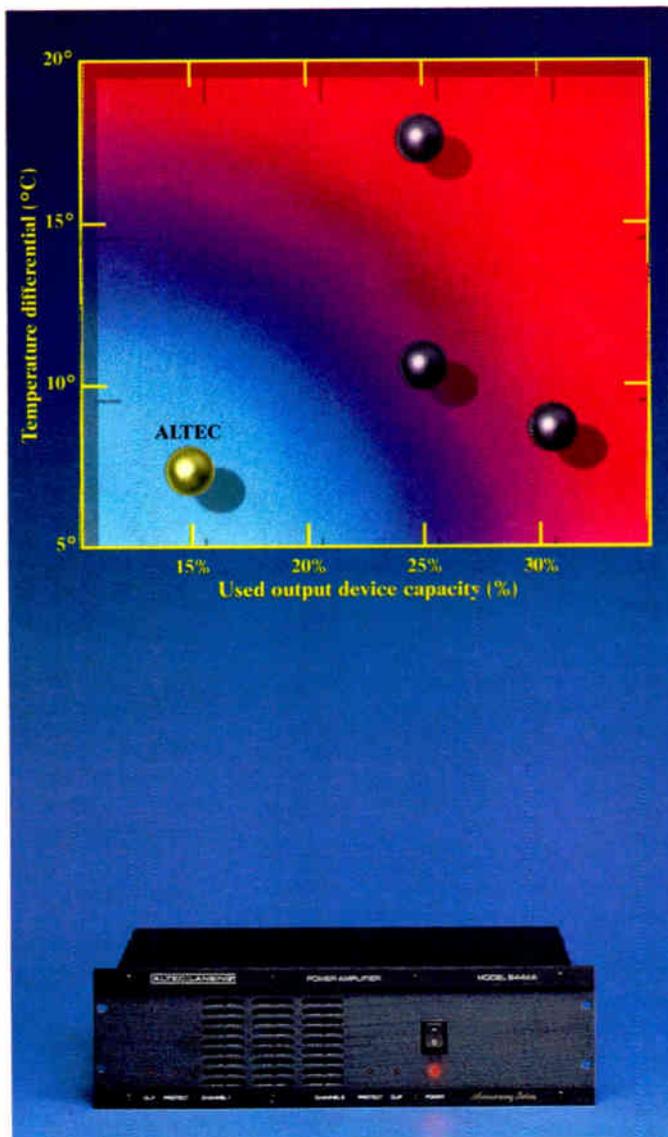


In power amplifiers, less heat equals longer life. It is also correct to conclude that the reliability of a power amplifier often comes down to the reliability of its output devices. At Altec Lansing we compiled a detailed study of these devices in terms of their sturdiness and thermal behavior. We found that two criteria appear to have been ignored in the past.

First, we know that output semiconductors must work together in order to produce accurate, distortion-free power. Therefore, any environmental variation among them varies the stress placed on each device. This poses the possibility that some devices will perform differently, and that those under greater operating stress are more likely to fail.

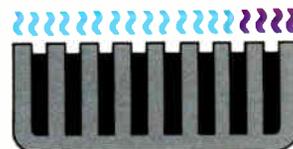
Altec Lansing engineers sought to reduce the variation in operating temperature from one output semiconductor to the next. We designed an asymmetrical heatsink that helps compensate for temperature differences between the transistor closest to the cooling fan and the one farthest away. This reduction in the temperature gradient evenly distributes the thermal stress placed on the devices. Our advanced heatsink has been incorporated into the design of the new Altec Lansing model 9444A power amplifier.

By means of this heatsink, a temperature differential of only 7.4° C is achieved, which is lower than that of any of the other popular, quality, fan-cooled power amplifiers tested. The vertical axis of the graph shows the results. The greater this temperature mismatch, the greater the amplifier



designer's failure to reduce the thermal stress differential among output devices.

The second often overlooked consideration we studied at Altec Lansing is what our engineers call dissipation headroom. This is the percentage of the rated power dissipation of the output semiconductors which is actually used at the rated amplifier output.



Reducing the temperature gradient distributes thermal stress more evenly.

The Altec Lansing 9444A uses sixteen output devices, each rated at 250 W. This means the total rated power dissipation at the output stage is 4 kW, of which 600 W is used as audio output. Thus, only 15% of the rated power dissipation is used, leaving 8.2 dB of dissipation headroom. This is significantly more than was found in other amplifiers, as shown.

What is the benefit of thermal uniformity and dissipation headroom? Our semiconductor manufacturer applied their mean time between failure (MTBF) criteria to these factors. All other factors assumed equal, they computed the output devices in the Altec Lansing 9444A to have a normalized lifetime 18.15 times longer than amplifiers without these provisions. Attention to these details means longer life in service, a vital criterion for sound systems designed by audio contractors and consultants.

Fact.

In Power Amplifiers, Less Heat = Longer Life



P.O. Box 26105 · Oklahoma City, Oklahoma 73126-0105 USA · 405-324-5311
© 1987 Altec Lansing Corporation

Circle 215 on Reader Response Card

World Radio History

three or four months," the general manager explained. "We put a fan in back of the amps to cool them off. They've overheated in the past. There's no video because the room, with two tiers, isn't really conducive to it. Most people wouldn't be able to see it. We have used it on special occasions like the Fourth of July.

"The interesting thing about a place like this staying around so long is the people who came here when we opened were 18, 19, 20 and are probably all married and gone," he said. "After a while, the kids who were 11 then, who are 19 now, come. That's what happens as a club gets older."

The Underground, along with a few dozen other places, relies on sound engineer and designer Lewis Feldman for maintenance. Feldman, who's been doing big-time audio since Woodstock, indicated that two factors are often overlooked in clubs. "Electricity is a key to a proper sound system," said Feldman. "The Underground had the typical problem of not supplying electricity to the sound system in adequate amounts, independent of general lighting and refrigeration. We changed the distribution without ever touching anything in the system itself."

Acoustical treatment is another priority for Feldman. "If a room is not acoustically right, the sound just isn't going to be very good," Feldman said. "That's also not paid attention to enough." Problems can also be avoided, the engineer said, by remembering the little things. His advice is to clean the air filter and change the phonograph styli every hundred hours.

Shout Along With The Music

One club that attracts a large late '80s crowd is Shout, though they do it by turning back the calendar. Shout, known in an earlier incarnation as Xenon, a heavyweight during the polyester suit John Travolta era, has thrived for over two years by playing the music of the '50s, '60s and early '70s. The songs' respective ages mean the DJs have to be nimble, according to general manager Mark Meredith.

"Fortunately, a lot of the older stuff is coming out on CD," Meredith said. "Our DJs put together a lot of mixes. In fact, they're responsible for all the music. They often have to switch back and forth between CDs and reel-to-reel tapes, as well as albums and 45s. What makes this even more difficult is a lot of the records weren't more than two minutes long, so they have to be quick. You have the girl groups who had no bass in their records whatsoever and then you switch to a Rolling Stones' record with so much bass. We use EQ for balancing between the highs and the lows," he said.

High ceilings—the building used to be the Henry Miller Theatre also threatened to give Meredith headaches. Speakers under the balcony helped keep things harmonious. Two separately-controlled speakers can be raised and lowered in accordance with the number

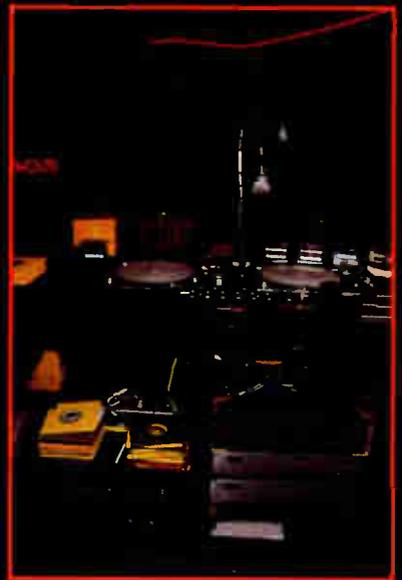
of people congregating below the balcony. Nobody, said Meredith, gets blasted out. Shout also features a diverse collection of video from the era, including early promotional clips, concert footage and classic *Ed Sullivan* musical highlights. Video and accompanying music are synched for patrons' dancing enjoyment.

Video mixing is done in the DJ booth, said Pat Smith, consultant from Plus-Four Productions, the company maintaining Shout's system. "Video hi-fi decks and a series of monitors in the DJ booth allow them to make up a lot of custom tapes," Smith explained. "Shout uses Panasonic hi-fi video decks and uses a Plus-Four Productions video and audio patch bay for syncing." Smith added that the lack of sophistication in recording 30 years ago doesn't

really pose a problem when those records are played today. "They were made live, with usually no dubbing," Smith explained. "They were made well, so they hold up."

Smith visits Shout every two weeks to look after a set-up that includes six high-frequency drivers. Cleaning tape machines and two amp racks may sound simple enough, but just try neglecting them. "In the middle of the night, you don't need

continued on page 73



Shout offers a variety of music from the 50s, 60s and early 70s. The DJ's booth consists of two Technics 1200 Turntables, a Bozak CMA10-200 Mixer, 12 Crown Series 2D-150A Amps, a Klark Teknik DN-360 EQ, and two UREI 525 Crossovers.

"Once in a while a kid will kick in a speaker, but we ordinarily get everything checked out every three or four months."

FOREGROUND MUSIC VIDEOS



In the common area of the Potomac Mills Mall, Washington, D.C., viewers can watch adult contemporary foreground videos and commercials for the stores in the mall.

A YEAR OF CHANGE



The video wall is the popular trend in today's foreground music market.



The Juniors Department in a retail store uses top 40 foreground music videos to attract teens.

By Loren Greenwood

In the time since *Sound & Communications* reviewed the use of foreground music videos last August, much has happened. These changes, for the most part have been positive. The industry has matured and the customer base has multiplied greatly. The one area that still needs attention from all parties is copyright infringement and illegal use in general. For example, many people use unlicensed videos for commercial applications.

For an industry that has not yet seen its tenth birthday, the music video business has had a meteoric rise. Originated as an alternative or supplement to live entertainment, it rapidly moved into markets that viewed it as the logical progression to foreground and background music. In the hospitality markets, comprised of hotel and motel clubs and lounges, free standing nightclubs and restaurants, music videos are now commonplace. In these markets, foreground music videos are a cost effective medium because they are interactive—they can be danced to as well as watched. In many cases, videos sound better than vinyl.

far from it. But, this represents a vast marketing potential for the planned music businessman.

The trends in supply of software, programming, distribution, and hardware supply are diversified across the country. Geographical locations affect distribution of software. For example, a recurring style of music requested along the eastern seaboard is "Beach Music" or "Shag." In the south, a popular style of programming is country western. Also in most major metropolitan areas, there is no difference in software distribution—contemporary music is the programming style.

Hardware trends vary. In retail, virtually everyone is using a multi-monitor approach (two or more monitors), and more and more are using pro-grade equipment. The hardware medium that has been gaining popularity over the past year is the 4 x 4 (16 monitor) video wall. This 8-foot display is dramatically effective and acts as a huge television screen, using a close-up of a video in four boxes and an overall shot in the other 12 monitors. However, it is also the most ex-

to assist them in designing video systems to integrate with their existing audio packages. Others unknowingly went the illegal route by taping MTV or accessing a video intended for the home market, while trying to adapt home market hardware components, all with limited success. Equipment designed for the home market is, for the most part, not suited for the rigors of extended and continuous play. Nor do the playback units have auto replay capability, a feature mandatory for effective retail application since a person on the sales floor is not always available to restart a program after the rewind mode.

A number of these latter retailers came and went through the music video market and are having to be re-educated with correct applications of a licenses program and professional equipment. There also remains a third portion of the fashion retail business. This group of retailers that maintains "their" under 25 audience cannot be motivated by the contemporary image developed by an appropriate programmed music video approach. To this there is only one answer. . . wrong! With



A prototype of a seatback entertainment center in a Boeing airplane.

Many of the nation's leading restaurants and hotels have found video to be a cost-effective, dynamic method of extending their customers' patronage. In these applications, video is sold exactly like foreground music with the size and need of the customer dictating the scope of the hardware installation. These customers are not to be confused with the traditional "disco" client, whose use of music videos is well documented, but rather, the restaurants and hotels found in every city in every state on every corner. This does not mean you will find music videos at this level of penetration,

Loren Greenwood is director of management at Sight & Sound Entertainment in Seattle, WA. He is also a contributing writer for *Sound & Communications* magazine.

pensive, ranging from \$50,000 to \$125,000, not including programming or maintenance.

RETAIL FASHION

While music videos were moving across the hospitality markets, they also established a base in the field of retail fashion. Progressive retailers soon realized their Juniors and Young Men's clientele were what the music video business was all about, since the vast majority of early music videos were produced for rock groups and emerging teen-oriented artists.

With limited information at their disposal, many of these companies struck out on their own to add music videos as a portion of their in-store image. Some of them found a source of licensed music videos and progressive contractors eager

“The future of programmed music videos could not be brighter with new markets emerging on virtually a daily basis.”

this consumer group many contemporary apparel styles are originated to copy a particular artist or lifestyle associated with them. We don't need to look any further than Michael Jackson, Cyndi Lauper or Madonna to find examples of this principle in action.

Trying not to be guilty of generalizing, what normally keeps these retailers away from video is a lack of understanding, which is the industry's fault. We have not presented the retail market with the facts needed to formulate an educated decision. Such topics as ASCAP/BMI licensing, copyright infringement, appropriate hardware to go with the videos and a general lack of understanding of our potential client's business have contributed to foreground video not being in wider use today.

Another reason is a personal bias not

to program music videos in their stores. In many instances, the use of foreground videos makes the decision a capital budget item and, as such, never gets past the individual whose position it is to approve or disapprove all capital items. Videos, appearing as a new line item are unfamiliar and fall prey to the red pen. And finally, there are some retailers who view all video as a bunch of kids with green and orange hair singing unintelligible words way too loud and, therefore, will not have them in their store! With more and more retailers using music videos as their foreground music source, while enjoying the contemporary visual merchandising impact videos provide, it is only a matter of time until the less progressive retailers must rethink their position.

One such company that jumped on the foreground music video bandwagon was Dayton Hudson Department Stores. This upper mid-western chain of stores has been using video foreground music in their Juniors and Young Men's clientele departments for several years. This year, the chain is looking into upgrading its two, three-monitor video display equipment systems to provide more for their customers, according to Kristin Staubitz, in-store media coordinator, who

is in charge of the video displays in 34 stores. "We feel that the music we play sets the right atmosphere for those kind of shoppers—young people. People tend to buy more if they are comfortable in their environment," said Staubitz. "They want to emulate the fashion trends and people they see in the videos."

"The videos are not intrusive to the store and the music is not played too loud," continued Staubitz. "We also change the videos once a month and review them. In between the videos, we show promotional, product and store trend spots."

The fact that some of today's department stores are now using foreground music videos in a variety of departments does much to dispel the notion that music videos are only applicable to Juniors' departments. "We use portable monitors in the Cosmetics' Department showing different products and our promotional spots in-between," said Staubitz. "People want to visually see how the make-up will look. We're also planning to buy more portable monitors for our other departments showing music and/or product videos."

Another area is the Childrens' Department, which can use a program that con-

tains cartoons, public service announcements, educational material and select music videos. If anyone doubts the power of this style, just watch Saturday, morning television. Home electronics' departments display adult contemporary programs to keep the customers from watching sporting events while providing a uniform visual and audio signal. Record departments feature multi-music genre programs to promote the sale of their products and may even contain promotion spots for other departments.

NEW MARKETS

The future of programmed music videos could not be brighter with new markets emerging on virtually a daily basis. The advent of interactive seatback entertainment centers containing color monitors and going operational this year with nationally recognized airlines and aircraft manufacturers could render traditional in-flight foreground music obsolete, with music videos now allowing passengers to see as well as hear their favorite artists. Specific information on this new technology is not readily available with a number of companies developing proprietary LCD systems simultaneously. To the best of our knowledge, the heart of the entertainment system is based upon the Sony flat screen technology.

Fast food chains are exploring alternatives to playgrounds in an effort to get out of the "me too" mold in attracting families to their restaurants.

Financial institutions looking to shed their old image are exploring adult contemporary programming interspersed with financial information as a method to inform their customers.

Health maintenance organizations can now provide relaxing video programming supplemented with public service announcements to inform patients and families across America's waiting rooms. Instructional videos on how to use a wok or how cattle are grown are showing up in many grocery stores.

These latter applications probably will not involve new hardware technology. But, the interest here is the ever-increasing ability to market existing hardware components coupled with the appropriate foreground music video.

The foreground music video industry of yesterday is not the same industry as today. Nor will tomorrow's be as today's. In summary, the foreground music video industry is alive and vibrant and offers the traditional foreground and background music industry new products and new markets of immense proportions. ■

TEK-ENTRY SERIES



TekTone's Tek-Entry Series Telephone Entry Systems are complete, automatic call and entry control systems, designed for easy operation and reliability.

Entering a simple 2 (or 3) digit code initiates a system call to the correct phone number. Entry is then permitted by the tenant, if desired. Front panel programming is push button simple.

Telephone Entry Systems

a 1 or 4 minute selectable talk time limit.

Tek-Entry Systems are of aluminum construction and include a metal telephone touch pad and hook switch, armored handset cable and a Lexan® display window.

Features include busy and door open displays, memory retention during a power failure, relay output for controlling elevators, doors or gates and

TekTone®

SOUND & SIGNAL MFG. INC.

1331 S. Kilian Dr., Lake Park, Fla. 33403-1988

(305) 844-2363 Toll-free order (800) 327-8466

Circle 230 on Reader Response Card

Sound & Communications

Who would believe a microphone this flat...



Model AT871 UniPlate™
Condenser Cardioid

could have a curve to match!

If you've tried other hemicondoid boundary microphones, you may have been disappointed in the sound... thin, peaky, and requiring lots of equalization. If so, it's time to listen to ours: the new AT871 UniPlate Condenser Cardioid.

UniPoint Technology at Work

Our experience pioneering UniPoint miniature condensers permitted us to take a new approach to boundary microphone design. We optimized the basic UniPoint cardioid element for boundary use, creating remarkable reach and presence, yet retaining extended high and low-frequency



response so vital to natural sound reinforcement.

Outstanding Gain-Before-Feedback

The AT871 UniPlate Cardioid has both the polar pattern and response curve to provide higher gain-before-feedback than you may have thought possible. But better gain-before-feedback and a great scunding element are only a part of the story.

Less Noise Two Ways

By using a very low-mass diaphragm and a case heavier than the others, we sharply reduced sensitivity to mechan-

ical noise. The electronics are audibly quieter as well – a tremendous advantage in typical boundary microphone applications. We also include a low-cut switch to help control acoustic room noise. The AT871 can be powered by an internal battery or from 9-52VDC phantom power.

Effective Problem Solver

The AT871 is solving problems in stage sound reinforcement, church sound, teleconferencing, boardroom applications... even TV and film locations. Wherever great sound is needed...unobtrusively. We urge you to test the AT871 side-by-side with any of the rest. Choose your most critical sound problems. The difference you hear will prove our point.



audio-technica®

1221 Commerce Drive, Stow, OH 44224
(216) 686-2600

Circle 238 on Reader Response Card

Profit Power! No SCA's... No Tape Machines

The Most Dramatic Profit Opportunity
in the History of the Background/Foreground Music Industry



Seeburg Direct is an Exclusive Service of Seeburg Music Satellite Network, Inc., Subsidiary of Capitol Broadcasting Company, Inc..



Introducing Seeburg Direct

- Six, seven, eight or more different music programs
- Direct to subscriber by high powered Ku-band satellite
- 300% greater fidelity than piped-in music
- Remarkably small satellite dishes - just over two feet across
- No SCA's. No tape machines. No telephone lines or central studios.

Seeburg Direct. Low cost - High profit. Reaches prospects everywhere, even the most remote areas. **Seeburg Direct**, the new key to profitable long-term contracts, recurring monthly music revenues, equipment/service income, and the power of cumulative profit build-up.

Seeburg is seeking aggressive profit-minded distributors to implement this exciting breakthrough. We welcome inquiries from background music companies, radio stations, CATV and TVRO operators and others with sales/installation capability. For details please call Seeburg General Manager Bill Fox.

