

SOUND & COMMUNICATIONS

Volume 39 Number 6

June 25, 1993

TAVERN SOUND

As bigger bands were booked for New York's Tavern on the Green, the sound and lighting systems in this glittering restaurant demanded an upgrade. Rare wood and chandeliers complicated the design along with the asymmetrical walls and low ceiling. But Tavern owner Warner LeRoy said he wanted "the best." **34**



IN THIS ISSUE

• AIRPORT OF THE FUTURE

The new Pittsburgh airport has won accolades for its people-moving capabilities. But the sound system too is intricate, thought-out, and the product of artistic and technical concerns. **40**

• THE ANSWERMAN

The fifties jukebox meets the CD. Diner decor with authenticity, as designers hide the medium. **12**

• A CASE HISTORY

A partial enclosure of the seating area of an outdoor theater solved the acoustical problems - and possibly

HOLOCAUST MUSEUM

The U.S. Holocaust Memorial Museum was formally opened to a pride of VIPs and an SRO crowd with sound, video and the White House Communications department. RCI conquered all the problems of the day. **26**

RING DISTANCE

ducts are proliferating as the 40 Americans covered by the ADA are clamoring for their due. Facilities may be slow to start, but consumer groups, manufacturers - and contractors - are making systems happen. How well can the contractors hear this? Not well at all. **18**



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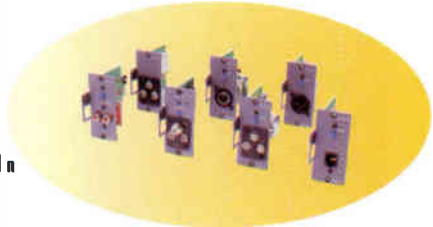
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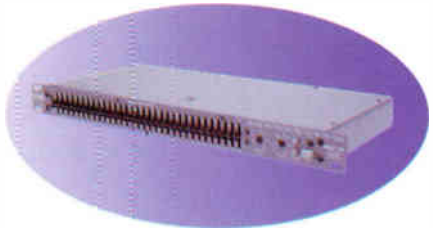
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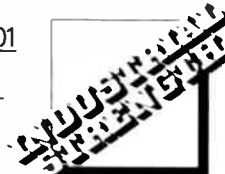
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Publisher/Editorial Director
Vincent P. Testa

Editor-in-Chief
Judith Morrison

Technical Editor
Mike Klasco

Associate Editor
Steve Jacobs

Research Assistant
Mark Miller

Contributors

Jeff Ader, Keith Clark, Jenay Cottrell,
Randy Scott Freed, William Freedman,
Clifford Henriksen, Benjamin Lein

Technical Council

Dr. Mort Altschuler
Professor Audiology, Hahnemann
University, Chief of Audiology,
V.A. Hospital, Phila, PA

C. Leroy James

Rees Associates, Inc.

Richard N. Jamieson
Jamieson and Associates, Inc.

Russell Johnson

Artec Consultants, Inc.

Joel Lewitz

Lewitz and Associates

Daniel Queen

Daniel Queen Associates

Jon Sank

Cross Country Consultants

Neil A. Shaw

Menlo Scientific Acoustics, Inc.

William R. Thornton

Phd, PE

Art Manager

Alicia Celli

Artists

Janice Kallberg, Janice Pupelis,
Kerri Reilly, Wendy Ser, Lori Vilardi,
Colleen Warenik

Production Manager

Ron Perone

Electronic Composition

Diane Catanzaro

Kim Marchica

Circulation Director

Debbie Vanderneut

Advertising Manager

John Carr

Classified Ad Manager

Patricia Torrisi

Traffic Coordinator

Teri Lubin

Director of Sales and Marketing
Nancy Davis

Editorial and Sales Office
Sound & Communications
25 Willowdale Avenue
Port Washington, New York 11050
(516) 767-2500
FAX: (516) 767-9335



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LETTER FROM THE EDITOR

In This Magazine — And In The World

The Holocaust Museum in Washington may be the ultimate theme park of our generation, taking us where theme parks were perhaps meant to go — using sound and light together with more mundane and nonelectronic furnishings — to capture a mood of the time. It's not trivial or trivialized, but creates a heightened mood. Other museums are doing this too and have been for awhile. I'm thinking especially of the low tech Hyde Park home of Franklin D. Roosevelt, where the taped tour was recorded by Eleanor Roosevelt and gives the visitor not only a knowledgeable tour of the place, but of the personal feelings of Eleanor towards her mother-in-law, towards the furnishings — aspects that could be caught only on sound since the feelings are there not in words but in the nonverbal clues that we give even in speech.

The Holocaust Museum uses sound and light sparingly, using it to fit a purpose, which is as it should be. Sound & Communications was at the opening of the Holocaust Museum, and our report is in this issue.

In this issue also is our report on the new sound system for Tavern on the Green in New York. Tavern has recently embarked on what seems a successful foray into cabaret, and that has added to its universal appeal as the bejeweled restaurant within Central Park. Warner LeRoy, a master of flamboyance, has been at the helm of the restaurant during its resurgence.

Those of you familiar with the Consumer Electronics Shows will also be familiar with the Tavern on the Green as the site of the semi-annual pre-CES party for the press and manufacturers, held by the EIA before each CES. Since June is the month of the summer

CES, our covering of Tavern seemed especially suitable.

One of the things we're bound to see is a slew of televisions including caption decoding for the hearing disabled. Federal law requires all sets above 13 inches to include the decoder by July 1993. Of course, those of us in the commercial field have been dealing



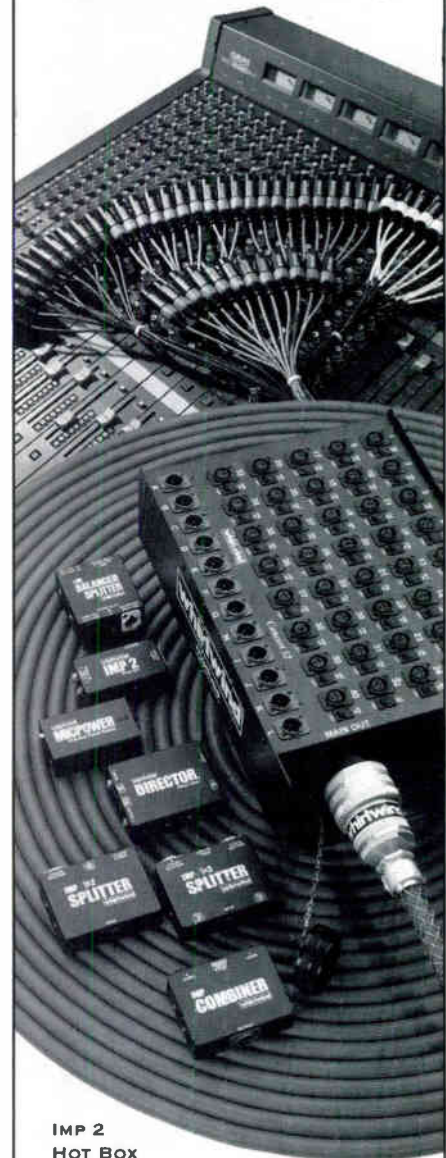
with these concerns for awhile. In this issue of Sound & Communications, Mark Miller investigates the products that are available, and talks to some of their purveyors to find out just where the state of the Hearing Assistance field is. (I know, we received letters asking us to say listening assistance instead of hearing assistance. But we received just as many letters going the other way. Should we take a survey?)

Speaking of surveys, next month we present our annual survey of Contractors. Survey questionnaires have been sent to several thousand contractors, and if you've received one and haven't sent it back yet — please fax it immediately. We try to keep a sampling that will make the survey valid.

Best regards,

Judith Morrison

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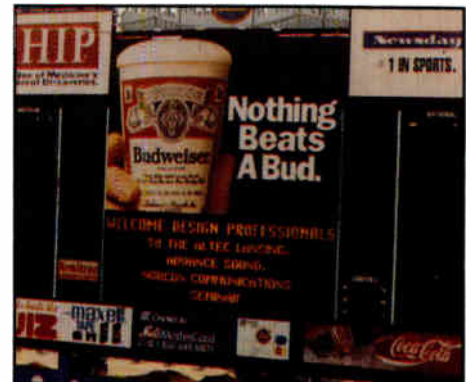
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By Mark Miller

An overview of the progress made by manufacturers, end users and the like in the hearing assistance field from one who knows. Can consumer groups put enough pressure on facilities so that ADA requirements are met?

26 AUDIO FOR AN ELEGY

By William Freedman

The opening of the \$160 million United States Holocaust Memorial Museum on April 22 was a solemn occasion marked by the presence of many luminaries. And by the presence of RCI who provided the complex audio/video systems for the historic event.

34 TAVERN ON THE GREEN'S OLD CHESTNUT

By Randy Scott Freed

Opened in 1934 this landmark New York restaurant in Central Park has turned its Chestnut Room into a serious musical showcase for Jazz. But the room's new system had to be installed overnight, on budget and on time.

50 SHAKESPEARE IN OREGON

By Jenay Cottrell

The 58-year-old Oregon Shakespeare Festival needed to upgrade its Elizabethan Theatre so that the audience could hear the performance. The solution was a \$7.6 million Allen Pavilion.

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Array Series. Designed To Impress Everyone Who Has Heard It All Before.



The competition to produce the "ultimate" sound reinforcement system is fierce. Each new system design brings claims of having *achieved perfection* or touts *this is the one*. Yet, in time, you can expect the very same manufacturers to introduce new models claiming to have further *perfected perfection* or that their *unorthodox* technology has rewritten the laws of physics. Sound familiar? So how do you impress everyone who has heard it all before? Simple.

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Pictured above, Array Series installation at the Grand Palace, Branson, Missouri.

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NEWSLETTER

VIDEONICS MIXER

Videonics has introduced its Digital Video Mixer, capable – according to the company – of generating over 200 broadcast-quality special effects, with dual-field time base corrector and switching capabilities from four separate video sources. The retail price is “under” \$1,200.

CEDIA EXPO DATES

CEDIA, the Custom Design and Installation Association, has announced the dates of its Fall Management Conference and Trade Expo, which will be held in Dallas on September 8 through 11. The exhibits and workshops will be located at the Infomart and the Fairmont Hotel will be the official headquarters lodging. According to Rob Gerhardt, chairman of the Expo Committee and vice president of the organization, last year’s event, which attracted 1500 attendees and 87 exhibitors, was “so successful” that the committee did not find it necessary to consider alternative sites. For the first time, all classes and exhibits will be in the same building. The exhibit floor has a total of 87,000 square feet of space, and a 10,000 square foot corner has been reserved for video demonstrations not requiring sound booths.

MARTIN AUDIO UPDATE

Word from England says that Colin James was charged with murder of David Martin of Martin Audio who had disappeared. James reportedly had been an acquaintance of David Martin. The announcement was made by David Bissett-Powell, managing director of Martin Audio.

SC-10 SETS OCTOBER DEADLINE

The Sound System Control subcommittee (SC-10) of the Audio Engineering Society Standards Committee has announced that it is publishing a draft document for public comment in October, describing its application protocol for sound systems. The draft document will specify an object-based protocol for audio equipment to be controlled and monitored remotely over a local area network. SC-10 has planned two three-day meetings to work out the remaining details before release of the draft. The first of these working sessions was held June 3 through 5. The second is scheduled for August 5 through 7. SC-10 was formed in the fall of 1992 with the mission of establishing local area networking standards for the professional audio industry. SC-10 is an international collaborative effort with members representing users and designers of professional sound systems and the major vendors of computer controlled audio equipment. SC-10 standards will allow manufacturers to produce equipment which will be interoperable with equipment from other manufacturers.

According to Bob Moses, chairman of the AESSC SC-10-3 Working Group on Information, the subcommittee hopes all audio equipment manufacturers will eventually adopt the standards resulting from the committee’s work. “Many of the manufacturers are currently developing products intended to comply with the expected standard. However, none of those manufacturers may now claim their products meet the SC-10 standard, because the standard isn’t finished. We hope publication of the draft document in October will rectify this problem.”

ITS PLANNED

The sixth annual International Teleproduction Society Forum and Exhibition has been set for July 8 through 12 at the Beverly Hilton Hotel in Los Angeles. The ITS International Monitor Awards, devoted to “promoting teleproduction as a medium of communication.” is scheduled for Saturday, July 10 at the Beverly Hilton.

HOME THEATER INDUSTRY ASSOCIATION FORMED

The first meeting of the Home Theater Industry Association was held in April, with the next meeting scheduled during the summer Consumer Electronics Show in early June. Over three dozen participants at the first meeting endorsed the organization’s goal of promoting Home Theater to the widest possible audience through shows and education programs to both retailers and consumers. Ken Furst, formerly of Denon, was named Acting Executive Director of the new organization.

NEWSLETTER

EIA CALLS FOR HDTV OLYMPICS

Gary Shapiro, group vice president of the Electronic Industries Association's Consumer Electronic Group, called on broadcasters to join the EIA in urging the Federal Communications Commission to set the 1996 Summer Olympics as the latest date for the first commercial broadcast transmission of high definition television to American consumers. Shapiro said, "It is time for the electronics and broadcasting industries to stand up and demand a launch date for HDTV."

NRSC FORMS DAB SUBCOMMITTEE

The National Radio Systems Subcommittee has voted to begin voluntary standard-setting for in-band, on-channel digital audio broadcasting systems. The NRSC will evaluate IBOC DAB systems in coordination with the Electronic Industries Association's DAR Subcommittee. The DAB Subcommittee is co-chaired by Al Resnick, Capital Cities/ABC and Randall Brunts, Delco Electronics.

AMPRO COMPLETES ACQUISITION

AmPro Corporation, the manufacturer of large screen display systems, has completed its acquisition of Greyhawk Systems, Inc., the California-based manufacturer of light valve projectors. AmPro's new Greyhawk Systems division manufactures a new line of light valve projectors for video, computer data and graphics images. Light valves and optical systems for the new products will be assembled in Greyhawk Systems's Mountain View, California facilities under the direction of Dr. David Stepner, who was named executive vice president of AmPro Corporation. The electronics will be manufactured in AmPro's Titusville, Florida plant.

KINERGETICS HOLDINGS APPOINTMENTS

Kinergetics Holdings (U.K.) Limited, the parent company of Celestion Industries and KEF America, has announced the appointment of Robert Heiblim as president of U.S. operations, responsible for both KEF America and Celestion Industries. Heiblim was previously president of Denon USA. Ray Lepper continues to head up the KEF operations, and Peter Wellikoff continues to head up Celestion. In addition, the company has reorganized KEF Audio (UK) Limited, with the appointment of Colin Cartwright as managing director, following the addition of Mark Dodd as product development manager and Stephen Halsall as marketing manager. Gordon Provan, managing director of Kinergetics Holdings, said, "We have now built a formidable team of experienced managers and engineers." Cartwright was formerly managing director of Bose UK. Dodd was with Tannoy, Halsall has been involved with projects at Mission/Wharfedale. Laurie Fincham, previously research director at KEF, left the company for Infinity.

TGI PRESIDENT, CALMA PROMOTED

TGI North America, which is the distributor of Bruel & Kjaer and all Tannoy products for North America, has announced the appointment of Bob Prideau as president of TGI, assuming all responsibilities of former managing director Wib Heuckroth who now serves as chairman of the board. Bill Calma, former sales and marketing director for the professional audio division, is now vice president of sales and marketing for all product lines - both consumer and professional. Prideau, who co-founded Crest Audio in 1978 created Pro Tech Marketing in 1982.

HHB SETS UP NORTH AMERICAN OPERATION

HHB Communications is strengthening its distribution throughout North America, with the appointment of Independent Audio of Portland, Maine, as the company's stateside business coordinator. According to HHB, the move reflects the growing demand in the USA and Canada for products such as the HHB DAT tape line, the professional portable DAT recorder, the CDR Indexer which transfers DAT track IDs automatically to CD-R recordings. Independent Audio is also now the US source for the ATC monitor line and the CEDAR DC-1 de-clicker. Fraser Jones is the proprietor of Independent Audio, located in Portland, Maine.

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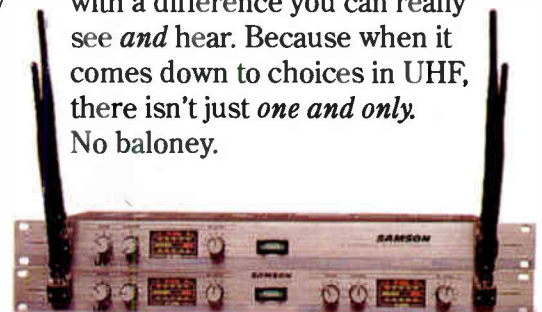
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World Radio History

The Mighty Wurlitzer

Dear Answerman,

I hope that you or one of your colleagues or network of contacts can help me source something.

Years ago a company called Seeburg made a banquet-mounted Jukebox controller called the Seeburg Select-O-Matic. There was one mounted in each booth in the cafe or soda fountain, and you put your money in and made your selection right from the booth.

I'm trying to find the very same device for a Theme restaurant at the Shangri-La Hotel in Taipei, for which we are just finalizing the specifications. We will be using a '50s-style Wurlitzer Jukebox, equipped with a CD changer, and we would like to find a compatible '50s-style booth remote controller. We need about 24 of the controllers.

Ward M. Sellars
Senior Associate Manager
Shen Milsom & Wilke
Hong Kong office
Hong Kong

Dear Ward,

The range of CD changer products for commercial sound installations is growing rapidly. The poor tolerances of phonograph records, their extreme vulnerability to excessive wear in changer mechanisms, as well as acoustic feedback problems relegated jukeboxes to a "low-fi" music reproduction medium. Although cassette changers have appeared from time to time, none have been reliable. DCC, the new digital cassette medium, does not look promising. The early DCC tape machines have terribly long access times, limited head life, and tape head alignment problems. Don't expect DCC to stick, at least in the commercial sound business. But CDs are dimensionally consistent, are not too sensitive to changer mechanism handling, do not wear out with constant playing, and have good immunity to acoustic feed-

back – just what you would want for a jukebox.

In the March '92 Sound & Communications Mike Klasco surveyed CD

THE RANGE OF CD CHANGER PRODUCTS FOR COMMERCIAL SOUND INSTALLATIONS IS GROWING RAPIDLY.

changers and CD jukeboxes. Quite a few inexpensive and innovative consumer/commercial changers have been introduced just in the last few months. For example, Fisher introduced a 24 CD unit for only \$500 retail (which competes with Pioneer's 18

ANSWERMAN

CD magazine products, except that Pioneer has coin operation versions), and Sony has a 100 CD capacity product for \$1,200. You might want to check out both Pioneer's new 300 CD jukebox and Denon's 200 CD jukebox, although these have a central control unit and do not offer wallmount remotes, let alone '50s styling.

But you are specifically looking for a jukebox multi-wallbox remote system that "polls" the customer's requests and prepares a "queue" play list from customer requests. The consumer CD players normally consist of the main unit and a handheld remote control – using multiple remotes would result in mayhem! Even most commercial machines assume that there will be a DJ or entertainment

coordinator to control the play list. Dancraft Enterprises (310-643-8782) offers their IR Jukebox, a single remote for multiple infrared control of lighting, audio, video, but this won't help your situation. Gefen Systems (818-884-6294) has developed a very flexible control systems for the 100 CD jukebox, called Touch-The-Music, a touch screen controller, but this still isn't what you are looking for. So what to do? The first place to start looking

THE FIRST PLACE TO START LOOKING WOULD BE THE ORIGINAL PHONO JUKEBOX MANUFACTURERS: SEEBURG, ROWE AND WURLITZER.

would be the original phono jukebox manufacturers: Seeburg, Rowe and Wurlitzer.

Seeburg (312-247-8484) offers its "Classic," a reproduction of the original Wurlitzer 1015 jukebox, that plays CDs. But they have not developed a "Select-O-Matic" CD wallbox remote system yet.

What about the original Wurlitzer

SEEBURG OFFERS ITS "CLASSIC," A REPRODUCTION OF THE ORIGINAL WURLITZER 1015 JUKEBOX.

company – the guys that made organs and jukeboxes? Wurlitzer is still around, although the jukebox side is now a separate company – The Wurlitzer Jukebox Company (201-807-2616). Wurlitzer also offers a resurrec-



The Rowe/AMI Walette jukebox.

tion of the jukebox they first introduced in 1947, except now it plays CDs. Only an infrared remote control is available, which controls the volume

WURLITZER
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level. Wallmount remote control is in the works, but at least six months away.

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Circle 251 Reader Response Card World Radio History




The One More Time jukebox from Wurlitzer.

as Rowe has just introduced their Nostalgia series, including a '50s bubble Wurlitzer-style jukebox and "diner-style" walette booth remotes. The product is very new, but since you can use multiple remotes (over 24 units)

**DO NOT FORGET
THAT THE MAIN
JUKEBOX MUST BE
COMPATIBLE WITH THE
BOOTH REMOTES.**

with the master jukebox, this looks like an ideal solution for your project. Rowe's international office is in London (4481-979-3300) and they can put you in touch with their distributor in Taiwan.

One last point: You mention that you are going to use a "50s style Wurlitzer Jukebox" with a CD changer. Do not forget that the main jukebox must be compatible with the booth remotes. Even though Wurlitzer and Seeburg both manufacture the main jukebox to fit your aesthetic requirements, only the Rowe offers the compatibility with its own remote units. ■



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THE AMERICANS WITH DISABILITIES ACT, PART 2

By Jeff Ader

I must start by apologizing for a mistake in part one. I cited section 1102.6 as the source for the federal guidelines on the minimum number of assistive listening devices to be made available in assembly spaces at 9 percent.

