

SOUND

COMMUNICATIONS

Volume 37 Number 6

June 25, 1991

NSCA EXPO '91

Record setting attendance, record square footage, more educational meetings than ever made the Cincinnati site a success — for the annual convention of the National Sound and Communications Association. More new product introductions along with new companies and new agreement among companies made this show pivotal for the industry. **22**



IN THIS ISSUE

• Question of the Month — Computer Control

As computer control proliferates questions of standardization and compatibility are of prime concern. Manufacturers respond to our question of the month. **12**

• DJ Expo

A new convention in a reborn market has its second showing, becoming the venue for club installers and equipment makers to network, learn and introduce new products. **47**

• A Consultant's Office and Lab

A growing consulting firm moves into what was the world's first digital multitrack studio. **50**

THE OFFICE OF THE FUTURE

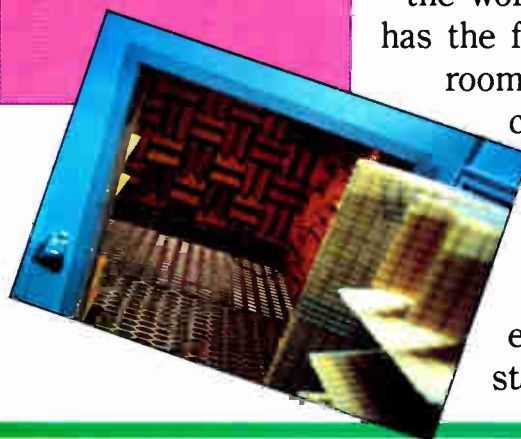
New England Telephone brought the future to today's workplace with control rooms, presentation rooms and all around systems that fit the company's image with image and control products on the cutting edge. The focal point is the Network Operations Center Command Center, which puts "the workstation on the wall" and has the feel of a World War II war room but has the latest in A/V control. From touch screen displays to intelligibility Browse & Associates and H.B. Communications spent a lot of money and energy to facilitate the first stage of this project. **38**

TOPANGA
21000 W HINFIELD RD
CA 90290
MARK GANDER
SEAR SCUNDER
COMMUNICATION
STOP
902
3-DIGIT
065C
0211U45A
00649
00649
00017872
1090



OFFICE OF

How are contractors faring in a down building market? Where's the work coming from? Who's getting which jobs? And how are we all coping with the new economic reality? Our reporter talked to several major contractors to find out their opinions. **30**



We've added a whole new twist to our LM microphones.

Crown introduces a new low-profile addition to our series of lectern microphones, the LM-300. Like our other lectern microphones, the LM-300 is aesthetically pleasing and unobtrusive.



A low frequency roll-off switch reduces low-frequency rumble.

It's built for years of trouble-free use. It installs quickly and easily. And, like our other LM mics, it gives you beautiful, natural sound with superior gain-before-feedback. But there's a twist.

Literally.

The new LM-300 adds a noiseless gooseneck section for more flexible microphone positioning. Now, you can place the microphone exactly where you want

A noiseless gooseneck improves the positioning capabilities of the LM-300.

it without worrying where it might wander off to.

But we didn't stop there.

Along with the new gooseneck, we've provided additional mounting options: a standard 3-pin XLR panel connector, or the accessory *lockable* shock mount for reduced mechanical noise and theft prevention. We've also improved the already excellent characteristics of the microphone element. You'll enjoy smooth, wide-range frequency response, better control of ambience and

higher output. A new low-frequency roll-off switch helps reduce low-frequency rumble and "P-popping". Couple this with superior RF suppression and 12-48V phantom powering and you'll find the LM series

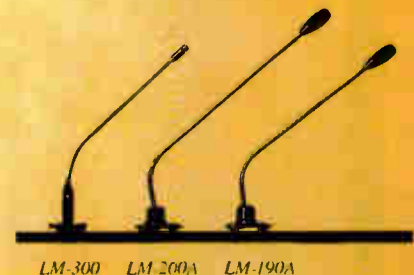


Optional lockable shock mount for the LM-300 reduces mechanical noise.

perfect for all your lectern mic-ing problems.

Like all Crown microphones, the LM series carries a full three-year unconditional warranty against malfunction with a lifetime warranty on the acoustic system.

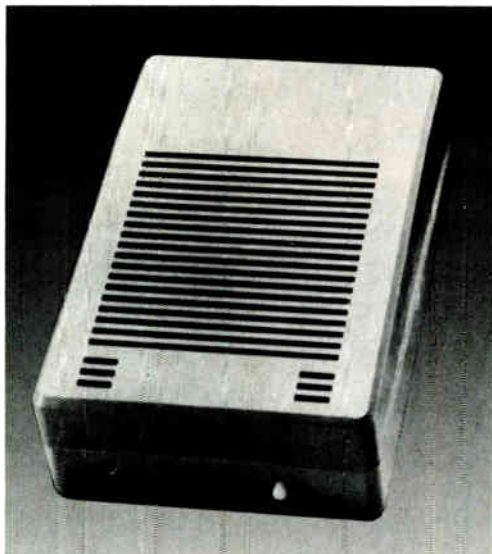
For more information on our complete line of microphones, see your Crown dealer or call toll-free: 1-800-535-6289.



CROWN
Guaranteed Excellence

Made in U.S.A. Exported by Amcron
P.O. Box 1000 • Elkhart, IN 46515-1000

* See your Crown dealer for full warranty details.



Conversation Piece.

It's the "talk back" voice paging technology everyone is talking about.

If your customers' talk back paging system isn't from Wheelock, they might as well be talking to themselves.

Because Wheelock's amplified talk back systems can give them the kind of performance that's unheard of in two-way telephone-to-speaker communication.

Wherever a telephone is inaccessible or people must respond hands free, a quality talk back system is a must—whether it's for a computer room, laboratory, factory, warehouse, loading dock, auto service center, or hospital operating, exam, x-ray and nursery room.

Featuring an omni-directional microphone and a pre-amplifier for talk back, Wheelock's TBH-104 and TBM-101 speak well for your customers—providing fast, noiseless operation, no word clipping and superior talk back distances, direction and intelligibility. The TBM-101 has a 4" speaker and 1W amplifier for paging, while the TBH-104 has a 4W amplifier and one or two remote horns for paging. Both provide

separate talk back and paging volume controls, as well as a privacy LED.

And Wheelock paging products not only make great conversation, but they offer a wide variety of paging applications, all types of telephone access, zone paging, background music and tone alerting.

Whether it's a 70V central amplifier system or a 24 VDC amplified speaker system... when you choose Wheelock, you've made the right choice. With highly experienced technical support engineers and knowledgeable customer service representatives as close as your phone.

To cash in on Wheelock's 60 years of experience in easy-to-sell, easy-to-install telephone system add-ons, call 800-631-2148. Or contact Wheelock, Inc., 273 Branchport Avenue, Long Branch, NJ 07740.

And let's talk.

wheelock INC.

CONTENTS

Volume 37 Number 6

June 25, 1991



47



50

FEATURES

22 NSCA '91: A REPORT FROM CINCINNATI

By Judith Morrison

Once again, the NSCA had a hit on its hands at the recently completed Expo '91. Attendance was up, educational sessions were more extensive and NSCA-TV News was on the air.

30 SOUND FACTORIES

By Malcolm Howard

As the recession has been hitting, contractors have had to explore outside their region for factory business, and have had to offer services to compete.

38 NEW ENGLAND TELEPHONE

By Daniel Kumin

How does one of the largest telephone companies manage a telecommunications network with millions of customers spread throughout a five-state region?

16 SALES & MARKETING: Soldiering in the Second Industrial Revolution

By David Lander

44 TRADE SHOWS: Trends at NAB

By Allan Varela

47 TRADE SHOWS: DJ Expo Draws Club Community

By Mike Klasco

THEORY AND APPLICATIONS: The Consultant's Own Office

By Steven J. Orfield

58 PEOPLE

60 NEWS FROM AROUND THE INDUSTRY

64 PRODUCTS

65 LITERATURE

67 MARKETPLACE

70 PRODUCT CHECK: Restaurants

DEPARTMENTS

6 LETTER FROM THE EDITOR

7 LETTERS TO THE EDITOR

9 NEWSLETTER

12 QUESTION OF THE MONTH: Computer Controlled Systems

SOUND
COMMUNICATIONS

Here it is in Black and White . . .