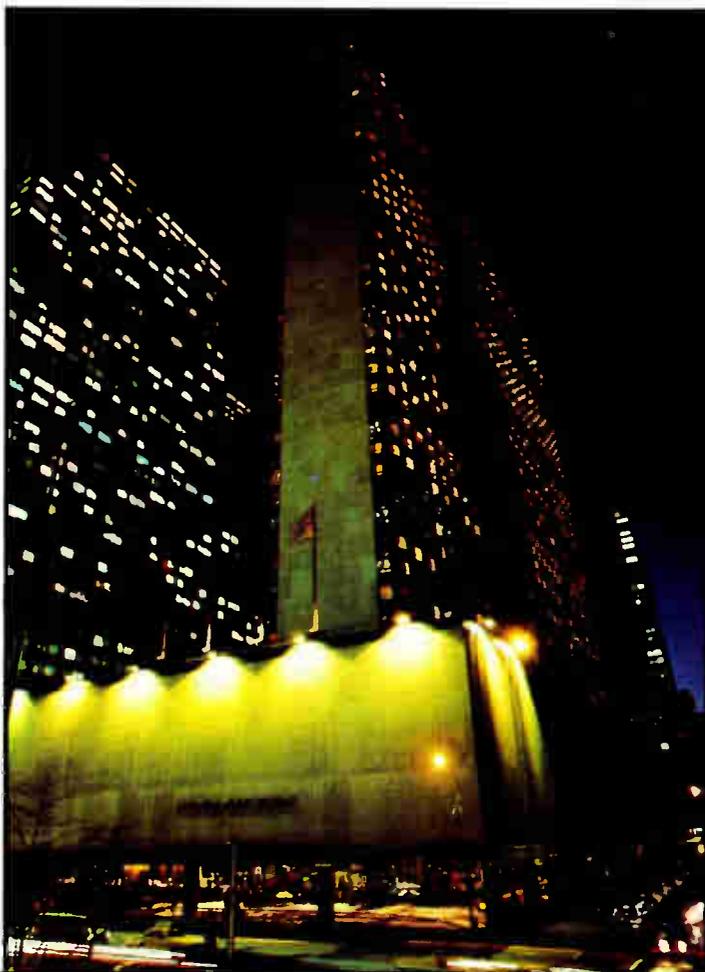
1-800-334-1561
SEEBURG

Circle 219 on Reader Response Card

5706 New Chapel Hill Road, Raleigh, North Carolina 27607

THE BIG APPLE SHINES UP FOR AES

THE SHERATON CENTRE



THE HILTON



OVER 90 PAPERS TO BE PRESENTED AT THIS YEAR'S CONVENTION

by Debra A. Pagan

The Big Apple will welcome over 12,000 Audio Engineering Society (AES) convention goers from Friday, October 16 to Monday, October 19. Over 90 papers, a record number, will be presented at over a dozen sessions at

PRO POWER SERIES.. PROFESSIONAL PA and BACKGROUND MUSIC AMPLIFIERS



PRO-20T



PRO-40T



PRO-50



PRO-120



PRO-T

- Professional, rugged P.A./ Background music systems
- Built-in custom features
- Balanced or unbalanced, high or low impedance microphone inputs. No matching transformers required.
- ALL CANNON lock-in microphone connectors
- TRUE RMS Power ratings
- Efficient integrated circuit construction. Lowest noise microphone preamps in any P.A. line
- Rack Mount construction
- Overload Protection built in
- Equalizer Input feature in all models except PRO-20T
- Up to FOUR Microphone inputs
- PRIORITY PAGING Feature
- AM-FM Tuner accessory unit (Model PRO-T)
- Background Music AM-FM Tuner built-in (Models PRO-20T, PRO-40T)
- Phone-type jacks for speaker connections
- Traditional Fanon Quality construction and advanced engineering
- Full Fidelity—Factual, guaranteed specifications
- Custom Styling
- "Soft Gold" Anodized front panels
- Four step-up Power Ratings: 20 watts, 40 watts, 50 watts and 120 watts.
- More Watts per dollar

the Hilton Hotel, and almost a dozen workshops will be conducted at the Hilton and the Sheraton Centre in Manhattan. About 475 exhibitors will display their latest products at both sites.

Sound contractors, manufacturers, reps, broadcasters, studio owners and college professors will attend the four-day event, exchanging information on the newest technology developments and trends in the music and digital/audio worlds. One of the goals of AES this year is to find out what members feel are the most important issues in the technical arena, according to president-elect Dan Gravereau. "For the first time, we're asking AES members to help give guidance to the AES committees by participating at the technical council meetings," said Gravereau. "We're trying to make AES responsive to the needs of the technical community. We want their input in the technical areas and what they believe is important in audio. ASA (Acoustical Society of America) has been using this procedure and it has proved successful for them. We think it will also be successful for us," he said.

Another goal for AES this year is to augment membership. The association, which is in its 40th year, currently boasts membership of 9,750 throughout the United States and in 45 countries. "Growth is important," said Gravereau. "We want membership to include more of those in the audio industry that we haven't been able to reach. Hopefully, again, we can be responsive to the needs of those who have not yet joined."

SESSIONS

A popular portion of each AES convention is the Technical Papers Sessions, which will only be presented at the Hilton. This year, AES will present over 90 papers, each of which

is one-half hour in length. Each session will also include one invited paper. "We're excited about the sessions this year because there will be a record-breaking number of papers presented (over 15 more than last year's) by the foremost authorities in the AES, and many of the topics are on breakthrough technologies," said papers chairman Ron Singer.

"This year we'll touch off this 83rd AES convention Friday morning with a paper on "Advances in CD and DAT Multimedia," chaired by Ken Pohlmann of the University of Miami," said Singer. "Plus, this year we'll have four Special Paper Sessions to highlight the work of the AES Technical Committee and to bring to the attention of the membership the different technical topics that this individual committee considers important and those technical areas that need to be encouraged."

"Advances in CD and DAT Multimedia" will be presented in two parts: Part I will be presented during a 9 a.m. session and Part II will be presented at a 1 p.m. session. Also beginning at a 9 a.m. session on Friday will be "Acoustics and Intelligibility," which will be included in a session chaired by Don B. Keele, Jr., of Techron. Also on Friday at a 1 p.m. session, Professor Diana Deutsch of the University of San Diego will chair a session that includes a paper on "Psychoacoustics." Two Technical Council Special Paper Sessions will begin at 7 p.m. "Transmission" will be chaired by Daniel Gravereau, a consultant, and "Acoustics and Sound Reinforcement" will be chaired by Ken Jacob of Bose.

On Saturday during a 9 a.m. session, Larry Boden of JVC will chair a session that includes a paper on "Recording and Playback Technology," and during another 9 a.m. session, Professor John Vanderkooy of the University of Waterloo will

BURGER KING HAS MUSIC "THEIR WAY"



Functional Communications Corp., the Muzak affiliate in upstate New York, serves the business areas of Rochester, Albany and Syracuse, NY. They provide background and foreground music for a broad spectrum of retail, restaurant, and industrial locations. Wendell Martin, Vice President of Engineering for Functional Communications Corp., has designed the Muzak background music system for many BURGER KING Restaurants. Reviewing the drawings at the S. Salina Street, Syracuse location he concluded that using standard loudspeakers would require the need to install six units. However, Wendell determined that one Soundsphere #110 in the center of the dining area would do the job effectively.

Choosing a sandtone color, the speaker blended in with the wooden ceiling decor. By utilizing one speaker unit, a cost saving was effected in materials and labor. When asked about the Soundsphere #110, the manager stated, "It's the best Burger King I have been in for even background music."

FCC has also used Soundspheres in the main terminal building at Syracuse Airport and the Danbury Fair Mall in Connecticut. John Romig, President of FCC, stated "Soundsphere equipment is an effective tool for acoustically challenging environmentsthat means business!" Circle 225 on Reader Response Card

Write or call direct for further information.

SOUNDSPHERE

A PRODUCT OF
SONIC SYSTEMS, INC.

737 Canal Street • Bldg 23B • Stamford, CT 06902 • USA • Tel (203) 356-1136

chair a session that includes a paper on "Transducers," Part I, and continue on in Part II during a 2 p.m. session. Also during another 2 p.m. session, Larry Boden of JVC will chair a session that includes a paper on "Studio Digital Recording, Mixing and Editing." Two more Technical Council Special Sessions will be held at two sessions beginning at 7 p.m. "Signal Processing" will be chaired by Don Eger of Techron and "Transducers" will be chaired by John Bullock of Shure Brothers.

During a 9 a.m. session on Sunday, chaired by Robert Adams of dbx, "Analog and Digital Signal Processing" will be presented and "Sound System Engineering" will be included in a 9 a.m. session chaired by Daniel Queen of D. Queen Associates, who is on the *Sound & Communications* technical council as well as the AES technical council chairman. John Strawn of S Systems will chair a session that includes a paper on "Digital Signal Processing Chips for Music Synthesis, Recording and Processing," and Steven Lyman of CBS will chair a session that includes a paper on "Audio Techniques in Film and Broadcasting," each at 1 p.m.

On Monday at 9 a.m., Richard Cabot of Audio Precision will chair a session that includes a paper on "Audio Measurements and Evaluation," Part I, and will continue with Part II during a 2 p.m. session. John Prohs will also chair a session during this time which includes a paper about the late Richard Heysler.

WORKSHOPS

There will be almost a half-dozen workshops, giving convention goers an opportunity not just to talk about developments, but to talk about practices and see how people use technology in their industry, such as microprocessors to control mixing consoles.

The workshops, which will be held at the Hilton and the Sheraton, will begin on Friday at 9 a.m. with "Tape Recorder Maintenance," chaired by Greg Hanks of NY Technical Support Co. Beginning at 2 p.m. will be "Pre-emphasis and De-emphasis in Digital Recording," chaired by Albert B. Grundy of the Institute of Audio Research, and beginning at 7 p.m. will be "Disk-Based Audio Editing," chaired by William Foster of Tape One Studios.

On Saturday at 9 a.m., "Techniques for Subjective Listening Evaluation" will be chaired by David Clark of DLC Design, and "User Interfaces for Electronic Music" will be chaired by William Buxton of the University of Toronto beginning at 2 p.m. At 7 p.m., "Management in Recording Studio Operations" will be chaired by Gary Helmers of SPARS.

On Sunday beginning at 9 a.m., "Creating Sound for Modern Motion Pictures" will be chaired by John Allen of HPS-4000 Sound Systems at the Ziegfeld Theatre across from the Hilton, and at 2 p.m. David Kaye, a consultant, will chair "Sound Reinforcement." Finally on Monday at 9 a.m., Tom Source of Masque Sound will chair "Sound in the Theatre and Performing Arts," and at 2 p.m., Martin Polon of Polon Research will chair "Education: What the Jobs Are."

In addition, they'll be two technical tours held during the weekend. One will be at the Kaufman Astoria Studios in Astoria, Queens, and the Rogers and Hammerstein Sound Archives will be the second.

Also, a concert of live electronic music will be presented on Saturday at 7 p.m. in the Mercury room at the Hilton. A panel discussion on "Performance Problems of Live Electronic Music" will follow the concert. The Performance/Workshop will be chaired by Dr. William Moylan of the University of Lowell. The concert will include works by a variety

(continued on page 75)

"I can depend on consistent, reliable, quality performance from Crown every time."

"If I can pick only one mike supplier it will be Crown — they just always work."

Over the last 38 years, Crown has become known for high-technology, high quality, reliable products. Crown microphones have been used all over the world by demanding professionals in the kinds of conditions that really test a product's ability to perform. Crown continues to pass the test with flying colors. That's why a professional like Tom Durell, with the experience of 14 years in the Disney organization, independent credits such as the audio for the opening ceremonies of the 1984 Olympic Games and full audio project coordination, 1986 Liberty Weekend, chooses Crown.

"When you live by the motto 'no go, no show,' you have to depend on reliability as well as quality. Crown puts those two attributes together better than any manufacturer I have seen. I can depend on consistent, reliable quality performance from Crown every time."



Tom Durell.

North Hollywood, California

 **CROWN** INTERNATIONAL, INC.
1718 W. MISHAWAKA ROAD, ELKHART, IN 46517

Circle 223 on Reader Response Card

A DIVERSITY B
 RF LEVEL
 A 1 2 3 4 5
 B 1 2 3 4 5
 TRUE DIVERSITY SYNTHESIZED VHF-FM RECEIVER BR-3

POWER
 AF LEVEL /dB
 -10 -5 0 3 6

CHANNEL

CH7

UP
DOWN

AF LEVEL
4
3
2
1
0

SAMSON
 BROADCAST STD SERIES
 dbx NOISE REDUCTION



SUPERIOR PERFORMANCE ANYWHERE, ANYPLACE, EVERY TIME.

No matter how much you spend on a wireless system without selectable channels in the receiver and transmitter, you'll always be vulnerable to potentially damaging interference.

That's why the Samson Broadcast STD wireless system offers ten selectable channels in *both*. Simply dial up the ideal channel in the receiver, then select the identical channel in the transmitter

for optimal transmission quality.

We also included an exclusive Samson feature to let you see the RF level on each available frequency before you use the system. The receiver's visual "window", two five-segment L.E.D. level ladders, scans each channel for instant confirmation of the clearest frequency.

But the real benefit of Broadcast STD truly becomes apparent once

you hear the system. Samson's sophisticated "new generation" RF circuitry with dbx* noise reduction provides more dynamic headroom and the purest, most transparent audio quality available in wireless today.

The Broadcast STD Series combines these leading edge features so you *know* you're getting matchless performance. Anywhere, anyplace and every time.

Broadcast STD Series available in Hand-Held, Lavalier & Instrument Systems.

Circle 209 on Reader Response Card

Samson Technologies Corp. 485-19 South Broadway, Hicksville, NY 11801 (516) 932-3810
 TLX 284696 SAM UR FAX (516) 932-3815
 In Canada: Omnimedia Corporation Ltd., 9653 Cote De Liesse, Dorval, Quebec H9P 1A3
 514-636-9971

* dbx is a registered trademark of BSR North America Ltd.
 © 1987 Samson Technologies Corp.

SAMSON®
 WE TOOK THE WORRY OUT OF WIRELESS

SUNNY CALIFORNIA TO WELCOME IBMA

by Debra A. Pagan

Over 230 manufacturers, reps and other association members are expected to attend the IBMA convention from Wednesday, October 14 to Saturday, October 17 at the Marriott Rancho Las Palmas Resort in Southern California. The convention floor will host 35 exhibitors displaying their latest products.

Now in its 17th year, this year's convention, entitled, "Problem Solving for the 80s," will feature a variety of seminars. IBMA president Joe Elum said, "Our seminar

Seminars will cover "Problem Solving for the 80's"



The Rancho Las Palmas Marriott

October 1987

program this year will be better than ever because it is geared specifically for the individual music operator. We sent out a questionnaire to all our association members asking them what *they* wanted to hear at the seminars. I think they've come up with some of the most pertinent topics to this industry, topics that everyone can relate to," said Elum.

SEMINARS

Two sessions will be held on Thursday, October 15, at 11 a.m. and repeated at 11:45 a.m. "Collections" will be presented by Olad Chan of Comcast and "Affirmative Action/EEO, Practical Applications," a program on hiring and firing, will be conducted by Robert Kemp, employment manager at Pacific Telcom in Vancouver, Washington.

Two seminars will also be held on Friday at 11 a.m. and repeated at 11:45 a.m. "Direct Mail Advertising" will be presented by Bill Fox of Seeburg Music Library, and "Marketing Foreground Music," which will focus on how to avoid pitfalls and common mistakes when dealing with a foreground music customer, will be conducted by Jack Craig of Audio Environments.

On Saturday beginning at 9 a.m., Dr. Laurie Hawkins of the Blanchard Training Institute in San Diego will anchor a special program entitled, "Situational Management, a Tool for Management Problem Solving."

Convention goers will also have the opportunity to mix business and pleasure on the green and on the court. On Wednesday beginning at 8:30 a.m., convention attendees may participate in the annual IBMA Golf Tournament and on Thursday at 1 p.m., the annual IBMA Tennis Tournament will be held. Both events will take place at the Rancho Las Palmas Country Club.

A CHANGING INDUSTRY

Elum also pointed out that members will be discussing some of the changes in the business music industry that have transpired over the past year, most notably the Muzak-Yesco merger. "Muzak was purchased by an affiliate of the Field Corp. of Chicago from Group W. Radio, Inc. in November, 1986. However, Field combined the business of Muzak and Yesco in January. Also in August, Muzak bought Musi-Call in Chicago, which was the largest independent music company in the U.S., and just prior to that, Audio Environments bought Sound and Music Environments in San Francisco. 1987 was surely the year of the acquisition," said Elum.

Jim McGowen, manufacturer's rep for the IBMA Board of Directors, said that although there are many new products out, he doesn't expect to see the industry change this year. "I expect the music business industry to stay steady," McGowen indicated. "We're different than many of the other sound associations. We're designed for the background music industry rather than only the sound contractor.

EXHIBIT FLOOR

As far as the floor goes this year, "they'll be some selling going on with the usual convention specials on quantity or price discounts," said Elum. Convention hours will be 8 a.m. to 1 p.m. on Thursday, Friday and Saturday. Elum also indicated that several companies will be displaying new products. One of them is Seeburg Music of Capitol Broadcasting Co. which is introducing a new direct-by-satellite commercial music service after three years of research and development.

According to Bill Werner, head of marketing at Seeburg and former vice president of marketing at Muzak, the Seeburg Direct is the first multi-channel system that will deliver music

A · E · S · T · H · E · T · I · C · S

The new CSV Series speaker systems by Community complements the decor of the most discriminating contemporary commercial environment. CSV sound systems and floor monitors' built-in dynamic protection circuitry assures high reliability. Our simplified brackets guarantee ease of installation and offer the system designer a wide choice of mounting options. Also available are visually identical, specification-equivalent, optimally vented low frequency enclosures.



Community

Community Light & Sound, Inc.
333 East 5th Street
Chester, PA 19013
(215) 876-3400
tlx 834649 PhillyPA Cher

Circle 241 on Reader Response Card

USA TODAY



We love baseball, apple pie, our mom, and coming up with innovative, mind-boggling all-American technology. Take the AC 22 and AC 23, for example. They're loaded with so much exclusive American Rane technology, the blueprints will probably wind up at KGB headquarters.

Rather than improving on existing crossover technology, Rane decided to reinvent it. The result means features like 24dB/octave slopes, the distinct performance advantages of Linkwitz-Riley crossover design. State-variable filters, coupled with the precision 41-detent continuous frequency selectors,

offer unequalled accuracy, consistency and flexibility.

They're packed to the metal with so many capabilities, you could write a book on them. Which we did. And it's included with every unit. As you discover the capabilities of the AC 22 at the suggested list price of \$389, and AC 23 at \$499, your system will improve with cleaner, tighter sound. And more of your audience will hear the best sound your system can deliver. Maybe even all the way to Siberia.

Rane Corporation, 6510 216th Southwest,
Mountlake Terrace, WA 98043. 206/774-7309.



programs simultaneously by Ku band transmission, directly to small subscriber dishes slightly larger than 24 inches across.

"This system provides 300 percent more fidelity than current background music," said Werner. All distributors, including Muzak, can now eliminate the cost of SCAs, telephone lines and central studios. The Seeburg Direct allows small operators to get into remote areas where an FM signal or telephone line would be too costly to use.

"You don't have to have a tape player," continued Werner. "By using one receiver for each dish, the signal comes in via satellite by pushing buttons on a console. The subscriber puts on a set of headphones and can choose from easy listening, hard rock, classical, top 40, jazz, or others, depending on what the marketing requirements are."

Listeners can tune-in on Thursday and Friday on the exhibit floor, where they will be able to try out the Seeburg Direct. "The exhibit floor and seminar rooms will be large enough so that attendees can move about with ease," said Elum. "We just want everyone to get the most out of the convention and enjoy themselves." ■

SALES & MARKETING

(continued from page 10)

15 push-to-talk master stations from a single, compact power source; ST-120 is a recently introduced high-tech simplex system designed for schools, detention facilities and other applications where monitoring is the prime concern. One-touch contact to as many as 120 substations can be made from a single master station location; teleCOURIER is a RF pocket pager system featuring digital readout messages; and digiLARM is a new pocket transmitter system that allows wearers to alert a central monitoring station.

To simulate actual intercom applications, the van is equipped with a sound-proof booth. This enables a person inside the booth to make calls and converse with other people at demo-stations as if they were in remote locations.

Slide and video tapes include presentations on the company, intercom applications in various businesses, industrial and institutional operations and on various systems and their components.

The length and content of the presentation/demonstration can be tail-

ored to the interests of the participants. Architects or consulting engineers may want to test out and hear about all systems, so they can evaluate the particular ones that best suits particular clients. Depending on the questions asked and amount of details sought, such a complete session could take two or more hours. Attendees from hospitals, on the other hand, may only be interested in a presentation on the best system applicable to a particular clinical department, and the session could last less than an hour.

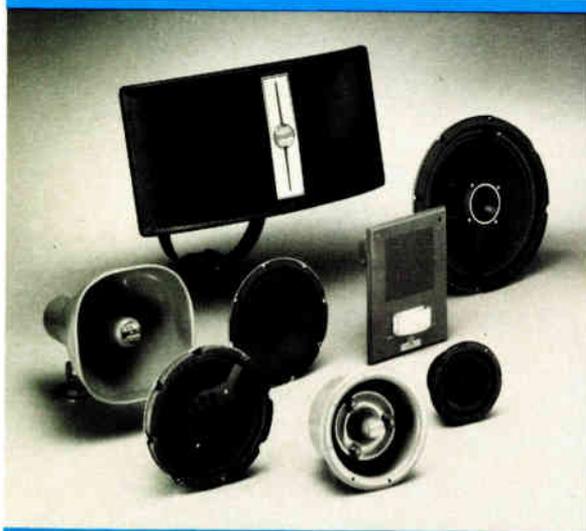
One advantage of a mobile demonstration "studio" is that the dealer can schedule the visit of the van and the nature of the presentation to suit the convenience and interest of his different customer groups. This includes scheduling the van to park right at the customer's location.