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FIGURE AD-1

Paragraph (19)(b) provides greater guidance that UFAS regarding the requirements for assistive listening devices or receivers. UFAS section 4.1.2(18)(b) requires that a reasonable number of people with hearing impairments be assisted. Paragraph (19)(b) requires assistive listening devices or receivers equal to 4 percent of the total number of seats, but in no case less than two, which would provide measurable guidance. This provision is important due to a misunderstanding of the need for assistive listening devices to enable those with hearing impairments to use assistive listening systems. Assistive listening systems, in contrast to audio amplification systems, are designed to transmit sound as directly as possible to a receiver/transducer used in the ear of the listener. A common misunderstanding is that all individuals with hearing impairments use a T-switch on a hearing aid to interact with a transmitter. Thus, it is often believed that a transmitter alone is sufficient. This is obviously untrue for those individuals with hearing impairments who do not or cannot use hearing aids. Less obvious is the fact that hearing aids are not required to be sold with a T-switch. Furthermore, not all assistive listening systems are compatible with hearing aids. Therefore, a requirement for a specific number of assistive listening devices or receivers is essential for those who need such devices.

The Bureau of the Census has reported that there are 7,213,000 individuals who have difficulty hearing what is said in a normal conversation with another person. Bureau of Census, *Disability Functional Limitation and Insurance Coverage: 1984-85*. This number does not include those who cannot hear at all. At the time the study was conducted, this number represented slightly more than 4 percent of the total population aged 15 and older. This is a conservative number. There are other studies which indicate that a greater percentage of individuals have a hearing impairment such as the National Center for Health Statistics which found a 7.9 per cent rate. *National Health Interview Survey, 1979-80*. New York State census estimates the population of persons with hearing impairments at 9 per cent of the population. Section 1102.6(c) of the New York State Uniform Fire Prevention and Building Code requires the minimum number of assistive listening devices or receivers to be provided to be equal to 9 per cent of the total number of seats for buildings with seating up to 1,000 seats.

Federal Register Vol. 56, No. 14, pp. 2306.

This is correct for *New York State*. The *Federal* guidelines say, according to UFAS section 4.1.3 paragraph (19)(b), "which requires assistive listening devices or receivers equal to 4 percent (four percent) of the total number of seats but in no case less than two (2)." (See *Federal Register Vol. 56, No. 14, pp 2306.*)

I'll be the first person to admit that it can get confusing. But it is worth the time and effort for sound contractors because of the number of systems that must be installed permanently or systems that are portable and can be moved from

space to space, that must be provided.

The notice prototype that I cited also comes from *New York State*. The notice required by the *Federal* government is the International Symbol of Access for Hearing Loss. (See *Federal Register Vol. 56 No. 144, pp 35660, 4.30 Signage.*)

We had previously discussed public accommodations regulations. You must also be aware that employers are going to be responsible for accommodating their employees.

Discrimination in employment includes: "not making reasonable accommodations to the known limitations of a qualified person with a disability, unless the employer can demonstrate that the accommodation would impose an un-

Jeff Ader is head of the Infrared department at Sound Associates in New York City.

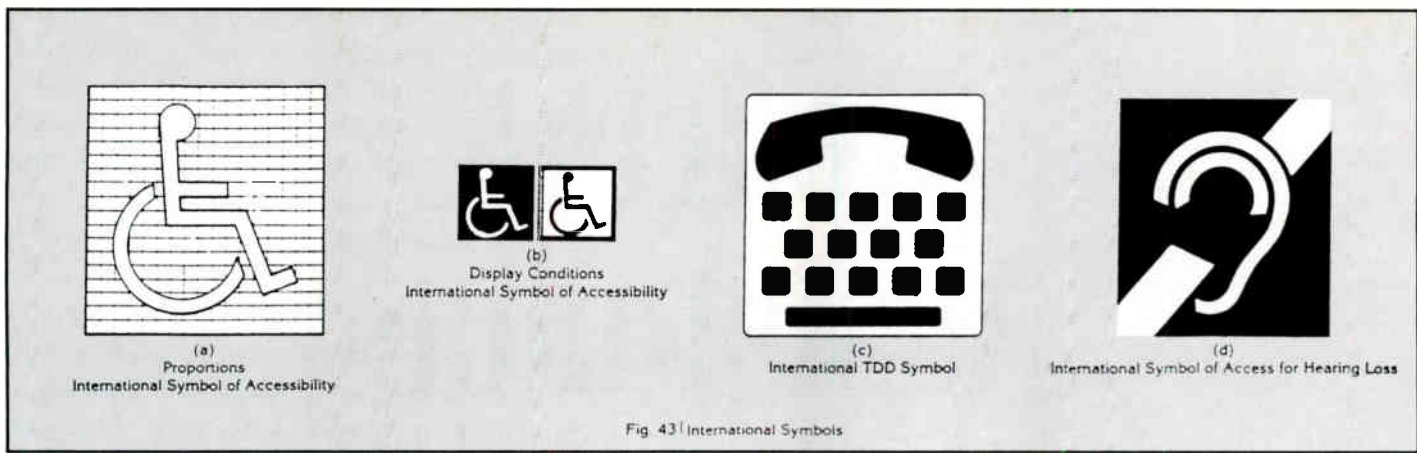


Fig. 43 International Symbols

Federal Register Vol. 56 No. 144, PP. 35660, 4.30 Signage.

due hardship." Undue hardship entails significant difficulty or expense, which depends on the overall size of the business, nature and cost of the accommodation number and type of facilities and budget size.

Reasonable accommodations include: "making existing facilities accessible and acquisition or modification of equipment or devices including buying amplifiers, assistive devices or hearing aids."

Effective: July, 1992 for employers with 25 or more employees. July, 1994 for employers with 15 or more employees.

To make things a little easier for em-

ployers, the ADA offers a 50 percent tax credit for small businesses. (Annual gross under \$1 million or fewer than 30 full time employees.) Expenditures cannot exceed \$10,500 in order to qualify for the tax credit.

Regulation and enforcement are divided among four separate agencies. Title 1, which deals with employment, is enforced by the E.E.O.C. (Equal Employment Opportunity Commission). Title II, which deals with public services, comes under the jurisdiction of the Department of Justice. Title III, which covers public accommodations, is handled by the Department of Transportation and Title

IV, telecommunication services, is overseen by the Federal Communications Commission or F.C.C.

According to Title III part 308 (b) (1) (A) (i), in general, "The Attorney General shall investigate alleged violations of this title and shall undertake periodic reviews of compliance of covered entities under this title."

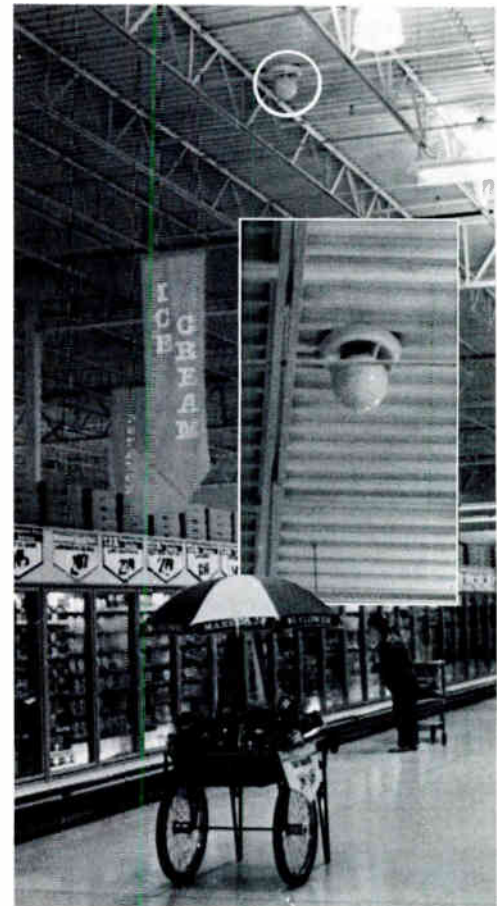
Penalties for non-compliance can go as high as \$50,000 for the first violation and \$100,000 for subsequent violations. There is also the possibility that monetary and punitive damages may be awarded the victims of discrimination. ■

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While Soundsphere Loudspeakers have been utilized in Cub Foods stores in Eden Prairie, Cottage Grove, Bloomington and Plymouth, Minnesota, the most recent installation has been at the newest 120,000 sq. ft. store in Apple Valley. Twenty-five Soundsphere #110A speakers with transformers tapped at 75 watts were installed to gain quality music and voice page.

Craig Streich, the Store Manager, takes advantage of the music quality and added efficiency of clear voice page when reassigning workers to various tasks in the expansive store.

Scott Miller, Manager of Pro Sound at Muzak of Minneapolis, notes that the Cub Foods executives selected parchment-colored #110 Soundspheres to meld with the ceiling color and felt that the shape and color were highly compatible with the contemporary interior design esthetic.



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Hearing Assistance

The State of the Market

BY MARK MILLER

When I was little, my sister and I had this monstrous volume control system connected to our television set. It allowed us to sit seven feet away from the set and set our own volume level. It trapped us in a video world.

Today's hearing assistance market is working on freeing the hearing impaired masses from their seven foot cables and bringing some heavy income to the facilities that bother to follow the ADA.

Many facilities are partially ignoring the ADA requirement that four percent of a facility's seating capacity must have hearing assistance capabilities.

"The main factor is time," says Paul Ingebrigtsen, VP of Marketing for Williams Sound. "The other factor is consumer groups that pressure facilities into compliance. Unfortunately, a lot of that happens through lawsuits."

Lawsuits are not commonplace yet but it could start happening soon. The main problem here is educating the public.

"Consumer groups are doing a good job pressuring facilities," says Kathy Anderson, FM Coordinator for Phonic Ear. "When our system is put into a theater, we try to make it well known that hearing assistance devices are available to an audience. We mail information to local schools, we provide a slide for before the film, we provide signs to hang in the lobby."

The problem is getting facilities to

Mark Miller is the Research Assistant for Sound & Communications and the Editorial Assistant for The Music & Sound Retailer.



The StarSound infrared system from Phonic Ear.

put in the systems. Jim Pehringer, Sales Manager for Hearing Assistance at Telex, sees the manufacturer as carrying the responsibility of informing the public about hearing assistance. Michael Koss, President/CEO of Koss, sees it as a facility's responsibility.

"How do you advertise a product that isn't necessarily at a facility?" asks Koss. Some facilities are not going to put in the product or enough of the product until it is forced either by the

The main problem here is educating the public.

government or by a consumer group. Some hearing impaired groups are taking action and asking members to report any facilities that do not have the proper systems.

"The issue of the ADA is access," says Gary Stanfill, President of Vega,

access to the performance space and being able to access the information of the performance no matter what your disability. Making the facility accessible to the disabled allows for a huge untapped market. "Those who would not or could not go places before are now going places," says Pehringer. He cites a government study that says 20-26 million Americans are hearing impaired. The ADA is supposed to affect 40 million Americans. Over half the people it affects are in the hearing impaired market.

According to Anderson, hearing assistance is one of the cheapest and easiest ways to comply with the ADA, much easier than widening doors and building ramps. It seems that hearing assistance is the obvious first step for a facility to take in order to comply with the ADA.

The strong-arm marketing tactic of saying "It's the Law" can create problems, while pushing hearing assis-

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Koss' infrared stereo headphones and transmitter.

tance as a cash cow seems to be the tactic of choice.

Still, the number of facilities not in compliance is fairly big. That number is big because people are not forcing the issue.

"I was demonstrating a product the other day at a community college," says Dee Herfel, Sales Manager for Assistive Listening Systems at Gentner. "Some students wanted to know how they could get this kind of sound anywhere they went. They didn't know it was the law; that places are required to give them this possibility."

Some facilities, though, began to look into and purchase hearing assistance systems before the ADA even existed. AMC Theaters has had Phonic Ear's FM Easy Listener for several years.

"Part of the reason it was chosen was that it was compatible with most school hearing assistance systems and AMC does a lot of work in the schools," says Anderson.

Compatibility is the future of hearing assistance and, with time, all systems should be able to work together.

Most manufacturers, according to Herfel, want to form some type of alliance and make everything compatible. It would not happen for a long time, with too many systems already

in existence, too many MHz to play with, and too many types of hearing loss out there. Hearing assistance is tough to define when each person has a different type of loss. In hearing, losses have many variables that an assistance system cannot necessarily help. Different people hear different frequencies better or worse in a wide variety of situations. Some people deal with background noise well; some cannot have it at all. The ideal situation for the hearing impaired would be to have a tunable hearing aid.

At NSCA in April I stopped by Comtek's booth and discovered such an item, using my own ear mold on their product. I entered some future bubble and saw the true possibilities of hearing assistance. Having a receiver within a hearing aid would allow someone who is hearing impaired

We try to make it well known that hearing assistance devices are available

the ability to go to any show, game, event, etc. and merely switch the aid to the proper frequency and listen. No need to get there early and deal with extra lines for hearing assistance which waste time and set you apart, sometimes a traumatic experience for an adolescent with hearing impairment. There would be no bulky receiver to deal with, just a simple switch when the lights go down. Of course, Comtek's product only received certain frequencies and cost a bundle but it is a step in the right direction.

"The real future of hearing assistance," says Mike Lieske, Applications Engineer for Sennheiser, "is in size. Things will just keep getting smaller and smaller, with receivers in hearing aids."

The other step is finding a common ground between infrared and FM.



Richard Thomas with a Sennheiser Infrared listening system headset. Thomas, National Chairman of the Better Hearing Institute, was appearing at Hartford Stage in Mark Lamos' production of William Shakespeare's Hamlet.

"Some companies are combining FM and infrared receivers," says Anderson, "but this tends to be expensive."

Receivers would also sell as mass-market items to the hearing because, as Paul Ingebrigtsen says, "there are situations where the acoustics are just poor or there are distractions and a hearing person might want a receiver."

According to Pehringer, he spent a day at a trade show in New York and hit Broadway afterwards. He used their hearing assistance system for his "tired ears," and it helped immensely.

I went to a film with my friend Lee. I used the hearing assistance system. He didn't. The man behind us talked during the whole performance. I heard the film. Lee didn't.

Pehringer believes there is a market for the hearing to use hearing assistance systems but it will take much time to attract and will be built mainly on the "friends of the hearing impaired," and the "curious," according



Telex's Sound Enhancement System.

to Ingebrigtsen.

Pehringer's own view of hearing assistance is the creation of a receiver that will do language translation, visual

description for the blind as well as the actual presentation on different channels, emphasizing different frequencies for different types of losses.

For now Gentner begins experimenting with signal processing for hearing assistance systems just after it released its FM Assistive Listening System, which features 37 different frequencies to help reduce the possibility of interference and a universal stage input in the transmitter that accepts audio from mic, line, or speaker levels.

Phonic Ear, which has put together systems for over 30 years, produces both an FM system (the Easy Listener) and the StarSound infrared system. StarSound was introduced in January and is being placed in United Artists Movie Theaters in California now with plans for national placement.

Sennheiser's latest, the S101 Infrared System, covers 11,000 square feet and offers both line and mic level in-

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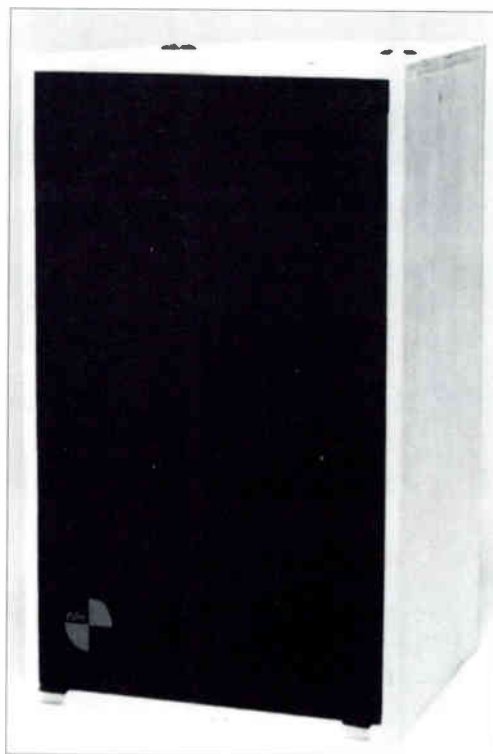
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put and output connections to facilitate routing of input signals to the house PA.

Nady's IR-310 Infrared audio system which premiered at NSCA can cover up to 5,000 square feet and features adjustable line and mic inputs.

Williams Sound put a new wireless infrared TV Listening System, the WIR 100A, on the market this year. In addition to TV listening, the system is fairly compatible with many small infrared systems in boardrooms or classroom situations. Williams prides itself on its compatibility, as the Personal PA/FM four-channel receiver lets the user select any of four pre-set auditory assistance channels on the 72-76 MHz band.

An interesting product Williams puts out is the Auditory Trainer which has two mics and two volume controls. The first mic is put at the sound source by the user, *i.e.*, the teacher, the TV, the amp. The second mic is on the body of the Trainer so the user

20-26 million Americans are hearing impaired. The ADA is supposed to affect 40 million Americans.

does not lose track of what is happening around him or her. This item also allows a user to hear his voice effectively so that he can help any speech deficiency he may have.

Telex's main system is the Sound Mate FM which features a portable belt pack transmitter that has a peak reading LED display which allows at-a-glance audio level monitoring.

Audio-Technica will be introducing a hearing assistance system in the very near future and is still under a code of silence.

With these products, and many others, sound contractors have much choosing to do. It seems that sound contractors should begin choosing, for

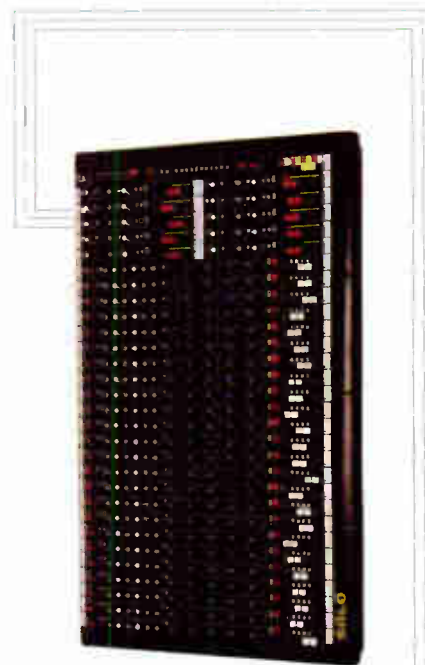
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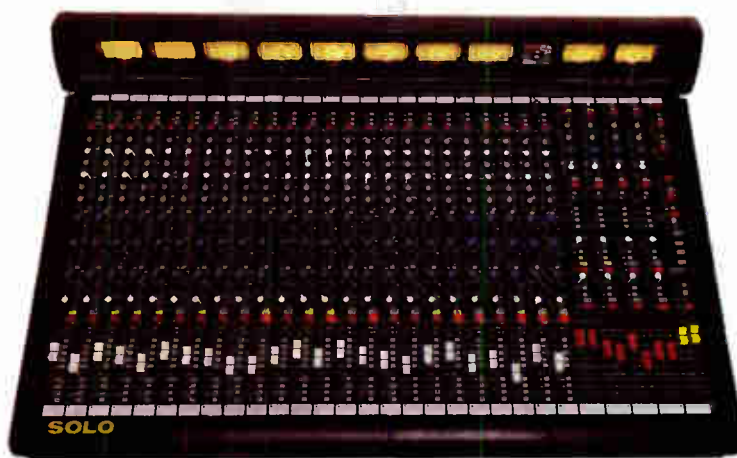
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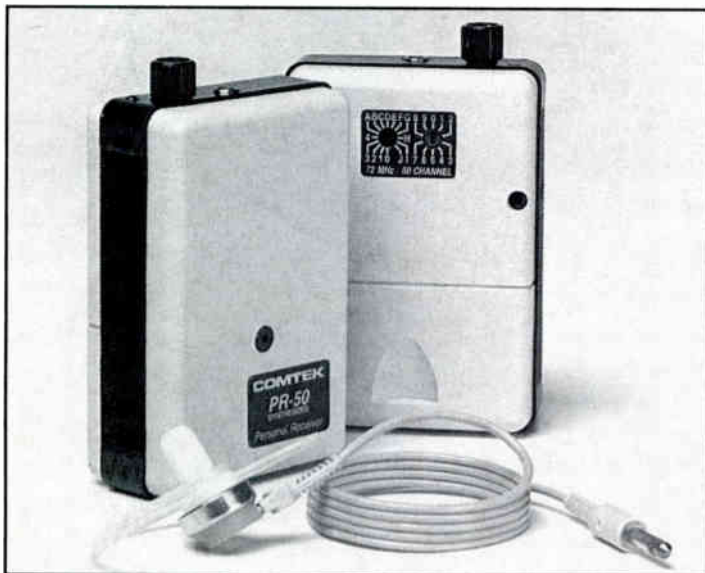
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Comtek's PR-50 personal receiver.

the people she tested at the NSCA show had some type of loss. Most of the losses were between 4,000 and 6,000 kHz, the usual starting point for a gradual loss. "I've never seen a

"The real future of hearing assistance," says Mike Lieske, Applications Engineer for Sennheiser, "is in size."

larger percentage of people in one group with a loss," said Kennedy. "Most knew they had a problem but some had no idea. Two or three actually had serious disabilities that they had just ignored."

according to Dr. June Kennedy, an audiologist who performed free hearing tests for Phonic Ear at NSCA Expo

in Orlando, they have a high percentage of loss. According to Kennedy, 90 percent of

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Williams' Personal PA system.

market is too big for anyone to financially ignore in these hard times. More importantly, a sound contractor's job is to bring the highest quality sound possible to the listener. With hearing

assistance a contractor has the possibility of bringing a whole new world to a listener.

Every manufacturer had a story – Pehringer told about providing hear-

ing assistance for the Super Bowl, one of the loudest events in the world. Herfel talked about two Salt Lake City girls who were testing his system.

"What's that sound?" one asked.

"A saxophone."