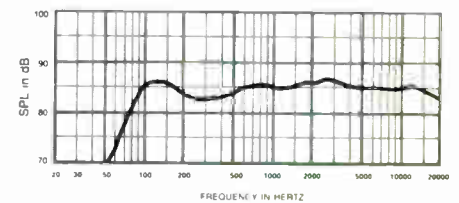
- **PRO™ circuit independent high-frequency and low-frequency speaker protection**
- **Threaded inserts for mounting ease**
- **Rugged, weather-resistant, paintable, polystyrene cabinet**
- **4-ohm version and built-in 70-volt transformer version with screwdriver-selectable taps**

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®
a MARK IV company

LETTER FROM THE EDITOR

How's Business? Where's the Data?

How's business? In the rough and tumble recessionary world of 1991, the answer isn't resounding — but it is a hearty "not bad" for many of our readers. And considering the state of some related industries, we have to view that consensus we're finding as a broad affirmation of the stability of the sound and communications business.

This month we surveyed the office and factory segment of the market, and we found contractors and consultants who were relying on their wits and their legs to keep things healthy in an unhealthy time. They're spreading their business, and spreading their territories in order to keep things balanced. You can read about it in "Sound Factories" in this issue. In keeping with our office theme, we went to the majors. And we feature, in this issue, one of the major office installations of the past few years — the New England Telephone headquarters in Massachusetts, which the company uses not only for practical reasons, but for a showplace for prospective clients. Dan Kumin visited the installation and talked to the pertinent players and gives us an inclusive look at the control rooms and presentation palaces therein.

And Steve Orfield writes about his own offices — finding the site, renovating, and apportioning space for his consultant needs.

Flexibility and innovation are sorely necessary in these less than perfect economic times. We saw, at the NSCA convention, more and more companies joining the sound and communications industry from their traditional nesting places which ranged from residential products to pro audio. That alone speaks of the strength of this business. And more people we run into are talking up the sound contracting business, including publications whose

heart lies elsewhere. That should give a measure of joy to those toiling out there in the field. When companies peripheral to this business start paying attention, the point has to be that this industry is doing better than most others.

We'll be giving you more information, and some hard data on the state of the market, next month in our annual Contractors' Survey. At the time of this writing, survey forms have been sent out to many of you (you're randomly selected; so if you haven't received a form, that's because the computer skipped over you in order to keep statistical validity). The completed forms have begun to come in, and our research house will be tabulating the responses so we can present the results to you. We look forward to your responses. And we thank those of you who are taking the time to fill out the four-page form. We know it's not easy; and you have little time. But there's so little data from which you can derive business direction, that we do this survey each year as a service, unlike other magazines who provide the data only to their advertisers. We hope that we help you. Thanks for *your* help.

When the editorial department of Sound & Communications calls anybody — consultants, contractors, manufacturers — the only thing we're selling is free communication within a communications industry. So keep in touch.

It's always good to talk to you.

Best regards,



Judith Morrison
Editor in Chief

SOUND COMMUNICATIONS

Publisher/Editorial Director
Vincent P. Testa

Editor-in-Chief
Judith Morrison

Technical Editor
Mike Klasco

Associate Editor
Steve Jacobs

Research Assistant
Russell Redman

Contributors

Malcolm Howard, Daniel Kumin, David Lander,
Steven J. Orfield, Allan Varela

Technical Council
Dr. Mort Altshuler

Professor Audiology, Hahneman 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

William Parry

Maryland Sound Industries, Inc.

Daniel Queen

Daniel Queen Associates

Jon Sank

Cross Country Consultants

Neil Shaw

Paul Veneklasen Associates

William R. Thornton

Phd, PE

Art Director

Joyce Dolce

Artists

Alicia Celli, Janice Pupelis,
Scott Schlemmer, Colleen Warenik

Production Manager

Michelle Montoya

Typography

Christina Buckley

Diane Catanzaro

Circulation Director

Arturo Lizarra

Classified Ad Manager

David Saraf

Traffic Manager

Ron Perone

Advertising Manager

John Carr

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



Sound & Communications • DJ Times • Post
Sound & Communications Blue Book
The Music & Sound Retailer • The Retailer Red Book
The Music & Sound Buyer's Guide
CES-TV News • NAB-TV News • NAMM-TV News
NSCA-TV News • CROSSTALK/AES-TV News

Baseball and In-Wall

Our stadium features in the March 22, 1991 issue generated a great deal of interest and some controversy, as shown below. In addition, our speaker features have been a source of comment.
— Editor

REMOTE CONTROL SYSTEM

Regarding your article, "Ball Park Solutions," Crown is the only company which is currently developing a remote control system, other than IED, who has more limited capabilities than we do. Crest and QSC, also mentioned in this article, are not delivering such a system.

Lumping all these amplifiers together in the article was not appropriate, since Crown worked very hard to develop this system and has a patent pending.

Clay Barclay
Product Development
Manager, IQ
Crown International, Inc.

The Crown IQ System was in fact given a good deal of coverage by consultants interviewed in the article. At the time of that writing, Crest and QSC had announced their plans, and consultants were in fact mentioning those brands to the writer, who so reported. There was no intent to denigrate Crown's contribution. (For another response, see the following.) — Editor

The days of a few solitary offerings of remote control systems for power amplifiers are over. Last year, in Sound & Communications' survey of power amplifiers we interviewed a half dozen firms that were developing these systems. In this month's "Question of the Month" quite a few companies responded that they will be introducing various types of remote systems, or at least amplifiers that will interface into remote systems.

IED pioneered computer-controlled systems and has established itself especial-

ly in large permanent facilities such as stadiums and arenas. I recently worked on an impressive installation using an IED controller on the cruise ship Crystal Harmony. IED's Tom Roseberry has led the AES effort to develop and define the PA422 standard.

Crown's IQ 2000 system has been successful both in concert sound reinforcement, including touring sound systems, as well as permanent installations. Just last month I took a look at Seattle's Kingdome which is having a Crown IQ 2000 system installed. The system is impressive.

Back in our August 1990 issue, in our amplifier survey we reported that Crest would be introducing their remote system. The delay in the introduction of Crest's NexSystem is due to Crown's patent pending mentioned by Clay Barclay. QSC also ran into this problem, but has already revised their system to conform to the 422 standard and will be introducing their package shortly.

Still more remote control systems are coming from another direction. In the March 1990 issue of Sound & Communications we reported on a number of fiber optic snakes that were under development. A few are finally being introduced.

Mary Gruszka "lumped" all these amplifier remote systems together because they represent an engineering trend that makes sense and will progressively attract more sound contractors and consultants in specifying them, as well as additional manufacturers to design and market them. At Sound & Communications we intend to cover these developments and expect to see ongoing coverage of this topic.

— Mike Klasco, Technical Editor

FLUSHMOUNT SPEAKERS

I read with interest your recent article on flush mount loudspeakers. We were disappointed that you were probably unaware of Video Link's line of in-wall speakers at the time you wrote the article but feel that you and your readers would be interested in many of the unique features of our in-wall speakers.

The Video Link line of in-wall speakers has been designed by some of the top transducer engineers in the business but provide the first truly successful marriage of infrared remote control technology and in-wall speakers. Video Link has long been a leader in multiroom remote control technology and has basic patents which are licensed to several major hardware makers. A unique feature of our speakers is the provision for mounting of our "Dinky Link" high-sensitivity infrared receiver into a recess provided in the baffle panel. This permits remote control operation of all of the IR-controllable equipment in the system without the need for a separate wall mounted or free standing infrared receiver — or for that matter, direct access to the equipment itself.

Herb Seymour
President
Xantech Corporation/Videolink

WHITE SOX WINNERS?

Thank you for the interesting article about the new sound and visual equipment at Comiskey Park (the new one, that is). However, John Parris Frantz made a very big mistake in the first paragraph. The White Sox have been far from "weak hitting" for a long time. In fact, the 1990 94-68 White Sox was a great hitting team. In the future, please edit out these mistakes before they get to press. The first paragraph of an article should be correct, so that the rest of the article isn't suspect for credibility. Is it possible that anything in this particular article is accurate?