All transporting of the van and presentations are conducted by trained Stentofon personnel and demonstrations are kept professional. Although cost and ordering information is available, no hard sell techniques are used. All the dealer has to do is schedule a Demo-Van visit with Stentofon, invite

(continued on page 73)



One Source For All Indoor & Outdoor Loudspeaker Requirements



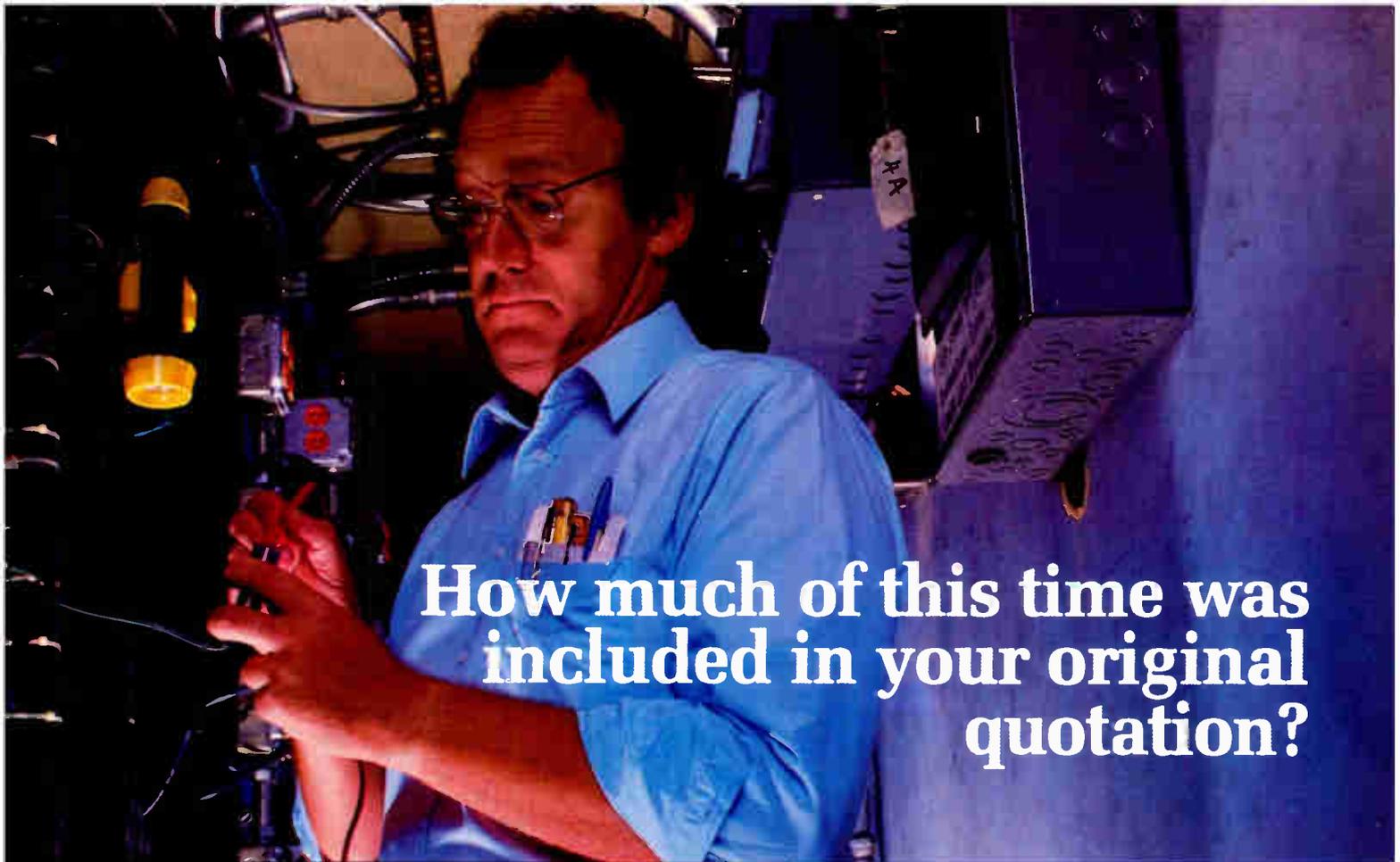
ATLAS/SOUNDOLIER . . . quality products for all applications and price-ranges including: 4", 8" & 12" diameter standard, high compliance, dual cone and coaxial type speakers with transformer options • Surface, ceiling and recessed-mounting loudspeaker systems • Environment-resistant units for paging, communications, audio evacuation and community warning systems • Foreground & background music speakers • UL-listed & explosion-proof equipment and audio-visual signal devices • Sound masking systems • Reflex, bi-axial and wide-angle sound projectors • High efficiency compression drivers • Power handling selection from 1/8 to 180 watts.

SUPERIOR SERVICE: A computer-connected network of five factories and eight regional warehouses throughout the U.S.A. • "Quick-Shipper" products for 48 hour order-processing.

OUTSTANDING QUALITY: 83 years of combined Atlas/Soundolier manufacturing experience, engineering expertise and craftsmanship. *For your best value, contact us today.*



ATLAS/SOUNDOLIER DIVISION OF AMERICAN TRADING AND PRODUCTION CORPORATION
1859 INTERTECH DRIVE • FENTON, MISSOURI 63026 USA • (314) 349-3110 • TWX 910-760-1650



How much of this time was included in your original quotation?

Lower standards of design, construction and testing could make our equalizers less expensive to purchase. But it would make them more costly to own. There are no short cuts to true "set and forget" operation.

Klark-Teknik products for a full range of applications

Perhaps you'd like to spend less time patching things up: if so, you owe it to yourself to investigate Klark-Teknik graphic or parametric equalizers and digital delay lines. For full information on their design, construction and applications, write to Klark-Teknik or your distributor at the address below.



Klark-Teknik reliability means lower total lifetime cost

Unplanned service calls will consume your profit margin on an installation faster than you can say "I'll take care of it." That's the best reason we know of to specify and install equipment on the basis of its total lifetime cost, not just the initial purchase price.

Klark-Teknik standards deliver operational security

Our standards are so demanding because operating conditions can be so severe. We use only the highest grade components: oil-damped metal shaft faders, sturdy rack mount chassis, toroidal power supply transformers.

Years ago, our equalizers pioneered the use of thick film micro-electronic circuits. This technology reduces equivalent solder connections by more than 50%: its proven reliability is one reason we back Series 300 Graphic Equalizers with a five year limited warranty.

The other reason is the 100 hours of testing every Klark-Teknik product undergoes before being shipped. Our standard procedures include stereo dynascope board inspections, full performance verification and a cycled burn-in followed by a complete re-check.



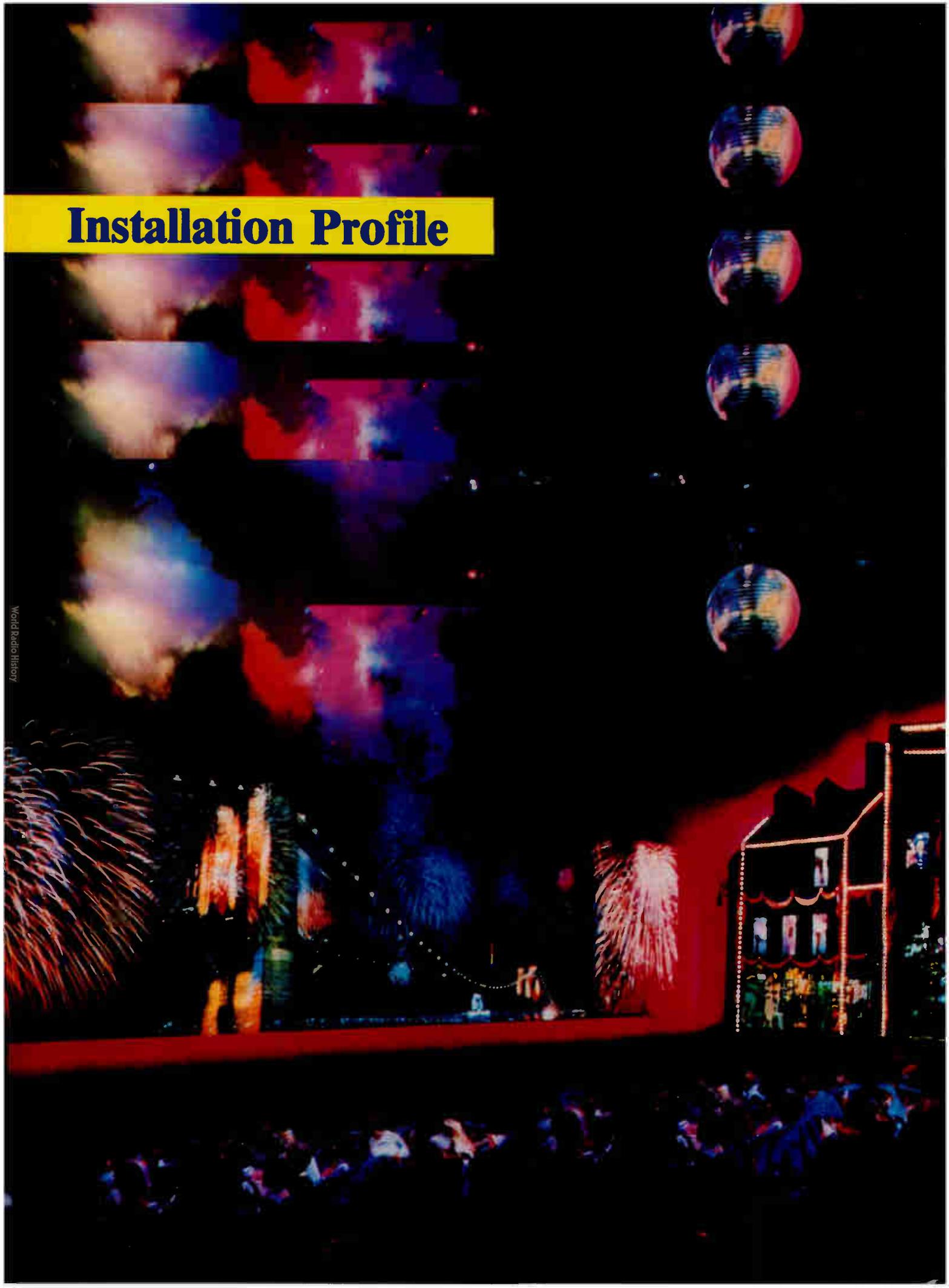
Each one of Klark-Teknik's Series 300 Graphic Equalizers, Series 400 Parametric Equalizers and Series 700 Digital Delay Lines is optimized for specific applications.

Klark-Teknik Electronics Inc.,
30B Banfi Plaza North,
Farmingdale, NY 11735 (516) 249-3660
Klark-Teknik Plc., Klark Industrial Pk., Walter Nash Rd.,
Kidderminster, Worcs., U.K. DY11 7HJ (0562) 741515
Distributed in Canada by: Omnimedia Corp., 9653 Côte de Liesse,
Dorval, Quebec H9P 1A3 (514) 636-9971

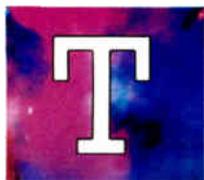


Circle 216 on Reader Response Card

Installation Profile



The SEAPORT EXPERIENCE



The songs of sailors and whispering of a ship's rigging in the wind; the cry of a gull and laughter from a bawdhouse; the babble of fishmongers and groans of a gale-wrecked clipper going down off Cape Horn—all the mystery and romance of the sea are captured in "The Seaport Experience," a spectacular multi-screen attraction playing to crowds at the Trans-Lux Seaport Theater, the showplace of the revitalized, popular South Street Seaport.

South Street is Manhattan's old seaport, the crossroads of the world, and the first home-based center of world trade.

The multi-screen attraction is shown in the specially-designed theater on Front Street, in the recently \$400 million revitalized Seaport district. The landmark building, constructed in 1914, was once a soup factory, and later a fish market. Audiences watch the show from swivel seats, enabling them to turn from the front multiplex screens to side-screens flanking the theater.

THE SHOW

Rusty Russell, director-designer-writer and all-around media whiz, boldly displays the Seaport's colorful buyers and sellers on a 50-foot multiplex screen flanked by the illuminated "stage set" facades of the district's warehouses, stores, hotels, and taverns whose windows are

used as some of the 33 auxiliary screens. The fabled voyage that puts the viewer on a clipper ship rounding Cape Horn and then drops him on a screeching diesel truck loaded with fresh fish is a romantic adventure punctuated by billowing clouds of fog, storms, thunder, gunfire, and the sea chanties of sailors at work.

"The show is pure fun, but also makes a statement about the steely sophistication of what we call the New York 'personality.' It is about a bunch of Dutch merchants who wanted to sell something. New York is a city of power. And it has developed an absolute genius for putting together people who have something to sell with people who want to buy."

Rusty Russell is a triple-threat dynamo whom critics have called a "multi-media master," although he deprecatingly replies, "I just put together a big slide show." He has successfully produced multi-screen extravaganzas across the country including The San Francisco Experience, The Hawaii Experience, The New York Experience, and Where's Boston. "The New York Experience," his homage to Manhattan, is now in its 14th year in Rockefeller Center. It is also the longest-running film attraction anywhere in the world today and has been seen by over 5 million ticket buyers.

"To some people, multimedia is a bad word," says Russell, "but it simply refers to the technique of simultaneous presentation. There are many factors dominant

in our perception of the environment that you do not experience in a film. Multimedia is a way of capturing and heightening reality." In his productions for such varied clients as DuPont, the Smithsonian Institution, ABC-TV, and IBM, art and scientific ingenuity coexist in an aesthetic and efficient unity. To Russell the multimedia theater is, "A giant music-box filled with lots of balls and whistles that make up an artist's palette—unparalleled by any other medium like film or video."

THE SYSTEM

The simultaneous action—a collage of movies, photographs, graphics, and over 100 special theatrical effects—is transmitted by 104 projectors and scores of staging devices, and the sound is reproduced by 33 multi-channel loudspeakers. The whole program is on an 8-track audio deck which drives a computer that controls the entire complex system. The main screen is about 10-feet high by about 50-feet wide, and is covered by 32 slide projectors that present a seamless picture format. Part of this screen is covered by a 35mm projector, but because it has a number of different optical mattes, it can appear in different parts of the screen. There are 31 auxiliary screens, and two "flying sail" screens.

The three principle image segments are made up of the front-32 Kodak E-3 slide projector matrix, the Century SA 35mm

projector with various optical mattes, and the mobile Elmo 16mm projector. The side wall sets, which depict the street circa 1830, contain screens in the windows. When they are opened, they are played upon by another 32 Kodak E-2 projectors and reveal other screens. Certain of these windows also have special effects like fires, heads, or other optical devices. In addition, these windows have a number of loudspeakers.

The basic sound reproduction unit is an Otari MX-5050D MKIII—8 half-inch eight-track tape deck with Dolby-A noise reduction. Four channels are dedicated to discrete loudspeakers across the front of the main screen, providing adequate coverage and source localization. There are two assignable effects tracks, controlled by a computer, and are fed through a Tonmeister Ltd. line-level switch-matrix to any one of the 20 loudspeakers. These loudspeakers are located throughout the theater beneath seats, in the windows, and in the ceiling. In addition, a sub-woofer system realistically reproduces

gunshots, hurricanes, crashes, etc.

The other two channels are used for synchronization of the 35mm and 16mm using 24 FPS SMPTE timecode on track #7. Track #7 is a proprietary clock-track called "Omni-Loc" that synchronizes all of the slide projectors, the effects switching matrix, and the narrative projector movements and audio-panning. The computer system used to drive these devices, as well as control all of the special effects, is designed by Arion Corporation. The computer system uses an Arion 895 for controlling the pan-man, and two Arion 852s for controlling the slide projectors and special effects. All of the programming was done on an IBM PC, and each of the Arion computers has its programming stored in non-volatile RAM—ensuring that the show quickly starts up exactly the same way every time. The 35mm and 16mm are controlled by NPL (National Precision Laboratories) SMPTE Film Sync controllers which cue and start each unit with one-frame precision throughout the show.

PAN-MAN

The story is told by two narrative voices. One is on tape, and the second is a character called the "connector." The connector is shot on 16mm film and runs on a special mobile projector so that the image literally "walks across the screen." This character is used throughout the presentation to introduce segments, tell the story, and act as the general guide and host. As one can imagine, it was difficult in that the sound for the "connector" had to follow the image, and the producers wanted the sound to be as good as the magnetic sound.

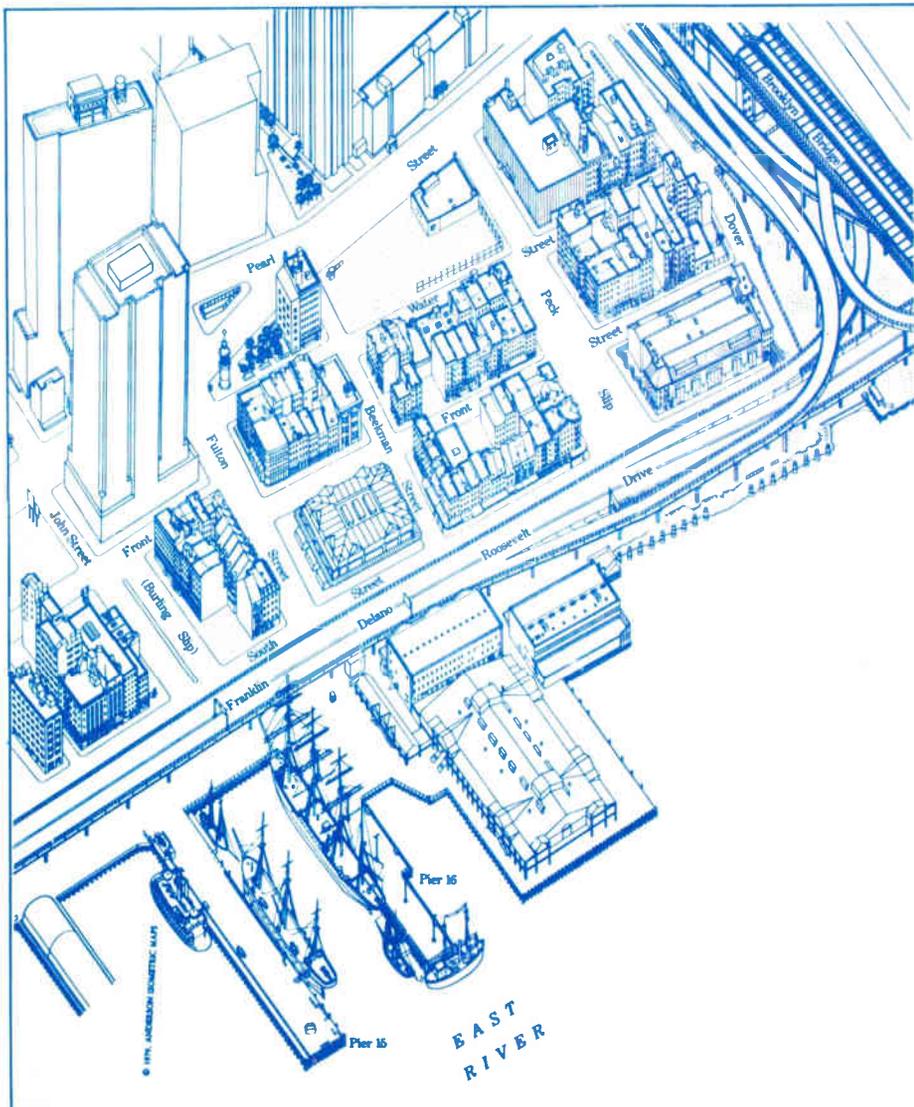
The way sound and image for the "connector" is produced is quite interesting. Basically, the audio was first recorded on a SMPTE-synchronized Nagra recorder using Dolby-A noise reduction, and then transferred to 16mm optical using dbx noise reduction. The net effect was superior signal-to-noise, headroom, and frequency response, when compared to straight 16mm audio. After the show opened, a Barcus Berry Electronics 002 processor was added.

The connector, or "Pan Man" as endearingly named by the operating crew, is run on a large lazy-susan like platform that moves the projector in an arc across the screen. The table is controlled by a fascinating Rube Goldberg like "Gizmo" that uses digital electronics, fishing line and weights. The screen is actually divided into 32 positions, and the digital code determines a respective "go-to" position.

However, people don't start out walking as fast as they are when they are in their stride. Therefore, six rates of acceleration were created for going into a move, and six rates of deceleration were created for transitions out of a move, in addition to different velocities for slow and fast walking. These parameters are constantly monitored in a real-time mode by the on-board computer. The turntable is driven by a series of stepping motors, which in turn are mechanically linked to a series of audio-output potentiometers which ride against a shaft by means of rubber "tires."

As the projector moves from side to side, the respective pots are turned up by the movement, and the previous pot is returned to its appropriate setting by the counterweight and fish-line. This setup effectively produces a matrix that divides the screen into five sections, so that when the projector moves, the audio tracks the narrator's movement naturally. This electromechanical installation has proven itself to be reliable and maintenance free. Is it effective? Early in the run, a little old lady came up to the producers and

(continued on page 75)



Effective.

CS Series speakers put new efficiency in sound reinforcement.

Introducing four new high-efficiency ceiling speakers. Speakers that offer what contractors tell us they want—high quality at a reasonable price.

Close tolerances, select materials and precision assembly methods fill the need. With reduced power requirements—especially significant in large installations. And a smoother, less peaky midrange—CS Series speakers often require no EQ.

What's more, the universal transformer option on both 4- and 8-inch models permits installation in systems with 25-, 70.7- or 100-volt lines. Complete and accurate spec sheets are another plus, featuring helpful guidelines for proper system design.

Put our new CS Series speakers to the test. Compare them with any others. Your decision should be easy. And effective.

The CS Series—pro quality in commercial sound from:



ART's IEQ Intelligent/ Programmable Equalizer

by Jesse Klapholz & Richard Feld

Since the art (no pun intended) of equalization has evolved from hand-building circuits from a trunk full of coils, capacitors, and resistors, the industry has been exposed to vacuum tubes, transistors, ICs, gyrators, slide-pots, phase compensation, and higher mathematical techniques. Now we are seeing the proliferation of MIDI and μ -processors. There is a trickle of digital audio, but for right now the cost is prohibitive. Computer technology and algorithms are becoming more powerful and creative tools for the audio system, and the ART IEQ with Smartcurve™ is one of the latest entries into this market.

The IEQ can be said to consist of three domains; they are: computer, MIDI, and a constant "Q" $\frac{2}{3}$ octave equalizer section. When we first heard about the unit, we obtained a color demo showing how the controls, and resultant curves, would look both with and without the Smartcurve™ in the circuit. The demo shows the effects and benefits of the Smartcurve™

software, in improving the age old problem of adjacent band interaction.

The unit itself is based around the constant "Q" equalizer section, which is under the control of the computer, and which can be communicated with via MIDI. The computer has 128 on-board presets contained in non-volatile memory. Also, there is a second MIDI loop that is set up for the interconnection of up to 16 IEQ units to be controlled from one unit called the controller. The slave units are called satellites and a rear-panel dip-switch determines the satellite number in rank order. If two units are assigned the same number, they will track each other since they are responding to the same commands; this is useful in a stereo application.

Many μ -processor units these days use multi-line LCD displays, and some synthesizers have recently become available that will directly drive video monitors. The IEQ has both an LCD display and is the first equalizer to have a comprehensive video display

output. In short, the whole philosophy of the IEQ is accurate, repeatable, control. If button turning is what you need in a unit, this is not it. This unit is a computer type device, and therefore should be approached with a dialogue/interface approach.