Herfel says, "Watching someone hear a sax for the first time is amaz-

90 percent of the people she tested at the NSCA show had some type of loss

ing. Moments like that make me see hearing assistance in a new way. Gentner wants to get into more educational areas and continue to grow with this industry."

And the industry, once it gets a few kinks kicked out, has just begun to grow. ■

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RCI Crew Amplifies Voices Silenced 50 Years Ago

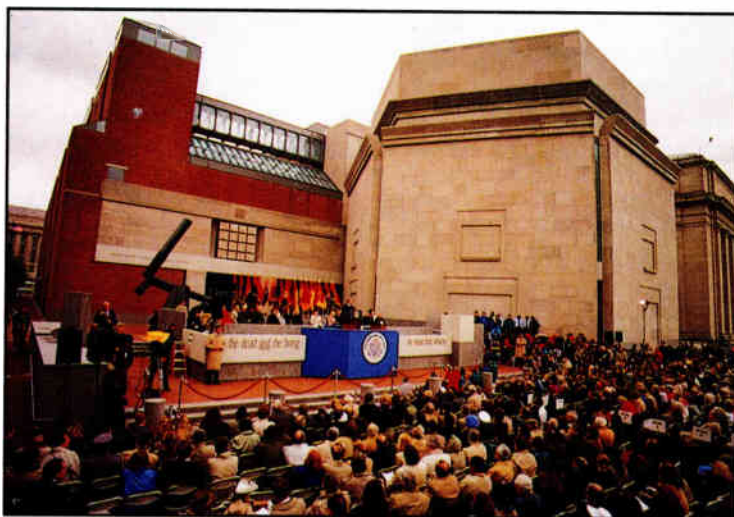
BY WILLIAM FREEDMAN

Hey, lookit that park ranger!" somebody shouted over the rain and wind. "He looks just like Jesse Jackson!"

He *was* Jesse Jackson. And no, the Reverend is not so hard up for a federal job that he'd work as an over-glorified mall cop. But that bizarre weather to which D.C.-based sound techs have become inured decided to act up that day. Jackson attended the April 22 ceremony wearing a business suit without an overcoat. Then the cold rain turned to sleet and snow, and some member of the Interior Department's Finest must have had pity on the poor guy.

The ceremony marked the opening of the United States Holocaust Memorial Museum. Jackson was there as one of a pride of VIPs who joined with a dozen heads of state to mark the occasion. The Park Police were there to keep the revisionist morons chanting "ADL, Go To Hell!" on the other side of Independence Avenue. [ADL refers to B'nai B'rith's Anti-Defamation League.]

And RCI, the Rockville, Maryland-based audio installation firm, was there to make sure that the voices of Holocaust survivors drowned out those chants. Six of the company's 50



The opening ceremony of the United States Holocaust Memorial Museum.

employees were out that day at the museum, literally in the shadow of the Washington Monument. Supported by eight temporary staffers working the load-in and tear-down, they provided sound, lighting, power and event management for the dedication.

Generating 125 kilowatts of juice, RCI powered up a sound system that served a crowd of 20,000 – 8,000 of whom were standing – that stretched all the way back to the Tidal Basin.

"You could see the crowd going back forever," said Jay Kingery, president and founder of 20-year-old RCI.

You could also hear the sound go back forever. RCI's "homebrew" SM15A monitors worked the stage; eight JBL Control 12s reinforced the

VIP section; four R490 medium-throw cabinets and two R240 long-throws brought the ceremony to the people in the back.

If you were seated anywhere behind the VIPs, you probably couldn't see too much of the podium, so RCI subcontracted Transit Image, from New England, to supply the 20-by-27-foot Sony Jumbotron screen. Taking a feed from a camera mounted on the platform that served as RCI's sound booth, the Jumbotron carried the scene to the SRO section.

The screen caused some minor problems though, both technically and tactically.

"The video sound was out of sync," said Rick Shepard, RCI's head engi-

William Freedman is a freelance writer who resides in Washington, D.C.



Testing of the system was made difficult by the inclement weather.

neer for the event, “and there was no way around that. Light is light and sound is sound.”

But the decision to go with a giant screen at all – not to mention settling on dimensions for it – was more of an issue than you might think.

“It was such a sensitive type of event that it was hard to determine what would be overly flamboyant and what would be appropriate,” Kingery said. He specified the size of the Jumbotron as a decision that required a great deal of deliberation between his people and the museum’s.

“We’re used to working festive occasions,” Kingery continued. “And this was clearly not a celebration.”

No, but it was a big one. President Clinton and Vice President Gore both spoke. (If the podium got hit by lightning, who’d run the government? Hillary was there too.) ABC News’ Ted Koppel, whose parents survived the Holocaust, was master of ceremonies. Israeli President Herzog and Nazi-hunter Elie Wiesel both offered their remarks. Edward R. Murrow’s 1945 radio account of the liberation of Buchenwald was replayed. There was an orchestra, a chorus with soloists, and an off-stage announcer who was the one of the few people involved fortunate enough to be stationed inside.

All these sources had to be miked,

and that meant using 15 of the 16 channels available to board operator Matt Snyder. Three of these (the podium mic, the announcer’s mic and a composite feed) had to come from White House Communications, who get involved whenever “the Boss” speaks. Ever since President Reagan joked in front of a live mic about bombing Russia, nobody touches the chief executive’s audio before WHC does.

“The weather caused one minor inconvenience,” Shepard said. “The feed from White House Communications’ line to us had fuzz on it. . . . Later, they took the wind screens off the mics and wrung out the water.”

Shepard described the event as “an advertisement for the Shure SM57,” WHC’s standard mic, which they prefer because of its resiliency outdoors in the elements.

RCI’s mixer fed about 100 outputs, according to Shepard, including the press pool’s TV truck, other media feeds and the live sound for the crowd.

Shepard and Snyder manned the



A Sony Jumbotron was used to display video programming relating to the Holocaust prior to the beginning of the actual dedication ceremonies, and to allow those spectators situated near the rear of the immediate area an opportunity to view the ceremony as it occurred.

booth during the event, a job which Shepard characterized as “on auto-pilot” once the speeches began.

“That’s not to minimize the skill of the technicians involved,” Snyder quickly added.

Kingery, Peg McKee and Alan Henig worked backstage, sending cues via wireless intercom and testing the on-stage sources. John Conley controlled the remote speaker stacks for the latecoming crowd. His job took him up towers that climbed up to 42 feet into the air.

The dedication ceremony started shortly after 11 a.m. and lasted into early afternoon, ending with the lighting of an eternal flame in remembrance of the Holocaust victims. RCI’s outdoor system stayed up for a candlelight vigil that evening. After the dedication, much of the crowd moved indoors for the 3 p.m. dedication of the memorial for the Holocaust’s 1.5 million murdered children. A last tile was placed in a mosaic commemorating them.

Rick Shepard and Matt Snyder manned the booth during the event.



Ted Koppel speaking at the opening ceremonies.

RCI's affiliation with the Holocaust Memorial goes back to 1989, when Kingery's company was commissioned to install sound in the museum's two performance centers: the Joseph and Rebecca Meyerhoff Theater and the Helena Rubinstein Auditorium. The job still isn't finished, but that's not because of anything RCI did or did not do, according to the museum's audio-visual consultant.

"I haven't bought out on it yet," said Jimmy Wallace of Orlando, Florida, who is winding up an 18-month contract with the Holocaust Memorial.

"The biggest hold-up has been the screen in the Meyerhoff Theater," Wallace continued. The result, accord-

ing to Wallace, could be a sagging problem six months down the line.

But aside from that, Wallace had praise for the RCI team, headed by chief engineer George Saur.

"When I first ran into those folks, they invited me up to Rockville and showed me their operation and showed me what they were doing up there," Wallace said. "It was all pretty impressive."

Most of the work at RCI, according to Kingery, is designing and building audio-visual systems for conference centers. Although the designs for the Holocaust Memorial's theaters were already established years before the company was brought on-board, RCI

suggested several recommendations to modernize the design. Saur cited touch-screen panels as one example of technology that was added to update the design.

Constructing a sound system for a five-story museum with such strong political and financial backing is a mammoth undertaking that involved a number of specialized firms. The permanent exhibit, the children's exhibit, and even the gift shop have audio-visual reinforcement. And the Wexner Learning Center lets the museum visitor sit in front of a computer and call up videos of Holocaust survivors who tell their stories in their own words, their own voices. ■

GRAND OPENING OF THE U.S. HOLOCAUST MUSEUM

BY RICHARD C. INGRAM

"History, despite it's wrenching pain, cannot be un-lived, and if faced with courage, need not be lived again" – Poet Maya Angelou.

The gray skies, sleet, and rain that poured over the Nation's Capital on April 22, 1993, provided an ominous, though appropriate, backdrop for the events about to take place. Today, thirteen years after a unanimous act of congress chartered the United States

Holocaust Memorial Council, vision became reality with dedication ceremonies marking the opening of the United States Holocaust Memorial Museum.

A host of foreign leaders and dignitaries, possibly the largest gathering of this type since the funeral of President John F. Kennedy, assembled at the entrance of the museum to remember the victims and honor the survi-

vors of one of mankind's most horrific atrocities against itself, the Holocaust.

The museum, built on Federal land with over \$160 million dollars in private funds, and just 400 yards from the Washington monument, is intended to enlighten visitors to the human suffering and world tragedy during the years between 1933 and 1945. It was during this time that over 11 million persons, including over six million

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The lighting of an eternal flame in remembrance of the Holocaust victims was the culmination of the dedication ceremony. Israeli President Chaim Herzog, Bill Clinton, and author Elie Weisel lit the flame.

Jews and an assortment of Gypsies, Germans, Poles, Russian P.O.W.s and other religious and political dissidents, were exterminated through Nazi Germany's ethnic cleansing of Europe.

Designed by James I. Freed, the museum will take those who visit on a journey through one of mankind's darkest hours by a complete sensory assault. The usual museum fare of artifacts, photographs, and documentation will be supplemented by displays designed to be touched and felt, by eyewitness testimony, and by audio visual and multimedia technology, all of which is intended to incite within the visitor the emotions experienced by those who survived, and those who fell victim to the Nazis.

Hired to provide and install the complex Audio/Video systems utilized throughout the museum was RCI Systems, Inc. of Rockville Maryland. Better known nationally for their AVD series plates, panels, and broadcast mult boxes, RCI Systems Inc. is the moniker for a corporation that has many other different and individual companies under its umbrella. These include a Systems Design Group, an A/V Systems Installation Division, a Foreground Music Service Division, an Audio/Video Service Center, and a Production and Commercial Rental Division.

With all of these capabilities under the direction of one company, it is easy

to see why RCI Systems Inc. was called upon by the Directors of the Museum to provide the Audio/Visual production for an event of this magnitude.

Expectations of heavy media coverage for the ceremonies, coupled with the fact that both the President and Vice President of the United States were scheduled to speak, helped to make the staging and production of this event slightly outside of the norm.

As anyone familiar with Presidential speaking engagements knows, WHCA (White House Communications Agency) sets up equipment that is White House owned and operated for every event that the President is a part of, and delivers their audio feed to the "house" mixer. In this instance, both the podium mic located on the main stage, and the offstage announce mic were input to the WHCA system. Both lines were then run individually to the "house" console, along with a composite feed.

Additional inputs at the "house" included those delivered by choir mics used to pick up the Alice Deal Junior High School Chorus, those set up to capture the U.S. Army Band, and the audio feed from the video programming.

The "house" console, a Yamaha M1516 selected for its durability and ease of operation, was manned from a tarp covered platform shared with the WHCA system, and situated stage

right, directly across from the press area. The mixed audio signal was processed and sent to a Yamaha DDL 3 digital delay unit for distribution to the public address systems, which covered the VIP seating and press areas, the reserved seating area, and the SRO area set up for the general public near the mall.

The VIP reserved seating area, located directly in front of the stage platform was covered by eight JBL Control 12 full range speakers mounted on Ultimate Support Stands. The Control 12 was selected because of its high quality audio and durable weather resistant enclosure, which was a necessary feature at this event. The speakers were set up in pairs, one pair at each end of the stage, and the same configuration approximately 35 feet from the front with the appropriate delay.

The larger reserved seating area to the rear of the VIP seating (actually situated across Raoul Wallenberg Place in a grassy area) was a different situation altogether. This section held approximately five times the number of people as the VIP area, and was an open area as opposed to the more contained sections near the building. This called for a system mounted on 40 foot scaffolding, and comprised of four RCI Systems R490 Super boxes and two R240s. The R490 is a four-way 90 degree cabinet, the R240 a two-way long throw high mid box. The speakers were positioned at the front corner of the reserved section, stage right, and aimed diagonally across the area.

To the rear of this area, the general public standing section was covered by a smaller tower with a single R490 atop it.

The time delayed audio signals for both rigs was delivered to the large tower via cable. The signal for the rear tower was then transmitted via a customized RF audio link, in order to avoid dragging cable across a heavily populated field.

The same program signal being de-

livered to the Public Address System was also being sent simultaneously to RCI Systems Mult Boxes, which provided over 100 isolated audio outputs to the international press corps.

Completing the audio set up were eight RCI custom SM15 monitors placed at the presidential podium, in front of the Army Band, and in front of the choir. A smaller version of the monitor was also placed in the off stage announcers area.

To the rear of the VIP seating area, erected directly in the street separating the two reserved seating areas was a Sony Jumbotron video wall, which was supplied by Sony. The Jumbotron was used for two primary purposes; to display video programming relating to the Holocaust prior to the beginning of the actual dedication ceremonies, and to allow those spectators situated near the rear of the immediate area an opportunity to view the ceremony as it occurred.

Future View, a Washington area video production company, was subcontracted by RCI Systems to perform the many video related functions during the dedication. The live video source material was gathered by a total of five video cameras located within the area of the stage platform. A video production truck, located just to the left and rear of the Jumbotron handled the complete video production of the event, and provided a satellite uplink as well as video distribution to the press.

As with the audio, 25-inch video monitors were also placed in strategic locations, including the stage, the off-stage announce area, the press stands, and the VIP seating area to enable greater ease of viewing throughout the entire event.

Other events covered by RCI in conjunction with the dedication of the museum included services held at Arlington cemetery the day before the official dedication, and the candlelight services at the Children's Wall of Remembrance inside the museum the evening after the dedication. ■

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Tavern on the Green

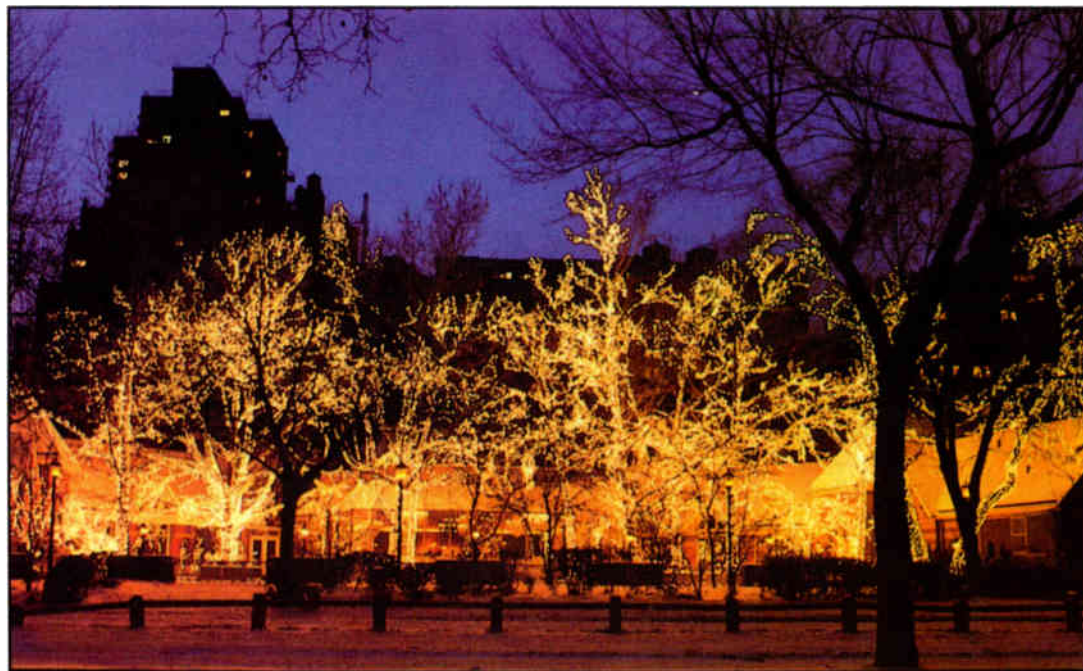
Teaching An Old Chestnut To Sing

BY RANDALL SCOTT FREED

Stroll along Central Park West at 67th Street any night of the year, and you'll find the glittering restaurant known as Tavern on the Green hard to miss – and harder to pass by. The Tavern's glass-enclosed Crystal or Terrace Rooms might be hosting a political banquet or a Broadway opening night party, while tourists "ooh" and "aah" over the lavish decor in the Elm, Rafters or Park rooms. Outside, stretch limos jockey for position with horse-drawn carriages. Between the chandeliers twinkling inside, the lights that festoon the trees in and around the garden, and the elaborate topiary installed this spring, Tavern on the Green is Central Park's most dazzling structure.

It seems incredible, but the Victorian Gothic structure at the heart of the Tavern was designed by Jacob Wrey Mould in 1870 to house 200 South Down sheep, their shepherd and his family. Central Park's Sheep Meadow lives on in name only, and the sheep have long since departed for greener pastures. Today's Tavern on the Green was born when the auto-

A former designer and operator for touring Broadway shows, Randall Scott Freed is the resident sound designer for the Bay Street Theatre Festival. His company, Sound Projects, provides consultation, design and installation of commercial and residential sound, video and communications systems.



Tavern on the Green in New York City.

cratic Robert Moses, principal architect of metropolitan New York's modern greenways and the first ruler of the Port Authority, decided that the sheepfold should become a restaurant. He installed the shepherd in the lion house at the Central Park Zoo, sent the sheep to Brooklyn's Prospect Park, and opened the first Tavern on the Green with Mayor Fiorello LaGuardia in 1934.

Raymond Loewy redesigned the Tavern in the 1950s, wrapping the Elm

Room around an old elm tree that inhabited the grounds. By 1974, however, the restaurant's rustic charm had faded, and it was closed. Fortunately for the city, the Tavern was reborn under the guidance of Warner LeRoy, who acquired the lease and undertook a \$20 million renovation. LeRoy brought the Tavern to its current rococo brilliance, revealing the original hand-hewn rafters and vaulted ceilings and highlighting them with Tiffany chandeliers, brass, stained glass,

etched mirrors, original paintings and antique prints.

AN OLD CHESTNUT BECOMES A NEW JAZZ CLUB

LeRoy's first version of the Tavern was a huge success. But his relentless desire for excellence led him to renovate again in 1988, creating the Park Room and adding a new front garden. More recently, the Chestnut Room, so named for its wall and ceiling panels of exceedingly rare wormy chestnut, began a new life as a serious musical showcase.

As the Chestnut Room became more successful and began to book bigger names and bigger bands, upgrading the sound and lighting systems became a necessity. The existing system was adequate for trios, solo pianists and soft vocals, but could not be expected to reproduce full range musical instruments at high sound pressure levels. In my first meeting with Warner LeRoy and his design director, Zina Zimmerman, LeRoy said simply "I want the best." The Chestnut Room's piano is one example of what Mr. LeRoy means by "the best." This gorgeous Hamburg Steinway Model D was purchased from Carnegie Hall, where it had been one of the favorite performance instruments (the underside of the lid is autographed by many of the most famous pianists ever to grace the Carnegie stage).

The original sound system consisted of four 2-way speakers powered by an integrated mixer/amplifier. Their first location near the upstage wall was visually unobtrusive, but the low ceiling above the stage (under 10 feet) made the system extremely prone to feedback. The speakers were then relocated to form a gentle arc above the downstage lip. This is not an unusual practice, and can effectively create the sonic illusion of a point source. Unfortunately, the center of this particular arc was in front of the speakers, not behind them. This configuration aimed every one of the speakers at the



With the electronics racks' locking top in place, its chestnut exterior blends into the Chestnut Room's decor.

same table.

The effect of this placement was mitigated by a large rough-hewn wooden truss bisecting the room, which made it impossible for anyone past the third row to see the system or hear any direct output from it. When we pulled the old boxes down, we were stunned to find that they had been mounted horns up. The rafters converged on either side of the speakers, effectively blocking the horns on either side. Thus, while the audience in the front of the room could see the speakers, they weren't getting much more direct sound than those in the back. The reinforcement for the room was almost entirely provided by the background music system, which had an auxiliary feed from the stage mixer.

A CHALLENGING DESIGN

The problems presented by this space were not easily solved. The Chestnut Room is asymmetrical and unusually divided, with a low ceiling obstructed by rustic exposed beams and magnificent chandeliers. This made it difficult to fill the room and

provide adequate gain before feedback while balancing visual aesthetics and acoustics. As usual, budget and time constraints for the installation had to be taken into account.

The simplest and fastest solution was also the best for fidelity and intelligibility – a central cluster for the main portion of the room (the rear), with fill speakers on the stage side of the large wooden truss. Since the main cluster would be 20 feet in front of the stage, time alignment with a delay line would be necessary. A potentially greater problem was that the optimum placement for this cluster was partially blocked by a large Tiffany chandelier. I met again with Mr. LeRoy and explained the dilemma, whereupon he surprised me by agreeing to move the chandelier as much as possible.

In the end, this amounted to a diagonal travel of about one foot. Space was still extremely tight, so I began evaluating small speaker systems. Nothing I found was able to generate enough SPL for a Louis Prima-esque ensemble on a rowdy New Year's Eve, until I read about some new systems by Eastern Acoustic Works being used at EuroDisney. Gina Valenze of Sam Ash Music in New York obtained a preliminary data sheet on the JF200i's. They seemed to have the bandwidth and SPL capabilities needed for the Chestnut Room. I had already auditioned a similar EAW stage monitor system and been quite impressed. The next day, Gina had a JF200i from the factory for me to show to Mr. LeRoy and Ms. Zimmerman.