Gerald Jefferson
Peoria, IL

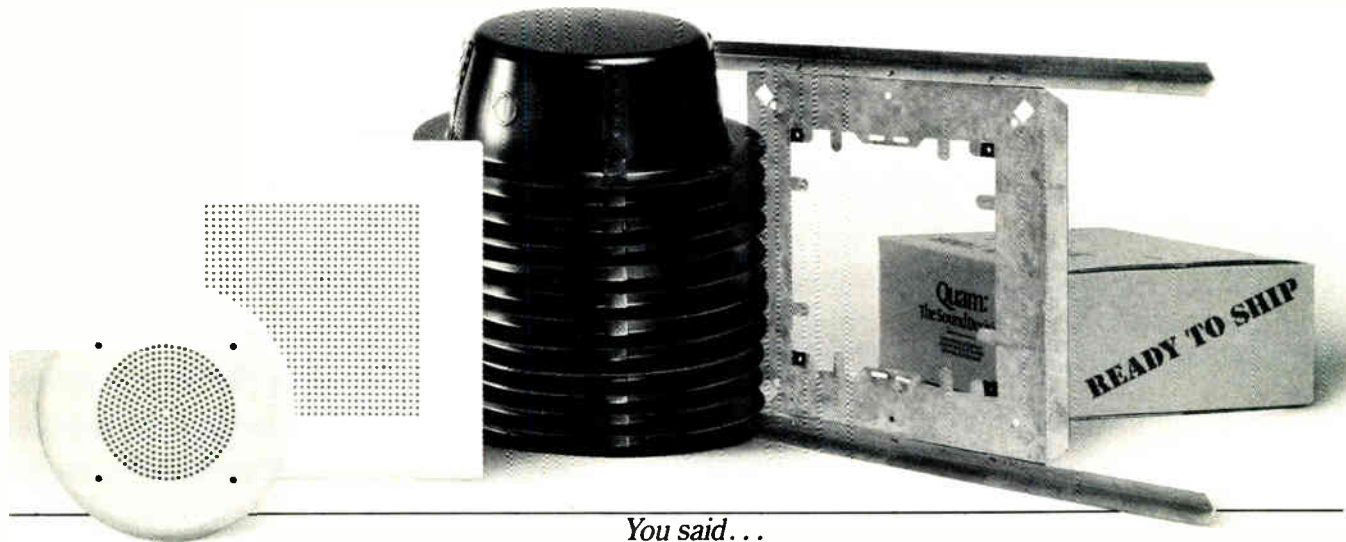
Thank you for your extremely insightful commentary. Unfortunately, our fact checking ability extends only to the realm of Sound & Communications issues. We have yet to hire a Baseball Editor but if you'd like, you can be the first. And besides, at press time the White Sox are in sixth place with a 22-24 record. So much for home field advantage.
— Editor

YOU KNOW US FOR SPEAKERS.



THE FACT IS, WE'RE LISTENERS.

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



You said . . .

"GIVE ME BAFFLES THAT REALLY LAST."

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

"BACKBOXES TAKE UP TOO MUCH SPACE."

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

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

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

"I NEED IT, WHEN I NEED IT."

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

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

Quam: The
Sound Decision
Since 1930

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

Circle 203 on Reader Response Card

NEWSLETTER

PROMOTIONS AT PELTON MARSH KINSELLA

Pelton Marsh Kinsella, Inc. has made the following executive changes: Gary T. Kinsella, P.E. has been appointed Chairman. He served as president of the firm from its inception in 1984. David E. Marsh has been promoted to President. He assumes administrative responsibility for the firm's day-to-day operations. Russell O. Mack has been promoted from Senior Consultant to Vice President, responsible for the firm's Sound & A/V Systems Group. Howard K. Pelton, P.E. continues as a principal of the firm. Michael Fann, P.E. continues as vice president in charge of the Industrial & Environmental Noise Control Group. The firm has been involved in projects such as the new Fiesta Texas Show Park, the Orlando City Hall, Birmingham/Jefferson Medical Forum, and the new American Airlines Learning Center in Grand Prairie, Texas.

SIGNAL PROCESSING STUDIED

The National Institute of Standards and Technology has added a new research facility built around a "video supercomputer" to study signal processing techniques needed for future high performance computer displays and video imaging systems, according to institute director John W. Lyons.

Testifying before the House Subcommittee on Technology and Competitiveness, Lyons said the new facility features a "Princeton Engine" video computer created by the David Sarnoff Research Center. The facility is funded in part by the Defense Advanced Research Projects Agency (DARPA).

WALSH LAUNCHES AD AGENCY

Jesse Walsh Communications, a full-service advertising and public relations agency specifically for the professional audio and musical instrument markets, has been formed by Jesse Walsh, president of the new company. Walsh was previously director of advertising and promotions for Electro-Voice, and has more than 17 years of experience in the pro audio industry. Jesse Walsh Communications is located at 2255 Oak Forest Road, Buchanan MI 49107.

NEW ERA OFFICERS

New officers of the Electronics Representatives Association were elected to two-year terms at the association's 1991 annual board of directors meeting in New Orleans. Joel H. Schwartz, president of L-C-A Sales Company, has been named Chairman of the Board. Schwartz is a member of the National Sound and Communications Association and is the current president of the Electronic Sound & Systems Conferences Show Corporation. He succeeds Russell F. Diethert, co-owner of LTD Technologies.

W. David McCoy, president of Cartwright & Bean, Inc. has been elected president of ERA. He is also the current president of the Electronic Industry Show Corporation which sponsors the Electronic Distribution Show.

The four ERA members elected to senior vice presidents are: Timothy H. Eyerman, Cetech Electronics Corp.; Roger W. Ponto, Roger Ponto Associates; Glenn R. Alverson, Hilltronics, Inc.; and Steven T. Ross, Ross Marketing Associates. The seventh member of the ERA Executive Committee (ex-officio) is executive vice president and ceo Raymond J. Hall.

MARK IV — INTELIX AGREEMENT

Mark IV Audio has entered into a technology purchase, marketing, and development agreement with Intelix which includes the purchase of the Mind Control system hardware and application specific software. The Mindnet protocol software will be licensed on these and future Mark IV products. Intelix is also soliciting inter-industry manufacturers to install Mindnet protocol ports in their products. Intelix product for Mark IV Audio will be manufactured at Altec Lansing's facility, and products made specifically for Mark IV will be marketed as "Intelix, a division of Mark IV Audio." Dave Merrey, president of Altec Lansing, directs the activities between Mark IV Audio and Intelix. Commenting on the agreement, Merrey said, "Not only will audio contractors using Mark IV products benefit, but the entire professional audio industry will benefit as well."

NEWSLETTER

PANASONIC CCVED ANNIVERSARY

The Closed Circuit Video Equipment Division of the Panasonic Communications & Systems Company is celebrating its 25th year of continuous service to the closed circuit television industry. Milt Landau, General Manager of Panasonic CCVED, who has been with the division for 24 years, said the three biggest changes he has witnessed in CCTV have been the conversion from tube to CCD cameras, the emergence of digital circuitry in products, and the growth of the S-VHS format.

NEW NATIONAL STANDARD

The Standards Secretariat of the Acoustical Society of America has announced the publication of a new national acoustical standard. Because of the growing interest in the development of an international audible signal which, when heard, would unequivocally mean "evacuate the building immediately," an international standard, ISO-8201, entitled Audible Emergency Evacuation Signal, was approved and published in December of 1987. A national standard, bearing the same title, is written to conform with the international standard.

AES PAPERS

The AES Convention Committee has released its full program of technical papers, seminars, workshops, and technical tours for the upcoming 91st Convention to be held in New York October 4 through 8, 1991. According to Convention Committee Chairman Jerry Bruck of Posthorn Recordings, a record number of papers were submitted. The convention theme, "Audio Fact and Fantasy: Reckoning with the Realities," drew more than 160 submissions. Papers Chairman Earl Geddes of Ford Motor Company accepted 142 papers for presentation, almost double the number heard at recent U.S. Conventions. To accommodate the papers, the Technical Program has been extended to five days.

PANASONIC PROMOTES GREENBERG

Panasonic Company has named Bob Greenberg Vice President/General Manager, Communications Division, it was announced by Kirk Nakamura, Panasonic President and Chief Operating Officer. In addition to directing the company's national advertising and public relations efforts, Greenberg assumes expanded duties. He will act as one of the company's principal liaisons with recently acquired MCA/Universal Pictures and with the United States Olympic Committee. Under Greenberg's direction, Panasonic advertising campaigns have won numerous international awards, including a gold award for Best A/V presentation from the 1990 International Film and Television Festival.

PIONEER TAD APPOINTMENTS

Pioneer Electronics (USA) Inc. has named Hiro Takahori manager of technical applications and development, and promoted Leon Sievers to senior product planner in its Technical Audio Devices (TAD) division.

EESCO BUYS GNWC ASSETS

EESCO, Inc. has issued a letter of intent to purchase substantially all of the assets of GNWC Wire, Cable and Network products. GNWC is currently in Chapter 11. Based upon the EESCO letter of intent, GNWC believes the purchase price would yield approximately \$6,000,000 in proceeds at closing. After closing, under the agreement, the business of GNWC would continue without interruption under substantially the same management but new ownership, and would be separate from and unaffected by the Chapter 11 estate.