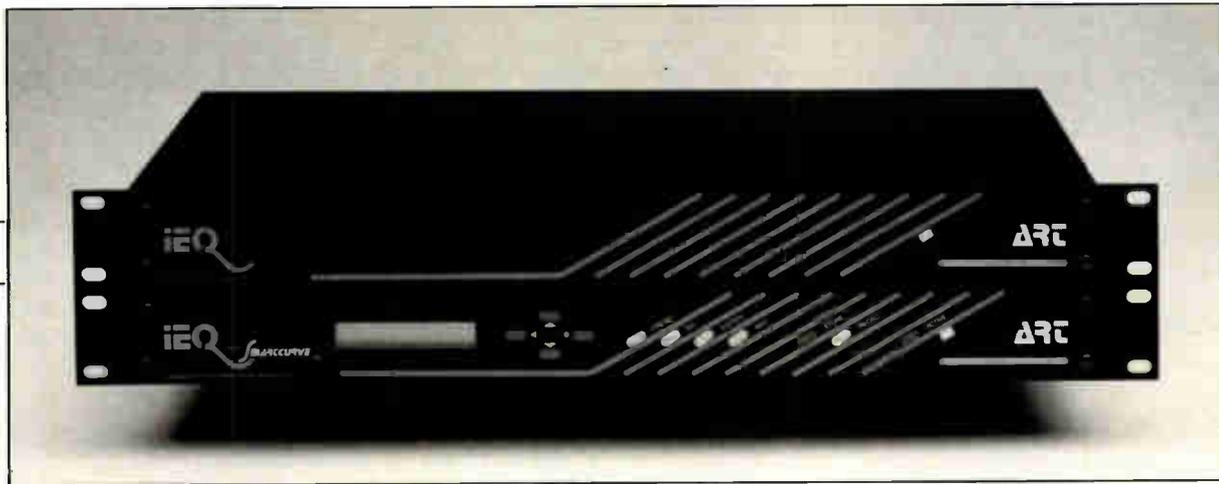
Directly to the right of the LCD display is a cluster of four directional cursor controls: Up, Down, Right and Left. These allow the operator to scroll between functions under the selected function key. To the right of the cursor keys are four function keys, Store and Recall keys, and an Active/Bypass toggle key. The bypass is a hard-wired through connection. There is a three-color LED which indicates the Active/Bypass mode and a 30-day warning that the memory backup-battery is low. However, there are no level or peak indicators. The system is assumed to be used in a proper gain structure, and also assumes that if one is using Smartcurve™ there will be plenty of headroom.

The four function keys are Preset, EQ, System, and MIDI. The Preset key places the display cursor in position to select one of the 127 presets, or 128th temporary work setting. The EQ key places the unit into the equalizing mode and the cursors are used to move from band to band, and set boost/cut. Up to 10 dB boost or cut can be effectively set with Smartcurve™ active.

The System key's functions include Smartcurve™ on/off, Controller/Satellite#, Tracking#, and LCD view. The LCD view adjusts the viewing angle from -20° to $+60^\circ$, in eight steps. This neat feature allows one to easily read the LCD display no matter where it is mounted in the rack.

MIDI is a function new to equalizers and new to many contractors.

Specifications	Manufacturer's	Lab Tests
Maximum input	+20 dBm balanced, +24 dBm	+27.5 dBm
Maximum output	+26 dBm balanced, +20 unbalanced	+27.5 dBm balanced
Frequency Response	20 Hz - 20 kHz ± 0.5 dB	20 - 20 kHz ± 0 dB, -3 dB @ 20 kHz
Distortion		
THD	<.009% @ 1 kHz, 0 dBm	<.007% 20 - 20 kHz, 0 dBm <.003% 20 - 20 kHz, +24 dBm
IM	NA	.02%, 0 dBm
S/N	NA	98 dB, below 30 kHz
CMMR	NA	42 dB
Accuracy	10% of dB indicated, or limited by filters	>.1 dB



Until now MIDI has principally resided in the musician's domain. But it is rapidly expanding into many other fields. It is economical, and simple to implement and operate. Two-conductor-plus-shield wire is used as the data transmission loop, and connectors are inexpensive DIN types. Also, ground loops are generally not a problem since opto-isolators are part of the standard (more on MIDI can be found in the February, 1987 issue of *Sound & Communications Magazine*).

In short the MIDI key enables the computer to be programmed so that it may properly communicate within an entire network. This may be as simple as two units, or as complex as banks of 16 equalizers being driven by sequencers in tandem with other effects and controls, and dynamically with external control from synthesizers. In a typical situation, blank-front-panel type equalizers (Satellites) may be placed in the rack-room of a large facility, and controlled from within the auditorium itself. The Satellites are then set by authorized personnel, and cannot be tampered with by uneducated users.

A look inside shows a simple ± 15 , +5 volt supply, and the standard high-quality TL070 and 5530 series chips. The inputs and outputs are active-balanced types, and are accessible via 1/4-inch connectors or barrier strip. The infamous Z80 is the CPU and a 32 K EPROM holds the firmware (μ 0.73 in our unit). Computers are getting into everything at competitive to

analog technology pricing.

The main function keys select the mode to operate in, and the cursor keys change the values—simple. The EQ key allows the selection of level and 2/3 octave-band from 25 Hz to 16 kHz. The Preset key is used to select any of the presets which may be titled with up to 16 of the upper/lowercase alphanumeric characters, and also Locked. These will be the most often used modes.

The Tests

The frequency response and distortion test results were beyond our expectations. The input could not be overloaded by our Sound Technology 1710A (+26 dBm). Noise and 'clicks' from switching in an active mode could

only be detected with abnormally-high gain settings. Under normal (even rock & roll) gain structures, no noise could be detected. Likewise the distortion tests, both static and intermodulation, done at various levels throughout the whole audio band indicated a well-behaved unit.

The first thing one should be careful about are the internal ground straps. With unbalanced operation this is of no concern. However, in balanced mode they need to be removed, by a simple removal of four screws and two quick pulls. While there are no provisions for balancing transformers, this should be necessary for most installations, as the common mode rejection is adequate for unity gain

(continued on page 75)

General Specifications:

Storage	8K bytes, lithium battery back up
MIDI:	
Programs	0-127, any program number may be assigned any user preset
Channels	1-16, OMNI on/off
Jacks	MIDI IN, MIDI OUT, Satellite OUT, Satellite IN
Dimensions	1.75" H x 19" W x 10.6" D
Net Weight	10 pounds
Price	controller: \$595 pro net, satellite \$395 pro net

PRODUCTS IN REVIEW



New Surface Mount Microphone from AKG

AKG Acoustics has introduced the C562 BL Boundary Layer Microphone. The C562 is a pre-polarized condenser surface mount microphone for recording situations where unobtrusive microphones are needed, or where the natural character of its sound is desirable.

Omni-directional in the hemisphere of its low profile plate, the C562 BL's sensitivity and frequency response depends largely on its placement, though bass reproduction has been significantly improved in the C562 over similar designs. Compared with conventional omni-directional microphones, the C562 BL's output is six dB hotter when mounted on a larger surface (floor, ceiling, piano lid, etc.)

Circle 30 on Reader Response Card

ART Introduces New IEQ Family Members

ART has introduced the newest member of the IEQ family, the IEQ-1/3 Controller and Satellite and the ART video monitor.

The ART video monitor supports the IEQ in the studio or on the road with its 19 inch rack mount case.

The ART IEQ 1/3 EQs are professional programmable one third octave graphic equalizers with Smart-curve™. Each offers 128 presets, complete MIDI, a rack mount case, video output displaying frequency response, Knob and Pot settings, preset number and title, system status, controls up to 15 other ART IEQ-1/3 programmable EQs and has balanced inputs and outputs with rely

bypassing.

The IEQ-1/3 offers a number of enhancements over previous IEQs including: programmable low cut filter, unique multiple slider editing, and IEQ operating system enhancements.

ART'S video monitor allows any of the IEQ controllers video outputs to be displayed on a nine inch diagonal CRT. The large screen allows the user to oversee the operation of the IEQ without being right on top of the display. The monitor also accepts monochromatic video from other sources such as video recorders, and cameras. Front panel mounted controls allow the user to adjust the monitor to suit the user's taste.

(See write-up in Lab Test (page 52) on ART's IEQ Intelligent/Programmable 2/3 octave equalizer).

Circle 31 on Reader Response Card

Atlas/Soundolier's Outdoor Loudspeaker

An environment-resistant loudspeaker with built-in intercom amplifier for hands-free talkback operations in conjunction with telephone systems is now available from Atlas/Soundolier.

Designated Model APA-7, the hands-free intercom unit interconnects with a standard 600 ohm telephone line and produces a sound pressure level of up to 112 dB (four feet on axis at rated power) for attention demanding, high intelligibility paging.

Circle 32 on Reader Response Card



Akai's Digital Patchbays

A new product line of Digital Patchbays have been introduced by Akai. These patching systems will bring automated control, with SMPTE lock-up, to patching systems for the first time, according to the company. Each system is controlled by a computer

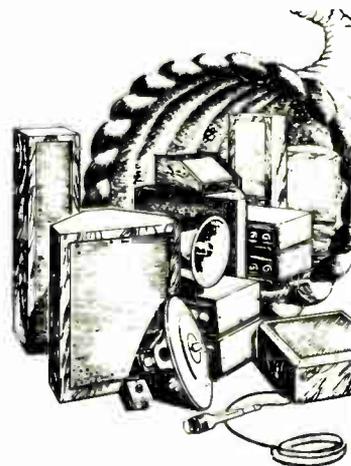
that automatically routes all signal paths.

The DP3200 is a 32 input/32 output audio patching system designed to work with balanced line systems. The use of buffer amplifiers allows any number of inputs to feed any number of outputs. Connections are made by multicable which can be terminated in either balanced XLR connectors or balanced phone connectors. A studio can also wire its own connectors to terminate in the multicable. The DP3200 has 65 built-in memory banks for storing patch patterns for the connection and switching of up to 640 patterns. Memory banks are backed up by battery. Multiple DP3200's can be connected together by using the Control In/Through and AUX-CH jacks. All patch pattern switching is controlled by the PG1000 Programmer.

The DP Series Digital Patchbay is also available in an audio/visual configuration.

Circle 33 on Reader Response Card

the original
Single Source Supplier



FOR 54 YEARS, SPECIALIZING IN SERVICE TO SOUND CONTRACTORS.

TO RECEIVE OUR FULL LINE CATALOG CALL:

1-800-527-5705 NAT.

1-800-442-1564 TX

1-214-651-7341 LOCAL



J.W. DAVIS & COMPANY

Circle 236 on Reader Response Card

INNOVATION

*designing products
to fit your plans*



The MPS2300 fully integrated two-zone music and paging system with full remote capability.

More than new technology, product innovation can be defined in terms of unique and effective solutions to application problems. We believe that QSC products are examples of innovative problem solving. In developing products, we look at applications, listen to and work with customers, contractors, designers and installers — and we learn a lot.

Our latest products, the QSC Series Two, bring to the marketplace the next generation of foreground music and paging systems delivering the finest audio performance, functional sophistication and operational simplicity available in an integrated package. We've priced Series Two to compete in today's "world market" and we back these American built products for three full years. **QSC Series Two — innovation that you have to hear!**



For more information on Series Two write, QSC Audio Products, Inc.,
1926 Placentia Avenue, Costa Mesa, CA 92627 or call Greg McVeigh at QSC toll free (800) 854-4079.

Circle 207 on Reader Response Card

World Radio History

a closer look

by gary d. davis



Audio Control's SA-3050A Real Time Analyzer

Audio Control Industrial has announced it is now shipping a new, enhanced model of its SA-3050 third-octave real time analyzer. The new model, designated the SA-3050A, has the additional features of peak hold on the spectrum display, averaging of any or all six non-volatile memories, full screen digital SPL and peak hold on this full screen digital SPL.

The analyzer package includes a calibrated condenser microphone for the price of \$965.

As with the SA-3050, the new SA-3050A has a 30-band display with a large, easy-to-read 270 dot matrix grid, resolution controls of 1, 2, 3, and 4 dB/step, and fast, medium and slow decay integration. The total display range is -56 to $+36$ dBm and the unit utilizes double-tuned, fourth order filters meeting ANSI Class II standards for accuracy.

Other standard features are six non-volatile memories with read, write, freeze, and RTA-memory comparison functions. Any new model including weighting of certain memories to allow for center versus side of room effects.

SPL may be displayed conveniently as a bar graph alongside the frequency response display or in place of the response curve as a full screen digital display. In either mode, peak hold capability is available at the touch of a button.

Three inputs are standard; a phantom powered balanced XLR input, an instrumentation BNC input, and a balanced bridging $\frac{1}{4}$ -inch T/R/S line level input. In addition, the SA-3050A includes a precision digital pink noise generator with adjustable output that has the power to drive a speaker or crossover directly.

Options include an internal rechargeable battery package which permits portable operation, a parallel IBM/Epson-type printer interface for easy documentation, a rack mount frame and a soft carrying case.

Comments: Audio Control has upgraded an existing product and made it a particularly attractive buy. In regard to the old SA-3050 and the new SA-3050A, we posed a number of questions to Bill VanGundy, the Audio Control customer service manager.

We wondered about the correlation between the 24 dB/octave filters in the SA-3050A and the filter characteristics of the typical $\frac{1}{3}$ -octave graphic EQ—how well did they match? VanGundy claims that if the EQ is a true high-pass/low-pass type, then there will be an excellent correlation with the rectangular filters in the SA-3050A... even if there is some frequency offset. This is important, since one wants the analyzer to respond appropriately to changes made with an EQ.

By simple division, we calculate there are nine LEDs per band. If the

front panel is set for four dB/step resolution, that means the viewable dynamic range is 36 dB—not extraordinary, but pretty typical. On the other hand, setting the unit to one dB/step resolution should make it possible to achieve reasonably precise EQ results. We were curious as to the actual SPL range that could be metered, given that only the electrical sensitivity (-56 to $+36$ dBm) was given in the release? With the included microphone, the range is 54 dB SPL to 126 dB SPL. In fact, the analyzer could display levels to 136 dB SPL if the mic could handle it. If you are working in a particularly quiet environment and want to look down near the noise floor, you'll need an external mic preamp (or a more sensitive calibrated mic). However, the useable range is probably fine for most applications.

The availability of a pink noise output that can actually drive a loudspeaker is a real convenience feature. It will deliver a quarter watt into a four ohm minimum load impedance. That doesn't seem like much, but, then, a quarter of a watt of noise into a speaker rated at 90 dB SPL/1W/1M will produce about 75 dB SPL at about 25 feet (assuming no reverberant field), which is adequate to drive the analyzer.

The ability to store response curves in up to six memories, then average them, is very important. It enables one to make multiple measurements and thus avoid making decisions based on a localized room mode. Further, the same curve can be loaded into two or more memories, then average with additional measurements to provide a weighted overall response. This could be useful for cluster tuning. Incidentally, the printer output is a handy feature. The format of the printout is an $8\frac{1}{2}$ by 11 inch page which includes lines for customer information on the top (client, site address & comments)

(continued on page 75)



Converter Concepts' Engineering Data Guide

Converters Concepts, Inc. has announced the availability of the Engineering Data Guide for its switching power supply line.

The data guide includes a full product range description, application notes (which discuss features and technologies), standard product specifications with available options, and ordering information. Also highlighted are Converter's comprehensive quality control department and procedures.

The Converter Concepts' Engineering Data Guide is a tool designed to help engineers determine their power supply specifications and needs.

Circle 35 on Reader Response Card

Systems, a new line of Economy A/V Carts, and Winsted's new Beta storage "Tape-Cube."

Circle 26 on Reader Response Card

Champ Connector Systems' Catalog from MPA

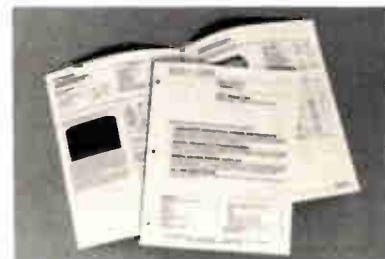
Champ's connectors are the subject of a revised catalog from AMP Incorporated. Catalog 73-152 describes the connector line's shielded and unshielded products, from insulation displacement cable connectors and printed circuit board connectors to connectors for special applications.

Circle 27 on Reader Response Card

Shure Offers Info on Wireless Mics

Shure has made available a color brochure on its wireless microphone system. Included in the brochure are product descriptions of the W25DR receiver, W20R Receiver, W10BT Body-pack, WL83 microphone and specifications for all the products.

Circle 28 on Reader Response Card



Sorensen Company's Illustrated Price Lists

Sorensen Company, a division of Switchcraft, Inc. has released new illustrated price lists for both domestic and international customers. Each price list contains product photographs, brief product descriptions, condensed specifications and unit prices for cost estimating or purchasing convenience. The price lists contain information on the Sorensen full line of programmable laboratory/industrial power supplies. Also included is a line of modular power supplies for OEM applications.

Circle 29 on Reader Response Card

EIGHT TIMES BETTER THAN REMOTE CONTROL.

1. Puts precise volume control anywhere without degrading audio signals.
2. LED's indicate attenuator level.
3. Knob has no mechanical stops so it can't be twisted off.
4. Remotes on the same control loop accurately track each other.
5. Can be unplugged or turned off without affecting levels.
6. Independent preset and priority controls.
7. 1.5 dB steps including a 90 dB off position.
8. Can be mounted in standard electrical boxes.

Actually, when the RC-16 is hooked up to our DCA-2 Digital Control Attenuator it's ten, maybe twelve times better. For the whole scoop, just give us a call. (205) 942-6779.

THE OXMOOR RC-16 REMOTE CONTROL

Oxmoor Corporation, 237 Oxmoor Circle, Birmingham AL 35209

Circle 242 on Reader Response Card

World Radio History



Winsted Shows Off New Video Furniture

A new 76-page, full-color catalog of Video Furniture is available free from the Winsted Corp.

Expanded to include several new product groups, the catalog features Winsted's complete line of video cabinets and consoles, tape and film storage systems and accessories. New products featured in the catalog include Editing Consoles, Tape Storage

New Dual Float Bushing Connectors

A complete line of metal shell d-subminiature connectors with dual float bushings for more flexible panel mounting is now available from the Connector Division, TRW Electronic Components Group.

Dual float bushings allow the connector to be mounted on either side of a panel or chassis. The dual float bushing is designed to replace the earlier standard float bushing and the reverse float bushing system connectors, which only allow the connector

to be mounted on one side of a panel. All TRW Dual Float Bushing D-Subminiature Connectors meet the applicable requirements of MIL-C-24308.

Circle 19 on Reader Response Card

Dees Communications New Power Supply

Dees Communications Engineering has announced the addition of a new 24 VDC power supply. Output is 400MA and is equipped with a spade tipped cord. Brochures are available upon request.

Circle 20 on Reader Response Card



Electronic Specialists Expand Isolators Line

Electronic Specialists recently expanded its Isolator line to include remote switching, power fail interruption and 20 amp circuit options. These options, combined with the standard Isolator interaction control provide AC power conditioning equipment.

Isolators have been found useful for isolating microprocessors from peripherals, as well as for isolating disruptive power line noise and damaging power line surges. Isolators with selected options are available from stock; unique combinations are available in one to two weeks. Prices start at \$100.

Circle 21 on Reader Response Card

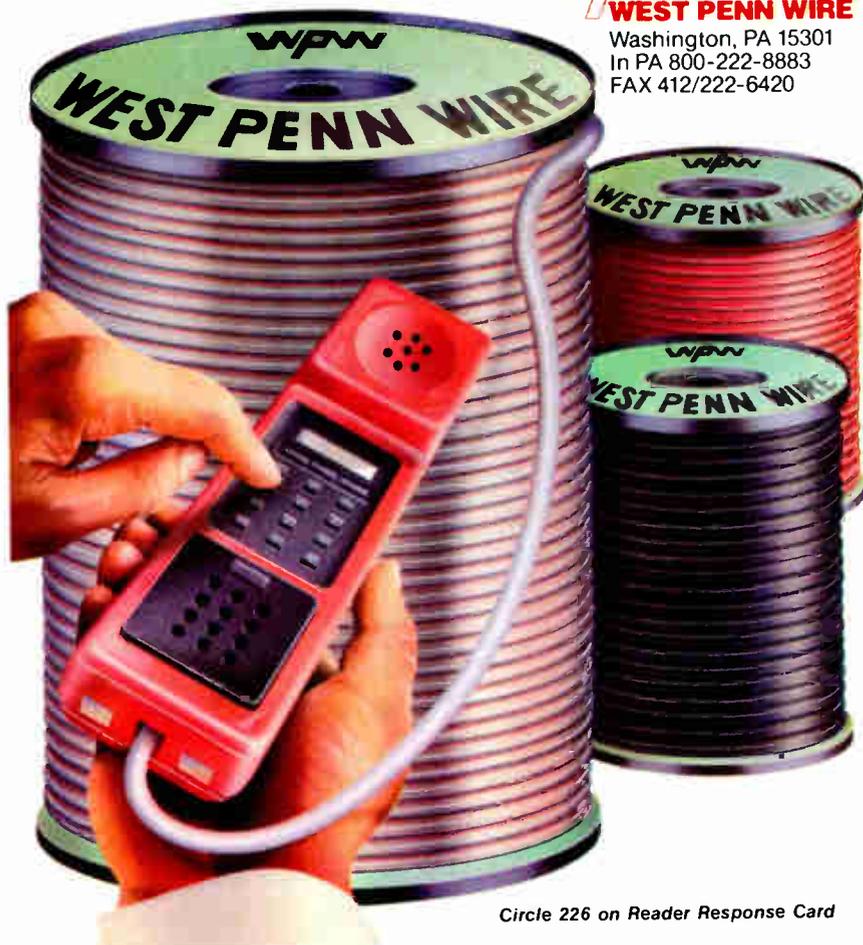
CALL 800/245-4964 AND... LET YOUR FINGERS DO THE STOCKING

From Anchorage to Miami, Los Angeles to Boston and anywhere in between, if you need wire in a hurry, just call West Penn Wire. With hundreds of different types of plenum and non-plenum electronic cable in stock, we'll ship exactly what you ordered, right to your door, ...that's our promise. (Stock items shipped within 24 hours.)