The JF200i differs from the typical two-way system with a 12" woofer in that its 2" compression driver is coupled to the air with EAW's proprietary WGP conical wave guide. EAW claims that this method for delivering high frequencies provides wide and even dispersion, while eliminating the throat distortion associated with conventional horns. Anyone who has heard these "non-horns," originally developed for the Metropolitan Opera,

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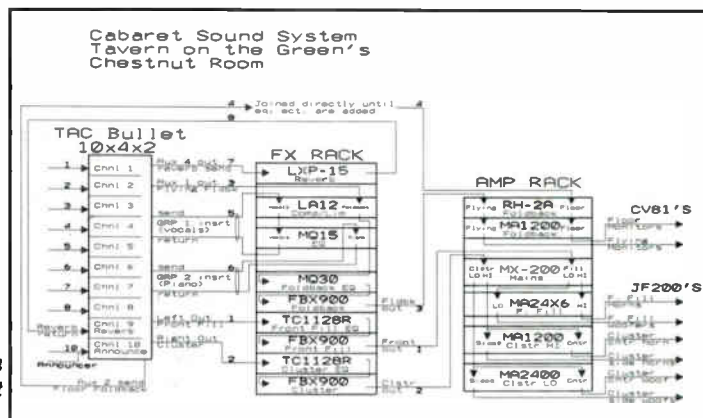
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Block diagram of the cabaret sound system.

can attest to their extremely hi-fi sound quality.

I was concerned about pattern control, since I planned a central cluster of three JF200i's and the WGP has a conical dispersion angle of 100 degrees. The side by side mounting of the units would narrow the array's vertical dispersion and help to keep too much sound from shooting up into the vaulted ceiling. In addition, the sound field in the Chestnut Room would be more diffuse than in the typical jazz club due to the plush furniture, multi-angled walls, chandeliers, statuary, pillars and beams. The wider dispersion of the WGP might actually be an asset in this situation. Frank Loyko and Sandy Macdonald at the factory pointed out that EAW also makes a similar system, the JF260, that has a 60-degree constant directivity horn. I was reluctant to abandon the unique qualities of the WGP, however. With a backup option available in case of excessive lobing at the overlap points, I decided to experiment with a central cluster of JF200i's.

Front fill near the stage presented a different kind of challenge. The Chestnut Room's stage is nearly 30 feet wide, but the throw from the low ceiling over the front of the stage to the nearest patrons is only six feet – hardly enough to allow sound to spread sufficiently. To further complicate matters, these patrons can practically lean their elbows on the stage.

Delivering adequate levels to their seats without simultaneously projecting it right into the stage microphones was a difficult trick.

I prefer centralized sound sources whenever possible to aid in localization and reduce unpredictable comb filtering caused by multiple sound arrivals. In this case, however, the best option was to hang JF200i's on either side of the stage, toed in slightly. This compromise increased the level at stage right and left, while also raising the potential gain before feedback. For maximum height, these front speakers are hung sideways – their conical dispersion allows this without any loss of fidelity. They are fed from a short delay so that the nearest audience members will perceive the sound as originating on stage and to attenuate any comb filtering. Since Mr. LeRoy objected to the idea of floor wedges cluttering the stage, we mounted two of the original Renkus-Heinz two-way systems to the ceiling facing the stage as "flying foldback."

ELECTRONICS — BALANCING CONTROL AND SIMPLICITY

My proposal to the Tavern on the Green included a recommendation that they hire a full time sound and lighting system operator. As I write this, a highly qualified person has been added to the staff. But when the electronics spec was being written, I could not assume the presence of a



Tavern on the Green's blend of charm and elegance is the result of a \$20 million renovation by restaurateur Warner LeRoy.

trained and experienced operator. I wanted a system that was "idiot-proof," yet would still provide professionals with the proper tools to maximize its potential.

I chose an Amek/TAC Bullet Custom mixing console because it is the only rack-mountable four bus board I know of with ten inputs. The Bullet's abundance of balanced outputs, highly regarded EQ section and extremely quiet performance were also plus factors. The console's left and right main outputs feed the central cluster and front fill systems. A T. C. Electronics 1280 stereo delay and 1128R 28-band equalizers are used for room alignment and EQ. The monitors are EQ'd with a Rane MQ-30 graphic. The 1128s were chosen as much for the security lock on the 99 presets as for their outstanding specs. The lockout feature prevents anyone from tampering with the "standard" room EQ unless they have a good reason to do so. In addition, the standard curves can easily be restored. I used UREI LA-12 limiting on the monitor system send and on the group 1 insert for a similar feature – an "auto" setting that allows an operator to have things sounding great right away, then tweak the limiter parameters when the rest of the system is up

and running. A Lexicon LXP-15 is included in the processor rack for reverb and delay effects. Finally, I included three Sabine FBX900 digital feedback exterminators, one each for the front fill, cluster and foldback feeds.

The central cluster and front fill systems are biamplified, with one channel of EAW's MX200i Closely Coupled Electronic Processor providing crossover, phase alignment and amplifier clipping protection for each feed. The two front fill JF200i's are driven by a Crown Macro-Tech 24x6, while the central cluster is powered by a Macro-Tech 2400 for the woofers and a 1200 for the tweeters. A second 1200 powers the stage monitors. OnePower and ETA sequence/protect controllers are provided to eliminate snaps and thumps at power-on.

INSTALLATION WORKAROUNDS

The contract for the installation was signed on December 31, 1992. Work was to commence on January 4, 1993 and the system had to be up and running for an afternoon sound check on January 19. The restaurant serves from noon until midnight, so preliminary wiring, etc. could only take place during the wee hours. Nightly perfor-



The Chestnut Room's main cluster of three EAW JF200i's just fit the space left by moving a large Tiffany chandelier.

mances were scheduled for the Chestnut Room, so the changeover for both lighting and sound systems had to be fully accomplished in one 36 hour period. All tradesmen were aware of the consequences if an old system was disabled or removed and the new replacement failed to function. Spare parts and proper tools and hardware were of utmost importance since no businesses would be open to provide emergency assistance.

Our first challenge was to fit the central cluster into the space created by moving the Tiffany chandelier. To keep the cluster as small as possible, we bolted the cabinets directly to each other. All five sides of the JF200i enclosure have internal L-brackets to which threaded nuts are welded. EAW's manufacturing tolerances are so tight that we were able to remove the component drivers and bolt right through the sides of the cabinets without stripping the threads of the welded nuts. This gave us a compact array of three cabinets in perfect physical alignment, without any rigging hardware at all. It fit into the available space – with less than an inch to spare.

Hanging the cluster required further ingenuity. Neither the rare wormy chestnut panels above the cluster nor their plywood backing was capable of supporting the cluster's weight. I am lucky to have a master carpenter, Will Smith, as my assistant. With a miniature pry bar, Will removed the

delicate hole-ridden chestnut. We then threaded aircraft cable through the facing and secured it to the beams above using hooks and compression fittings. Since compression fittings do not allow adjustments once they are set, we took extreme care to hang the cluster correctly the first time. By sleeving four cables into two pairs we were able to provide each speaker with a support cable while making only two small holes in the ceiling. Nevertheless, when Will replaced the ceiling panels with nary a blemish, we breathed a sigh of relief.

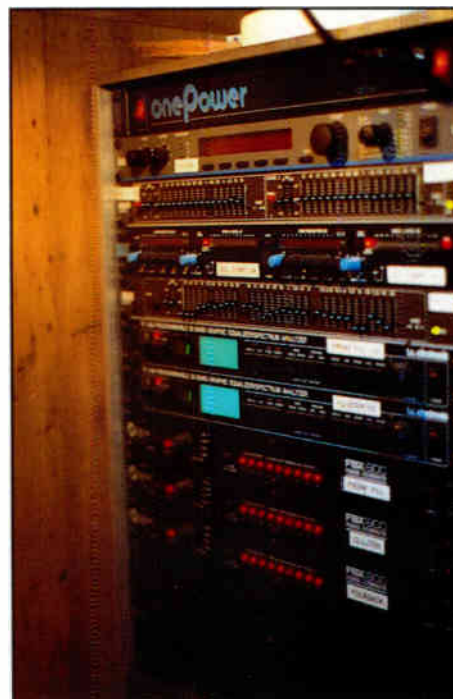
The mixing console and processing electronics, as well as the new lighting console, are installed in a locking wormy chestnut cabinet. The cabinet's welded frame pivots, allowing the operator to step behind it. The amplifi-

ers are housed behind the cluster in a loft space that had been unoccupied.

RESULTS, REACTIONS, REVIEWS

The original design called for daisy-chaining the three central cluster speakers so that a single cable could be run from the amp loft to the mono cluster. But when initial measurements and listening tests revealed a hot spot in the center, I decided to rewire the cluster and switch to 2-channel mono operation. Once the center speaker was balanced with the two outer ones, we were able to achieve ± 3 dB throughout the room, with the exception of a few seats tucked into an alcove in the rear.

It is a rare treat to be able to put a top quality system into such a small



Three Sabine FX900 digital feedback eliminators keep the Chestnut Room feedback-free, despite the tight spacing between stage mics and fill speakers.

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The Illinois Jacquet Big Band playing in the Chestnut Room.

and elegant venue, and the many difficulties we had to overcome make the success of the installation that much sweeter. The EAW JF200i's have lived up to all my expectations, reproducing everything from the piano of Sir

Roland Hanna to the big bands of Illinois Jacquet and Kit McClure with warmth and fullness. Vocalists such as Susannah McCorkle, Jackie and Roy, and Helen Merrill come across intelligibly, with a clear and natural qual-

ity that remains even at concert sound pressure levels. Warner LeRoy has said his new system is "absolutely outstanding," while Rex Reed calls the room "something of a miracle – a room you want to take home." New York magazine's reviewer called the room "top-drawer" and "blissfully free of feedback" (those Sabine units really do their job).

Like everyone involved, I'm pleased with the look and sound of the installation. But I'm particularly proud of the way the system went in. Not only did we manage to slip a concert sound reinforcement system in amongst the gold reindeer, Edwardian hunting scenes and old pine beams, but we did it under everyone's noses, in the middle of the night, on budget and on time. And it works. ■

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INSTALLATION PROFILE

PITTSBURGH'S AIRPORT OF THE FUTURE FEATURES "STATE OF THE ART" AUDIO AND COMMUNICATIONS SYSTEMS

By Keith Clark

Simply stated, the new Pittsburgh International Airport is the model by which other airport facilities will be measured for some time to come.

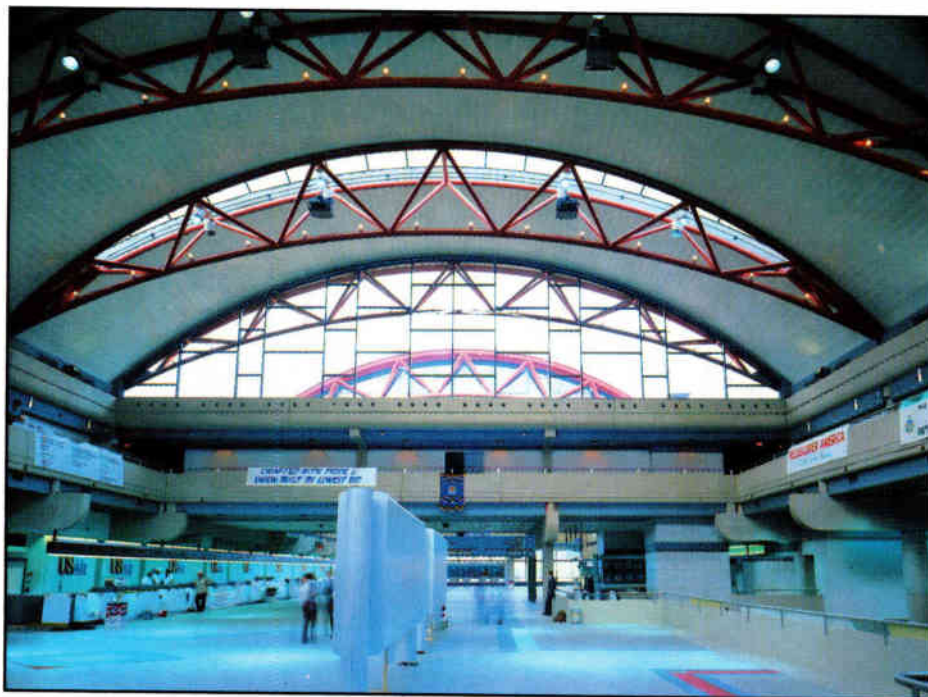
The \$1-billion project is a mix of efficiency and aesthetics. Primary objectives are to make air transportation quicker and more convenient and pleasurable for travelers, and to provide a facility capable of handling increased traffic.

At the heart of the project is the new Midfield terminal, centrally located within the bounds of the airport's three parallel runways. (Plans call for a

A TEAM OF AUDIO PROFESSIONALS WORKED CLOSELY THROUGHOUT SYSTEM DESIGN AND INSTALLATION.

fourth runway to be added in the near future.) Besides being outdated, the prior terminal had been located at the edge of the 12,000-acre airfield, resulting in long taxi times and the waste of millions of gallons of fuel for primary carrier USAir and other carriers.

Keith Clark is President of Priority Communications.



The \$1-billion Pittsburgh International Airport's Landside building.

The Midfield terminal occupies more than 900 acres, with Landside and Airside buildings connected by two underground "people movers." The 1.7-million square-foot complex features an advanced audio system, highlighted by an Announcement Control System (ACS) which ensures that all travelers and employees are kept well-informed.

A team of audio professionals worked closely throughout system design and installation, assuring its quality, timely installation and effectiveness.

THE PLAYERS

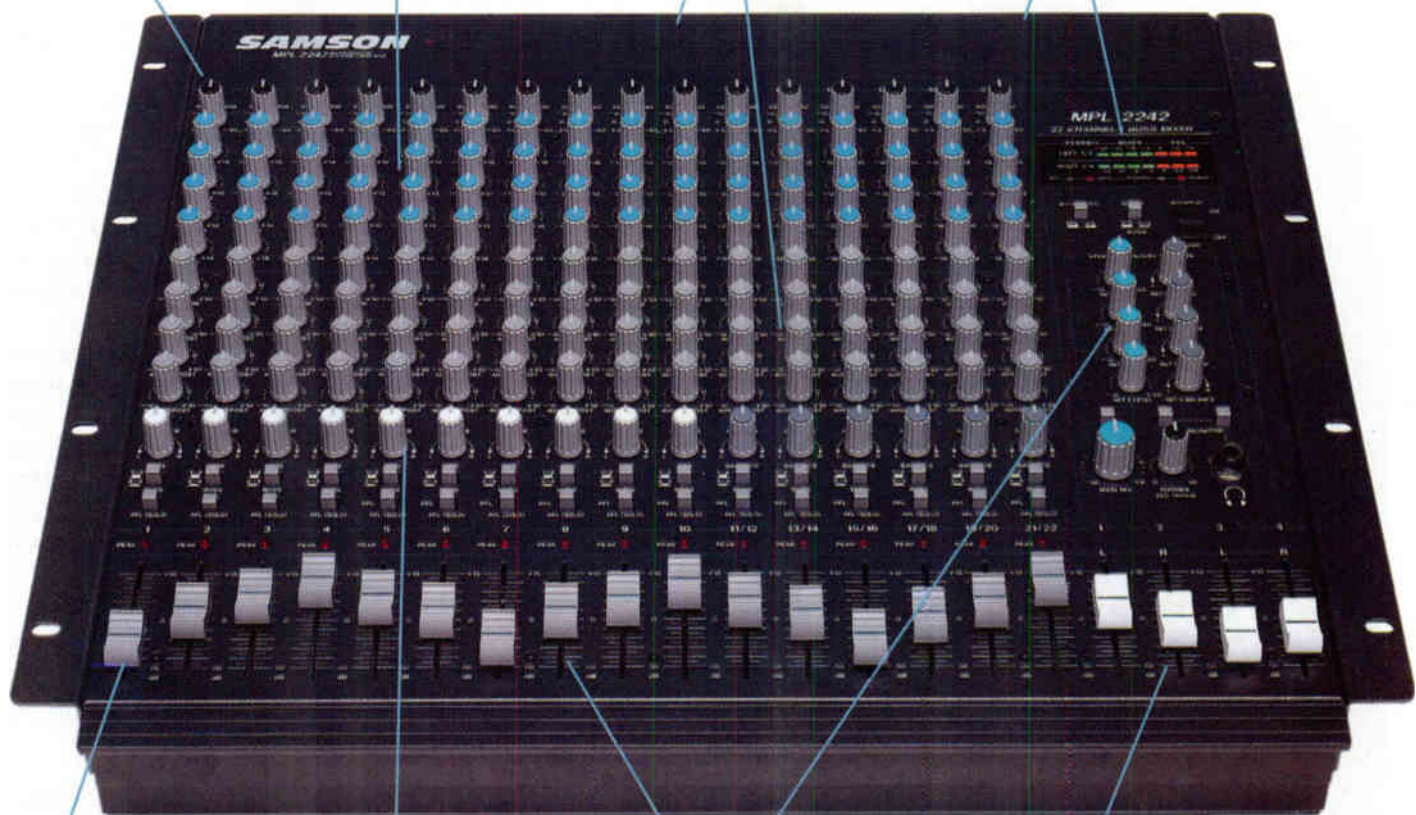
Coffeen Fricke & Associates of Lenexa, Kansas was contracted to begin audio system specification in the earlier planning stages of the project. Primary system designer Robert Coffeen brought a great deal of experience to the table in tackling this extreme challenge.

Working closely with Tasso Katselas, chief architect for the new terminal, Coffeen was able to design a system that not only meets the spe-

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cialized needs of the facility, but also meets specific aesthetic requirements. "The specifications were the result of combining our experience, CAD technology, the needs and desires of the primary carrier, and the expectations of the architect," says Jeffrey Tucker of Coffeen Fricke & Associates.

In consultation with Coffeen, engineering fabrication and technical sup-

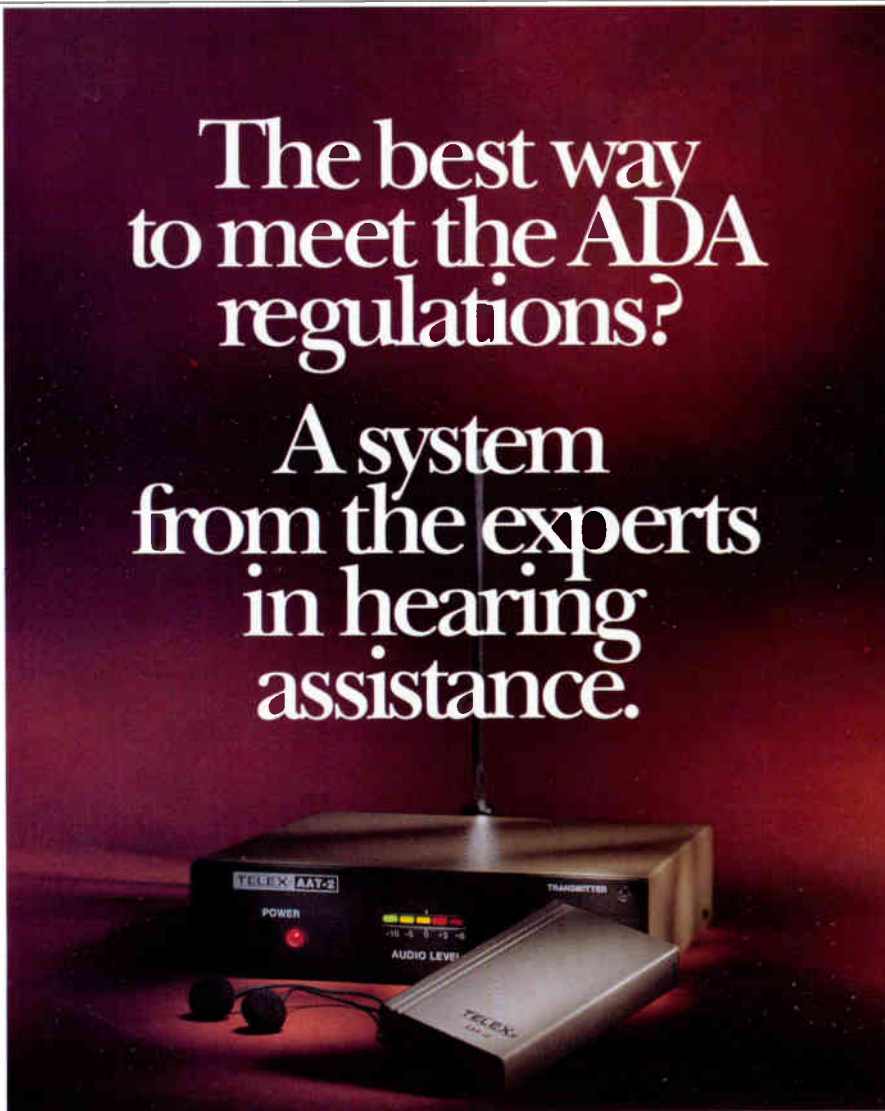


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Eighteen cluster span these arches featuring Electro-Voice components.

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port was provided by Washington Professional Systems, located in both Wheaton, Maryland and Mt. Laurel, New Jersey. On-site installation was performed by JWP/Sargent of Pittsburgh, the prime sound system contractor. The installation process took nearly a year to complete.

"Our scope was to provide engineering, on-site coordination/supervision and pre-fabrication of all of the sound system equipment racks. Documentation relating just to the sound system included more than 100 full-size drawings as well as a significant volume of

THE INSTALLATION PROCESS TOOK NEARLY A YEAR TO COMPLETE.

text, runsheets, tables, connection details and other information critical to an efficient on-site installation," says Tom Knauss of Washington Professional Systems. "We provided

SEVERAL TIMES WE NEEDED TO RELOCATE CONDUIT AND CABLING FOR MANY OF THE SPEAKERS THAT WERE INSTALLED.

all audio equipment except wire and conduit, and oversaw its installation. JWP/Sargent served as the primary contractor, installing all audio devices, conduit and cabling."