PHONIC EAR RELOCATES

Phonic Ear has relocated to an expanded facility in California's Sonoma County. The 35,000 square foot site serves as corporate headquarters for other regional and international offices in Maryland, Canada and Denmark. The new building accommodates over 150 employees with increased manufacturing capacity and amenities that include a fitness center, basketball court and showers. The new address is 3880 Cypress Drive, Petaluma CA 94954-7600.

Sennheiser Infrared



Excellence Needs No Explanation.

To learn more about the Sennheiser excellence in design and engineering,
please call or write.

 **SENNHEISER®**

6 Vista Drive, P.O. Box 987
Old Lyme, CT 06371
Tel # 203-434-9190 FAX # 203-434-1759

MICROPHONES • HEADPHONES • BOOM SETS • RF WIRELESS • INFRA-RED TECHNOLOGY

Manufacturing Plant: D-3002 Wedemark, Federal Republic of Germany

Circle 214 on Reader Response Card

WILL COMPUTER CONTROLLED SYSTEMS BE COMPATIBLE? WE ASK THE INDUSTRY

This issue's "Question of the Month" deals with the question of compatibility which is on everyone's mind these days. Those who agreed to answer our question include Bill Raventos of Crest, Barry Andrews of QSC, Dave Merrey of Altec, Tom Roseberry of IED and Verne Searer and Clay Barclay of Crown.

Bill Raventos
Crest Audio

I've given a lot of thought to your question, and we've all batted the subject around here. The one thing we can say *for sure* is that this is one of the "buzz questions" of the year.

It is always easier to answer a question with another question, and there are so many questions hanging loose around this issue that there will always be one or two that can be asked. However, I would rather answer your direct question by saying that the only sure bet is that there will always be *some* incompatibilities; the question is really whether the compatibilities will outweigh the incompatibilities.

(After all, this is the same industry that couldn't agree on a standard for XLR connectors — is pin 2 hot, or pin 3? — for more than 20 years, and now that there is a "standard," many still do not conform to it for obvious reasons that to do so would mean turning their backs on years

of existing product and production!)

We gave long and careful consideration to what we might use when first considering how to design our NexSys™ control system. For more reasons than can be enumerated here, we settled on RS485, with a communication protocol that is proven through considerable use in military and other circles, and is extremely fast.

In conversations with others in our industry, it is evident that there is still a great deal of controversy in this subject. We suspect that will continue for some time; at least until there is a great deal more hardware out there than there is now.

The question of everyone agreeing to a standard architecture and protocol may never be answered. Barring an unforeseen breakthrough of some type in the next year or two, we suspect what will happen is that various manufacturers will group together in their approaches (by convenience or philosophical preference), and that various *groups* of equipment will begin to develop compatibility. The specification writers and consultants in the industry will play a vital hand in determining what will and will not be used in the "formative years" of this type of product.

Finally, one or two or three or four *different* approaches may emerge. One development that will probably happen is a technology which may allow one type of system (say, MIDI controlled) to be operated by or in concert with another (say RS485).

To guess, at this point, that everyone will climb on the same bandwagon would be a mistake. I think we will be listening to the "battle of the bands" for some time to come.



Barry Andrews, QSC Audio Products

Barry Andrews
QSC Audio Products

To answer the question on compatibility we have to define the *degree of compatibility* that we require. Do we require the entire system to operate on one computer, or one network standard, or one integrated user interface? Adding to the confusion, we need to define *system*. By system do we mean part of the audio system, the entire audio system, the audio and lighting systems, or the audio, lighting and mechanical systems?

Rather than attempt to predict the future, we'd like to present our vision of it:

We would like to see a single, technically sufficient standard. One that allows system designers, installers and operators to

quickly and easily tune, operate, modify and troubleshoot an entire audio system. This system should be able to easily integrate with lighting and other mechanical control systems. One can foresee a day when the entire environment is easily controlled through a single operator interface with all systems working in concert to maximize the capability of the facility or performance.

To make such a diverse system work, a number of things would be required: a very powerful communication protocol and networking system, the capability for third party controlling software and the capability for diverse products to be installed in the controlling software and operated on the system.

Achieving such a standard would require a common and clear vision by a diverse group of individual companies and a will-

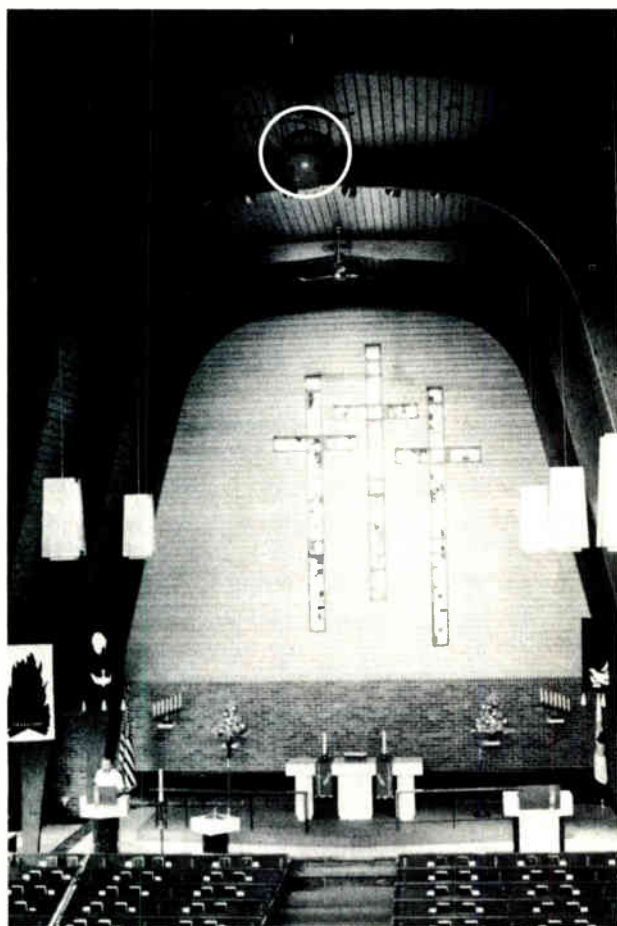
ingness to work together for the common good, or a company with a communication product so strong that the industry adopts it as a universal standard. Neither scenario appears very likely at the moment although there may be more hope for the latter.

As it now stands, we see three groups of companies: those that have a technically sufficient standard but are taking a proprietary stance, those that are backing an open but technically insufficient standard, and those that are standing and waiting until a clear trend emerges. One company, Lone Wolf, is working on a powerful communication engine called MediaLink that offers tremendous potential if it can be delivered at low cost and is readily accepted.

The way things are going lately the most likely scenario appears to be a muddle of

companies using different communication systems with "compatibility" handled at the computer. A complete system may require several communication networks and just as many user interface programs. Of course, such a "kluged" together system will not be very acceptable to customers. Therefore, initial acceptance may be limited. This may stimulate manufacturers to band together to develop an effective standard later in the decade.

QSC is currently developing a computer control system to operate on either PA-422 or RS-485. We have chosen PA-422 even with its technical limitations because it offers some hope of becoming an industry standard. If another standard emerges we will back it. It is our belief that an open standard including controlling software is essential to meet the needs of customers in the '90s.



"...excellent voice clarity and beautiful music reproduction!"

Pastor Don F. Thomas

The Prince of Peace Lutheran Church, Ida, MI, has used a Sand colored Soundsphere #2212-1 loudspeaker for a few years. Pastor Don F. Thomas has been delighted with the improvements. He stated "there is no comparison between the former system and what we have now. The single Soundsphere loudspeaker produces excellent voice clarity and beautiful music reproduction. It also achieves very even sound distribution in my church. With it, we now do a lot more speaking by church members with wireless mikes from various areas of the church with good results. Even special programs done with children are now clearly heard in the church."

This Soundsphere installation was done by Monroe Sound in Monroe, MI. They have also installed Soundsphere loudspeakers in many other local churches, gyms, and auditoriums. A representative of Monroe Sound stated that, "Soundsphere speakers are a quick and easy installation. My employees can finish more jobs in a shorter time period resulting in improved cost efficiency for the church and for the company."

Write or call direct for further information.

SOUNDSPHERE A PRODUCT OF
SONIC SYSTEMS, INC.

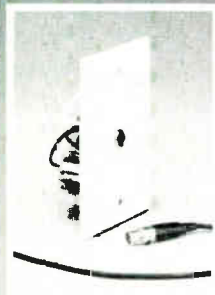
737 Canal Street • Bldg 23B • Stamford, CT 06902 • USA • Tel (203) 356-1136

Circle 249 on Reader Response Card

World Radio History

The easy way
to install the
unique sound
of UniPoint®...

New AT853PMa
cardioid condenser
with wall plate mount



also available in white
as AT853PMWa

"The great sound
of the AT853a mike
has been enhanced
by the ease of installation of the
new AT853PMa plate mount."