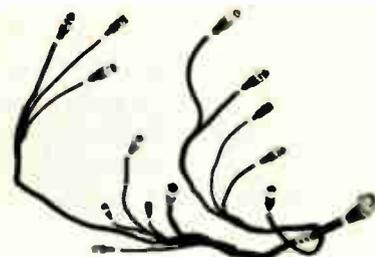
Reliability, quality, service and the best price. That's what West Penn Wire is all about.

Send for our free electronic cable catalog.

WPW
WEST PENN WIRE
Washington, PA 15301
In PA 800-222-8883
FAX 412/222-6420



Circle 226 on Reader Response Card



Kyle Offers Cables with Sealed Connectors

Custom interconnection systems combining Kyroflex® hermetically sealed connectors with molded cable assemblies for use in hostile environments are now available.

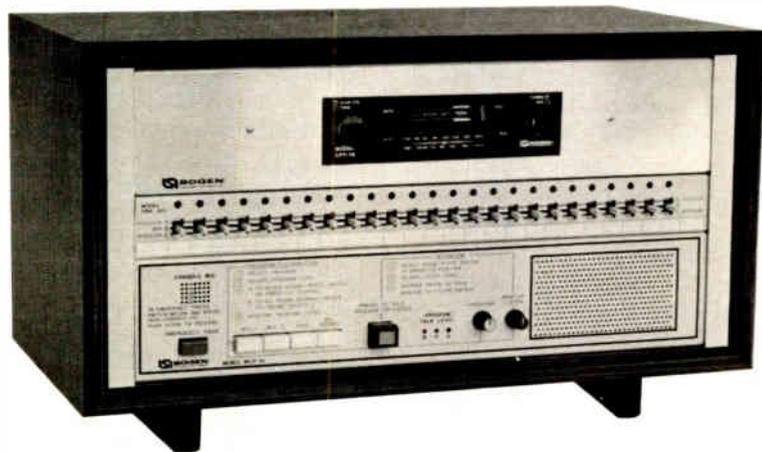
Kyle Technology interconnect systems have flexible metal sheaths for EMI and RFI shielding and can withstand temperatures from cryogenic to +1500°F. Cable harnesses are said to resist fluid and water, withstand pressures to 20,000 PSI and radiation to 10¹³ RADS Gamma. Materials that can be molded include silicone, Viton, Aflas, neoprene, fluorocarbon rubber, polyurethane, and Teflon.

Circle 22 on Reader Response Card

Ad Index

RS#	Company	Page
	AKG Acoustics (203) 348-2121	19
215	Altec Lansing (405) 324-5311	29
240	Anchor Audio (213) 533-5984	14
220	ART (716) 436-2720	31
224	Atlas/Soundolier (314) 349-3110	46
238	Audio Technica (216) 686-2600	35
227	BBE (714) 897-6766	67
222	Bogen (201) 934-8500	59
210	Bose (617) 879-7330	3
241	Community (215) 876-3400	44
223, 237	Crown (219) 294-8000	41, 63
212	dbx (617) 964-3210	5
216	DDA (516) 249-3660	47
218	EAW (617) 620-1478	61
201	Electro-Voice (616) 695-6831	C. II
204	Fanon-Courier (714) 669-9890	39
233	Faraday (517) 423-2111	16
243	Fostex (213) 921-1112	15
202	IRP (312) 439-3600	C. III
213	JBL (818) 893-8411	22
236	J.W. Davis (214) 651-7341	54
239	MacKenzie (818) 579-0440	78
232	Multivox (514) 321-3131	78
231	Music Supply Co. (214) 946-8450	77
242	Oxmoor (205) 942-6779	57
207	QSC (714) 645-2540	55
211	Quam-Nichols (312) 488-5800	7
217	Rane Corp. (206) 774-7309	45
209	Samson (516) 489-2203	42
219	Seeburg Music (919) 851-5823	36
203	Shure (312) 866-2200	C. IV
225	Sonic Systems (203) 356-1136	40
235	Tappan Wire & Cable (914) 359-9300	56
230	Tektone (305) 844-2383	34
221, 228	Telex (612) 887-5550	72, 24
205	TOA (415) 588-2538	17
214	University (616) 695-6831	51
226	West Penn Wire (412) 222-7060	58
229	White Instruments (512) 892-0752	54
206	Yamaha (714) 522-9011	25

Why Bogen's SI-35 Control Center Can Make Sales That Others Can't



Even the most critical customer will see unsurpassed values when comparing the SI-35 to others:

- *Desk-top capacity for 75 staff stations*
- *FM/AM tuner can be built-in with 50 staff switches, or tuner/cassette player combination with 25 switches*
- *Handsome executive-style cabinet*
- *Surprisingly low cost*

A superb intercom, paging, and background music center for schools, institutions, or commercial establishments, the SI-35 features simple, color-coded instructions right on the panel for easy operation. Dual channels, 8-watt intercom and 35-watt program, permit simultaneous use and effective levels. Push only one button for emergency announcements. Staff calls are annunciated by tone and light. Terrific? The SI-35 is only one model in a whole new line of very saleable control centers serving from 25 to 250 staff stations. For full information, just use the coupon below.

BOGEN®

COMMUNICATIONS, INC.

50 SPRING STREET, P.O. BOX 575, RAMSEY, NJ 07446 • (201)934-8500

Please send information on your new control centers.

NAME _____

TITLE _____ PHONE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

How to Write a Usable User Manual

Edmond H. Weiss, *How to Write a Usable User Manual*, Philadelphia, ISI Press, 1985, 197 pp., \$14.95, paper.

How to Write a Usable User Manual by Edmond H. Weiss is not simply an exhortation to good spelling and grammar. It confronts the reader with the foolishness of his naive ideas about manuals. It forces him to think about the user, to look at a new product or system through the user's eyes. It points out the way to modular organization of manuals. It re-defines the concept of a "good manual." It sorts out and simplifies the Sisyphean task of manual maintenance for future editions.

If you are a successful manufacturer of sound products, or a successful designer of sound systems, you are producing user manuals—whether you want to or not, whether you know it or not. Weiss' little book will convince you that good manuals are not a dead loss, an artistic afterthought, nor the

product of ineffable art. He will remind you that your product or system means nothing in the carton going out over the shipping dock; its value is in its successful, reliable use. He will show you that good manuals are a vital competitive edge.

This book is not a style manual; it does not teach grammar or spelling. Rather, it shows how to organize and structure the creation of user manuals. It is divided into three main parts, with several chapters in each. Part one describes manuals as a "science of user documentation." It probes what manuals do, why they so often fail, and how a successful manual can be identified. This segment of the book explodes, thoroughly and forever, the myths of manual-making that have retarded the art.

Part two shows how to create manuals in a structured way. This is aimed at those charged with making manuals, and those who supervise them. It shows how to determine what

"The chapter giving 10 sure-fire ways to write unclear instructions is worth the price of the book, and should be framed above the word processor of every manual writer everywhere."

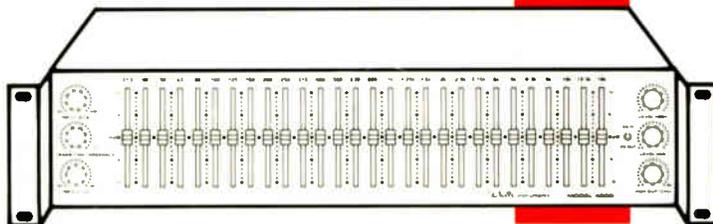
publications are needed, and how to define what should be included in them. It illustrates the "modular" structure of manuals that are usable, and indicates how modular manuals are maintainable; that is, they can be revised and updated easily and without complete rewriting. Particularly useful is the chapter on testing and editing manuals; close adherence to these ideas will result in better manuals very quickly. The chapter giving 10 sure-fire ways to write unclear instructions is worth the price of the book, and should be framed above the word processor of every manual writer everywhere.

The last part of the book speculates on the future of user documentation, and the way future hardware, software, and systems can be made without manuals at all.

Our industry would be very much better off if every company producing user manuals put several copies of *How to Write a Usable User Manual* in circulation among their employees. Our final product, the sound systems, would work better and suffer less down-time, even without any technical changes whatever.

In the meantime, however, only a few manufacturers and contractors have opened their eyes to the competitive advantages of good manuals, and these companies enjoy a success others will never quite understand.

**We've Gone
in Another
Direction . . .**



sliders

. . . our first Graphic Equalizer featuring *Linear Controls* with the best signal to noise and highest filter precision of any R-C Active Graphic we've tested!

**White
instruments**
Division of C VAN R Inc

P. O. Box 698, Austin, Texas 78767
TELEX 776409 WHITE INST AUS
512/892-0752

Your one-stop source for Music Systems

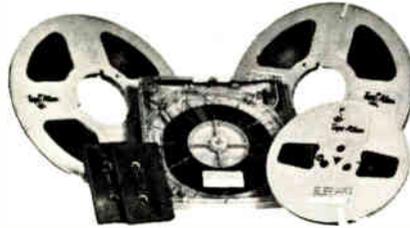
• STEREO • FOREGROUND • BACKGROUND • BROADCAST • NARRATION

Tape-Athon offers a complete line of Audio-Systems for any application you can name. We've added new Electronic and Mechanical designs to all our equipment to make the best even better; solid-state electronics; ball bearing capstan assemblies; improved clutch mechanisms to mention a few, along with the Worlds Largest Environmental Music Library Need details, facts, or prices?

Literature will be on its way the same day we receive your request. Or for even faster turn around, call our Sales Department, at (213) 676-6752



The Messenger III System is designed for inserting messages in a Environmental Music System for use in Supermarkets, Department Stores, Mass Merchansers, and others wanting point point of purchase advertising.



Why Tape-Athon Environmental Music? Because Tape-Athon, alone, offers the finest, most complete systems and formats, custom-fitted to your needs!

The Tape-Athon Library is the largest of its kind in the World as a source medium. From this vast Library, our "Musicologists" painstakingly create a Master Program that is an artistic, psychological, and scientific blend of the best Environmental Music in the World!



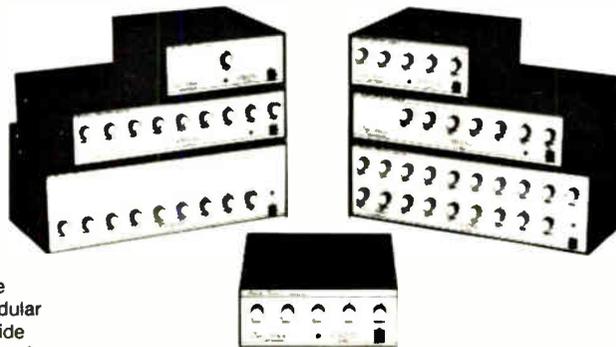
The 702, a Reel-to-Reel Type Tape Playback Unit, the standard of the Industry, for Environmental Music and Narrative applications. A truly high reliable system, it is in use at over 100,000 locations. Also available in a rack mounted and a stereo version.



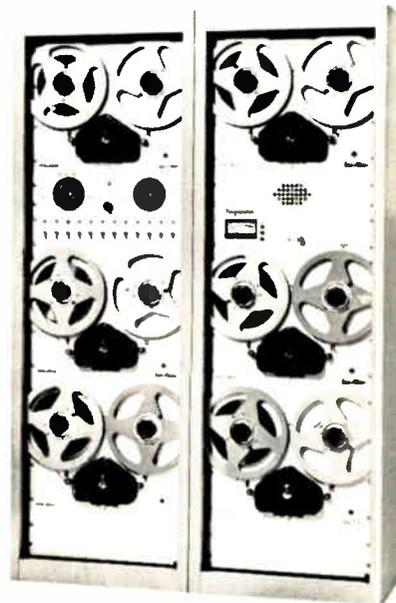
Electronic Tower Chimes are tape transport systems supplied in modular or rack-mounted versions to provide hour strike, followed by an interval of carillon music two, three, or four times per day. Ideal for banks, churches, schools, and similar institutions, Tape-Athon Chimes are a proven builder of good-will and community relations.



The Cassette Music System is ideal for on-location music in Offices, Retail Stores, Restaurants, or any location where music can assist in providing a atmosphere. Uses convenient tape cassettes from Tape-Athon's extensive library.



The complete line of Audio-Master Amplifiers are designed for Paging, Speech Reproduction and especially music. Unique design allows inputs to be field changed without costly plug-in modules, whether microphones, tape head, phono, tuner, telephone lines or auxiliary.



The Programmer for S.C.A. or Wire Operation Background Music Centers. It offers an integral "Time of Day" and sequencing control of 3 programs with a multitude of pre-selected music tempos eliminating repetition.

Tape-Athon manufactures more than a dozen varieties of Multi-Transport Inter-Mix Systems.

Tape-Athon®

CORP. 13633 Crenshaw Blvd. • Hawthorne, CA 90250 • (213) 676-6752



**DON
KIRKENDALL**

Kirkendall Becomes Dir. of Advertising for EV

Electro-Voice has announced that Don Kirkendall has been appointed director of advertising. Kirkendall will be responsible for the direction and development of media advertising, public relations, product and sales literature, point of purchase materials, and show exhibits.

Before joining Electro-Voice he operated a freelance writing and advertising consultation service, Kirkendall Communications, after his retirement from Audio-Technica U.S., Inc. where he was director of marketing communications for nearly 10 years. He had similar responsibilities at several Chicago firms: Bell & Howell Co., Victor Comptometer, Norlin Music Co., and R.R. Donnelley & Sons.

Threlkeld Joins JBL as Media Coordinator

Bill Threlkeld has recently joined the staff at JBL as media coordinator. In his position he will be the contact for all press release material and new product information for JBL, UREI and Soundcraft. He will also be coordinating media planning and product reviews.



**ROBERT A.
POISTER**

Poister Named Regional Sales Manager of Elgin

Robert A. Poister has been appointed southwest regional sales manager at Elgin Electronics. Poister will serve Elgin in marketing the firm's line of telecom power products and systems in the Southwest. He has more than 35 years experience in the telecom industry in both management and field

sales. Poister was formerly with ITT power systems and has a B.S. and EE from Tri State University in Indiana. Poister is headquartered in Elgin's Phoenix, AZ, office.

Stewart Opens Headquarters, Appoints Sales/Marketing Manager

Stewart Electronics Corp. recently opened its new facilities at 11460 Sunrise Gold Circle, Suite B, Rancho Cordova, CA 95670.

The 11,000 square foot location will contain all phases of Stewart's operation, including sales and marketing, R&D, and manufacturing. In a move designed to better service their dealer and reps, Stewart has included seven additional incoming phone lines. However, Stewart's main business number (916-635-3011) will not be effected by the move.

In other news, Stewart has named James M. Ruse as its national sales and marketing manager. Ruse, formerly with DeltaLab (the pro-audio division of Analog and Digital Systems Inc.), will handle all sales and marketing at Stewart.



**PAUL
SMENTEK**

Smentek is Dialight's Marketing Manager

Paul Smentek has been appointed to the newly created position of marketing manager for Dialight Corp.

For the past seven years, Smentek was the mid-american region manager for Dialight, headquartered in Chicago. Prior to that he was with ITW for seven years in that company's Cortron, Paktron and Licon divisions, holding a variety of internal and external sales positions. In his new post, Smentek will have his office at Dialight's corporate headquarters in Manasquan, NJ. He will have responsibility for product management, application engineering and advertising for the Dialight, Kulka and HHSmith product lines.

Pro Audio and MI specialists **Raleigh Perry & Associates** have been named representatives in the Southeast U.S. for **C-T Audio Marketing**.

Broadening its sales coverage to provide increased customer Service, **IMC Components Corp.** has retained **D.H.R. Marketing** in Raleigh, N.C. D.H.R. Marketing will provide sales representation for IMC Components and its other product lines in the southeastern United States. Sales territories include North Carolina, South Carolina, Georgia, Alabama, Mississippi, Tennessee and Virginia. IMC Components Corp. has also retained **Frank Polese & Associates** in San Diego, CA. The firm will provide sales representatives for IMC Components and its fans in the greater San Diego area.

Symco, Inc. of Millington, NJ, has been appointed manufacturer's representative of **Visual Communications Specialists**. Symco's responsibility is to introduce its products to the video dealers and system houses. Symco is also representing **Viking Cases** in New York.

Wilson Audio Sales of Nashville, TN, was named "Rep of the Year" by **Electro-Voice, Inc.** According to Paul McGuire, vice president of marketing at Electro-Voice, "Wilson Audio posted the best overall performance in any of Electro-Voice's 23 US and Canadian territories." Wilson and Whaley were presented with personalized EV tour jackets. Wilson also received a diamond ring carrying the designation "EV Rep of the Year."

Amek Consoles, Inc., has named **Western Audio Sales Representative** of the Year for 1986. In related news, **New Horizons** was given the award for Most Improved Territory for 1986. AMEK/TAC attributes Western Audio Sales overall performance in sales and support of the line, along with excellent management of its territory (which includes Southern California, Southern Nevada and Hawaii), as the principal reasons for winning the award. AMEK/TAC went on to praise New Horizons, which handles Illinois and Wisconsin for AMEK/TAC.

Shefler-Kahn Company will represent **International Purchasing Network** in a sales territory covering Arizona and New Mexico.



**Special
Olympics**



PRINCIPAL SPONSOR OF 1987 INTERNATIONAL SUMMER GAMES

Salutes:

Atlas/Soundolier, Fenton, Missouri
Beldon Wire and Cable, Richmond, Indiana
Boardwalk and Baseball, Haines City, Florida
The Bradley-Toner Agency, Inc., Mishawaka, Indiana
Carol Cable Co., Pawtucket, Rhode Island
Cetec Vega, Inc., Elmonte, California
Community Light and Sound, Chester, Pennsylvania
Electro-Voice, Inc., Buchanan, Michigan
Klark Teknik Electronics, Farmingdale, New York
Koontz-Wagner Electric, Inc., South Bend, Indiana
Micro Innovations, Winter Springs, Florida
Pro Co Sound, Kalamazoo, Michigan
Sharp Communications of South Bend, South Bend, Indiana
Shuford Mills, Hickory, North Carolina
Starcase, Munster, Indiana
Tascam, Inc., Montebello, California
Tripp Lite, Inc., Chicago, Illinois
Whiteford Truck Lines, Inc., South Bend, Indiana

**for soundly uniting with our
commitment.**

S & C's Job Report

Format

STATE

city: Name of Job, \$ Total of Construction, Phase of Project. Contact: Name, Company, City, State; Telephone Number.

TOTAL CONSTRUCTION

- 1—up to \$1 million
- 2—\$1 million to \$9 million
- 3—\$9 million to \$17 million
- 4—\$17 million to \$25 million
- 5—\$25 million and up
- NA—Not Available

PHASE OF PROJECT

- A—Planning=Consultant is designing system
- B—Pre-Bid=Final plans near completion
- C—Bidding=Bid date set
- D—Starting=Electrical Contractor/
General Contractor/
Owner buying now

The following jobs are in various phases leading up to bid. If you are interested in any of the projects, please contact only the names printed below.

ALASKA

Fairbanks: Fairbanks Activity Center, NA, B. Contact: Craig E. Park, Paoletti/Lewitz/Associates, San Francisco, CA; (415) 391-7610.

CALIFORNIA

Concord: Automatic Data Processing, 1,D. Contact: Craig E. Park, Paoletti/Lewitz/Associates, San Francisco, CA; (415) 391-7610.

Los Angeles: Ketchum Communications, 1,D. Contact: Craig E. Park, Paoletti/Lewitz/Associates, San Francisco, CA; (415) 391-7610.

Los Angeles: Simon Wisenthal Center, 3, A. Contact: Neil A. Shaw, Paul S. Veneklasen & Associates, Inc., Santa Monica, CA; (213) 450-1733.

Menlo Park: Raychem Corp, 1,A. Contact: Craig E. Park, Paoletti/Lewitz/Associates, San Francisco, CA; (415) 391-7610.

Milpitas: Sun Microsystems, 1, A. Contact: Craig E. Park, Paoletti/Lewitz/Associates, San Francisco, CA; (415) 391-7610.

Modesto: Trinity Presbyterian Church, 1,D. Contact: Craig E. Park, Paoletti/Lewitz/Associates, San Francisco, CA; (415) 391-7610.

Oakland: East Bay Municipal Utility District, 1,A. Contact: Craig E. Park, Paoletti/Lewitz/Associates, San Francisco, CA; (415) 391-7610.

Oceanside: Oceanside City Hall, 3,B. Contact: Neil A. Shaw, Paul S. Veneklasen

& Associates, Inc., Santa Monica, CA; (213) 450-1733.

Ojai: Ojai Valley Inn, 5,D. Contact: Neil A. Shaw, Paul S. Veneklasen & Associates Inc., Santa Monica, CA; (213) 450-1733.

Palo Alto: Kleiner, Perkins, Caufield, Buyer, 1,C. Contact: Craig E. Park, Paoletti/Lewitz/Associates, San Francisco, CA; (415) 391-7610.

Pasadena: Lake Avenue Congregational Church, 4,A. Contact: Neil A. Shaw, Paul S. Veneklasen & Associates, Inc., Santa Monica, CA; (213) 450-1733.

Sacramento: Mercy Hospital, 2,D. Contact: Neil A. Shaw, Paul S. Veneklasen & Associates, Inc. Santa Monica, CA; (213) 450-1733.

San Diego: UCSD Graduate School of International Relations, 1,A. Contact: Craig E. Park, Paoletti/Lewitz/Associates, San Francisco, CA; (415) 391-7610.