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The two-way clusters feature two HP-640 horns, each equipped with a DH1A and firing in opposite directions, as well as a single TL606-DX cabinet firing down.

"One of the keys to this installation was careful coordination with the multitude of other contractors involved with the project," says John Heck, project manager for JWP/Sargent. "For example, several times we needed to relocate conduit and cabling for many of the thousands of ceiling speakers that were installed."

TWO BUILDINGS LINKED AS ONE

The terminal's Landside and Airside buildings are linked for specific communications functions, including audio announcement capabilities. The IED 500ACS announcement control systems (ACS) in each building share

THESE STATIONS ARE ACCESSIBLE BY AIRPORT PERSONNEL THROUGHOUT THE TERMINAL.

audio and control data with each other and collectively allow more than 220 individual stations to access the total terminal.

The IED ACS "is the key to the entire audio system," says Bob Pry of Washington Professional Systems. "It is an upgraded version of what is becoming the standard ACS for airport use."

The ACS paging stations are equipped with either Electro-Voice

DO56 microphones or Altec D-91P microphones with DO56 elements. These stations are accessible by airport personnel throughout the terminal at locations like ticketing counters, gates, baggage claim areas, security stations, automobile rental counters and countless other places.

What functions does the ACS provide? It's probably easier to ask what

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it can't do. Bob Pry programmed all pertinent configurations and operational parameters at the Washington Professional Systems facility prior to shipment to the job site. This and other capabilities of the ACS, via the system computer and master control units, provide management and operation of the entire system.

The ACS provides: announcements

in real time; announcements recorded digitally and distributed on a "first in, first out" basis; announcements assembled from paging station-entered information combined with prerecorded phrases into a message appropriate for distribution, such as "USAir Flight 200 is arriving at Gate 23;" announcements from prompts that play prerecorded messages auto-

matically, such as FCC-mandated information.

These announcement features have priority rankings, ensuring that they are made in a timely and appropriate manner. The assembled and prerecorded functions free up personnel devoted solely to making the same announcements countless times throughout each day, providing consis-



"Your best bet is the Jumbo Mount from Peerless," he told me.

Now that we've got it installed, I see what he meant. We really like the Jumbo's innovative features. Its unique "arm in arm" design gives it plenty of strength, even for our 35" monitor. This also provides extra rigidity and prevents excessive tilt.

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**THESE
ANNOUNCEMENT
FEATURES HAVE
PRIORITY RANKINGS,
ENSURING THAT THEY
ARE MADE IN A TIMELY
AND APPROPRIATE
MANNER.**

tent information free of human error.

The various paging stations can be set up to provide all of these announcement functions. Announcements are initiated by the paging stations through the link to the master control units, which also distributes them to the appropriate zones.

For example, when passengers are disembarking from an arriving flight, they are automatically greeted with a

**WHEN PASSENGERS ARE
DISEMBARKING FROM
AN ARRIVING FLIGHT,
THEY ARE
AUTOMATICALLY
GREETED WITH A
MESSAGE CONTAINING
KEY INFORMATION.**

message containing key information such as the location of the baggage claim area. And not only is this information provided in English, but in a wide spectrum of languages.

For a particular flight arriving from

Germany, the ACS broadcasts messages to passengers in German, French, Italian, English and possibly other languages. These messages also are automatically broadcast in key zones of the terminal, again in the appropriate languages.

Another feature of the IED system is the Ambient Noise Analysis function. This feature maintains the announcements at an intelligible level in

**THIS FEATURE
MAINTAINS THE
ANNOUNCEMENTS AT
AN INTELLIGIBLE
LEVEL IN RELATION
TO THE AMBIENT
NOISE WITHIN
SPECIFIC ZONES
OF THE ENTIRE
PUBLIC AREA.**

relation to the ambient noise within specific zones of the entire public area. It also provides a background music level adjustment based on the time of day.

An integral part of the announcement control system is an on-line monitor and test function that is uti-

**THE LANDSIDE
TICKETING LOBBY
FEATURES
18 CLUSTERS, WHILE
THE AIRSIDE
CENTRAL
CORE HAS SIX
CLUSTERS.**

lized to determine the integrity of the complete audio complex. This function tests the audio signal path and electronics from the microphone inputs all the way through to the

power amplifier outputs. The monitor function on the power amplifier output not only checks the signal level at that point, but also checks the load characteristics of the speakers and associated wiring. Some tests are performed on a periodic basis with appropriate fault condition alarms, and information is displayed accordingly.

LOUDSPEAKERS APLENTY

Loudspeakers installed in both buildings include a combination of both cluster and individual systems. In fact, more than 3,500 ceiling speakers are used.

The Landside ticketing lobby features 18 clusters, while the Airside central core has six clusters. "Low or semi-low ceilings require only ceiling

microphones



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Electronics include the IED 500ACS Announcement Control System.

speakers," says Tucker. Cluster components were specified to be Electro-Voice HP-series horns, DH1A drivers and TL-series low-frequency cabinets, while E-V PRO-8As were specified for low ceilings.

**"THEY DELIVER
CLEAN, HIGHLY
INTELLIGIBLE SOUND
THAT IS FREE OF
COMB FILTERING
OR OTHER PROBLEMS
COMMON TO
INSTALLATIONS OF
THIS MAGNITUDE."**

The more elaborate cluster system, supported by ceiling speakers, is housed in the Landside building. With its 60-foot ceiling in a vaulted arch design, this facility was designed to be both functional as well as aesthetically pleasing to passengers. The arches create an old-time railroad terminal feel, while also serving to help direct passengers to ticketing or mezzanine

balconies. Colors were also selected to highlight the building's architecture.

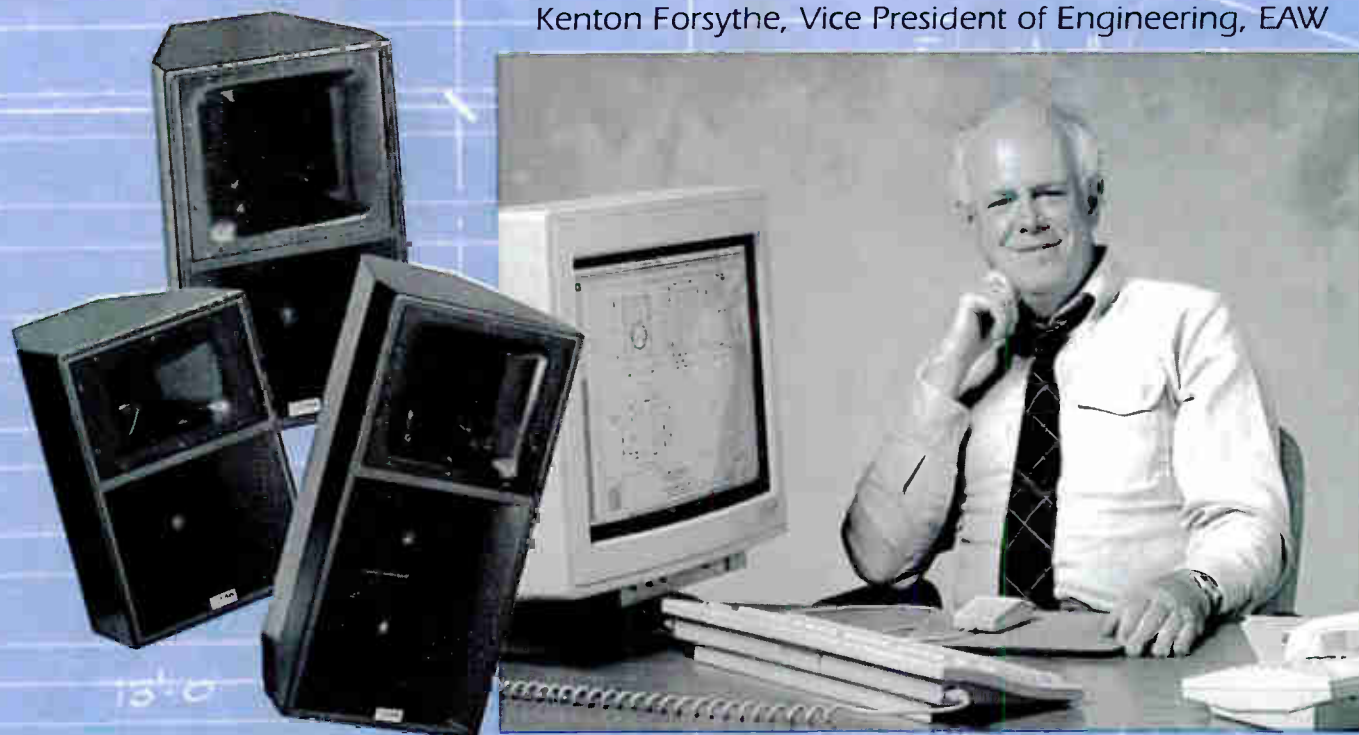
A total of 18 clusters span these arches, located about 50 feet apart. The two-way clusters feature two HP-640 horns, each equipped with a DH1A and firing in opposite directions, as well as single TL606-DX low-frequency cabinet firing downward. This configuration, employed by Coffeen in previous projects, provides clean, clear sound for both paging and background music.

**"THE FRAMES WERE
CONSTRUCTED SO
PRECISELY THAT THE
CLUSTER DIDN'T
REQUIRE ANY
ADDITIONAL
ADJUSTMENT."**

"The coverage provided by the clusters is extremely good," notes Pry. "They deliver clean, highly intelligible sound that is free of comb filtering or other problems common to installations of this magnitude."

"It's no longer necessary to sacrifice musical fidelity for vocal intelligibility."

Kenton Forsythe, Vice President of Engineering, EAW



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The clusters are mounted in custom steel-welded frames that were designed by Washington Professional. "The frames were designed based primarily upon the architect's desire for a single hanging point," says Pry. "We designed them, and then sent along the plans to a structural engineer for approval."

THE AIRSIDE BUILDING FEATURES SIX CLUSTER SYSTEMS THAT ARE CONFIGURED SIMILARLY TO THE LANDSIDE SYSTEM.

With the single point, the clusters can be suspended from the single post in an arch. They were also designed to incorporate the proper aiming angles as specified by Coffeen, and were painted black to blend in with their surroundings. "The frames were constructed so precisely that the cluster didn't require any additional adjustment or aiming once they were installed," Pry says.

The Airside building features a similar yet smaller archway design, and employs six cluster systems that are configured similarly to the landside

"THERE IS A WEIGHT LIMIT ON THE FLOOR IN THE AIRSIDE BUILDING."

system. Each of the two systems has its own electronic components but they are linked via the IED system for shared messages.

In the Airside building, JWP/Sargent faced some complications in the cluster installation process. "There is a weight limit on the floor in the Airside building," says Heck. "Because

of this, we couldn't just bring in any boom or lift to use for suspending the clusters, and instead had to make other arrangements."

After investigating various alternatives, Heck decided that a small two-wheel lift would work best. This particular lift had to be moved about manually, and also had four outriggers that needed to also be positioned manually each time the lift was moved. As a result, it took JWP three nights to install the six Airside clusters. In other words, a good deal more time was required to move the lift than to suspend the clusters.

In the Landside terminal, a conventional electric-powered lift that was already on-site could be used for cluster hanging, and as a result it took only four nights to suspend 18 clusters.

Loudspeaker components are powered by more than 120 Crown Com-

THESE LOW-CEILINGED CONCOURSES, IN ADDITION TO THE NUMEROUS OTHER PUBLIC SPACES, REQUIRED AN ELABORATE CEILING SPEAKER SYSTEM.

Tech 200 and 400 amplifiers, with White 4710 equalizers and Electro-Voice XEQ-2 crossovers also employed. All of these components are rack-mounted in secured rooms in each building.

Concourses for domestic flights are 100 feet wide, while international concourses are more than 120 feet across. These low-ceilinged concourses, in addition to the numerous other public spaces, required an elaborate ceiling speaker system.

As previously mentioned, E-V PRO-8A ceiling speakers are used for distributed systems throughout. "We

like the PRO-8As for applications like this," Tucker says. "Their coaxial components provide reliable full-frequency coverage under conditions of high

overlaps that of the clusters, such as in the ticketing areas of the landside building.

**COFFEEN FRICKE &
ASSOCIATES,
WASHINGTON
PROFESSIONAL
SYSTEMS AND JWP/
SARGENT ALL PLAYED
SIGNIFICANT ROLES
IN THE DESIGN
AND INSTALLATION.**

sound pressure levels." Delay of the audio signal to these ceiling speakers is necessary where their coverage

CONCLUSIONS

Besides the advanced audio systems, the new Pittsburgh International Airport also offers a number of other technological wonders designed to make the air travel experience a bit easier on both passengers and employees. For example, a \$34-million automated baggage handling system has been incorporated, as well as an automated ticket reading system.

Coffeen Fricke & Associates, Washington Professional Systems and JWP/Sargent all played significant roles in the design and installation of the revolutionary audio systems that are sure to be much-imitated in airport designs of the future. ■

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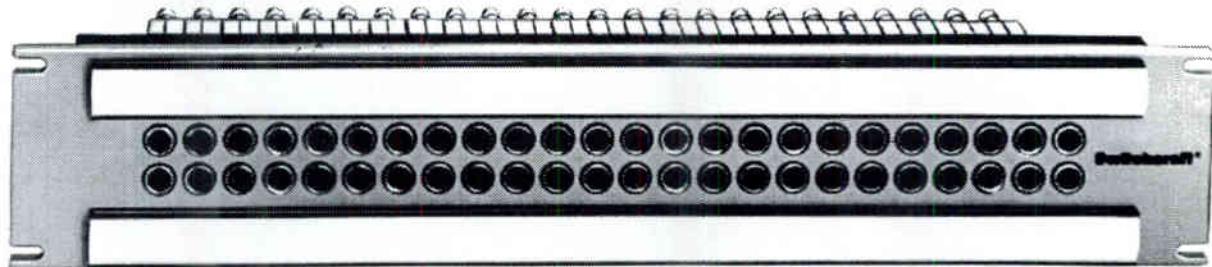
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A Case History

The Allen Pavilion of the Elizabethan Theatre Creates A More Intimate Environment

BY JENAY COTTRELL

This year, the 58-year-old Oregon Shakespeare Festival (OSF) in Ashland presents its second season with the benefit of the Allen Pavilion, the first major improvement in more than 30 years to the present 34-year-old Elizabethan Theatre, the OSF's centerpiece performance space. A \$7.6 million project, the Pavilion partially encloses the seating area and incorporates state-of-the-art acoustics and new lighting positions. It was designed and built to provide an acoustic environment that allows for performances of increased vocal and dramatic range. New features within the Allen Pavilion include vomitories (entrance passages for the actors to the front of the stage from under the audience), increased seating slopes which improve sight lines, a comprehensive audio system for music and special effects, and lighting towers, galleries and equipment which increase technical capabilities by 500 percent.

The Festival is the largest regional theater company in the country and has the oldest full-scale Elizabethan



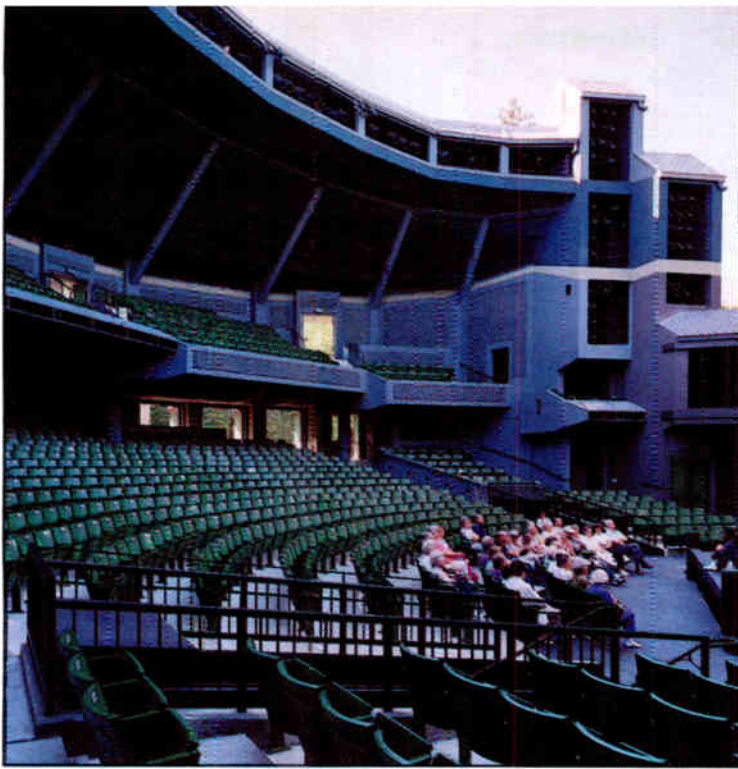
The Allen Pavilion as shown during a performance of Shakespeare's Othello in 1992.

stage in the Western Hemisphere. In addition, the OSF operates two other stages in Ashland and a fourth stage in Portland.

In 1988, the OSF Board of Directors voted to launch a major capital campaign to raise funds for renovations to the Festival's hallmark performance

space, the 1,200-seat outdoor Elizabethan Theater. It had long been in need of repairs. The concrete pad under the seating area had deteriorated substantially, and the 30-year-old seats needed to be replaced. More importantly, acoustical problems had increased. While the outdoor theater had pre-

Jenay Cottrell is principal of Cottrell Communications, a public relations and marketing communications firm, in Novato, Calif.



The 1,200-seat Allen Pavilion of the Elizabethan Theatre at the Oregon Shakespeare Festival was completed in June 1992.

sented vocal challenges to the actors for more than 50 years, in recent years it had become increasingly difficult for the audience to hear the actors' words.

ACOUSTICAL LIMITATIONS

As Ashland had grown, so had the street and park noises emanating from just outside the theater. Patrons seated in the rear of the theater were distracted by these ambient noises, and those patrons seated close to the stage were aware that the actors were shouting even in scenes that should be quiet and intimate. Artists were straining their voices in order to be heard and were increasingly unhappy about the theater's limitations. Many were becoming reluctant to accept parts on the outdoor stage. Without major improvements acoustically, the Festival risked patrons and artists losing interest in the theater.

DESIGN SOLUTION AND RESULTS

The solution was the Allen Pavilion. A team of experts collaborated on the design and construction of the structure: Treffinger, Walz and MacLeod (architects/designers of San Rafael, Calif.), S. Leonard Auerbach & Associates (theater consultants and architectural lighting designers of San Francisco) and R. Lawrence Kirkegaard & Associates (acoustics consultants with offices in Chicago and Boulder, Colorado). Emerick Construction of Portland was the general contractor. This team worked hand-in-

hand with Richard L. Hay, principal theater and scenic designer at the Oregon Shakespeare Festival.

"Staging Shakespeare outdoors is the hallmark of the OSF," says Hay. "It is essential that we have a playhouse in which Shakespeare's plays can be properly performed."

"The OSF wanted to preserve and protect the existing stage house and the concept of the original Elizabethan Stage," explains Len Auerbach of S. Leonard Auerbach & Associates. "The original Shakespearean audience/performer relationship was very intimate. It was important to settle on a solution that would protect the stage and experience as much as possible."

The design goals for the Allen Pavilion were to provide acoustic isolation and support while retaining as much of the feeling of openness to the sky as possible. The existing 80-foot wide stage house had to be included within the audience area (forming in effect, a very wide proscenium) and the resulting structure had to fit within the existing Chautauqua wall with sufficient clearances to maintain access to the exits, according to Ian MacLeod of Treffinger, Walz & MacLeod.

Another criterion was to ensure that each person's experience from any seat be excellent, not only in terms of sight lines to the stage and moat, but in giving a feeling of inclusion in the audience/actor relationship.

"What the OSF didn't want was a theme park-like reiteration of a

Shakespearean theater," comments MacLeod. "A neutral design was essential to keep the focus on the stage. We felt that something more akin to the neutrality of the Chautauqua wall than to the stage itself was best."

Though the number of seats has not increased, balcony seating has been added and the rake – or rise of the seats – increases at a sharper angle. All of these changes dramatically reduce surrounding noise and provide a more intimate space for patrons and performers. Additionally, the shape and size of the Pavilion balance the large stagehouse facade, creating a sense that the performance space is a playhouse rather than an amphitheater.

At first Hay was concerned about the size of structure. "I was worried that the scale would be too large and that the stage would be dwarfed. What happened is that one feels closer to the stage and actors."

IMPROVED ACOUSTICS AND LIGHTING CAPABILITIES

The Pavilion was shaped in a way that made as many surfaces as possible useful acoustic reflectors, according to Joseph Myers of R. Lawrence Kirkegaard & Associates.

"Most pertinent was the time delay between the direct sound and the reflected sound that bounces off the walls of the Pavilion," he explains. "We carefully angled and treated the surfaces so that where possible the delay would be less than 1/20 of a second."

A longer delay would cause the audience to perceive the reflected sounds, or echoes, as being distinct and overlapping sounds, making performances confusing and less clear. Where it wasn't possible to angle the surfaces, absorptive materials were added.

The curved shape of the back wall tends to focus sound back to the stage at a long time delay. It was therefore important to tilt and shape the underside of the balcony to intercept this path and bounce the sound down to the patrons under the balcony.