— Stephen Minozzi
Monte Brothers, Inc., Dobbs Ferry, NY

For further information write or call us today.



audio-technica®

Audio-Technica U.S., Inc.
1221 Commerce Drive, Stow, OH 44224
(216) 686-2600 • FAX (216) 688-3752

Circle 270 on Reader Response Card



Dave Merrey, Altec Lansing Corporation

Dave Merrey
Altec Lansing Corporation

Will there ever be compatibility among computer controlled systems? The answer is simply, "Yes if we want there to be." We took a leadership role in developing the PA-422 protocol and along with the other cooperating companies have discovered its shortcomings. Now that we have completed the arrangement with Intelix [See "Newsletter," in this issue], we will be using and promoting the use of PSY-485. However, there are systems out there using PA-422 and they work fine. There are systems that should use PA-422 in the future. There are systems that will use PA-422, PSY-485, RS-232 and MIDI. The key word in your question is "compatibility." You didn't ask if the industry should or would adopt one standard. Adopting a single standard is not practical at this time because this is all too new to our industry and we would surely choose the wrong one. But in the meantime can we make these various protocols compatible? You bet we can if we want to.

There is a meeting of the AES Working Group on Sound Systems Control (whew!) scheduled for Monday, May 20, during NSCA. I am hopeful that this group will continue to work cooperatively and will direct its efforts toward achieving compatibility to its maximum extent. This is a group comprised of some of the best talent we have in our industry. I believe they can achieve such a goal if we encourage them to do so. The encouragement should come in the form of them knowing that people like me want them to do what is best for the industry, particular-



Verne Searer, Crown International

ly the users, and not defend the protocol(s) their company presently uses.

We believe PSY-485 is the best protocol for fixed installation sound systems that use the kind of equipment we make and we are encouraging other manufacturers to utilize it in their products. But in many cases these systems will use products that contain interfaces developed around other protocols. If these protocols are not compatible the system could get very expensive and the customer might decide he doesn't need all this fancy control after all. Wouldn't that be a shame?

Verne Searer
Clay Barclay
Crown International

Yes, there will be some compatibility among systems because there is already. RS 232, RS 422 and PA 422 are used now by most equipment with any digital interfaces. As manufacturers, installers and users gain experience, improvements in protocol, hardware interface, software etc. will flourish. The main problem this creates besides vendor compatibility is retrofitting systems. We think the incompatibility situation will probably migrate just like video tape formats. The "first" or the "best" may not be the "last." We are pushing for distributed processing in each component rather than relying on just one central host computer. A host computer may die and you don't want your entire system down.

A distributed processor system also reduces the amount of data the bus structure needs to be handling at any one time.



Tom Roseberry, Innovative Electronic Designs

You only communicate changes to those entities that need it. Breaks in the system don't take down the whole system. The host is then for overall system management and reconfigurations.

With the very recent issue of the patent on Crown's IQ System, we are investigating equitable and sensible means to increase compatibility by licensing it to other manufacturers. The Crown bus structure is now being seen as an economical, sensible alternate choice for the future because of its flexibility, simplicity and potential options for transmission media.

Tom Roseberry Innovative Electronic Designs

The AES Working Group on Sound System Control has been meeting and discussing:

- Review of the status of the AES15-1991 standard.
- A continuing discussion on the establishment of a library of manufacturers' function codes to be supervised by the AES. These codes would then be available to any system software designer to incorporate in his software structure.
- Initial material and discussion will be submitted for review on the structure of an RS485 format to be used as a basis to write a proposed standard.

A standard is a process that has been proven and utilized successfully and recommended to others to follow. A professional organization such as AES may agree upon a voluntary consensus standard by a process which assures participation of Producers (i.e., Industry), Consumers

(i.e., Consultants, Installers, Users), and General Interest (i.e., Academic, Government, General Public) Parties. This is the purpose of the working group's meetings.

It is possible a total complex audio system structure could be composed of many component parts by various

manufacturers utilizing both PA422, RS485, and some future standard. This system could be controlled by one or more computers and appropriate software.

Tom Roseberry is Working Group Chairman, Sound System Control, AES Standards Committee. ■

The shape of pure sound...

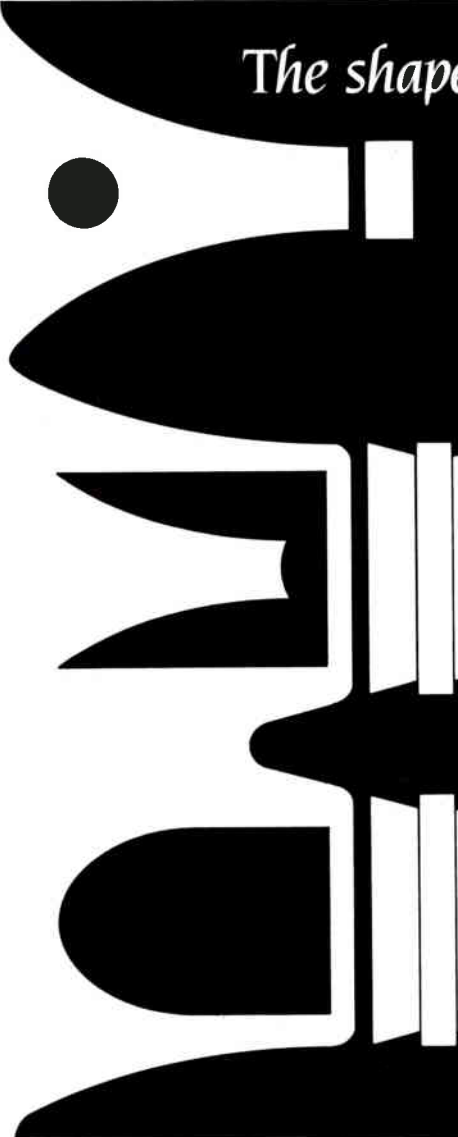

Community's design philosophy has always been a little unconventional.

When everyone else was insisting on metal, we promoted the precise shapes achievable through fiberglass. When others built walls of direct radiators, we built efficiency. When most of professional sound was divided at 800 Hz, we concentrated on midrange.

For those prepared to listen, the rewards of good design are clear.

In the RS220 Wavefront Coherent™ Loudspeaker system we have created the true culmination of Community design—precise fiberglass curves flowing into matched components—a system designed for effortless performance with maximum efficiency, power and clarity.

Community's RS220
The shape of pure sound...

Community
PROFESSIONAL SOUND SYSTEMS

333 East Fifth Street
Chester, PA 19013
(215) 876-3400
FAX (215) 874-0190

WHY YOU SHOULD SOLDIER IN THE SECOND INDUSTRIAL REVOLUTION

By David Lander

Every reader of this magazine should be exposed to the thinking of Raymond Kurzweil.

While Kurzweil's Massachusetts office is a mere rifle's shot from Lexington Common, where the Minutemen once mustered, he hardly fits the image of a guerrilla. The Italian silk suits and Mickey Mouse watch this boyish, curly-haired native of Queens, New York is fond of wearing are illusive, however. Ray Kurzweil has been called one of the most brilliant students of his generation to pass through the prestigious Massachusetts Institute of Technology. Though still in his early forties, he's been compared to Marconi and Thomas Edison.

Perhaps more than any other living individual, this remarkable man is capable of persuading sound and communications professionals that a revolution is taking place around them. And that their financial well-being could well depend on the part they choose to play in this momentous event.

Kurzweil is an expert in artificial intelligence. He conceives and builds machines that think, power tools for the mind, as they've been called. And Kurzweil understands as well or better than anyone the place of these tools in what he sees as the second industrial revolution, a spiral of change that will continue to whirl around us as this century wanes and the next gets underway.

The key difference between this in-

dustrial revolution and the previous one, Kurzweil has explained, is that "the first involved machines that multiplied our physical capabilities, extended the reach of our muscles. The new age is multiplying our mental capabilities."

His own inventions have played a part in this process. Nearly two decades ago, Kurzweil developed a breakthrough device for the blind. Using a computer technique called pattern recognition, which identifies the most basic characteristics of sounds

FOR THOSE WHO WALK INTO THE FUTURE WITH ONE EYE CLOSED, THE ECONOMIC CONSEQUENCES COULD BE SEVERE.

or images (in this case the letters of the alphabet), his invention identified printed words and, through voice synthesis, read them aloud. Kurzweil systems are used by more than 1,000 doctors to enter patient information.

Kurzweil later produced a machine that worked in reverse, a voice-activated word processor that called up spoken words on a computer screen.

Raymond Kurzweil is of course also responsible for a series of advanced electronic musical instruments, having invented the first synthesizer capable of imitating the sound of a grand piano, not to mention anything else played into its digital memory.