San Francisco: First Interstate Bank of California, 1,C. Contact: Craig E. Park, Paoletti/Lewitz/Associates, San Francisco, CA; (415) 391-7610.

San Francisco: Kleiner, Perkins, Caufield, Buyer, 1,A. Contact: Craig E. Park, Paoletti/Lewitz/Associates, San Francisco, CA; (415) 391-7610.

San Francisco: Portman Hotel, 1,D. Contact: Craig E. Park, Paoletti/Lewitz/Associates, San Francisco, CA; (415) 391-7610.

San Jose: Ford Aerospace, 1,A. Contact: Craig E. Park, Paoletti/Lewitz/Associates, San Francisco, CA; (415) 391-7610.

San Jose: McDonnell-Douglas, 1,B. Contact: Craig E. Park, Paoletti/Lewitz/Associates, San Francisco, CA; (415) 391-7620.

San Jose: San Jose State University Recreation and Events Center, NA, D. Contact: Edward McCue, Paoletti/Lewitz/Associates, San Francisco, CA; (415) 391-7610.

San Jose: St. Joseph's Cathedral Center, 1,B. Contact: Craig E. Park, Paoletti/Lewitz/Associates, San Francisco, CA; (415) 391-7610.

Santa Monica: Santa Monica Bay Hotel, 5,B. Contact: Neil A. Shaw, Paul S. Veneklasen & Associates, Inc., Santa Monica, CA; (213) 450-1733.

CONNECTICUT

Hartford: Connecticut State Capitol Hall of the House of Representatives, NA, D. Contact: Marc L. Beningson, Jaffe Acoustics Inc., Norwalk, CT; (203) 838-4167.

FLORIDA

Miami: Bayfront Park, 2,D. Contact: Chuck McGregor, Jaffe Acoustics, Inc., Norwalk, CT; (203) 838-4167.

Naples: Naples Performing Arts Center, 4,B. Contact: Robert A. Lorelli, Brannigan-Lorelli Associates, Inc., New York, NY; (212) 420-8787.

KENTUCKY

Alexandria: Campbell County H.S. Gymnasium, 1,B. Contact: Richard J. Lemker & Associates, Covington, KY; (606) 261-9529.

Covington: Holmes High School Auditorium, 1,D. Contact: Richard J. Lemker, Lemker & Associates, Covington, KY; (606) 261-9529.

MASSACHUSETTS

Boston: Hayden Hall, Boston University, 2,B. Contact: Chuck McGregor, Jaffe Acoustics, Norwalk, CT; (203) 838-4167.

MINNESOTA

Minneapolis: Minneapolis Armory, NA, A. Contact: Steve Orfield, Orfield Associates, Minneapolis, MN; (612) 727-2557.

MISSOURI

Mokane, Callaway County: South Callaway R-2 School District, NA, C. Contact: J. T. Weissenburgger, Engineering Dynamics International, St. Louis, MO; (314) 991-1800.

New Madrid: Central School Auditorium, 1,A. Contact: J.T. Weissenburger, Engineering Dynamics Intern, St. Louis, MO; (314) 991-1800.

NEW YORK

Astoria: American Museum of Moving Images, NA,B. Contact: Wade Bray, Jaffe Acoustics, Norwalk, CT; (203) 838-4167.

Jamestown: Palace Theatre, 2,B. Contact: Robert A. Lorelli, Brannigan-Lorelli Associates, Inc., New York, NY; (212) 421-8787.

New York: John Jay College for Criminal Justice, 5,D. Contact: Robert Benson, Knudson-Benson Associates Inc., Mercer Island, WA; (206) 232-2273.

New York: JP Morgan Bank Trust Committee Room, NA,D. Contact: Marc L. Beningson, Jaffe Acoustics, Inc. Norwalk, CT; (203) 838-4167.

New York: Metropolitan Opera, NY Philharmonic Summer Parks Concerts, 3,A. Contact: Chuck McGregor, Jaffe Acoustics, Inc., Norwalk, CT; (203) 838-4167.

OHIO

Cleveland: Palace Theatre-Playhouse Square, 2,D. Contact: Marc L. Beningson, Jaffe Acoustics, Inc., Norwalk, CT; (203) 838-4167.

Columbus: Ohio State Office Tower (Office) NA, D. Contact: Marc L. Beningson, Jaffe Acoustics, Inc., Norwalk, CT; (203) 838-4167.

To have your jobs listed in S&C's Job Report, send your information to:
S&C's Job Report
25 Willowdale Avenue
Port Washington, NY 11050

EAW AES NEWS

AES 83rd Convention • Product & Application News For The EAW Professional User Community • October 1987

Application Briefs **Freelance Productions: Sunfest '87**

Ancha Electronics has installed 20 EAW BH800 Bass Horns in the new Miami Dolphins Stadium. Joiner Rose Group provided system design services. Each horn is loaded with an EAW LAB L18/851K 18-in driver for over 20,000 watts AES power handling and 152 dB SPL peak output for the 20 unit array. • • • **Lasalle Pro Audio** has installed 4 BH800 bass horns at the University of Rhode Island and is responsible for sales of L12/CX2 coax loudspeakers to Advanced Animation in Stockbridge, VT who uses them for sound sources in their animated characters. Lasalle also sold a new stage monitor system to the Connecticut sound hire company One Site Audio built around eight EAW SM155Ts. • • • **Sound Productions** (Dallas, TX) Charles Kitch installed an EAW system in Emerald City for live rock concerts, using 2 JF500's hung on either side of the stage, an MH101 hung directly above center stage and 2 VB318 subwoofers below the stage. At Gabriel's, Summit Hotel's Vegas Show Room, Sound Productions installed a central cluster including MR101's and VB125's for maximum performance and excellent sight lines. • • • **Washington Pro Systems** (Wheaton, MD) supplied Harrah's Marina Casino in Atlantic City with a new stage monitor system including EAW SM222 high output slant stage monitors. • • • The Fast & Cool clubs have new EAW based systems with MK Audio (Dallas, TX) installing a large multi-element system utilizing EAW MH142 mid bass horns in the Dallas club. **LD Systems** (Houston, TX) installed a smaller distributed system utilizing 8 EAW FR153 wide coverage loudspeakers and 2 custom 2x18 subwoofers into Fast & Cool's Houston location. • • • **LD Systems'** Rob McKinley has standardized on the use of multiple FR122PI compact systems combined with a custom LD built subwoofer for use in the unique "SiFi" en-

West Palm Beach, FL - 330,000 persons enjoyed live music at this summer's Sunfest '87 on the beach during a recent sunny weekend, courtesy of a large EAW system fielded by Freelance Productions of Jupiter, Florida. A total of 17 nationally known recording acts appeared on the main stage, while five other talent stages showcased local and regional musical groups. Sunfest '87 was highlighted by the appearance of such artists as Three Dog Night, Rare Silk, Spyrogyro and Kenny G.

Twenty stacks, consisting of EAW BH800 bass horns loaded with 1,000 watt EAW LAB Series 18-inch drivers and MH102 mid/high frequency horn loaded reproducers each housing an EAW/RCF 12-inch driver and EAW HF590 horn with JBL two-inch exit compression drivers, supported the live music mixes at the main stage. The system was powered by Crest 4001 amplifiers. "This was the 4th Annual Sunfest, and it has really turned into a major event in this state," advised Freelance co-owner Will Kirkland. "We work all over the state of Florida, and our primary area of operation is between Miami and Orlando. We have rental sys-



tems out with touring musical groups, and work with a wide variety of clients, including Disneyworld. In the past few years, though, we have been seeing a lot of growth in the civic event field. Productions such as Sunfest are becoming very popular, and it takes a high quality sound system to get the show across to large outdoor audiences."

Sponsored by the city of West Palm Beach, this year's Sunfest '87 was produced with the help of a national beverage manufacturer. The 4-day event, with stages and food booths spread out over 3/4 of a mile of beach area, drew approximately 330,000 persons at \$2.00 per head

EAW Invades European Sound Hire Company Market With Formation of London Based Marketing Company

EAW International, a new company based in London, England, brings together a dynamic team of experienced audio professionals to manufacture and market EAW products throughout Europe. EAW International's objective will be to capture better than 50% of the European sound hire company market over the next 18 months.

Hans Freytag brings to EAW International extensive experience in both management and marketing in the European pro sound industry. Over the past 14 years Hans has been involved with the European marketing of many US and European built products including ATC, Gauss and Nexo loudspeakers, Samson wireless, and Saje consoles. Hans will be responsible for European production operations along with the overall management of the company.

EAW International's new director of sales Bob Kelly, who was most recently international sales manager for Martin Audio (London), is an American residing in England. He has extensive experience in the international touring circuit having worked with Emerson Lake & Palmer, Pink Floyd, George Harrison and The Rolling

Stones, before joining Martin Audio about two years ago. Working along side of Bob as sales administrator will be Lynn Chappell who also comes to EAW International from Martin Audio.

As part of Bob's evaluation of EAW's prospects for success in Europe he recently traveled to the United States to see and hear EAW's new products, including the KF850 Virtual Array™ system, before deciding to leave Martin Audio. Bob's reaction was, "This system is so far ahead of the field that I could not resist the opportunity to launch it in Europe, and from what I have heard from house engineers, Kenton Forsythe has done a wonderful job and has developed a very special system."

EAW International will start off concentrating on selling the new KF850/SB850/MX800 system to several major touring companies who are presently in the market looking for something special. Bob expects, "We will have great success after demonstrating the 850 system", and predicts, "We will have some important sales announcements ready for the next issue of EAW NAMM News in January."

As of this writing the office location was not finalized but anyone interested in contacting EAW International should call at 01 541 0180

Application Briefs

Continued From Page 1

environment of Photon (fast growing chain of "laser tag" amusement centers). As of September he has completed 17 installations including Photons in Houston, San Antonio, Los Angeles, Akron, Cleveland, Phoenix, Ocean City, MD, Baltimore and Wildwood, NJ. Bruce Kaufman, also with LD, sold 4 KF550's to the Bert Guerra Band based in Corpus Christi, TX. The band will use the system for larger club and outdoor shows. • • • • AL&M's (Norfolk, VA) Tom Parker installed a rock music playback system in VA Beach's main surfers hangout "Chichos" that included 8 FR153's.

According to Tom they wanted to be able to play music "real loud" and he's happy to report that 8 FR153's in a tiny room get more than "really loud". Tom also installed 3 new MH-102-90 mid / high frequency Virtual Array™ reproducers and 2 BH800 bass horns at Busch Gardens in Williamsburg.

• • • • Todd Rundgren is touring the US with new EAW FR253 full range systems for instrument monitors. These replace old EAW MK3000's recently lost in a Woodstock fire.

Todd has been using EAW Systems on stage since 1979. • • • • Roger Goodman Associates (N. Boloxi, MS) recently completed a world class dance music system for Coconuts in Cleveland, including multi-element arrays built around EAW / RLA custom horn loaded reproducers.

• • • • TekCom's (Phila., PA) Richard Feld installed 8 FR153's and 2 SB528's as the main dance floor system at Alyson's Restaurant in Wilmington, DE. TekCom also sold 4 BH800 bass horns for use as subwoofers at Enchante in Cherry Hill, NJ. • • • •

Marie Osmond's house sound engineer Ed Pratt of Pratt Sound (Salt Lake City, UT) has purchased some SM222 stage monitors for Marie to use, for consistent stage sound. According to Ed, they've done a lot of state fairs and a number of the sound companies supplied SM222's. Marie had never been happy with the stage monitors she used until the SM222, which really im-

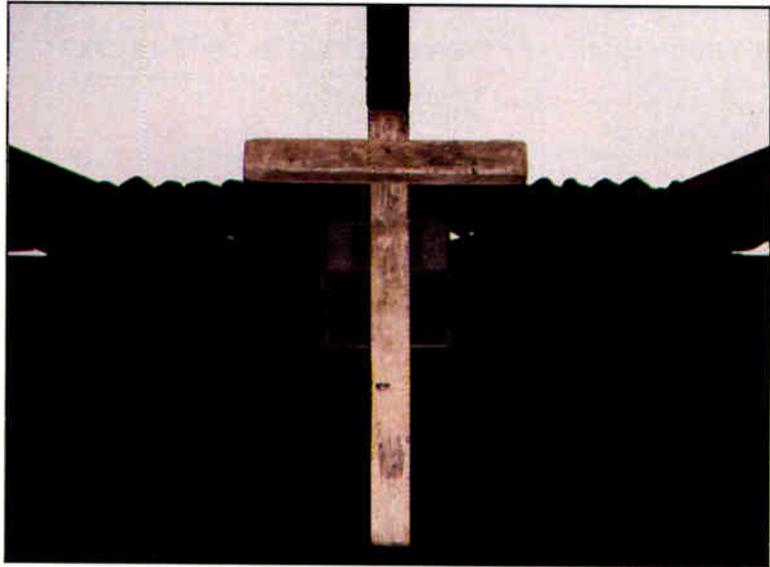
Continued On Page 4

Church Installation By Speeda Sound

Fresno, CA - One of Fresno's largest religious congregational facilities is now hearing both the Word and the music loud and clear since the installation of a new EAW loudspeaker array. Installed by Speeda Sound, Inc., the new system incorporates a pair of EAW KF550 full-range modular loudspeakers along with a prototype MH102-90 trapezoidal mid/high system. The loudspeaker cluster supplies high-quality sound reproduction for 1,000 seats.

The Northwest Church in Fresno has a very active music department and is known throughout the region for its special holiday season productions, including an Easter musical and a special Christmas candlelight service. "Marilyn Scott, the church's Technical Director, has a staff of perhaps six or seven sound and lighting technicians who really do a great job," explained Speeda Sound owner Mike King. "They realized that a newly installed in-house speaker system would save a lot of time and effort for their productions since a temporary rental system would no longer be required."

The Northwest Church's sanctuary is wide. "The seating area to be covered describes an arc of perhaps 280 degrees," advised King. "There was an existing steel structure connected to the stained wood beams, used to suspend lighting instruments. To fit the required speaker components in the available space, we had the EAW factory produce a custom angled mid/high frequency system that fit neatly between the two



KF550's. The cabinetry and hardware are all painted black to match the theatrical draperies. Everyone has been pleased with the results."

EAW's V.P. of Engineering Kenton Forsythe commented, "We were in the process of updating the 8 year old design of the MH102 mid/high reproducer to incorporate our new Virtual Array™ constant coverage technology. We were very fortunate that both the Speeda Sound's installation and AL&M's Busch Gardens (Williamsburg, VA) installation required this type of system just as we reached the final prototype design stage. As a result, in both instances we were able to supply an ideal array component that was not commercially available before."

Drop-forged steel chains, Aeroquip quick-link type fittings and EAW's standard flight-track hardware were used to suspend the speaker systems. "The hanging of the speakers was quick and easy, and the system sounds good in the room with very little e.q.," noted King.

EAW Installations For S.U.N.Y. Performing Arts Center

Purchase, NY - The music and drama programs at the State University of New York here have gained the ability to present a wide variety of productions in three of their theaters without renting outside sound equipment, thanks to the recent purchase of versatile EAW loudspeaker systems. System design was coordinated by LaSalle Pro Audio of West Hartford, Connecticut. Peter Solak of LaSalle worked closely with S.U.N.Y.'s Audio Supervisor John Langston to determine the sound equipment needs for the three different theater spaces.

"The Performing Arts Center presented some interesting acoustical challenges," recalled LaSalle's Peter Solak. "We recommended speaker systems from EAW for both high sound quality and cost effectiveness." The system for Theater B consisted of a custom EAW mid/high frequency system that included a titanium alloy compression driver on a 90 by 40 horn and four 170mm (6.5 inch) cone midrange drivers in a very compact box that was flown center stage. This unit is augmented by a single subwoofer system located next to the pipe organ.

The larger and less formal Theater C re-

quired concert sound pressure levels for live rock performances in addition to flat extended response for the more traditional theater projects also performed in this venue. The solution included an MH102 horn loaded mid/high frequency reproducer hung over center stage with a JF500 horn loaded three-way full range loudspeaker system hung at each side of the stage.

According to Peter, Theater D is "an interesting multi-purpose performance space that hosts everything from ballet recitals to rock concerts and television shoots. They need to be able to arrange the sound system for that room in a variety of configurations." The answer was to use EAW FR253 full range systems, "the FR253 enclosures are compact and portable yet very efficient." Another benefit of the portable system is that these units can be used for other productions throughout the center including events in the common area outside of the theaters. After the sale John Langston praised the systems saying these are the "most competent loudspeakers we have ever used, excellent quality and a big star on construction."

Jonas Productions Fields KF850 System

Indianapolis, IN - Jonas Productions here took delivery of a new EAW KF850 based Virtual Array™ system this summer, just in time for the Iowa State Fair. "We've had EAW products before, so we really trusted their speaker systems," explained Jonas Productions' owner Ted Jonas. "Upon first hearing about the new KF850 system this spring, we flew back to the EAW factory for an audition. We could tell immediately that it would fit our needs very well."

For the Iowa State Fair, Jonas Productions used 12 of the new KF850 three-way mid/high systems and 12 matching SB850 dual 18 inch subwoofers along with a pair of EAW closely coupled electronic signal processing units. Popular entertainers using the system for this year's grand stand shows included Crystal Gayle, the Jets, Roy Clark and the Miami Sound Machine. "We took a well-considered chance, choosing to purchase such a new system," stated Jonas. "It turned out to be the right decision. The MX800 system processor is a great little unit, and all of our users commented on the high-fidelity sound of the new system. We'll be adding an additional 24 EAW KF850 enclosures to the rig this fall, as we prepare for concert touring dates."

Jonas Production is designing a custom-built modular flying hardware system for the KF850's. "We're a new firm, but we are getting great response already this year," noted Jonas. "We like to offer our clients the best. We use EAW SM222 high output floor slants for stage monitors, and we are finding that the KF850/SB850 setup makes a terrific 4-way stereo sidefill monitor package."

Ted was amazed by the ease and efficiency with which the trapezoidal EAW 850 Series loudspeaker cabinets pack in Jonas Production's semi-trailer truck. "We pack all of the KF850 mid/high cabinets on the deck, since they have a



bit more weight than the SB850 subwoofers; they go on top. The boxes fit in four across, and there is no significant wasted space."

Jonas Productions powers the KF850/SB850 system with Carver PM2.0 amplifiers and consoles from Yamaha and Soundcraft. Jonas Productions takes great pride in their extensive signal processing capabilities including units from such firms as Lexicon and Klark-Teknik. The company can be reached in Indianapolis at (317) 861 - 4754.



Hot Rod Cafe Gets EAW Installation

Alameda, CA - The first in a string of new restaurant/club facilities with an innovative classic auto motif, the Hot Rod Cafe has opened for business with a dynamic sound system installation that features loudspeakers from EAW. Design consultation and equipment was supplied by Leo's Audio of Oakland.

Six EAW FR253 three-way high output nearfield full range loudspeaker systems and two SB528 dual 18-inch subwoofers bring the dancers out onto the floor and keep them there. The FR253's are some of the first units EAW has shipped in their latest configuration that includes their new titanium alloy compression driver. Additionally, 24 ultra compact EAW FR102 two-way speakers are distributed throughout the facility as a peripheral house system.

"This newly installed EAW based system has an extremely good 'hi-fi' sound to it, which is exactly what the owner wanted for this new club," explained Brian Botel of Leo's Audio. "It's an excellent companion to the \$200,000 lighting system that has gone in. The ceiling features an array of structural metal girders, from which both lighting instruments and the loudspeaker enclo-

tures are hung."

Botel recommended powering the new system with amplifiers from both Crown and QSC. "Each EAW FR253 runs off one side of a Crown Mirotech 1200, and a QSC MX1500 powers the subwoofers," noted Botel. "All amplifier channel outputs are driving four ohm loads for maximum amplifier efficiency and cost effectiveness. A bank of smaller output QSC 1200's powers the 24 FR102 units." For maximum versatility and control of the system a pair of Rane distribution mixers are used to feed each amplifier channel, resulting in individual level controls for the various zones throughout the club.

Program input for the high level music playback system is primarily supplied by LP's spun in the DJ booth. Based on the success of the Hot Rod Cafe a second location (Hot Rod Cafe II) is currently under construction, and a third location is planned for the San Francisco Bay area.



New Products
EAW AES Booth #190
The Next Step In
Virtual Array™
Technology
KF600
 Full Range System
MH102-XO
 Mid/High Reproducers



Eastern Acoustic Works, Inc.
 Manufacturing & Sales
 59 Fountain St.
 Framingham, MA 01701
 (617) 620-1478
 Administrative Offices
 Rydal Square, PO Box 46
 Jenkintown, PA 19046
 (215) 576-3000
 PRESIDENT
 Kenneth Berger
 V.P. ENGINEERING
 Kenton Forsythe
 V.P. MARKETING
 Frank Loyko
 SALES ADMINISTRATOR
 Sandy McDonald
 ADMINISTRATIVE COORDINATOR
 Joy Ramil

EAW International Ltd.
 London, England
 01-541 0180
 STAFF
 Geoff Lownstein
 Hans Freytag
 Bob Kelly
 Lynn Chappel

EAW AES NEWS is an advertising supplement produced by Eastern Acoustic Works, Inc., which is solely responsible for its contents. There is no direct or implied connection with Sound & Communications Magazine.