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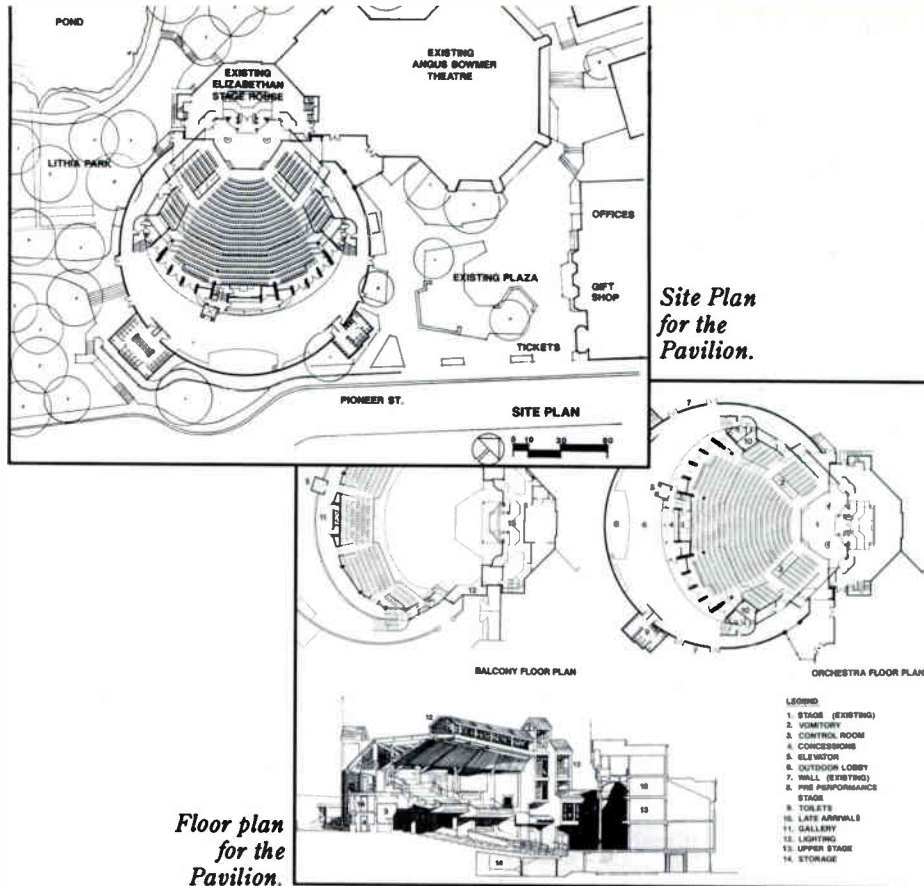


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Site Plan
for the
Pavilion.

Floor plan
for the
Pavilion.

"For patrons sitting under the balcony the effect makes it seem as if some of the sound is coming from above, as the rest of the audience actually experiences it," explains Myers. "Otherwise, patrons would experience a 'TV' sound coming from one direction with no reverberation and giving no sense of being in a larger space."

Because all of the Pavilion's surfaces are somewhat exposed to weather, selection of acoustic material was also a challenge. The material needed to withstand the elements while also being colorable to suit the architecture, was durable enough to avoid damage when people brush up against it, and highly absorptive because of the focusing geometry of the rear wall.

Also new are vomitories (flexible entrance passages within the audience seating area for the actors) as well as lighting towers and equipment that augment technical capabilities. The number of lighting instruments was increased from 175 to 400. In addition, new lighting positions and angles provide a greater range of possibilities for the lighting designer.

CONSTRUCTION

A groundbreaking ceremony for the Pavilion was held less than 12 hours after the final performance on the Elizabethan stage. Immediately after the groundbreaking, construction

crews began demolishing the seating area. The Pavilion was put on a fast-track construction schedule to meet its scheduled completion date, eight months later. This time frame was critical. Technicians, actors, directors and designers all needed time to prepare and rehearse in the completed space prior to opening three shows on one weekend.

This fast-track schedule worked only because the theater consultants, architects, acoustic consultants and the Festival didn't play the usual confining roles, according to Kevin Spellman, president of Emerick Construction.

"The Festival had an unusually astute approach to the construction process," explains Spellman. "All of the team players were brought on as early as possible. It was clear from the beginning that the logistics, site and time were everyone's challenges, so we immediately pulled together."

And, just what does the completed Allen Pavilion mean to the Festival, its actors and patrons?

"The improvement in the acoustics has been phenomenal," says Paul Nicholson, general manager of the OSF. "Patrons are able to hear the subtleties, the nuances of speech. And, from a directing point of view, the Pavilion has expanded the scope of what we can do. We have really changed the dynamics of the playing space." ■

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MICROSTATION PC: CHALLENGING THE STANDARD IN AUDIO ENGINEERING APPLICATIONS

By Benjamin Lein

Long the standard in PC-based CAD applications, AutoCad has deftly handled the drafting chores of many an engineer or systems designer. The program is licensed on literally thousands of workstations, and probably running on thousands more unlicensed PCs.

AutoCad is a stable, robust application that fulfills most of the requirements for just about any Computer Based Drafting and Design endeavor. So, given these particulars, why think of switching to another CAD program? Because it does the job better. Faster. More efficiently. These are the claims of Intergraph Corporation, distributors for Bentley System's MicroStation PC 4.0. Are their claims justified? Is MicroStation truly the next generation in PC-based CADD application soft-

Benjamin Lein does freelance stuff in the Los Angeles area and is the prime motivating force behind The Associates in Media Engineering, a Los Angeles-based firm specializing in the fields of commercial audio systems engineering, acoustical analysis, video systems engineering, computer based show control systems and general entertainment systems integration.

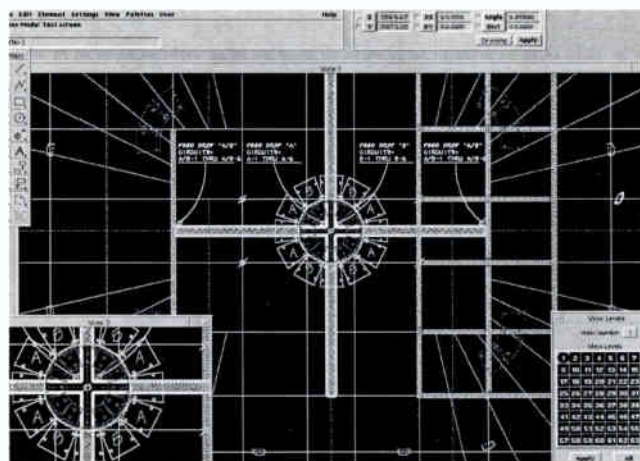


Figure 1: MicroStation Screen showing two edit windows, command window, main tool palette, precision input and level control dialogue boxes.

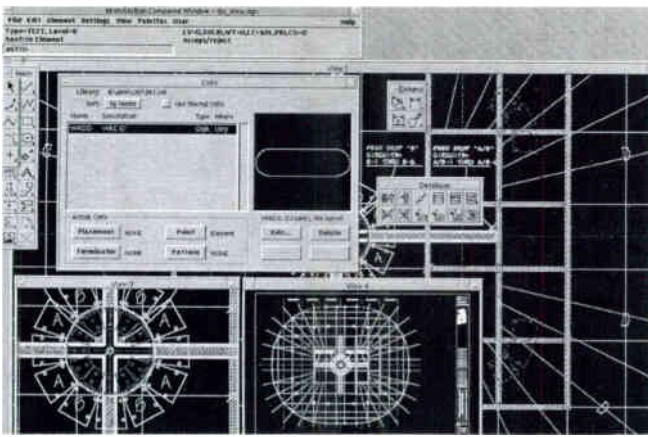
ware? These are some heady claims, and so it fell to us to prove them either right or wrong: to put MicroStation through its paces and see how it measured up, both on its own merits and in contrast to AutoCad.

THE PACKAGE

MicroStation came supplied in a shipping container worthy of its hefty price, a box measuring over 8" x 1' x 3', containing a three volume set of documentation manuals, a volume covering the MicroStation Design Language (a flavor of C, think AutoCad's AutoLisp, more later), assorted documents and tablet menus, program disks in both 3.5" and 5.25" format and the ubiquitous "dongle" or hardware lock (MicroStation is a hardware-secured application, requiring the use of a parallel port key or

"dongle" in order to run, Intergraph being careful to protect the rights of its software).

The installation application was straight forward, easily configuring and installing MicroStation's approximately 22 Mb's of executables and support files. With a minor amount of tweaking and hardware reconfigurations, MicroStation was up and running quickly and with few glitches. Few glitches, in that MicroStation is a little finicky about its use of memory, requiring some final adjustment of our extended memory allocations to get the app running in a stable manner. (MicroStation suggests the use of DOS' himem and emm386 managers; however I was able to configure 386Max to handle the job). Once we excluded our TIGA adapter's ROM space, as well as the address ranges of



Screen shot from MicroStation.

other system adapters, MicroStation ran in a stable manner. A strident claim of Intergraph is MicroStation's stable nature, with any reports of unexpected system halts or terminations being attributed to memory management issues. They appear to be right . . . our only system instability occurred in relation to memory allocation errors, extended memory or adapter conflicts and, once the problems were addressed, these problems disappeared.

THE GUI

The most immediate and impressive element MicroStation presents to the user, and in direct contrast to AutoCad's quasi text/graphics screen, is the user interface. Based on the OSF/Motif GUI *, MicroStation's interface is based on a fully windowed environment, not unlike the Mac's flavor of window/dialogue box operations and not unfamiliar to windows users.

The Open Systems Foundation's (OSF) standards for graphical computing were originally established for the X-window system as implemented on UNIX workstations. It applied a format for the actions and feel of the interface and much of the Mac's GUI, as well as MS Windows was written to these standards. As a result, you'll find the actions of dialogue boxes, pull-downs and other window elements to behave very similarly to the Mac, with mouse picks requiring a continuous press of the mouse button; releasing on a pull down element initiates that element's actions. Here is where the feel differs from MS Windows, but the differences are slight at most, and the interface will be intuitively familiar to the Windows user.

The opening screen reveals the MicroStation Manager, an initial file list/options window. With file list and

scroll elements, as well as drawing creation and utility pull downs, this is where the user selects the initial actions MicroStation is to take. Opening a new drawing, the user is presented with a workspace composed of up to eight movable, resizable drawing editor windows. Very impressive. Any view, in any rotation or area, can be displayed in the editor windows.

The next element presented to the user is MicroStation's graphical menuing system. Initially opened on the workstation's editing desktop are the Command area and Main tool palettes. The command windows provide access to MicroStation's command line interface, as well as access to the basic complement of utility pull-downs. All of MicroStation's numerous tool palettes can be access through the command window, as well as utilities for loading MDL applications, importing and exporting images and text, attaching reference files, opening cell libraries (Micro Station's equivalent to symbol libraries), and defining entity attributes.

The Main tool palette consists of access to MicroStation's more commonly utilized drawing/editing commands and provides access to what MicroStation calls sub-menu tear-offs. MicroStation's use of what it refers to as tear-off palettes amounts to series of available sub-palettes nested in a primary palette.

When the user selects with the pointing device any single element on a primary palette, the element immediately expands or pops out to reveal any sub-palettes contained therein. If you continue to drag the sub palette away from its nest or home, it creates a freely floating sub-palette which can be positioned anywhere on the desktop for easy access. MicroStation contains no less than 40 individual tool palettes available to initiate most of

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MicroStation's over 800 commands.

Another rather trick bit of code wizardry is Microstation's ability to utilize two system graphics adapters and thus supports two separate display monitors. With the necessary hardware installed, MicroStation will seamlessly pan any view, any tool palette – in short any graphics element from one display screen to another. This can be a big benefit, allowing the user to zoom in on a portion of the drawing on one screen, while maintaining a view of the entire drawing's extents on the other. Or using one display for MicroStation's multiple tool palettes, another for the drawing itself.

This kind of gives you the idea, right? What we are presented with is a very slick, windowed interface, very comfortable and easy to use, presenting a very pleasant, dare I say "groovy," interface to the application. But GUI's tend to really strain system resources. How did MicroStation perform under real world drafting editing and display operations? In a word: Not Bad. MicroStation deals with vector data in a fashion different from Acad, so direct comparisons for regen time aren't valid. Nevertheless, running as a protected mode application, MicroStation performed well against Acad in most display-intensive operations, despite the high overhead of the interface and the lack of a display list driver, as was running on top of our Acad test configuration (for the uninitiated, a display list driver is method of speeding drawing display times by caching or storing the screen-pixel to drawing-vector data in a portion of system or adapter ram. In so doing, the computer's CPU is freed from having to recalculate the display every time a drawing view is changed). So, with a display list giving the benefit to Acad, display and regen times were as follows, as based on AutoCad's "NOZZLE3D" sample drawing.

The installation of display list processing for MicroStation would prob-

ably bring the redispays up to AutoCad's specs.

	ACAD	MICROSTATION
Load Nozzle3d	9s	12s
Regen	4s	1.8s
Redisplay	.9s	1.8s

DRAWING/EDITING

At first, MicroStation can be a little intimidating. For almost every conceivable operation, there are at least three different ways of initiating the action. In Acad, placing a line is as easy as entering "line" or "li" at the command prompt, or choosing "draw – line" from the sidebar. In MicroStation you can choose one of the line/string icons from the line palette, enter "place line" at the command prompt, enter the foreshortened "pla lin", enter "place line at active angle," "construct line bisector," "construct minimum distance line, etc. etc. In fact, there are 16 available line commands, most allowing for the "first three letter abbreviation" scheme for command line input, or being available on the full line tool palette. It is the richness of the command environment, as well as (to the experienced Acad user) the unfamiliarity of the command structure which composes the intimidating aspects of learning and using MicroStation. It is, however, the scope of the command structure which makes MicroStation so powerful. And once the user begins to gain some familiarity with the use of palettes or the command syntax, the intimidation begins to yield to familiarity and efficient use of the system.

Editing actions take on a different nature in MicroStation. As opposed to Acad's "Action – Select Entity" format, MicroStation takes the opposite approach. Rather than selecting a command such as delete, rotate or copy, you first select the elements to be acted upon, then carry out the action.

DATA MANIPULATION

One of MicroStation's claims to fame is its ability to directly access and manipulate data elements and drawing entities referenced to a number of data base formats. Until the release of ACAD v12, Acad's primary abilities to interface to a DBMS was mono directional – from the drawing OUT. In other words, drawing attributes could be exported in a number of formats suitable for import into a data base. Now version 12 has added bi-directionality to the package, but to be honest with our readers, I haven't really had time to adequately investigate v12's capabilities. MicroStation on the other hand has always sported a bidirectional, interactive data base interface. Directly supporting Dbase and Oracle, with plans to support other SQL based DBMS', MicroStation allows for a direct and interactive access to a database table.

How this affects drawing entities becomes rather abstruse, and MicroStation's terminology must first be explained: In MicroStation, an "entity" refers to a single database record, one row or complete record in a standard database tabular format. Element refers to a single drawing component – a line string, a cell or symbol- one piece of the drawing.

With these distinctions explained, we look at the database interface: First, a control table is established linking the active database, SQL and data entry/edit form tables, as well as report tables to the drawing file in use. The control table exists in standard database table file structure and can be located through the use of directory flags pre-set in Microstation's system variable control file. Once the control table is loaded, any valid SQL type query can be used to browse and set the active database "entity."

Once again, in this instance, entity refers to a single row in the currently referenced database table. Once selected, the active entity can then be

(Continued on page 69)

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DR. WOKKA ANSWERS HIS MAIL

Dear Dr. Wokka,

Boy, are you hard to get in touch with. This letter through the magazine is a last resort, as there is a small but finite possibility that the editors will get their hands on it and publish it in your column. You know how New Yorkers are: they'll do anything for a buck. I tried to find you at Penn's Landing in Philadelphia, per your published address published in this magazine. There is no Philadelphia Medical College of Musical Knowledge there. So what is this, a hoax, or some kind of joke? It's actually a clever one if it is. Ha ha. Actually, a lot of people think

that Dr. Wokka is a big hoax and that you're really one of the editors or something like that. So, I'd appreciate it if you didn't let on that I have been writing to you; keep this letter in confidence. It's sort of like getting caught writing to the Easter Bunny or something. A man in my position can't be too careful.

So, anyway, it was great to have you come over to our demonstration at the NSCA show in Orlando. I especially enjoyed the debate over the loudspeaker theory re: our Coherent Zone speaker system you heard, and the dialogue re: your working agreement with us. I would now like to make formal arrangements and propose that you accept a position of Director of Research for my company. Of course, before we can proceed any further, we insist on a confidential nondisclosure agreement with you, that I am forwarding herein. We look forward to your visit to Lynwood and to your working with us. By the way, I'd love to hear your reaction to this, your first NSCA show.

Clifford A. Henricksen
Vice President of Product
Development
US Sound
Lynwood, Washington

Dear Clifford,

This ends up as an open letter to the industry, as the editors of this magazine are so nosy that they insisted on printing this. They open all my mail, and any other mail they can get to first. You should see them. They literally ambush the poor mail carrier every day. They insist on prying into

Dr. Wilhelm Wokka III heads up the Philadelphia Medical College of Musical Knowledge, 106 Penn's Landing, Philadelphia, PA 19001. Dr. Wokka is a pseudonym.

personal matters, just so they can get some kind of "scoop" to print. I am livid, but, hey, it's a living. Writing the truth is my life. Here is my response to your letter:

Never, ever in my life have I seen, talked to or heard of this "Clifford" fellow or any such "US" company. I have never had such a debate, and by the way, who ever heard of anything like a "Coherent Zone"? These wannabe know-it-alls just sit around

**WRITING THE
TRUTH
IS MY LIFE.**

and play test tones into silly measurement systems all day and think they know all the answers. At no time during the entire demonstration did I ever talk to this Henricksen, or anyone else, of a "working arrangement," not once. I never sign such nondisclosure agreements, as it is far below me. Such agreements are grossly limiting and totally disrespectful. What's more, this is a blatant indication of mistrust. And, anyway, the only way I would ever sign any such disclosure is if there

**BY THE WAY,
WHO EVER
HEARD OF
ANYTHING LIKE A
"COHERENT ZONE"?**

were any money in it and there was never any mention of money anyway. And, just, well who ever heard of a speaker with a zone in it anyway?

Actually, to be brutally honest, I did visit the NSCA show. That part I will admit to. Blanche and the kids insisted on going to Orlando; why I'll never fig-

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ure out. The place is a total fake city and only fit for alligators or those with too much money to throw away. You should see what they spent on parking alone! At the show, I spent most of the time incognito, avoiding the press in general, and specifically that dreadful Mike Klasco in his usual Hell's Angels attire. Why don't they give him a haircut? All he can talk about is deadlines and "artistic control" and some kind of silly new invention. Imagine, this to me!

My reaction? Let me say it bluntly. This will be my first and very last NSCA show. The horror indeed. These are sound contractors? These people spent all their time looking at wires and nuts and bolts and equipment closets and connectors. That's like looking through the Thomas Register or the newest WW Grainger catalog. It was horrible and lethally boring. These are supposedly sound contractors.

What ever happened to the Golden Age of Audio? The days, I remember them so well. Big expensive suites in great hotels. Grandeur. Great men of audio science were everywhere, debating and arguing for days. Reputations were at stake. Theories were disproved. Equations were plagiarized. The halls of audio echoed with "obviously you never considered . . .", "your analysis is completely wrong: you dropped a minus sign in equation 187. . ." and the like. Ah, the Great Days. Voluminous papers were presented with endless data and curves, all plotting the future of the audio industry. And today? Blacksmiths, street urchins and cobblers. Doom and infinite tedium. Nuts and bolts. What did I think of the NSCA show? It will cause the destruction of the audio industry. Know-it-alls. Nuts and bolts, money and power.

Sour grapes? Guess again. I'm tired of these audio societies serving the wrong purposes. And I know I'm not alone. I know there are lots of you out there that feel the same way; that the NSCA is just a commercialized head-

in-the-sand self-serving waste of time. I didn't hear a single heated debate or red-faced embarrassment of some ill-conceived theory. Nuts and bolts, wires and connectors. What could be more from the truth of real audio?

What the nation needs is a new audio society that will truly lead the way for intellectual thought and thus progress. I propose that this time next

year, I will start what is rightfully the real true organization for audio, the National Great Society of Audio, the NGSA. Here, Great Men of Audio Science, like me, can once again debate and theorize without fear of ridicule or transgression, without . . . well, anyway, that's what I'm going to start now. The NGSA. It's either this or quit and die. Never give up. ■

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NEWS FROM AROUND THE INDUSTRY

Professionals Choice Awards Presented; Record Sales Reported by Renkus

The Professionals Choice Awards ceremony.



Professionals Choice Awards Given

The Second Annual Professionals' Choice Awards ceremony was held during the NAB show in Las Vegas. The awards, "designed to symbolize excellence in new or improved products" are voted on by the readers of Post and Producer magazines, published by Testa Communications, who also publishes Sound & Communications. The ceremony was attended by several hundred working professionals in the industry. (Testa Communications also produces The Music & Sound Awards ceremony during the winter NAMM show. The Music & Sound Awards recipients are voted by the readers of The Music & Sound Retailer magazine.) Winners of this year's Professional Choice Awards include: In audio categories - Tannoy PBM5; Graham Patten D/ESAM 800 V. 2.0; Digidesign Pro Tools V.1.15. In graphics - Softimage V.2.6; Aurora Liberty; Quantel Paintbox V8. Companies collecting awards in the video category included Abekas, Grass Valley, Sony, Avid, Chyron, Ikegami and Canon. Highlights of the awards presentation were shown on NAB-TV News, the daily news program produced by Testa Communications and distributed via satellite to facilities and stations around the world.