In one instance a few years ago, a Kurzweil synthesizer was programmed to simulate a 61-piece orchestra then used to

accompany an opera company performing choral works. This made it a center of controversy during subsequent negotiations between Broadway producers and the musicians' union.


Not long afterward, Kurzweil addressed a convocation of students entering Boston's Berklee College of Music. Noting that the musical arts have always employed "the most advanced technologies available, from the cabinet-making crafts of the eighteenth century . . . to the digital electronics and artificial intelligence of the 1980s and 1990s," the electronics expert added that "the advent of this most recent wave is making historic changes in the way music is created."

The tide of advanced electronics, of course, has washed through many industries, and its currents will continue to affect the sound and communications business profoundly. For some of its practitioners, those who keep abreast of technological changes, higher profits may well be in store. For others, those who walk into the future with one eye closed, the economic consequences could be severe.

Kurzweil is quick to point out that a similar situation existed in the late 18th century, when the flying shuttle and other automated machines were introduced to the English textile industry. This gave rise to a political faction — called Luddites after their leader, Ned Ludd — that denounced what others called progress.

"It was patently obvious that employment was negatively affected, in fact ultimately would be devastated by these new machines, because one machine with one operator could do the work of 10 or 20 persons," Kurzweil told me during a

David Lander is a writer and consultant specializing in electronics marketing.



Introducing
The Shure
SM102.
Now The
Choice Is
Black And White.

The new Shure Microflex™ SM102 makes the job of choosing a miniature condenser microphone an effortless one.

With its flexible, 6-inch gooseneck, the SM102 is easy to set up and aim. And its high sensitivity and smooth frequency response assure a clear and natural sound.

Compare directional characteristics. You'll find the SM102's cardioid polar pattern exceptionally uniform throughout its frequency range, which accounts for its outstanding background noise and feedback rejection. What's more, it has the lowest self-noise in its class, so you pick up distant voices down to a near-whisper

and assure the intelligibility of every word.

And with a choice of in-line or wall plate preamps, both with switchable gain, the SM102 gives you the unmatched flexibility to hang it any way, anywhere.

In fact, the toughest decision you need to make is black or white. Take your pick.

The SM102 is a proud member of the new Shure Microflex family of miniature condenser microphones. For more information on the SM102 or other Shure Microflex products, call 1-800-25-SHURE. The Sound of the Professionals ... Worldwide.

SHURE[®]
microflex[™]

Weatherized™ Speakers

2-Way, 2-Speaker Series

Built To Stand The Elements, Inside Or Out.

This latest generation of high fidelity Weatherized™ mini-speakers from OWI has been designed to take the worry out of indoor or outdoor use (spas, patios, pool and garden areas) as well as space-limiting installations.

Power transformer selectors in OWI's high impedance models 572 and 5752 provide system modification with instant access. Model 502 offers the alternative to low impedance (8 Ohms).

These handsome mini-speakers in white, cream or black are perfect complements to an already formidable Weatherized™ lineup.

Ask your OWI representative for information on these and other distinctive speakers from OWI.

Versatile and water-resistant, this trio features ample frequency response and sensitivity in sturdy aluminum die cast enclosures, as well as installer-friendly U-bracket assembly and security screws.

3" stainless steel stakes available

U-bracket assembly with security screws

502

572

2.5w 5w 10w 15w

Power transformer selector—Model 572 (2.5, 5, 10, 15 watts)

Power transformer selector—Model 5752 (20, 30, 40, 50 watts)

20w 30w 40w 50w

5752

OWI

OWI Incorporated
1160 Mahalo Place
Compton, CA 90220
Outside Calif. (800)638-1694
or (213)638-4732
Fax (213)638-8347

Circle 272 on Reader Response Card



Raymond Kurzweil demonstrates a voice-activated computer running a VoiceMED system for voice-controlled patient reporting, manufactured by Kurzweil Applied Intelligence, Inc.

visit to his Waltham headquarters. "You could point to all these people, who had previously spun wool thread and woven cloth [and] now were thrown out of work because of these new machines. Yet, paradoxically, employment in England at that time rose dramatically, and there was an era of prosperity."



Raymond Kurzweil seen with the Kurzweil Personal Reader made by Kurzweil Computer Products, a subsidiary of Xerox Corp. Kurzweil is founder of KCP and current chairman of Kurzweil Reading Machine Division of Xerox, Corp.

"I think that's analogous to what's happening now," the inventor continued. "The English textile automation that occurred in the late 18th century and automation today are two points on a spectrum. We've had a couple of centuries now of automation. And the impact on employment over the last hundred years has been the same as in England when the textile

industry was automated."

In occupational and financial terms, what has that impact meant? "In 1870, we had 10 million jobs comprising 30 percent of the population," Kurzweil told me, adding that, today, the job total is more like 120 million and encompasses nearly 50 percent of the population. Moreover, he remarked, today's jobs tend to be more interesting to those who work at them while paying an average wage — in constant dollars — some six times higher than those of a century ago.

SOUND AND COMMUNICATIONS PROFESSIONALS WHO WANT TO SUCCEED IN THE YEARS AND DECADES AHEAD CANNOT STAGNATE INTELLECTUALLY.

"There is much more wealth, and this has led to expansion both in the private and public sectors," Ray Kurzweil affirmed. "We have huge programs, from Social Security to Medicare, that didn't exist a hundred years ago" because they were unaffordable. We can afford them now, he explained, "because of the increase in economic power and efficiency that automation has brought along with it."

By now, the moral of this tale should be clear. Sound and communications professionals who want to succeed in the years and decades ahead cannot stagnate intellectually. They must seek out and study new technologies. And be quick—though selective—in adopting and recommending important new systems and processes.