Application Briefs

Continued From Page 2

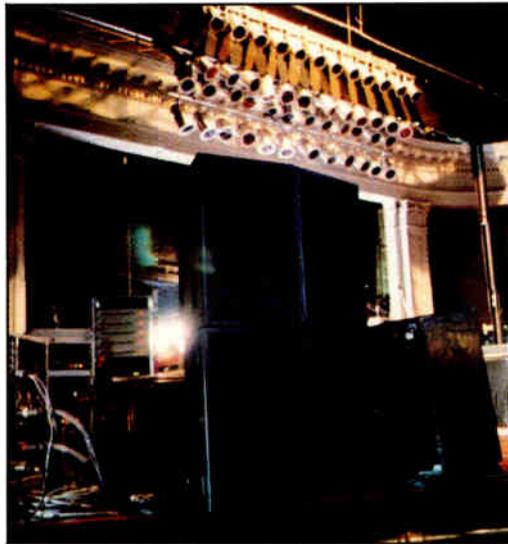
pressed her. • • • •
M.L. Marsh Associates (Portland, OR) installed 2 EAW dance systems for the Dakota Cafe in Portland. The main system is built around 4 DS123's and 2 FR122's operating from 100 Hz up along with 2 VB215's and a custom 2x LAB 18-in subwoofer. The second system for the bar area includes 8 FR153 full range loudspeakers for music playback. At Park Avenue, a 9,000 ft² teen dance club also in Portland, M.L. installed 8 FR153's along with 4 BH880 dual 18-inch subwoofer bass horns. At the club Primary Domain, M.L. replaced 4 large speakers with compact FR122's to be used along with the club's existing subwoofers. To quote M.L., "Everyone was surprised that the FR122's made up for the output of the much larger systems and sounded much better." • • • •
Sound Structures' (Grand Rapids, MI) Dave Pratt reports the installation of 4

Sun Sound / EAW On Tour With Suzanne Vega

Northampton, MA - Based in the Northeast, Sun Sound here is supplying an EAW KF850/SB850 Virtual Array™ system and full sound reinforcement services for Suzanne Vega's national tour. Heard from coast to coast during the summer months, the newly-assembled touring rig features one dozen EAW KF850 modular speaker systems along with eight EAW SB850 dual 18-inch subwoofers.

"The most striking thing about the new system is its phase consistency," enthused Sun Sound owner Herb Mayer. "You can clearly distinguish all parts of the mix much more than with other speaker systems that we have listened to. The result is that the P.A. seems to be more responsive to the mixing console and equalization. I've noticed that system users don't have to keep mixing more loudly in an effort to gain clarity."

Sun Sound powers the new KF850 speaker system with amplifiers from Crest and Carver. "We use the new Model 8000 from Crest for the lows and low-mids; Carver's PM 1.5 units power the mids and highs," detailed Mayer.



Sun Sound Small Venue KF850 System With The Suzanne Vega Tour, Columbus, OH

Sun Sound technicians John Gallagher and Fred Mueller have been touring with the new system on the road with Suzanne Vega. Robin Danar of Squid Productions in New York handles the house mix. When we caught up with them in Columbus, Ohio to let Bob Kelly our new European Marketing Director hear a KF850 system in action the room was very small (approximately 1,500 seats) and they were using only a pair of KF850/SB850's per side of the stage, with a single KF850 on each side of the balcony for coverage of the upper balcony seats. Robin was very enthusiastic about the definition and coverage of the system. His only regret was that as of now he could not find a KF850 system in Europe and Japan for their international dates.

Sun Sound is currently doing some regional work with the system while Suzanne is out of the country. After shows during September and October in Japan and Australia, Vega will be appearing at Radio City Music Hall in New York City.

DS123's and 4 VB118's in the Grand Rapids club Apple Core. The system is used for dance music and audio for video playback. Sound Structures also purchased a 6 box KF550 system to augment their existing EAW rental stock that includes 8 BH800 /MH102 stacks and SM222 high output stage monitors. • • • •
Andrews Audio Consultants (New York, NY) sold 4 EAW SM155P slant stage monitors to the Lincoln Center for their Outdoor Festival that included concerts at Damrosch Park and the Center's Fountain Plaza. The summer long festival included a wide variety of music including blues, gospel, folk, and C&W, as well as cultural shows. • • • •
HP Electronics (Baltimore, MD) sold an interesting system to the city's Baltimore Rowing Club to provide music, play by play commentary and general announcements over a 270 coverage area. The system used EAW loudspeakers exclusively, including 4 FR222's that roll out to

cover the park and parts of the river and a pair of FR102's to cover the deck area. • • • •
IRC Audio (Indianapolis, IN) has been busy supplying regional sound companies with more EAW products. IRC supplied Village Audio of Indianapolis with 4 BH800/MR102 stacks and expanded Williams Sound of W. Lafayette's system to include a total of 8 EAW BH500 bass horns, 4 EAW MR102 mid bass horns and 6 EAW SM122 stage monitors. • • • •
Michael Harris of Harris Audio (Miami, FL) sold a unique system to Motorola's Ft Lauderdale facility that used 4 FR122 systems along with a pair of EAW VB335 subwoofers for use in a sonic environmental simulation room. Digital audio recordings of various noise environments are played back in the room so that the effectiveness of different communication devices can be tested. • • • •
Ken Philips of Philips Pro Audio (Oklahoma City, OK) has completed system installations in Rock Street and City Lights

night clubs built around EAW. At "Fritzis", the area's leading live music venue, Ken installed a small dance music playback system using custom versions of the FR152 full range system. When "Fritzis" brings in national groups they rent Philips Pro Audio's EAW based concert sound system. • • • •
Ford Audio & Video (Oklahoma City, OK) has experienced great success using the L12/CX2 coaxial loudspeaker for distributed sound applications. Jim Ford oversaw an intricate installation at the Puttnum City West High School auditorium, where Ford Audio was responsible for both the acoustical consulting and contracting. The system included 20 L12/CX2's to augment the central cluster. Twenty L12/CX2's were installed as the primary sound source for another Jim Ford job at the First Nazarene Church conference/multiplex room in Bethany, OK. The coax speakers were hung in the ceiling as part of a six zone distributed system in

the complex venue where the stage is in the center of the room and sub-dividers enable the room to be used as six separate facilities. • • • •
New England Audio Technical (Hampstead, NH) is expanding with a new rental facility in Woburn, MA where its Rainbow Sound & Light's new KF850 /SB850 system will be based. NEAT's owner Bill Blaine is happy to report the installation of systems built around 4 DS123's and a pair of SB125 subwoofers in the Playroom Club in Waterville, ME, the Inn At The Park, Warwick, RI and at Meredith Station, Meredith, NH. For T.R.'s Tavern in Londondary, Bill installed 8 MS30's in the ceiling and a pair of SB125's as subwoofers. NEAT also sold portable BH500 /MH101 based systems to the newly signed Burlington VT based band The Boyz and the Portland, ME's band Network. The Newton, MA based band Instant Replay bought a BH800/MH102 system.

Circle 218 on Reader Response Card

Looking back at **SOUND & COMMUNICATIONS**

30 Years Ago . . .

In the October, 1957 issue of
Sound & Communications:

The column "Sound Business Practice" detailed the sound system of the September 7 high pontifical mass that took place in Yankee Stadium to celebrate the 25th anniversary of Cardinal Spellman's elevation to bishop. Among the equipment that was at the event were 12 University loudspeaker WLC's, 18 Electro-Voice 635 microphones, and 47 University IB8 speakers. Edward P. Casey and his company installed them all.

One of the new products introduced was the "Speedminder," a four speed record changer that automatically selected the correct turntable speed. By setting the control knob in the "speedminder" position, the unit automatically took over. With the standard groove stylus in play position, the changer automatically operated at (are you ready for this?) 78 rpm. With the microgroove stylus in position, the changer automatically operated at 33 and 45 rpm, and automatically intermixed and played at 33 and 45 rpm without regard to size or sequence.

20 Years Ago . . .

In the October, 1967 issue of
Sound & Communications:

The sound system of the Philadelphia Civic Center was examined. The system provided public address sound reinforcement and background music and paging. Some of the equipment installed were Bogen's BES-2 microphone amps, BES-5 line amps, and BES-31 AM/FM tuners. The system was subcontracted, designed and installed by Audio Electric Co. The design was developed by the Custom Engineering Dept. of Bogen in collaboration with Ed McKean of Audio electric.

The column db's reported on an experimental system that could broadcast printed copy into the home along with standard television programming and was ready for on-the-air-testing by

RCA Laboratories. The system operated by converting printed copy into a series of electromagnetic signals, which were blended at the transmitter with those of regular TV broadcasts by means of an electronic "hitchhiking" technique. The blended signal was broadcasted for reception by standard TV antennas, from which it was fed to the printer. The experimental printers could produce the equiv-

alent of a page from a standard paperback every 10 seconds, using an electrostatic printing process. As TV broadcast television signals in the '60s had 60 brief intervals a second during which no picture information was transmitted, the facsimile signals were inserted during those periods called "vertical blanking intervals." Among the applications that were envisioned were printed news, resumes, sports

Now! A Single Channel BBE with Mic Level, Line Level and Phantom Power!



The clarity, definition, presence, texture and voice intelligibility for which BBE has become world renowned is now in a single channel format. For *all* microphone uses—from vocalists to instrumental soloists and lecturers to distributed sound systems, the BBE 401 will become indispensable.

High or low impedance mics and musical instruments can plug directly into the front or rear panel jacks. The BBE 401 has its own preamp with gain controls, can be used as a direct box and will accept -10dBu line levels. 24 volts of phantom power are available from the low impedance mic output.

The BBE processors achieve time alignment of harmonic and fundamental frequencies that were present in the live performance but became reshuffled in the often convoluted paths of recording, playback and broadcast of audio.

The BBE 802

For use in broadcast, recording and large concert systems and industrial audio. Balanced and unbalanced lines +24 dBu headroom, hard wire bypass. The ultimate BBE for professional use.



The BBE 402

For use in home recording, clubs, discos, and systems using unbalanced lines. +14 dBu headroom -10 dBu levels. Home audio and cassette copies are greatly improved.

BBE

5500 Bolsa Ave., Suite 245, Huntington Beach, California 92649

714-897-6766 • 800-233-8346 (USA) • 800-558-3963 (CA)

(In Canada contact Daymen Audio, 3241 Kennedy Rd. #22 Scarborough, Ontario M1V2J9 or call 416-298-9644)

Circle 227 on Reader Response Card

A WIRELESS SYSTEM THAT MAKES SENSE

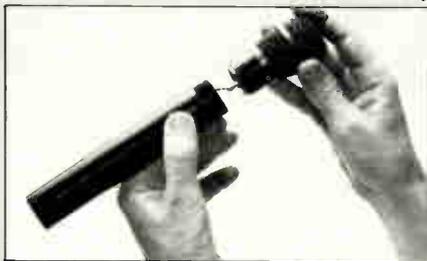


Introducing the Pro★Star Series

Here's a wireless system that puts it *all* together. Patented Pos-i-Phase diversity

eliminates audio dropouts while the multi-channel receiver and transmitter help prevent channel interference. Now, Telex introduces the HT-400 Wireless Microphone, a two channel mic/transmitter featuring interchangeable mic heads. You can choose from two different condenser heads; the Telex TE-10, or the Shure* SM-87. A Shure SM-58 Dynamic head is also available. The FMR-4

is a four channel diversity receiver designed for permanent rack mount installations or portable concert cases. Although its a great companion to the two channel HT-400, it is compatible to the entire line of Telex transmitters.



For more information about the

Pro★Star Series

write to Telex Communications, Inc. 9600 Aldrich Av. So., Minneapolis, MN 55420

TELEX®

*Shure is a registered tradename of Shure Brothers Inc.

Circle 221 on Reader Response Card

scores, stock market reports, syndicated columns and important speeches.

Joseph L. Ford and Richard L. Rounder, held patent 3,304,368 for a Noise Indicator that kept children quiet in an Indiana school bus. They invented an electronic equipment device that turned on a red light when the noise level got beyond the driver's endurance. The driver could adjust the instrument to the intensity of sound at which he wanted the light to go on. He also had a loudspeaker through which he could admonish the children. One side effect to it was the noise level indicator produced a game for the children.

15 Years Ago . . .

In the October, 1972 issue of *Sound & Communications*:

"Mobile Communications and Industrial Radio" reported that Sony Corp. had been granted a waiver for its videocassette player, permitting its model VO-1600 to function on TV channel numbers 3 and 4. No word if this action had any effect on the demise of the RCA device.

10 Years Ago . . .

In the October, 1977 issue of *Sound & Communications*:

In "Late Lines" *Sound & Communications* chided the independent sound and communication sound contractor for not joining a trade association because of fear of sitting down with competitors and giving away their secrets. *Sound & Communications* advocated that contractors join NATA (North America Telephone Association) to gain a voice in lobbying efforts and to network for advice.

"NATA in Washington: National Conference/National Concern" (no author) revealed that one of the principle speakers was Gary Hart. Remarking on the "Bell Bill" and how it would benefit AT&T, Hart said his message was "That we must take care that we not abandon our pursuit of an open and competitive free enterprise system before it has been given a decent chance."

SALES & MARKETING

(continued from page 46)

his sales prospect to attend and reap the benefits as sponsor of the event.

To assist in scheduling van-visits, Stentofon provides dealers with announcement mailers for use as invitations to his customers and prospects. The program also includes a "critique card", which attendees fill out at the end of their visit. This card not only gives Stentofon evaluation data on the presentations, it also provides the dealer with references for follow-up sales calls to interested prospects. As a goodwill memento of their visit, Stentofon sends a special design coffee cup to attendees who fill out the "critique cards."

The Demo-Van was put on the road in July, and made dealer-scheduled visits to customer locations in Massachusetts, Connecticut, New Hampshire, New York, New Jersey and Pennsylvania on its first tour. The second tour was made to dealer-scheduled locations in the North Central states and subsequent visits are being scheduled for other areas.

Consulting Engineers, have said they "would like to see a complete demonstration at a future date." and, "it is a good introduction to Stentofon."

From its more than \$100,000 investment in the Demo-Van, Stentofon expects a good return in terms of increased sales and dealer goodwill. Plus, the residual benefit of the van serving as a traveling billboard to promote the company's name and products.

The Stentofon Demo-Van will be exhibited at all six of the regional Electronic Sound and Systems Conferences. Additional information about the Demo-Van program may be obtained from Stentofon's Customer Service Department at (816) 231-7200. ■

NY'S NIGHTLIFE

(continued from page 30)

the amp to give out," Smith said. "A lot of dust gets kicked up in the course of an evening and you have to prevent overheating. Nobody's going to wait around for it to be fixed then."

Stargazing at the Saint

Stargazing is the order at the Saint, a club that could pass for the largest planetarium in the east. Folks dance underneath a 76-foot (in diameter) dome and are immersed in heavenly bodies—sort of. Technical director

Brian LaCoss explained the Saint features something called the Star Machine, a second cousin of R2D2, which creates an out-of-this-world effect. "Its \$400,000 worth of equipment that turns, tumbles and twists," LaCoss said. "It's got 10 35mm projectors that go 180 degrees around the room and can enlarge a slide to 10 feet, at eight feet high. We have images of the moon, the blue horizon, an amber horizon, and spaceships flying around. It's really like creating a universe," he said.

Fine, but can you dance to it? The music certainly comes in loud and clear. LaCoss noted that Yamaha's production coordinator Charles Sugomori and representative Frank Applestein did a reading on the room and found it "acoustically perfect." The technical director works with the house sound engineer to put together a wide variety of mixes that the DJs play. "Normally we don't employ delays," LaCoss said. "Reverb would sound muddy." In addition to the machine-made stars, video can be seen on an 18-foot by 18-foot screen. The club has been going loud and strong for eight years. With 630 speakers in the dome, four-speaker systems on the floor, and 52 separate channels of amplification in 32 separate BGW amps, LaCoss likened a night at the Saint to "being inside a big speaker."

Peter Sparrs of Entertech Associates designed the sound system and built the speakers for the Saint. "The sound system is quadriphonic and is designed to envelop the dancer within an acoustics space, said Sparrs. "The system does not require that the signal sources be encoated in quadriphonic in order to get the desired effect. It is similar to a dolby system but is not the same—it's more kinetic. It can be pinpointed acoustically in the dome."

All 630 speakers (32,000 rms) in the dome use Eminence, Philips and JBL components. "It is designed specifically for that space and not one speaker is seen," Sparrs continued. "We use no compression drivers or horns from 100 Hz to beyond 20,000 Hz. Below 100 Hz, we use specifically designed 16 foot exponential folded horns."

The Cat Club's Meow

Like the Saint, the Cat Club also alternates between live acts and recorded music. Cat Club production manager Jay Siano said his place is ready to switch from one to another with ease. "We've got a 24-channel console and bands use 20 channels,

leaving four free," Siano said. "Our Meyer Sound PA configuration has two columns per side and two Fostex bass bins. We also bring in phasers when necessary. The equipment is top-quality. James Toth and Associates who sold it to us is in once a week to dust out the amps."

When the live acts aren't playing, the DJ programs all the music, often with his own records, "whatever he might like," said Siano. "It's definitely dance music, though, whether it's rock or new wave or heavy metal. It's really all the same when you consider people dance to it." Does anybody not dance to it? We've got a neighbor upstairs who complains, so we can't play any music until 5 p.m. when he leaves work," mused Siano.

The need to balance between live music and the recorded kind is a contractor's concern. LaCoss calls it no problem for the Saint, where a record or tape comes on "three beats" after a performer leaves the stage. Sound consultant David Andrews, who has worked with several of New York's best-known nightspots, said a key is to see how easy the load-in of equipment is when a special act is appearing. Andrews' other major concern with clubs is payment. "These places tend to be transient," Andrews said, noting how some of the most *chic* discos—Studio 54, Danceteria, World, Peppermint Lounge—are nothing more than memories now.

"The last five years have seen a major change in formats," Andrews said. "It's a matter of trendiness versus the nature of this business. Getting paid is a major problem especially when you don't have a long-term relationship with a club. Money up front is a good idea in practice, but they always want to be a week or two behind in payments," he said.

Monetary Concerns

Chrislee Nardone, marketing coordinator for International Sound & Video, agreed that it is often difficult to collect accounts receivable. "Our terms are one-third when the job is complete," Nardone said. "Sometimes, though, you have to talk the client into that." International has done a number of clubs in New York and New Jersey, in addition to restaurants and office buildings.

Sound Control owner Dan Prosseda adds that he doesn't want to be constricted by expenses when he is doing

(continued on page 75)

CONTRACTING CLOSE-UP

Pro Media Busy with Installations

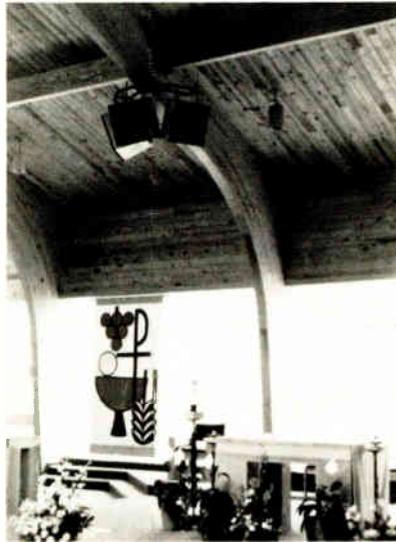
Pro-Media has been busy completing and starting up new projects. The company has supplied and installed the equipment for Merle Haggard's new studio in Redding, CA. Equipment for the facility includes an automated Neotek Elite Console, custom monitors using TAD components, a Sony 3324 digital 24-track, a Sony 3202 digital two-track, and an Ampex ATR 102 1/2-inch two-track analog machine. A variety of microphones, including AKG and Neumann's, were also supplied.

The company is also completing the contracting plans for a new sound reinforcement system for the new Hilton Tower in San Francisco. The plans include installations for meeting areas, ballrooms, restaurants, exhibit areas and convention rooms. All public and rental areas of the hotel are to be upgraded and equipped with new sound systems. The Hilton is refurbishing the old building and building a new contemporary tower—upgrading all convention areas in the process. The project is to be completed by March of 1988.

Also in San Francisco, Pro-Media was retained by Max's Opera Plaza to develop a new sound system for its cafe. The new system will enable the

singer/waiter or waitress to run a non-technical type of system that upgrades and provides clearer listening capability.

Davis Audio Installs PIs in Church



Davis Audio installed Professional Audio System's PI152P 15-inch coaxial loudspeakers in the St. Thomas the Apostle Catholic Church in Smyrna, GA.

According to Howard Davis, owner of Davis Audio, the speakers will replace a "music store special" that the church already had.

In order to install the speakers, a ring had to be suspended from the ceiling because of a beam that was in the middle of it.

The PIs had an added perk—they're made of natural birch so they fit in with the decor of the church. Davis said, "The speakers are aesthetically pleasing and fit in with the contemporary room."

Peirce-Phelps Installs A/V System at Scanticon

The Scanticon Corp. has awarded the audio/video division of Peirce-Phelps, Inc. a contract to supply and install audio and video systems at the new \$40 million Scanticon-Minneapolis Executive Conference Center and Hotel scheduled to open this month.

Scanticon-Minneapolis, a joint venture of the Scanticon Corp. and Prudential Insurance Co. of America, will have 33,000 square feet of dedicated, specialized meeting space, 240 guest rooms; two restaurants, and a recreation center. It is located in Prudential's Northwest Business Campus development along Interstate 494 just northwest of Minneapolis.

Scanticon-Minneapolis includes a large auditorium with seating for up

to 300, 8 conference rooms, 2 board rooms, 21 breakout rooms, and incorporates a full complement of advanced, built-in audio-visual and sound systems providing total support for small to large meetings. The conference rooms are completely sound-proof and equipped with modern audio-visual technology, including color TV monitors, display board systems and computer interface. Each center has its own staff of A/V technicians and TV and graphic arts studios to meet special needs of conferences.

Peirce-Phelps, which previously provided consulting service and supplied and installed equipment for Scanticon-Princeton, will supply and install equipment for the master con-

trol room, the main auditorium and individual conference, board and breakout rooms. For Scanticon-Minneapolis, video capabilities include permanently installed 3/4-inch U-Matic and 1/2-inch VHS playback and a mobile color video production unit. For audio, Scanticon-Minneapolis features stereo or mono speech reinforcement, a portable conference microphone system, wireless microphones, and cassette or reel-to-reel tape recorders. Projection systems are 35mm slide, 16mm film, or ceiling-mounted large screen video (RGB or composite video formats).

Other features the meeting rooms have are black-out curtains, stepless dimming of lights, remote control panels for audio and video functions.