Renkus-Heinz Announces Record Sales

Harro Heinz, president of Renkus-Heinz, has announced that sales for the first quarter of 1993 "shattered all previous sales records" and the company was expecting a banner year. March 1993 orders included an order from Siemens in Germany for the Gottfried Daimler Stadium in Stuttgart. When completed this summer, the multi-purpose stadium will be Europe's most modern stadium. The specifications developed by Acoustic Design Ahnert call for a total of 80 Renkus-Heinz coaxial SR-4 two-way loudspeakers and associated controllers, 15 coaxial horns, and a quantity of dual 18" subwoofers. Sonor AB, Hansa Nordic of Goteborg, Sweden contributed a large multi-cabinet TSC series loudspeaker order for the Liseberg Amusement Park in Gothenburg, Sweden. GMF Electronics of Orange, California ordered a total of 88 custom 12" Renkus-Heinz loudspeaker cabinets plus a SR-2A Smart system for the Los Angeles Convention Center expansion program. The Rollie Brooks design for the exhibition hall system features a yoke mounting arrangement that allows the loudspeakers to be easily rotated for different room setups.

Shoe Source Gets Crown

Crown has announced that Crown IQ computer control hardware and software are allowing control of "large-scale audio systems" at the Payless Shoe Source corporate headquarters and nationwide distribution facility in Topeka, Kansas. The two-phase design and installation of new audio systems at the facility was performed by Dodge/Carroll Electronics of Topeka. Dodge/Carroll worked closely with Crown to provide training, via modem and speakerphone, to Payless personnel. In phase one of the project, Dodge/Carroll installed nearly 500 Electro-Voice and University Sound speakers powered by seven Crown Com-Tech amplifiers in the Payless sorting/shipping building. Phase Two involved the installation of more than 400 University Sound speakers, controlled by five Crown Com-Tech amps, in a new 850,000 square foot warehouse building. Also in Phase Two, Dodge/Carroll implemented the Crown IQ system that links the two

buildings and provides a multitude of functions, all controlled from a single 386 PC located in the maintenance supervisor's office.

Notifier Expands Facility

Mark S. Levy, president of Notifier/Fire-Lite Alarms, has signed a contract to expand the existing 115,000 square foot facility by over 64,000 square feet. The expansion is scheduled to be completed in October. The additional space will be used to expand the manufacturing and warehouse facility, and, the company says, "further fulfill the commitment to the customer base of a prompt on-time delivery of a quality product."

Mics at Nebraska Capitol

The Nebraska State Capitol has upgraded the microphones in the meeting and hearing rooms. Further expansion will include teleconferencing and videoconferencing. Lonnie Theer is the acoustical consultant. BMS Sound and Communications was the



Left to right: Mark S. Levy, Dave DeMeo (standing), Don Anderson, Fabian Skretta, W. Allen Fritts, all of Notifier.

APARTMENT 4-C JUST INSTALLED OUR NEW 720 WATT HOME THEATER AMPLIFIER.



Our new HCA-1206 is easily the most powerful THX™-certified amplifier in the world. It has an overwhelming 120 watts on each of 6 separate channels, or 180 watts per channel at 4 ohms.

But we feel that such power is useless if it only makes your ears bleed. So we called on legendary circuit designer John Curl to bring high-end audio sophistication to home theater.

Toggle a few input switches and you have the ideal multi-zone stereo amplifier. You can even switch it to a 5 or 4 channel amp — delivering over 270 watts per bridged channel. So please be careful with your HCA-1206. Otherwise your favorite movie or concert just might bring down the house.



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THX is a registered trademark of Lucasfilm, Ltd.

Circle 202 on Reader Response Card

World Radio History

contractor responsible for the final system installation. Audio-Technica has announced that in each of the Capitol's seven meeting and hearing rooms, there are 15 Audio-Technica AT857QMa microphones, in specially manufactured housings with rubber shockmounts and A-T lavaliers. Each room features an AMX system with touch screens. The next phase will include a pre-production room or switching room which will enable the audio from all the facilities to be intermixed, providing full duplex communications between hearing rooms, or transferring the audio to any part of the state capitol. The output for each feed will be by fiber optics to the state television network and will automatically come back into the capitol. Satellite uplinking

to various cities in the western part of the state will provide videoconferencing out and teleconferencing in. This will enable someone to testify in another part of the state without actually going to the capitol. According to Theer, "We have specified 138 Audio-Technica microphones in the capitol, and they also have Audio-Technica microphones in the legislative chamber. In fact, the state capitol has set a precedent that all microphones must be Audio-Technica."

ADI Expo Held

ADI has announced that it and over 40 industry manufacturers found the 1993 ADI Atlanta Security Expo & Workshop, held on April 16, a success. Over 150 security professionals took part in



1993 ADI Atlanta Security Expo & Workshop.

the event. In addition to technical seminars, a four CEU false alarm prevention course was also offered. ADI Sales Manager John Smith said, "ADI put the expo in place to support security dealers. It was really a tremendous success. All of us at ADI extend many thanks to our vendors and our dealers who supported the event so wholeheartedly."

Signal Perfection Contract

Signal Perfection, Ltd. has been awarded the contract for installation of the sound system for the Trenton State House Annex Building. Project Engineer Philip DiPaula said he is "looking forward to working with Hatzel & Buehler again." Hatzel & Buehler is the electrical contractor. According to SPL, the new room is a "sophisticated committee room system" designed by Larry King of Klepper, Marshall & King. The project is in the submittal stage with project completion expected in 1994.

3M Agreement with Hughes

3M National's Sound Products group has reached an agreement with Hughes Network Systems, Inc. to provide direct broadcast

satellite music and audio advertising services to Hughes' domestic VSAT customers. 3M will provide Hughes Network Systems' customers a variety of music formats including classical, jazz, instrumental, top 40, hot country, and adult contemporary. The 3M in-store media network allows retailers to combine selected music starchannels with advertising announcements. Hughes Network Systems provides satellite-based private business networks. The interactive networks use Hughes Network Systems' Personal Earth Station very small aperture terminals.

Bose in Six Flags

The Peter E. Schmitt Company has announced that 76 Bose Free-Space Business Music Systems have been installed in the restaurants and various retail stores of all seven Six Flags Theme Parks across the U.S. V.P. Engineering Harold Hundson said, "The demo made it perfectly clear to Six Flags' executive staff that Free-Space was the perfect system for all our background music needs due to its sound quality, compact size, and aesthetic appeal," according to George Xouris of the Peter E. Schmitt Co., Bose's New York representative.



"If you can't teach an old dog new tricks - it's time to get a new dog!"

For value that lasts, the rugged BigFoot™ 1/4" phone plug from G & H Industries can certainly teach those "old dogs" a thing or two.

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- **Super Strain Relief** (large ground clip)
- **Lasting Value** (won't loosen up over time)
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Signacon Control Opens Boston Office

Signacon Controls, Inc., the security and life/safety systems company, has announced the opening of a sales and service center in Woburn, Massachusetts. Signacon, based in Elmsford, New York, is 28 years old and has developed turnkey security solutions. Signacon maintains six sales and service centers throughout the northeast.

Lokes Joins AMX for Media Retrieval

Richard Lokes has joined AMX Corporation to manage the development of all AMX/Prism media retrieval software. Lokes was formerly the owner and operator of Prism Media Systems, Inc. of Royal Oak, Michigan, the manufacturer of media retrieval soft-

ware. AMX acquired Prism in February of this year. Lokes will be responsible for the design, development, and quality control of media retrieval software. In addition, he will oversee the recruitment and licensing of all authorized AMX/Prism dealers. The system is designed to offer schools and corporate training facilities a reliable cost-effective method of distributing educational programs. AMX says the software's flexibility enables it to be used in many other applications.

New Finance Program for Karaoke

The Entertainment Division of Pioneer New Media Technologies has announced new finance packages to assist commercial operators in acquiring LaserKaraoke



Richard Lokes, AMX Corporation.

equipment. All authorized PMT LaserKaraoke dealers are able to

offer the program, which requires no down payment for entry level buyers up to \$1,000. Larger purchases require 10 percent down. The program is provided through GE Credit, which allows credit terms of up to 36 months. Pioneer also offers a "Profit Planner," which enables customers to project up front the return-on-investment they can expect.

QSC at Digital Theater

QSC has announced that 50 USA 1300 professional amplifiers were used to power the Everett 9 Cinemas in Everett, Washington. The ACT III theater is the first in the world to have all of its nine screens equipped with the Lucasfilm THX system and the Dolby Stereo Digital Sound System. All USA Series amplifiers are THX and Dolby AC-3 approved.

SOUNDSPHERE SPEAKERS KEEP NEWSDAY PRESSES ROLLING...

The Newsday corporate offices and printing plant are in a large building in Melville, N.Y. It contains the largest color offset operation in the country with ten printing presses. While they operate at the highest efficiency, the collation and inserting operations could not be stopped quickly when problems were encountered. The insert machines could not be turned off resulting in improperly collated newspapers.

After trying flashing lights, buzzers and various horn speakers, a Soundsphere #2212-1 model was tested and five more were installed in the extremely noisy inserting operations room.

Patrick O'Hanlon, Production Maintenance Electrical General Foreman at the site states, "The area in question is a high density noise area and communication is difficult. When Bernie Lory of Craftsman Sound talked about Soundsphere speakers in airport terminals, I knew it was the system for us. The even distribution allowed us to maintain a volume level that would not be overbearing, to permit quick quality control adjustments in the insert area and to still be heard in remote corners of the room."

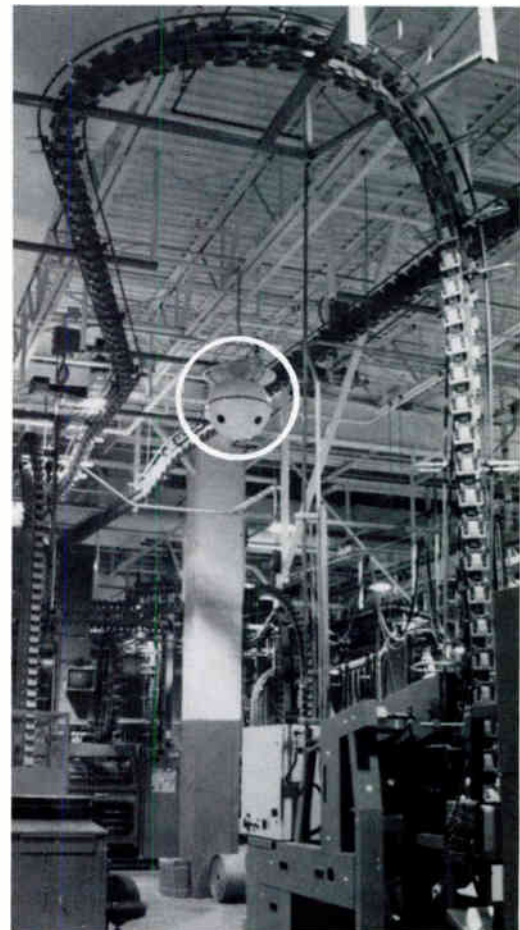
The installer, Bernie Lory has also put two Soundsphere #2212-2 speakers in the stacker area to improve the efficiency of that portion of the operation. He is planning to use more Soundsphere loudspeakers at this site to solve other operational problems.

Write or call direct for further information.

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Shea Stadium Plays Host to Altec

Every April, New York's Shea Stadium plays host to a rag tag bunch of supposedly major league caliber ballplayers known as the Mets. But in this year where there seems to be a distinct lack of "Mets Magic," the New York area a-v community came out in full force to generate more excitement than the old ball park has seen in the early part of the season.

Altec Lansing contractors Advance Sound of Bayshore, New York and Norcon Communications of Inwood, New York jointly held the April 30th seminar at

Altec contractors do not trust consultants and will attempt to redesign their systems.

Merrey also pointed out his belief that lack of communication between the manufacturer, contractor and specifier is the main reason why many sound systems don't work.

Altec products presented during the seminar included its paging technology known as the Announcement Management System, an automatic mic mixer, the 9864 speaker system, and software packages AcoustaEQ, AcoustaCADD and Acousta-



New York's Shea Stadium.

Shea's Diamond Club. Several Altec Lansing products, along with the Hughes Voice Intelligibility Processor and AmPro Esprit Video Projectors were highlighted in the day-long session.

One of the highlights was a speech given by Altec president F. Davis Merrey, Jr. that outlined the company's philosophy while attempting to debunk a number of "myths." Entitled "Industry Mythology vs. Altec Philosophy," the speech was delivered in response to ideas circulating through the industry that include the belief that the industry doesn't need consultants, that Altec is slow to adopt new ideas because "they invented everything 25 years ago," that limited distribution of its products make it difficult for consultants to get competitive quotes for their clients, and that

QWIK. Presenters included: Altec Lansing's Tracy Cranton, David Schultz, and Akira Machimaru; AmPro's Richard Sanford; and Stage II Productions' Jim Hammond who outlined Altec's AcoustaEQ which was actually developed for Altec by Crown's Techron Division.

The culmination of the day was a tour of the a/v system in Shea Stadium given by Norcon Communications President Steve Schlaff and Advance Sound Company's Joel Mele. New York's a/v luminaries along with technicians from the New York Transit Authority were seen traipsing around the same warning track that has seen the likes of Willie Mays and Darryl Strawberry...in an exceedingly more graceful state than the Mets of today.

-Steve Jacobs

Thingey Comes Out of the U.K.

Maris J. Ensing has formed Maris Ensing Ltd in Kent in the United Kingdom. The former Electrosonic software development manager is specializing in time code and AV/lighting control equipment. The Thingey is a line of time code readers/generators in a hand held format of in a 1U high 19-inch rackmount configuration. The portable Basic Thingey is for an engineer and reads and generates SMPTE, EBU and Film time code, and has a built-in loudspeaker allowing the user to listen to the incoming audio. The type of time code received is shown on the two-line LCD. Other models include the Super Thingey and the Ultimate Thingey.

REP NEWS

Future and New Times Merge

John Caporale, president of Future Sales, Inc. of Washington, and Bill Mitchell, owner of New Times Marketing of Oregon, have announced the merger of their companies. Both companies are manufacturers representative firms servicing all aspects of the professional music, sound, audio visual and lighting industries in the Pacific Northwest as well as Alaska and Hawaii. The home office number is 206-788-0766 and is located near Seattle, Washington. Bill Mitchell is located at Future Sales' Oregon office in the Portland area and can be reached at 503-692-1719.

Telecall Honors Reps

At Telecall America's national sales meeting, the following sales reps were honored for their work in 1992: Bencsik Associates, Inc. for Rep of the Year and Largest Percent Increase Over 1991; Kodo Associates Inc. for Most Inspirational Rep; Charles Kirmuss and Associates for Best Customer Service Rep; and G.

Andrew Wright of Bencsik Associates, Inc. for Salesman of the Year.

ERA Elects Officers

New officers have been elected to two-year terms at the Electronics Representatives Association. ERA's new chairman of the board is W. David McCoy, president of Cartwright & Bean in Norcross, Georgia. He is the association's immediate past president. The new president is Timothy H. Eyerman, CPMR, vice president of CEtech Electronics Corp., Potomac, Maryland. The four ERA members elected to the association's four senior vice presidencies are: senior vice president/fiscal and legal - Glenn R. Alverson, president of Hilltronics, Inc., Royal Oak, Michigan; senior vice president/industry, principal and government relations - Jess Harper, CPMR, president of EPM Corporation, Margate, Florida; senior vice president/education - Clark Moulthrop, CPMR, president of Moulthrop Sales, Inc., Pleasanton, California; and senior vice president/membership is Roger W. Ponto, president of Roger Ponto Associates, Inc., Kirkland, Washington. Raymond J. Hall is Executive Vice President and CEO and the seventh member of the ERA Executive Committee.

Diethert to Hall Of Fame

Russell F. Diethert, co-owner of LTD Technologies, Inc. in Itasca, Illinois, and a 30-year veteran as a manufacturers' representative in the electronics industry, has been elected to the Hall of Fame of the Electronics Representatives Association. He is the 18th ERA member to be named to the Hall of Fame since the award's establishment in 1969. Diethert is a former ERA national president and chairman of the board.

New England Technical to EAW

Eastern Acoustic Works has

The screenshot displays the IQ Turbo software interface. At the top, there's a frequency response graph with a logarithmic scale from 31.5 to 12.5k Hz. Below it, a control panel includes a 'DSPI' button, 'HI-PASS' filter, and 'OUTPUT' level controls. A central 'Add Module' dialog box is open, listing options: Text, Button, Pot, Bar Meter (selected), LED, Graphic Display, and Container. To the right, two vertical sliders labeled 'MASTER WEST' and 'MASTER EAST' are visible. The interface also shows 'MPX' and 'CT-400' channel strips, and various status indicators like 'All On' and 'All Off'.

Choose a fully functional, pre-configured GDM (Graphic Display Module) for any IQ System component.

IQ Turbo more than doubles the speed of previous releases. Plus, it's high-speed network compatible.

Multi-Link lets you sort and group amplifier channels according to your criteria.

Dynamic objects let you decide how to control any feature of any component.

Build detailed representations of any device with fully functional monitoring and control features.

HOW TO BOOST YOUR IQ.

(And have fun doing it!)

Introducing Turbo 1.0, the new high-speed control software for Crown's IQ System. It's fast—more than twice the speed of previous releases. And now, it's the easiest, most user-friendly software ever developed for controlling an audio system.

IQ Turbo is designed to give you exactly what you want in your system because you design the interface you want. Using simple tools, you can create anything from a simple on/off button in your choice of colors to a

full-color screen with fully functional representations of every system component.

Equally at home in a small church system or a touring rock extravaganza, Turbo lets you monitor and control every feature of every component in real time. And with outstanding new capabilities such as Multi-Link™, you have even more options in managing your system. Plus, IQ Turbo is designed for compatibility with current and future

high-speed networking options.

Best of all, the power of Turbo software is so easily configured that it actually becomes fun!

For more information on IQ Turbo or other Crown IQ System software and components, call us toll-free: 1-800-535-6289.

 **CROWN**
Guaranteed Excellence

Join the growing list of top manufacturers with IQ-compatible equipment. Crown's IQ System is now open for licensing agreements.

Circle 209 on Reader Response Card

selected New England Technical Associates to represent EAW professional loudspeaker systems throughout New England. EAW vice president of sales Frank Loyko commented, "Tony Cafiero has built New England Technical Associates into a strong service-oriented organization. We expect to form a powerful working relationship, one that will help acoustical consultants, sound contractors and touring sound rental companies." New England Technical Associates is based at 27 Mansion Street, New Haven CT 06512.

Ron Tunks Sales Appoints Baxter

Ron Tunks Sales, Inc. has appointed Steve Baxter as Pro Sound Representative for the metro-Atlanta market and sur-

rounding areas. Baxter brings to the firm 15 years of experience as a Yamaha Professional Audio representative. Ron Tunks Sales is headquartered in Tamarac, Florida.

Derek Allen Rep of the Year

Derek Allen and Associates was named Symetrix National Rep Firm of 1992. The company handles the Symetrix product lines for the Arizona, southern California, Hawaii, and northern Nevada territories. Sales increased over 300 percent in these territories.

Atlas Names Ponto Rep of the Year

Roger Ponto Associates, Inc. of Kirkland, Washington, has been named 1992 Representative of the Year for Atlas/Soundolier.

Roger Ponto, the agency president, has represented Atlas/Soundolier in Alaska, western Idaho, western Montana, Oregon, and Washington since 1981. As stated by Atlas, "The firm offers broad-based sales and marketing services to customers in the commercial sound, music, security, system install, access control, and pro audio industries."

Other awards were presented by Atlas/Soundolier to J.R. Morgan Agency of Phoenix; Pier Associates, Inc. of Needham, Massachusetts, Southeastern Communications of Atlanta, Avcom, Inc. of North Olmsted, Ohio. Rebel Audio of Canterbury, NSW, Australia, was named International Representative of the Year.

EAW Rep in Florida

Eastern Acoustic Works has appointed W3 Marketing to represent its professional loudspeaker systems in Florida. Frank Loyko, EAW Vice President of Sales, said, "Wayne Wyche has built the kind of strong professional organization we look for in our representatives. His staff has through knowledge of sound contracting, acoustical consulting and touring sound rentals." W3 Marketing is headquartered in Stone Mountain, Georgia. Douglas Lowe is the company's Florida representative. Offices are located in Tampa and in Miami.

Samurai for AudioTechnica Rep of the Year

Audio-Technica's Samurai Award for rep of the year has been presented to Tim Chamberlain, president of Ark Productions and Marketing. The announcement was made by Garry Elliott, national sales manager of Audio-Technical Professional Division. Located in Elmira, New York, Ark was appointed the territory representative less than two years ago.

IFS Reps Appointed

International Fiber Systems has

announced the appointment of manufacturers representatives: Commercial Video Representatives of Baltimore covering Maryland, Virginia and DC; Secure Rep of Dallas, covering Texas, Arkansas and Oklahoma; and C.T. Carlberg & Associates for Arizona.

Soundstream Names Reps

Soundstream Technologies has announced new representatives for its line of home theater and whole house A/V distribution systems: Audio Marketing Associates for Indiana, Kentucky, Ohio, West Virginia, West Pennsylvania. Westworld Marketing for southern California, southern Nevada. ST Marketing for northern Illinois, Wisconsin, Minneapolis/St. Paul. Audio Plus for the Rockies, Arizona, New Mexico, and El Paso. Meyer Marketing for Florida and Puerto Rico.

American Dynamics Covers Canada and U.K.

American Dynamics has appointed two sales representatives to handle sales of the company's CCTV products in Canada and the United Kingdom. In Canada: Access Direct Marketing of Orleans, Ontario. In the United Kingdom: Tavcom Ltd., Parklands Forest Road, Denmead, Hants UK.

KRK at Hollywood Digital

KRK Monitoring Systems has completed a custom installation featuring more than 40 monitors at Hollywood Digital, the video production facility. The system, housed in Hollywood Digital's ten edit bays and five audio rooms, features three pairs of 15A5 main monitors, six KX3A pure class A all-discrete active crossovers, 13 pairs of the Model 9000 close field monitors, and 14 custom pairs of the compact Model 7000 close field monitors.