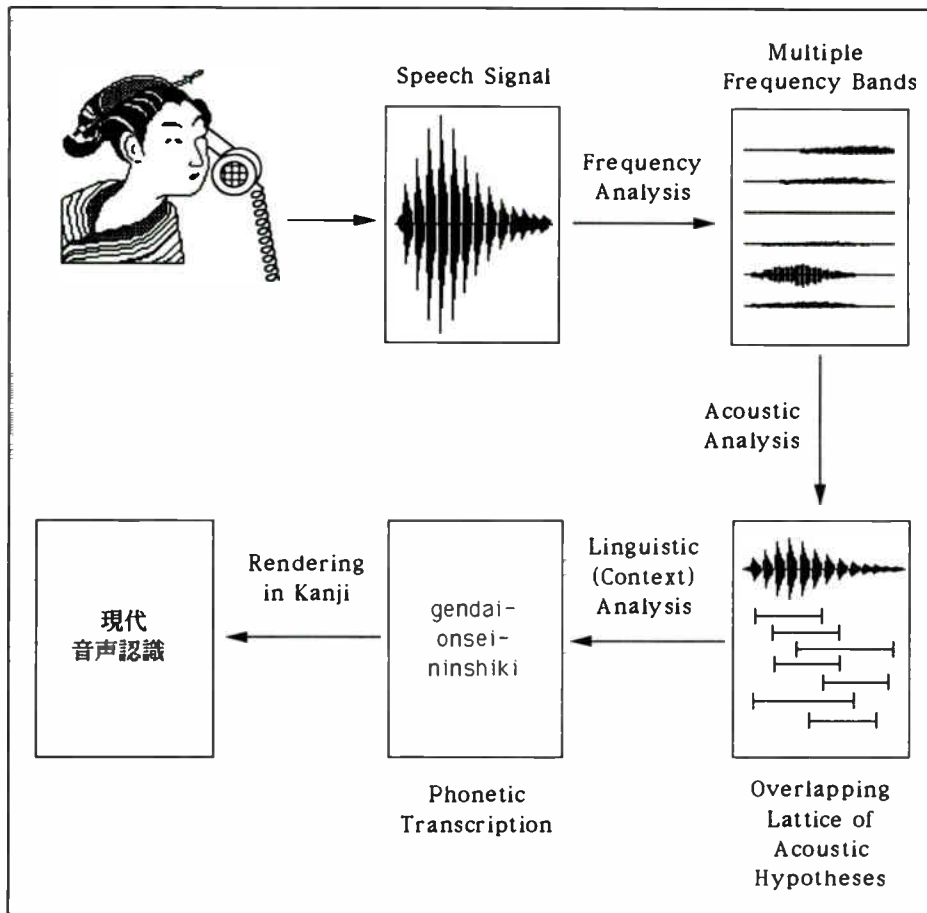


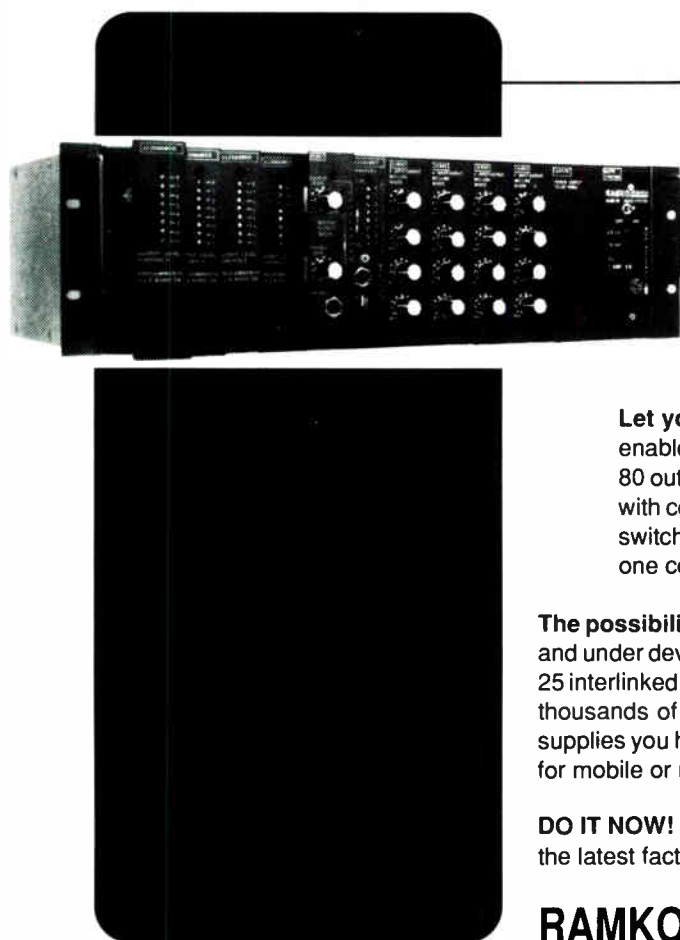
Diagram of joint development project between Kurzweil Applied Intelligence, Inc. and Fuji Xerox, Ltd.

No writer or editor can accurately predict what these will be three, five or 10 years from now, but you can be sure that those who create *Sound & Communications* magazine will work to keep ahead of the pack. And convey details of key discoveries to readers as quickly as publication dates allow.

To do otherwise would be to ignore the warning of Raymond Kurzweil. "If you want to weave cloth, as it were, the way it was done 10 years ago," he has remarked, "you may find yourself out of work." ■

Sound & Communications readers interested in learning more about artificial intelligence can read *The Age of Intelligent Machines*, a new book written by Raymond Kurzweil and published by The MIT Press, 55 Hayward Street, Cambridge, MA 02142.

Ray Kurzweil is currently developing a voice recognition computer for the Japanese market.



NEW!!

The xLAS-10. An integrated audio system so versatile, imagination may be its only limitation!

Let your imagination go! Visualize a modular sound system that will enable you to create an audio mixer with up to 32 channels or a 20 in by 80 out programmable distribution system or even an eight channel mixer with compression/limiting, EQ, eight output audio distribution and 4 input switching to both an individual output and the master mixing bus. All in one compact 5 1/4" x 19" main frame!

The possibilities are limitless. Sixteen plug-in modules currently in production and under development combined with 300 rear panel input output terminals and 25 interlinked, internal audio mixing and control busses, provide you with literally thousands of different variations. And, with the three different plug-in power supplies you have a choice of 110/230 VAC, 20VAC or 12VDC battery operation for mobile or remote operation.

DO IT NOW! Call TOLL FREE (800) 678-1357 or FAX (916) 635-0907 for the latest fact sheet & pricing on this fabulous new labor saver.

RAMKO RESEARCH (916)635-3600/ 3501-4 SUNRISE BLVD./RANCHO CORDOVA, CA 95742

A Report from Cincinnati, Ohio

The National Sound and Communications Association's Expo '91

BY JUDITH MORRISON

Just off the plane and past deadline, we're pausing to report on what was seen and heard in Cincinnati on May 20 through 22. This is a broad report of impressions. Sound & Communications will follow up in subsequent issues with in-depth treatments of products, promotions and the state of the industry as exhibited at NSCA Expo '91.

The National Sound and Communications Association once again had a hit on its hands, as its 1991 convention and expo attracted an attendance of over 2,000 contractors to the Cincinnati Convention Center.

The confab, which began 11 years ago as a small grouping of contractors with like interests, has evolved into a full-fledged convention, becoming the chosen site of important industry meetings, major new product announcements, and an educational environment that is increasingly fulfilling the mission of NSCA to provide a serious informational forum that will increase the level of expertise of contractors and lead to a comprehensive certification program.

Over 340 manufacturers chose to exhibit their wares at the convention, with another hefty number walking the show and checking it out. Of the non-exhibiting manufac-

turers we ran into, some were there because they OEM to exhibitors, others were there to check out the site for future exhibiting.

Industry committees meeting during NSCA included the AES Working Group on Sound System Control Standards headed by Tom Roseberry of I.E.D. Some progress is being made, despite disagreement among members, and patents granted to some companies, to develop an intercommunication protocol.

The NSCA Committee on Symbols Standards, headed by Doug Wilkens of Peirce-Phelps, met and expects to have a report out by fall.

The Electronic Representatives Association held a 7 AM meeting to discuss the relationship between reps and regional managers. And the NSCA Product Safety Group held an all-day meeting on May 21.

Over 50 hours of educational sessions were held during the convention, with a full special pre-show session on MATV providing certification. Don Davis gave a two-hour tutorial on Audio and Acoustics. And other industry leaders — including Sound & Communications technical editor Mike Klasco — presented sessions designed to fulfill the need to know of the contracting community. (Sound & Communications will be following up with reports on some of these sessions in future issues.)

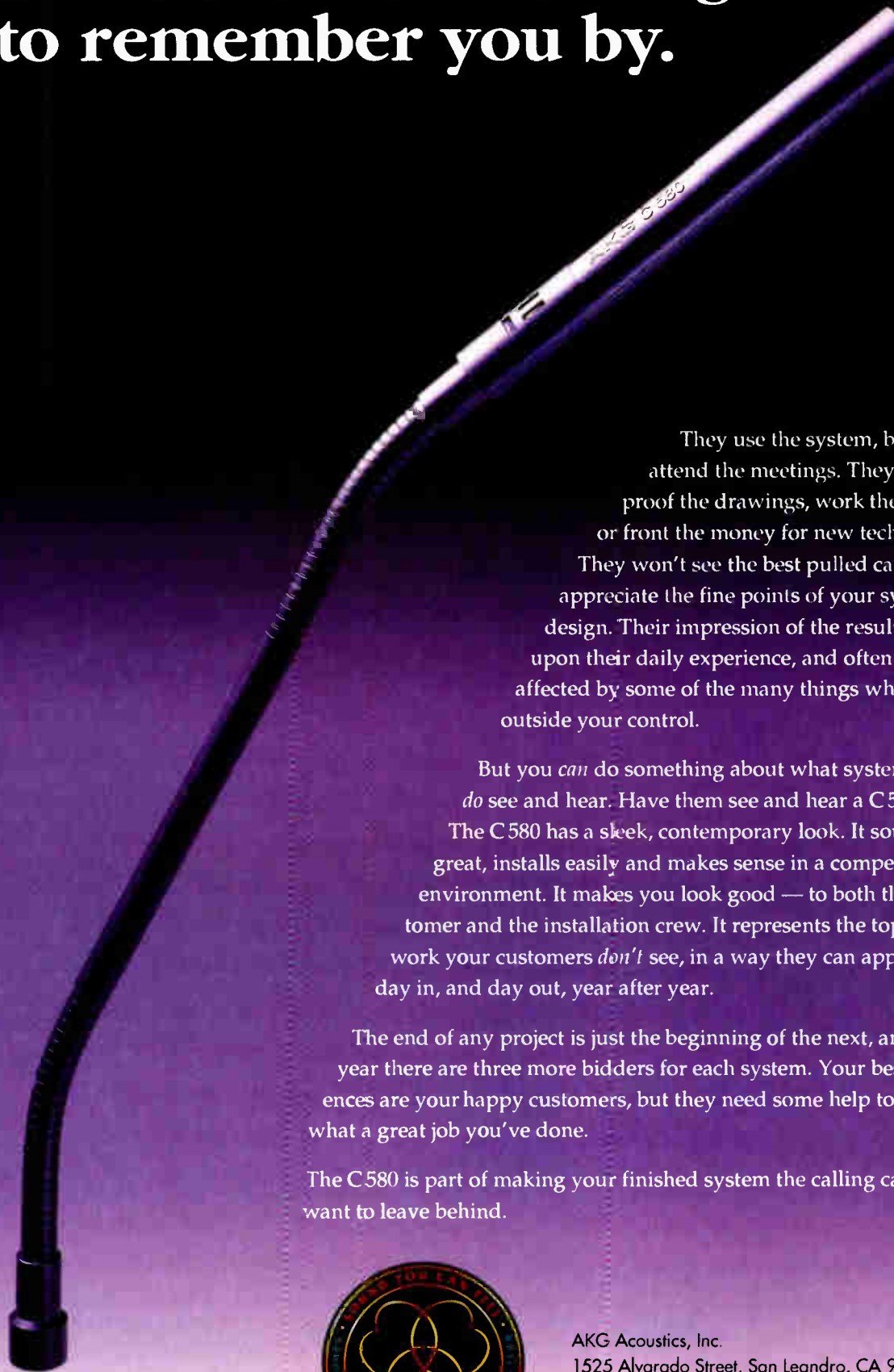
For the second year the association itself presented awards honoring contributions to the industry. This year for the first time, a full line-up of awards were presented — to four individuals all together. A trophy, called Tommy in honor of Thomas Edison, was presented to: Wayne Moore for the most requested videotape of the educational sessions of Expo '90 (Fire Alarm Design); Charles L. Bagnaschi, Milestone Award for innovation in the Lexicon Delta T101 digital delay, circa 1971; Clay Barclay, Innovation Award for the Crown IQ System 2000; Dr. Bruce Langmuir (Bose), Award for Exemplary Service on Behalf of NSCA (for fire safety programs).