NY'S NIGHTLIFE

(continued from page 73)

a nightclub job. "I'm mainly interested in quality sound, as opposed to a \$3 speaker and background music sound," Prosseda, who is also a New York-area contractor, said. "One of the big technical problems is doing a ceiling installation. We'll use a back box, which is costly, or an outboard unit with minispeakers. Nightclubs may want speakers zoned where they won't be too overpowering. And they may have a stage set up for live music, as opposed to dancing. Then you've got two different designs. For a live act, music has to come at you from the stage. When there's dancing, you should be immersed in sound," he said.

And New York is immersed in sound. Everyone keeps dancing underneath the bright lights of the big city and the Big Apple sound contractors help everybody keep the beat. ■

Greg Prince is a freelance writer specializing in electronics, audio and video. He has written for *Billboard*, *Backstage*, *Crain's New York Business* and *Home Entertainment*.

AES

(continued from page 41)

of electronic music composers, encompassing modern concert electronic/computer music through works by Chadabe, Stanley Junglieb, Paul Lehrman and other well known artists.

EXHIBIT INFO

The exhibit floors at both hotels will be open from noon to 7 p.m. on Friday; 10 a.m. to 6 p.m. on Saturday; 10 a.m. to 5 p.m. on Sunday; and 10 a.m. to 4 p.m. on Monday. Gravereau said this year there will be plenty of space to move around on the floors. "We learned our lesson from two years ago in New York—we were only at the Hilton and the space was too cramped. If we had held it at one convention center, such as the Jacob Javits Centre, it would have been fragmented from the social activities. It's important that everything is in the same area because AES members are not just attending a convention, but are part of it," Gravereau said. ■

SEAPORT

(continued from page 50)

asked, "How do you get that actor to perform like that on every single performance?"

THE CHALLENGES

The electroacoustic challenges of this project were summed up by Russell, "The building is a peculiarly shaped theatre—after all it was originally designed as a warehouse. So we had a pretty hard time designing sound that had both a sense of directionality and allowed everybody to hear. Even though an automated console was used for the mix-down of the 24-track to the final six audio-tracks, it took six hands to really mix it right fiddling with the pan-pots to get everything on the right mix busses."

With the average day running some 10 shows back-to-back, maintenance is very important. The theatre has its own in-house maintenance and operations staff headed by Milton Olshin. Every piece of equipment is routinely checked and cleaned, and worn parts, light-gels, bulbs, etc. are replaced. This is no easy task with some 2400-plus slides; one hour of half-inch magnetic-tape; 35mm and 16mm film; and all the fire, fog, smoke... ■

LAB TEST

(continued from page 53)

devices at line level, and since the associated equipment will be mounted within feet.

Comments

When the unit is first explored, do it with a video monitor and with the approach of dialogue with a computer through a simple command input panel. With a monitor hooked up you can see the 'analog' of a standard equalizer front panel. The hardware is rather simple, and that makes control simple, and keeps maintenance and tampering to a minimum as well. The software takes care of providing the user with a maximum of control with minimum operator intervention.

The manual we had was preliminary, but its content was fairly basic and covered what the typical user would need to know. For us more curious individuals some block diagrams, more detailed info on the circuit, and schematics would be nice. Also, the layout of the manual is somewhat crowded, which may lose the attention of some individuals. We applaud the omission of the power switch—thanks for listening. While it is not mentioned in the manual, there is a blank spot in the rear of the chassis for a computer-style connector labeled "interface option."

So what's next guys? (See page 54 for new IEQ family members). ■

CLOSER LOOK

(continued from page 56)

and a 3 by 7 inch "screen dump" of the analyzer readout at the bottom of the page. This printout thus becomes a useful addition to job documentation.

With regard to portability, we inquired about the working life of the optional internal battery, and about display readability in bright light. The battery is a sealed lead-acid type (which we prefer since it has none of the negatives of memory cycling inherent in a nicad), and provides an operating life of six hours on an eight-hour recharge cycle. The LED display is readable in bright outdoor conditions, though not in direct sunlight.

Given its straightforward operation, useful features and attractive price tag, we feel the Audio Control SA-3050A deserves your *Closer Look*. ■

Circle 34 on Reader Response Card

TECH. SPEAKING

(continued from page 78)

responsibility of the respective organizations and businesses to realize the power of the printed word.

Adding to this perplexing situation are the new tax laws that stipulate deductions for expenses incurred while writing a book may only be taken during the income producing period of said book. For example, if I write a book in 1987 and spend money on research and writing, these are applied to the book's income which is likely to be distributed across three to five years. Likewise, the deductions must be "equally" taken across the period of actual income. This means heavier cash advances by publishers, resulting in tightening of dollars committed to projects and higher price tags at the book stores.

As we are being reminded of our "Freedom of the Press" by the 200th Anniversary of the Constitution, we sadly observe the beginning of taxes restricting the freedom of writers and readers to communicate. The individual audio-writer will find themselves in a more difficult position to publish in book-form. Are books in our comparatively small audio industry passing through the final frontier? ■

Jesse Klapholz
Technical Editor

LETTERS

(continued on page 16)

tions in certain overlapping "audio areas" and the fact that the system can be disconnected in the event of a move. . . who would want to take such an antiquated system with them to a new modern stadium?

The word "budget" has popped up here and that brings us to a sticky point. When the total budget for the project is so low, why spend \$4,000 for a wireless microphone system that is just begging for RF interference (despite precautions that have been taken). It seems to me that the dollars should have gone into a more modern approach to bring quality audio to the patrons of Wrigley Field.

Service of any installed audio system is important and in the case of a major league baseball team, the service is even more important. The fact that Gand's staff will "check the system every 30 days" and that part of their service includes an extra Crown amp "for quick replacement" gives poor representation to the real day to day audio needs of a major league baseball team. Our service to the San Francisco Giants (and the 49ers) include a check of the system and game maintenance by our staff *every game day* and periodic checks and equipment updates when the teams are out of town. . . "a spare amp!" What if two or four fail! We have a complete spare amp system to guard against vandalism or theft—not because the system is unstable. Also, a one year service agreement was built into the project. We offer a three year service agreement and that includes one or more of our personnel at each and every event held at Candlestick Park.

If Mr. Gand and Mr. Brown want to present proposals to other major league teams, they better turn their technology towards the 20th century and rethink the everyday audio needs of a major league baseball team.

Doug Caraway, President
Steve Caraway, Vice President
Caraway Audio

Jim Brown Responds: Mr. Caraway was one of the people who has contacted the Cubs concerning a new sound system and was thinking in terms of a cluster/point source approach. While I am sure his firm is doing a fine job at Candlestick Park, Wrigley Field and the Cubs have far different needs.

My function, that of a sound system consultant, is to determine the needs of the client and advise him (her) as how to best meet them. The Cubs are now engaged (and have been for several years) in a campaign to obtain community approval of night baseball, and good community relations are essential to the success of that effort. Both the community and the Cubs are sensitive to noise. It is, in fact, a community noise ordinance which is currently prohibiting them from playing night baseball!

When I presented the first feasibility studies to the Cubs prior to their deciding on the approach to be used, I looked carefully at the options available. Although not made public at the time, the Cubs made me aware of their plans for expansion of the park, the instability of their plans to stay in Wrigley Field subject to approval of night baseball, and their overwhelming desire to do something for sound immediately.

Once it was decided that a distributed approach must be used, it then became a question of what loudspeaker devices were available to support the concept. I spoke in confidence with major speaker manufacturers attempting to learn of their plans to develop a more modern replacement for the EV CDP horns or an appropriate full range outdoor loudspeaker which would support music. The desired design parameters were: 1) maintaining the wide coverage angle but with better pattern control; 2) improved power handling and, if possible, sensitivity; 3) better sound; and, 4) at a cost within range of a distributed system. None admitted to having anything in the works, although several professed an interest. I urged all of these companies to work at coming up with something in the near future, and I hope they do.

I then presented the Cubs with budgets based on a temporary system based largely on CDP's, and with new electronics that could be updated to a more modern system when there were state of the art speakers that met their needs. Note that all of the electronics meets the criteria of being totally reusable with any redesign system and reliable enough for one to want to do so. I also presented them a budget for updating to a high level distributed system capable of supporting music using currently available technology. Since currently available technology is

limited to voice range devices with real controlled coverage angles of 90° x 40°, at least 400 devices (costing in excess of \$1,500 per device, not to mention the electronics to support them) would have been required. My advice to the Cubs was to put in the temporary system now and buy a better system when 1) their plan for the park have solidified, and 2) a manufacturer produces a product which better meets their needs. I stand by that advice.

On the subject of wireless microphones, I can only say this. As a licensed and experienced broadcast engineer for 25 years, I understand the correct specification and use of wireless mics in crowded urban environments, and have been doing so in Chicago with great reliability for the past 10 years. Chicago, because of the proximity of the high power radio and TV transmitters to the center of the city's business and entertainment districts, is widely recognized by touring professionals as the most difficult city in the country for wireless (second only perhaps, to Washington, D.C.). For reasons related to the ways in which the Cubs use their sound system, a wireless mic is a great operational benefit to them. It has also proven to be very reliable.

As to service, maintenance, and backup equipment: Good professional equipment, properly installed in a well designed system, should not require frequent maintenance or extensive backup. The Cubs do not do the kind of entertainment programming that would require either a high level sound system or an operator/maintenance person to support it. Both Mr. Gand and myself were asked by the Cubs to be present for the first use of the system on Opening Day. Exceland Electronics has, as part of its installation work and routine warranty checkouts, replaced defective equipment. We have all been invited to come out and watch some baseball, but to date, there have been no calls for service.

I would agree with Mr. Caraway that this is not a "state of the art" sound system. Not all sound systems need to be. It is a good one, it meets the client's needs at a moderate cost, and it does so by using some unusual combinations of our technology.

Jim Brown
President
The Audio Systems Group, Inc. ■

CLASSIFIEDS

SALES ENGINEER

Michigan based alarm and communication systems contractor seeks experienced individual to market fire alarm, school and health care communications systems. We are an Edwards and Rauland distributor. Attractive compensation plan plus a salary plus program, fringe benefits and car allowance. Responsibilities include calling on specifying engineers, electrical contractors and end users. We presently have openings in our Florida-based operations. Interested career-oriented individuals should submit a detailed resume including salary history to:

Industrial Communication Company
21470 Coolidge Highway
Oak Park, Michigan 48237-3238
Attention: Dave Weeden

All inquiries will be held in strict confidence.

Product Design Engineer—Custom wired communications equipment and systems. Looking for experienced analog/digital designer. Audio amplifiers, system control circuits, AC-DC converters and entire systems are typical assignments. Please send your resume to:

Personnel Department
Comco Systems, Inc.
20 Van Dam Street
Brooklyn, New York 11222.
An equal opportunity employer.

RJ31X JACKS & CORDS
WIRE & CABLE
UL-PLENUM-FIRE
"B" CONNECTORS, TIE WRAPS
DRIVE RINGS & PINS
ARROW STAPLERS
FASTENERS
CALL TOLL FREE

cabletronix

800-431-WIRE (USA)
800-942-WIRE (NY)

**PLEASE
SEND**
all your
contracting
company's
news to:

Contracting Close-up
Sound & Communications
25 Willowdale Avenue
Port Washington, NY 11050

FREE 32pg Catalog & 50 Audio/Video Applic.

PWR SUPP. EQ.
PHONO. MIC.
TRANS. ACN.
TAPE. VIDEO.
LINE. OSC.

Stereo/Mono Pwr Ampl.

Video & Audio Dist. Ampl. 8-in/2-out, 12-in/4-out, 16-in/4-out
TV Audio & Recd Prod Consoles

OPAMP LABS INC (213) 934-3566
1033 N Sycamore Av LOS ANGELES CA, 90038

SESCOM, INC.
"the audio source"

FOR ALL OF YOUR AUDIO NEEDS

2100 Ward Drive Henderson, NV 89015 U.S.A.

CALL TO RECEIVE A COPY OF
OUR POCKET-SIZED CATALOG

CATALOGS & ORDERS: (800)634-3457
OTHER BUSINESS: (702)565-3400
TWX(910)397-6996

- Regular Classified—\$52 per column inch.
- Marketplace Display—
25 percent off rate card (up to 1/3 page).

Classified listings are accepted up to the
25th of the month preceding publication.

Name _____
Address _____
City/State/Zip _____
Telephone _____
Credit Card # _____

Please send copy & payment to:
Sound & Communications Classifieds
220 Westbury Avenue Carle Place, NY 11514
TELEPHONE: (516) 334-7880

We are known as —

"THE INSTALLATION & SERVICE AIDS PEOPLE"®

— we save you TIME AND MONEY

BUYING FROM US IS AS EASY AS IF WE WERE NEXT DOOR TO YOU
FREE DELIVERY NATIONWIDE*

for 3 months, October 1, 1987 through December 31, 1987
30 DAY FREE TRIAL INSTANT OPEN ACCOUNT — NO CREDIT CHECK

- SPEAKER SUPPORT TRUSSES (T-BAR BRIDGES)
- SPEAKER ENCLOSURES U.L. LISTED EASY-KARY® Wire Reel Holders - 3 sizes
- PUSH-PULL RODS Get cable through tight places
- TEST-SET For the Audio Serviceman
- EXTENSION CORDS 3 ft. and 10 ft. U.L. Listed

WE CAN SAVE YOU MONEY — THREE WAYS

CALL OR WRITE FOR MORE INFORMATION WE'RE AS NEAR AS YOUR TELEPHONE
CALL TO DISCUSS YOUR REQUIREMENTS 50 STATES DISTRIBUTION

*48 CONTINENTAL STATES — by ground carrier of our choice

\$50.00 Minimum Required

MUSIC SUPPLY CO., INC.

809 N. MADISON

DALLAS, TEXAS 75208

All 50 states call 1-800-527-1522

Local 214-946-8450

World Radio History

Books—The Final Frontier?

There are not many comprehensive and well organized audio libraries around the country, or ones that are easily accessible to most. Often, many of us are at the mercy of those "who have" to disseminate detailed information that is sorely needed. A good technical resource is one that consists of books, journals, technical bulletins, and magazines. The point is that even though there are over 1,000 books concerning audio and acoustics published before the advent of the transistor, they are simply not enough.

The most often cited journals and periodicals of Bell/AT&T Labs, RCA, ASA, IRE/IEEE, SMPE/SMPTE, The Franklin Institute, the Philosophical Society, Acoustical J. Sound Vibration; and a multitude of magazines and periodicals collectively account for the bulk of information concerning the field of audio and its allied arts. Books are the ideas and opinions of one person or a small group of peo-

ple led by an editor. Journals and magazines are the ideas and viewpoints of an industry.

In the 1800s, there were not many acousticians, yet there was a written record of the work. There are periodical articles from the Architect, Brick Building, American Philosophical Society, the Royal Society and The Smithsonian. The 1900s saw great strides with telephonic and radio research, followed shortly after by talking movies. Many research facilities were opening, and the number of researchers were in the midst of a mind-boggling boom. It was the Golden Age for audio.

Classics were written during that period, mostly used as university texts. Among them are authors that include George Stewart, Robert Bruce Lindsay, Alexander Wood, Leo Beranek, Frederick Hunt, Vern Knudsen, Harvey Fletcher, Harry Olson, Frank Massa, N.W. McLachlan, Philip

Morse, Dayton Miller, F.R. Watson, etc. The list of scientists, researchers, and experimenters could go on as evidenced by the countless articles published during this era.

As one can easily observe, it is the monthly publication venue where the technology of audio is disseminated. It is also where the growth of the sound and communications business is clearly documented. The responsibility of all of us then becomes to understand that what we commit to these pages will become part of today's curriculum and history for those a decade from now.

There are few books written today that totally represent the knowledge required to be a qualified practicing audio engineer. Information must be culled from magazine articles, newsletters, manufacturer's bulletins and manuals, journals, and convention materials. As such, it is the further

(continued on page 75)

STOP FEEDBACK

IN HIGH NOISE-LEVEL AREA PAGING SYSTEMS!

Paging from and to the same high noise-level area always creates a feedback problem because the highly amplified audio feeds back to the paging system. MacKenzie Laboratories has the solution—our *FBI-1 Feedback Interface*. The *FBI-1* is an all solid-state, digital audio record/play storage unit which is installed between the paging stations and the amplifier. Features include:

- Natural voice, digitized audio
- Message length up to 30 seconds
- Solid-state—no moving parts
- No maintenance required
- Bandwidth up to 7KHz, selectable
- Line in/Line out
- Easy installation in both new and existing paging systems

For more information, call MacKenzie toll-free:

800-423-4147

MACKENZIE

5507 Peck Rd., P.O. Box 3029, Arcadia, CA 91006 USA,
In California, call (818) 579-0440

Circle 239 on Reader Response Card

SURVICOMM

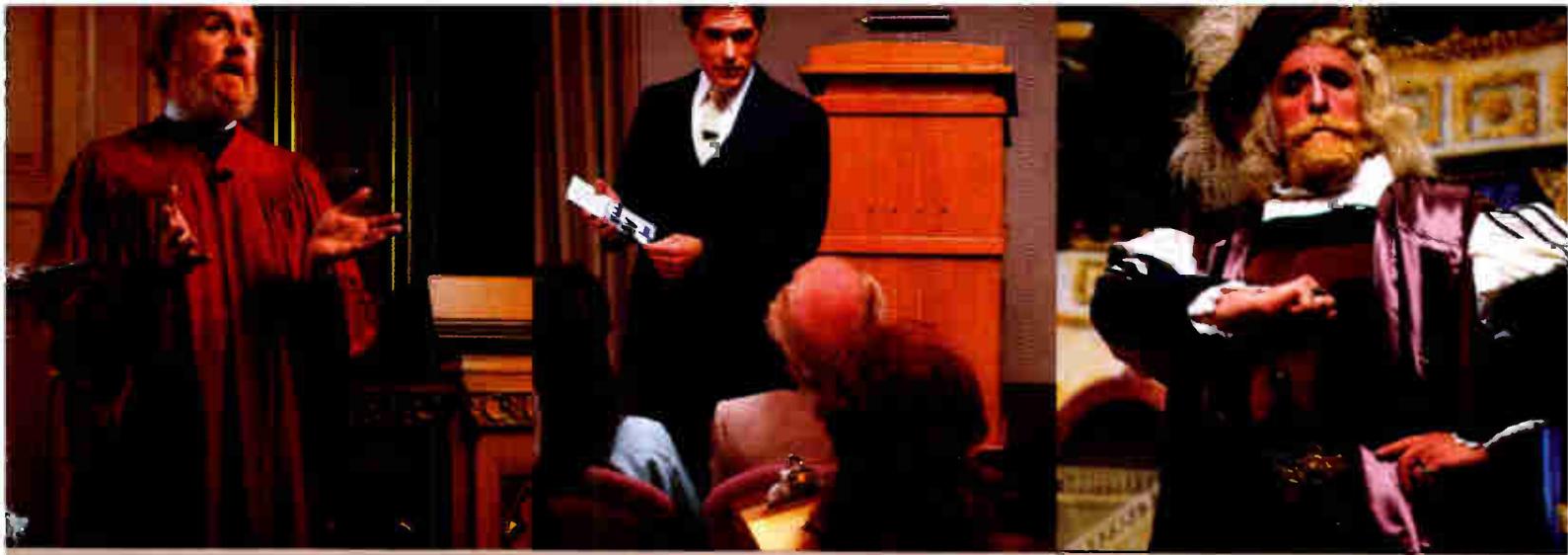
MICROPROCESSOR
CONTROLLED
NURSES CALL SYSTEMS



Multi-Vox

9967 BLVD ST-MICHEL,
MONTREAL, QUE.
CANADA H1H 5G7
TEL.: (514) 321-3131

Circle 232 on Reader Response Card



Introducing the only wireless that captures all a Shure mic can give. The new Shure Wireless System.

Never before has a wireless system so precisely matched advanced microphone technology with precision RF electronics. The result is superb sound quality and performance you might expect only from a conventional cabled microphone.

Most systems start with someone else's microphone.

No wireless system can give you more sound quality than the microphone itself can deliver. That's why each new Shure Wireless features a genuine Shure microphone for more accurate sound reproduction. Plus the reliability and durability you've come to expect from Shure.

Designed to overcome major problems found in other wireless systems.

The Shure system features our exclusive Diversiphase™ dual-antenna system designed to eliminate dropout and provide the strongest signal possible at all times. Unlike other systems,

Diversiphase corrects reflected or direct (multipath) signals that are out of phase, so they won't cancel each other...and adds them. Result: more antenna gain.

The new Shure Wireless also prevents interference from TV stations and other radio signals. Each system features a computer-selected frequency best suited to your area or a special frequency for touring needs. Individually tuned linear phase filters also help screen out unwanted signals, without adding distortion.

Fits nearly any application.

Choose from either W25DR Diversiphase or W20R Single-Antenna Receiver with compact W10BT Transmitter. Either Shure system can be used with the specially designed WL83 Electret Condenser Lavalier or a variety of other Shure mics. For information, call 1-800-257-4873 (In Illinois 1-800-624-8522) or write Shure Brothers Inc., 222 Hartrey Ave., Evanston, IL 60202-3696. G.S.A. approved.

Circle 203 on Reader Response Card



THE SHURE WIRELESS

World Radio History

The New lightweight Champ!

UL LISTED

Model DH-4020 Power Amplifier ...a dual 100 watt per channel amplifier

13.5 LBS.



NEW TECHNOLOGY

- Signal dependant power supply
- 100k Hz switching power supply
- Solid-state - no relays

FEATURES

- High efficiency MOS FET output stages
- Very low heat dissipation
- High reliability design
- Maintenance free/no fans
- No 60 Hz magnetic field
- Solid-state load protection and mute
- High fidelity specifications
- Absolutely clean clipping
- Optional 70 volt transformer

**INDUSTRIAL
RESEARCH
PRODUCTS, INC.**

A *Knowles*® COMPANY

321 Bond Street
Elk Grove Village, IL 60007
312-439-3600
Telex: 701845

Circle 202 on Reader Response Card