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MICRO STATION

(Continued from page 58)

attached to any graphics element. In addition, the active row can be edited filtered, or modified before or after attachment to a drawing element, thus allowing for a completely interactive form of interface. Placement commands can be set to either utilize an existing record or append the database with the newly attached record.

Database information can be attached in a number of formats, allowing for nested attachment to a drawing element, the display of attribute data in the drawing, or both. Once an element has been attached to a database entity, it can be graphically selected through the use of the "select database attribute graphically" command tool. By selecting the drawing element, this will bring up the SQL-query window containing the currently attached database row. Pretty nifty. The completely active nature of the interface allows for the development of highly sophisticated DBMS front ends for user specific application.

As a result, it is no wonder that MicroStation is in such wide use in IGDS and civil engineering firms. Existent through the entire process is a constantly updated database file directly linked to the drawing. In addition, and another really nifty feature, is the ability to edit the database off-line and, with a single command, update the entire contents of the drawing file to reflect the newly updated database file. All in all, this amounts to a very powerful tool for data manipulation, facilities planning or job costing that remains constantly tied to the development of the drawing (and vice versa).

EPILOGUE

This short review will provide our readers with an initial, albeit cursory overview of some of MicroStation's capacities. The application proved to be an efficient and well developed tool, capable of any two or three dimensional vector-based drafting project. In fact, it may well exceed the needs of many systems designer, as does AutoCad, if all that is required is simple drafting abilities. However, if your needs often exceed the simple drafting project with requirements fitting a full featured package, Microstation deserves a careful consideration.

Test Specifics:

System Components:

AMI III 486/66 DX2 EISA/VL Motherboard
20 Mb of system DRAM
256Kb Cache SRAM
#9 Computer GXI/TC Tiga co-processed Graphics Adapter
ATI's Graphics Ultra co-processed 8514 compliant Graphics Adapter on the VL Bus
Mitsubishi Diamond Pro 17" Display (Primary MicroStation display, secondary acad display)
Hitachi Super Scan 20" Display (Secondary MicroStation display, primary acad display)
AMI Fast — F SCSI Disk Controller w/4Mb DRAM
340 Mb Conner 3340 SCSI II
Number Nine Power Pac Display List Driver for AutoCad ADI ver 4.2

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PRODUCTS

Turbo Software; Community's Leviathan

By Steve Jacobs



Crown Goes Turbo

Crown has introduced its Crown IQ Turbo 1.0 software. Designed for use with the Crown IQ computer control system, IQ Turbo software provides realtime monitoring and instant control of every audio system facet through algorithms.

It allows the user to decide what level of complexity to work with, from construction of an on/off switch to the building of a multiple component screen in full color. For example, power amplifiers can be constructed on the computer screen to show controls and monitoring devices found on the actual unit.

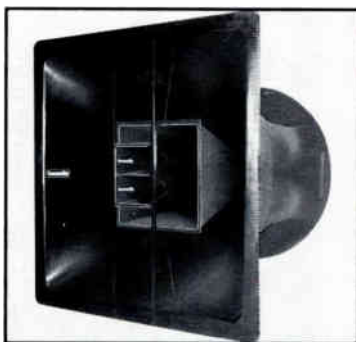
IQ Turbo also offers Multi-Link, which allows the linking of multiple power amplifiers together where they can be sorted or grouped by any desired control criteria. In addition, CR Com, IQ Turbo's communications module, is compatible with current and future high-speed network operations. Finally, IQ Turbo provides additional features when used as a standalone software package when used with IQ Sys-Config software.

Circle 1 on Reader Response Card

Steve Jacobs is the Associate Editor of Sound & Communications magazine.

Community's Leviathan

The Leviathan II M4 Tri-Axial loudspeaker system from Com-



munity is a horn-loaded, signal-aligned Wavefront Coherent tri-axial device. Designed by Community president Bruce Howze, the Leviathan II is designed to solve acoustical problems associated with large environments.

At the low end, six 15-inch ferrofluid-cooled low frequency drivers are coupled to a fiberglass horn measuring 84 inches from front to back and equipped with a mouth measuring 72 inches high by 72 inches wide.

Power handling is rated at 1200 watts continuous program/2400 watts program, its sensitivity at 1 watt/1 meter is 108 dB (50 Hz-250 Hz noise), while maximum continuous level is 136 dB. Mid-range performance is offered by

the M4 compression driver. The coaxially combined high frequency and midband sections of the Leviathan II are concentrically mounted within the mouth of the bass horn.

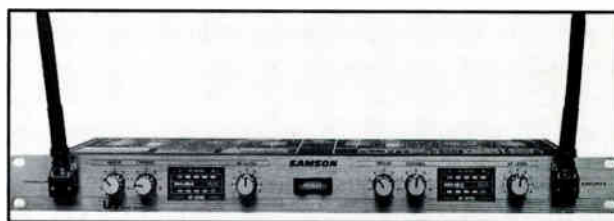
Circle 2 on Reader Response Card

installation venue, either independently or in user-defined groups.

Circle 4 on Reader Response Card

UREI's Platform Series

UREI has introduced a modular line of signal processing units.



Samson Flagship

Samson has a new flagship model - the UHF Synth Series. This multi-channel system features an RF level display on the front panel for selecting the clearest frequency in crowded environments.

Other features include new circuitry and dbx Noise Reduction. The Synth Series is available in single and dual receiver True Diversity formats.

Circle 3 on Reader Response Card

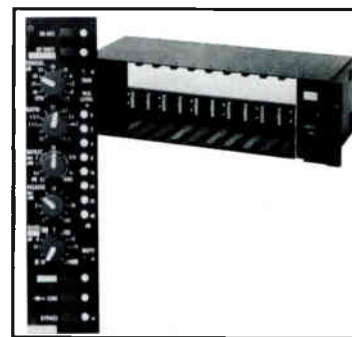
BSS Remote Control

BSS Audio has introduced its FPC-900 Varicurve Equalizer Analyzer Controller. The unit is a portable, wireless remote controller that offers calibration and control of distributed array sound systems.

The FPC-900 allows the user to control a network of up to 16 FCS-926/920 Dual Varicurve units from anywhere in an arena, stadium or

Dubbed Platform, the line includes a series of signal chain electronics cards that for signal quality, flexibility, compact size and remote control capabilities.

Features include a bus that allows summing and intermod-



ule communications. Communication between modules is coordinated by a single computer module that can be programmed to recall 100 memory settings of primary functions.

Circle 5 on Reader Response Card





Multimedia LCD Monitor

Sharp Electronics Corporation has unveiled a 16-million color computer-video monitor. The QD-100MM features a true-color display with full-motion capabilities and is compatible with PC and video systems. The monitor uses Sharp's 640 x 480 dot 10.4-inch thin film transistor color LCD with an active matrix drive system.

Circle 6 on Reader Response Card

An Allen & Heath Debut

Allen & Heath has introduced the GS3V; a VCA-automated version of the GS3. The layout is based on the original GS3 studio console and integrates a fader automation system. Additionally, some Allen & Heath "features for engineers" have been added including Programmable Function Keys.

The major feature of the GS3V is its internal computer. It offers true frame resolution on fader moves down to bit resolution on mute events. It can be driven from any MIDI source and is its own sequencer.

Circle 7 on Reader Response Card

Klark Teknik Goes Graphic

Klark Teknik has introduced the DN3600, a programmable graphic equalizer that is digitally controlled. The unit includes two special function keys that allow the user to alternate between an EQ curve, relative fader position



for channel A or B, or a combination of both.

In the stereo mode, the two channels can be linked together to provide identical curves to two signal paths from one set of fader controls. In dual mode, these can be adjusted independently.

Circle 8 on Reader Response Card

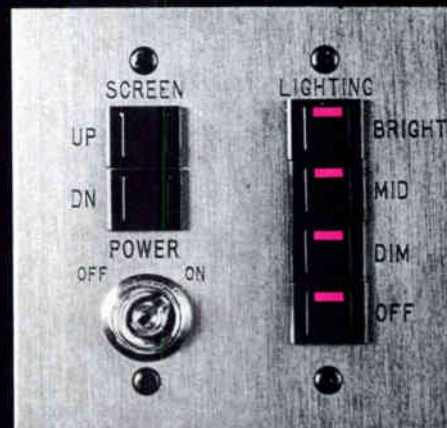


AKG Live

AKG has introduced two condenser microphones for live performance. Part of the Tri-Power series, the C5900 handheld vocal mic and C5600 large diaphragm mic combines condenser technology with ruggedness for stage environments.

The C5900 vocal mic features AKG's TPC-I condenser system designed for smooth off-axis response, hypercardioid pick-up pattern for high output before feedback and three switch-selectable bass contour curves. The C5600 features the large diaphragm TPC II condenser system

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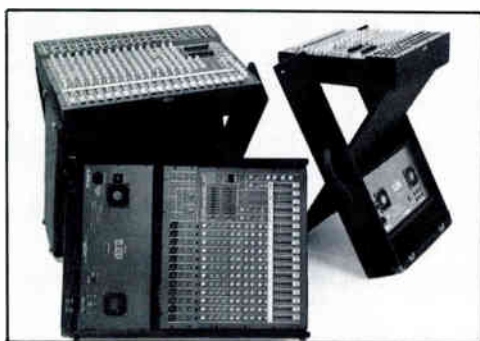
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to provide accurate re-production of complex vocal instrument waveforms at high SPLs.

Both models feature shock isolation provided by the AKG InterSpider suspension that takes the external spider-cage shock mount assembly used in recording studios and puts it into the microphone.

Circle 9 on Reader Response Card

Fender Mixers

Fender Electronics has introduced its PX Series of powered mixers, available in eight (PX-

2208D), 12 (PX-2212D and 16 (PX-2216D) input channel units. The PX Series combines a mixing stereo console with a built-in digital reverb, a dual nine-band graphic equalizer and two power amplifiers. (The PX-2208 substitutes spring reverb.)

The PX-2208 and PX-2208D include a two-channel 150 watt into four ohm power amplifier. The PX-2212D and PX-2216D include a two-channel 250 watts per channel into four ohm amplifier.

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EAW Expands JF Line

EAW has expanded its JF Series of high definition ultra-compact systems. The JF260 and JF560 use a two-inch exit compression driver coupled to a 60 degree constant coverage horn. The JF260's 12-inch cone and the JF560's 15-inch woofer have been developed for these systems.

Also new is the JF100i. The model produces 124 dB SPL from a 10-inch vented woofer and 1-inch compression driver, mounted on EAW proprietary WGP waveguide, in a 19.125-inch x 11.75-inch x 11.75-inch box.

Circle 11 on Reader Response Card

frequencies below 140 Hz, a triple 12-inch subwoofer enclosure, the CPA 12.3, is available.

Circle 12 on Reader Response Card

Shure Wireless

Shure Brothers Incorporated has made available its EC Series Wireless Systems. Available in six different lavalier and handheld configurations, EC Series Wireless Systems are designed to meet the RF standards of Germany and the United States, yet are available globally. EC series transmitters and receivers feature a digitally-controlled, frequency-synthesized design. The transmit-



Tannoy's Super Dual

Tannoy has introduced its Ultra-High Power capacity Dual Concentric loudspeaker system. The CPA 10S, a member of the

ters also feature Shure's Power-Gain antenna for radiated power.

The EC4 Diversity Receiver uses Shure's MARCAD technology that combines the signals from both receiver sections rather than switching between the two.

Circle 13 on Reader Response Card



Super Dual family of products, is a wide dispersion constant directivity 10-inch transducer with a 44 pound structure. Housed in a compact 10-degree trapezoidal space frame enclosure, using energy braced DMT construction, the CPA 10S is capable of 131 dB SPL from 140 Hz-22 kHz. For fre-



Prideaux at Tannoy; Numark Appointments

Prideaux is President; Calma Promoted

TGI North America, distributor of Bruel & Kjaer professional microphones and all Tannoy products for North America, has appointed Bob Prideaux its president. Prideaux is assuming the responsibilities of former Managing Director Wib Heckroth. Heckroth is now Chairman of the Board for TGI.

Prideaux has been working in the audio industry for 25 years. In 1978 he co-founded Crest Audio. In 1982 he created Pro Tech Marketing in southern California.

In addition, Bill Calma, former Sales & Marketing Director for the Professional Audio Division, was promoted to Vice President of Sales and Marketing for all product lines, both consumer and professional.

Numark Appoints Seiden and McGeachin

Numark Industries has appointed Barry Seiden to the position of National Sales Manager



Seiden

Barry Seiden has also held the position of National Sales Manager of Gemini Sound Products. He is active in industry organizations and has had extensive experience in retail audio and electronic sales. He also was Sales Manager of the origi-



McGeachin

nal Numark Electronics, where he supervised sales of the company's line.

Nick McGeachin had been European Sales Manager under the former Numark ownership, and was most recently Director of Export Sales for Apogee Sound. His position encompasses responsibilities for worldwide distribution of Numark products.

Rockwell Joins Community

Todd Rockwell has joined Community Professional Sound Systems as its engineering and marketing liaison. In this capacity Rockwell is serving as a link between the resources at Community's headquarters and consultants across the nation.

Rockwell comes to Community following a six-year stint with Electro-Voice and Mark IV Cinema where he held several positions. He received a Bachelor's of Science degree in Electrical Engineering in 1987 from Michigan Technical University.

Pioneer Promotes

Pioneer New Media Technologies, Inc. has announced several promotions in the Business Systems Division. David M. Nicholas, formerly vice president, was named senior vice president of the division. Paul Dempsey, formerly sales engineering manager and director of marketing and technology, has been named vice president of marketing and technology. Robert Bennett, hired as corporate manager of purchasing in October 1986, is now manager of sales.

Kowalczyk at Kurzweil

Thomas Kowalczyk has been appointed district sales manager for Kurzweil professional products. Kowalczyk oversees dealer sales and distribution throughout California.

Kowalczyk has extensive experience in musical product sales. For the past three years, as director of musical development for Young Chang America he supervised all music product shows on the west coast. He has also served as district sales manager for



Kowalczyk

Kurzweil Music Systems' Northeast territory. Previously, Kowalczyk served as district manager for the Yamaha Music Corporation in San Francisco.

Chrysler Chairman Joins Odetics Board

Odetics has announced that Paul E. Wright, chairman of Chrysler Technologies Corporation of Arlington, Va., has joined the Odetics board of directors.

Wright has served as chairman of Chrysler Technologies Corp. since 1988. In addition, he was president and chief operating officer of Fairchild Industries, Inc. from 1986 to 1988. Prior to joining Fairchild, he spent 28 years with RCA Corporation.

CALENDAR

Upcoming Events

JUNE

Consumer Electronics Show: Chicago, Illinois. Contact: (202) 457-4919. June 2-4.

Personal Communications and Computing Show: Chicago, Illinois. Contact: (202) 457-4919. June 3-6.

ShowTech '93: Berlin, Germany. Contact: 030/3038-0. June 8-10.

International Teleconferencing Association (ITCA): Washington, D.C. Contact: (202) 833-2549. June 14-17.

REPLItech International: Santa Clara/San Jose, California. Contact: (914) 328-9157. June 15-17.

Enterprise '93: Boston, Massachusetts. Contact: (508) 879-6700. June 16-18.

JULY

Image World: Dallas, Texas. Contact: (800) 800-6474. July 12-16.

AUGUST

Shure Applied Business telecommunications, BASIC Seminars '93: Denver, Colorado. Contact: (303) 987-2000. August 4-6.

International DJ Expo: Los Angeles, California. Contact: (516) 767-2500. August 23-26.

International Security Conference & Exposition: New York, New York. Contact: (708) 299-9311. August 31-September 2.

SEPTEMBER

CEDIA: Dallas, Texas. Contact: (800) CEDIA-30. September 8-11.

AEI Business Music Conference: Seattle, Washington. Contact: (800) 345-5000. September 24-26.

DSP World Expo: San Francisco, California. Contact: (617) 964-3817. September 28-October 1.

OCTOBER

Image World: New York, New York. Contact: (800) 800-5474. October 4-8.

Audio Engineering Society: New York, New York. Contact: (212) 661-2355. October 7-10.

Media Summit '93: New York, New York. Contact: (203) 352-8316. October 19-21.

NOVEMBER

TeleCon XIII: San Jose, California. Contact: (800) 829-3400. November 8-10.

DECEMBER

Image World: Orlando, Florida. Contact: (800) 800-5474. December 6-10.

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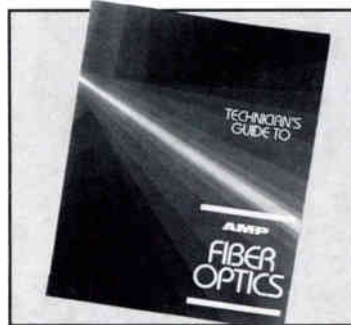
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or FAX (516) 767-9335

LITERATURE

Fiber Optics; Accessories

Fiber Optics Guide

The Technician's Guide to Fiber Optics is featured in Jensen Tools' 1993 Master Catalog. The guide is written by Donald J.



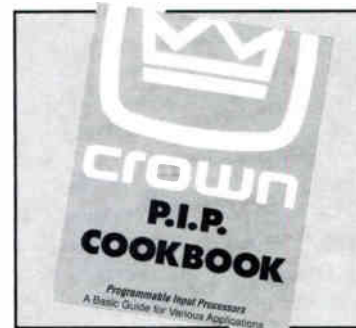
Sterling Jr., and is designed to be an aid for those who install and maintain fiberoptic systems. Intended as an introductory course for those already familiar with basic electronic and digital concepts, it also serves as a reference for the trained technician or as a beginner's course for the uninitiated.

Circle 14 on Reader Response Card

A/V Accessories Catalog

Switchcraft has released a 16-page audio and video component catalog. The four-color AVP-3 catalog features the company's products including jacks, plugs, connectors, patch panels and cords. Product photographs, dimensions, specifications, ordering and mating information is included.

Circle 15 on Reader Response Card



P.I.P. Cookbook

Crown has made the "P.I.P. Cookbook" available. The guide is 16 pages long and details the company's P.I.P. (Programmable Input Processor) modules. P.I.P. modules attach to the back of any P.I.P.-compatible Crown power amplifier and provide a number of functions.

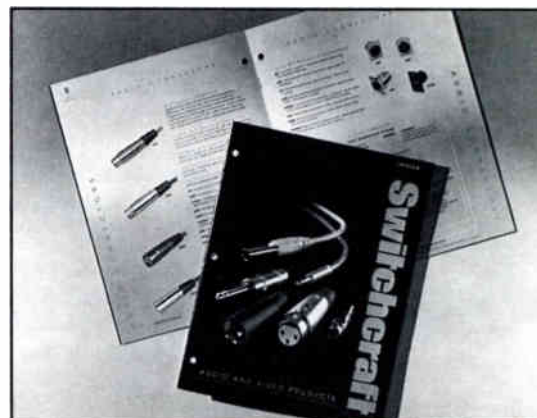
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DOD and DigiTech Brochures

DOD and DigiTech have introduced four color brochures to complement the introduction of several products and update existing literature.

The TSR-24's six-page brochure introduces S-DISC processing for digital reverb and effects. Another six pager details DigiTech's line of signal processors. Vocal harmony processors are highlighted in a four-page brochure introducing Vocalist models for live and studio applications. And DOD's FX series is featured in a four-page updated brochure.

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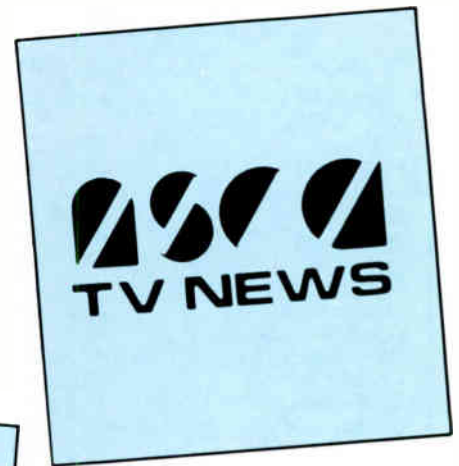


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SURVEY METHODOLOGY

1. The sampling pool for the survey consists of sound and communications contractors from Sound & Communications' subscription list. Only contractors within the United States and Canada are called.
2. In a telephone survey, contractors/installers selected at random are asked to identify what brand they used for various products in installations completed in the past six months and those in progress. A different type of installation is highlighted each month.
3. On completion of the survey, results are tabulated and the product brands are ranked on a scale from one to three, with number one having the most votes. Separate rankings are made for installations occurring in the past six months and for those in progress.
4. An asterisk (*) denotes a tie for that ranking.

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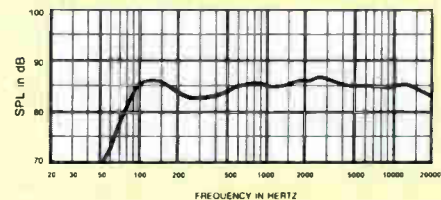
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- **Rugged, weather-resistant, paintable, polystyrene cabinet**
- **4-ohm version and built-in 70-volt transformer version with screwdriver-selectable taps**

Electro-Voice S-40 compact speakers handle 160 watts of long-term power per EIA standard RS-426A. Both high-frequency and low-frequency driver protection is provided by EV's exclusive PRO™ circuits. The S-40T incorporates a 70/100-volt, built-in transformer that handles 30 watts. It also has a weather-resistant, covered barrier-strip connector with a grommetted cable exit.

The cabinet, available in both black and white, offers mounting ease with optional mounting bracket or Omni-Mount™ Systems Series 25. Low magnetic leakage makes the S-40 ideal for use near video monitors without interference.



Screwdriver selectable taps on 70-volt version



■ The smoothest response in the industry

The Electro-Voice S-40 Speaker — the industry's best value in terms of size, versatility and performance.



Electro-Voice®
o MARK IV company

Electro-Voice, Inc. 600 Cecil St. Buchanan, MI 49107 616-695-6831 Mark IV Audio Canada, Inc. P.O. Box 520 Gananoque ON K7G2V1 613-382-2141

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