According to Barry Glick, NSCA board member who coordinates the awards, next year the program will be expanded. Last year only one award was presented — to Harold George for the most requested videotape of an NSCA seminar (running a service department).

More than ever, the NSCA convention was the site of news of manufacturer changes, acquisitions, and new distribution patterns. Just before the show, JBL Professional acquired the product lines of Audio/Digital. The JBL Systems Group has been formed with a specific focus on the contracting business and Gary Hardsy, founder of Audio/Digital, becomes Director of the new group. Lance Korthals,

Judith Morrison is The Editor in Chief of Sound & Communications.

Leave them something to remember you by.



They use the system, but didn't attend the meetings. They didn't proof the drawings, work the late hours or front the money for new technology. They won't see the best pulled cable or appreciate the fine points of your system design. Their impression of the result is based upon their daily experience, and often it's affected by some of the many things which were outside your control.

But you *can* do something about what system users *do* see and hear. Have them see and hear a C 580. The C 580 has a sleek, contemporary look. It sounds great, installs easily and makes sense in a competitive bid environment. It makes you look good — to both the customer and the installation crew. It represents the top quality work your customers *don't* see, in a way they can appreciate — day in, and day out, year after year.

The end of any project is just the beginning of the next, and each year there are three more bidders for each system. Your best references are your happy customers, but they need some help to realize what a great job you've done.

The C 580 is part of making your finished system the calling card you'll want to leave behind.



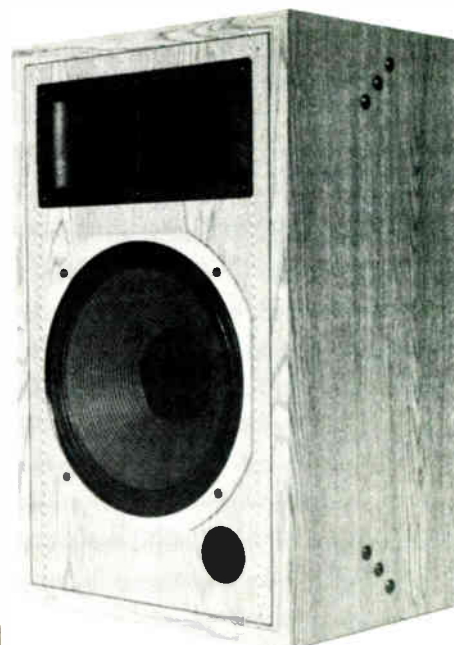
AKG Acoustics, Inc.
1525 Alvarado Street, San Leandro, CA 94577
Tel 415/351-3500 Fax 415/351-0500

VP of Market Development for JBL Pro, negotiated the deal.

During the show, Mark IV Audio officially apportioned the pro audio and M.I. lines of Dynacord (acquired last year) to its newly acquired Klark-Teknik division headed by Jack Kelly. The E.L.A. line remains under Altec Lansing distribution to the

contracting market.

In other Mark IV news, the company completed a pact with Intelix to develop computer hardware and software for a range of Mark IV products. Appropriate products will be manufactured by Altec Lansing and directed by Dave Merrey, president of Altec Lansing. Presumably a



Peavey Architectural Acoustics showed its PR 1200 two-way sound system.



Telex PAS-1 Portable Sound System.



FOUL WEATHER GEAR.

Perfectly suited to their environment, TOA's lineup of weather-resistant speakers takes the worry out of damp, humid and temperature-extreme installations. With ABS or polypropylene shells, zinc-coated brackets and stainless hardware, their sturdy constitution doesn't sacrifice sonic performance — woofers, CD horns and high efficiency drivers deliver uniform dispersion patterns and smooth frequency response. There are five models with 20-120 WRMS input power so that you can take on the elements like a duck takes to water.



TOA ELECTRONICS, INC., 601 GATEWAY BLVD.,
SOUTH SAN FRANCISCO, CA 94080
415/588-2538 • 800/733-7088



full complement of Mark IV Audio products could come under the Intelix communication protocol. Intelix was also actively soliciting support for its Mindnet protocol, which is licensed on a non-exclusive basis.

The trend thus continues of amalgamations of companies and products under giant umbrellas — Mark IV, Harman International, AKG. But this business is innovative — and there's always a new idea. So plenty of first-time and new companies showed up on the exhibit floor in Cincinnati.

With over 340 exhibits, 100,000 square feet, 50 hours of educational sessions, and an inestimable number of parties and networking opportunities, NSCA has acquired the complaint heard at other conventions:

There was just too much to see.

But on the exhibit floor certain trends were evident. Modular products and systems approaches continue their swing through the industry, as more companies design products meant for optimum flexibility and ease of use — and ease of sale, with turnkey operations considered from several exhibitors.

TOA introduced 35 new products to its Engineered Sound Systems Line. Dukane showed new audio products that make it easy to specify and acquire a total Dukane audio system. New additions to the line include a mixer/preamplifier, amplifier input modules, one-third octave equalizer, and



ATM exhibited its rigging systems.

a compressor/limiter. I.E.D.'s UDAPS was on display for a full demo. Peavey introduced new products to its Architectural Acoustics line.

New exhibitors brought new concepts to the gathering. ATM exhibited its rigging systems. Zoom showed its signal processing products.

J.L. Cooper introduced its automation system for churches, boardrooms and other applications, known as Instant Recall.



Zoom showed its signal processing products including the 9010 processor.



PLAN FOR THE UNEXPECTED.

Because you can never be too well prepared, the TOA AX-1000 mixer has eight input ports with a choice of 37 modules — including mic, line, aux, BBE, I/O and bridging — making design, upgrades and changes, quite literally, a snap. Advanced circuitry lets you tailor the gain sharing to match the acoustic conditions ... so each mic gets maximum available gain for intelligibility. It's completely automatic, completely modular, completely silent, completely reliable. Just what you'd expect from TOA. A versatile, forward-thinking mixer that helps you look very well prepared indeed.



ENGINEERED SOUND PRODUCTS FROM:
TOA ELECTRONICS, INC., 601 GATEWAY BLVD.,
SOUTH SAN FRANCISCO, CA 94080
415/588-2538 • 800/733-7088

Vidikron came to Cincinnati with its video projectors, Wharfedale brought its speaker line, and was looking for new distribution and dealers in the U.S. Dan Dugan, who has been licensing his automatic mic mixer to other companies, exhibited a new mixing controller under the name Dan Dugan Sound Design. Teac showed its RGB videodisc recorder. Infinity brought its in-wall speakers. Raxxess's drawers and shelves that fit into racks drew a great deal of interest. Paige brought its line of wire and cable. Sabine showed its signal processing gear that had attracted interest at last fall's AES. And Clair Brothers exhibited its sound contracting line to the entire industry.

In the security field, Panasonic displayed its aspherical lenses, first shown last year, as a way to increase the usefulness of color cameras and decrease the lux rating needed for quality security images. Sanyo showed a one-third inch chip camera.



Testa Communications Director of Sales and Marketing Nancy Davis at the Sound & Communications booth.

Peace Of Mind.



Designing a sound system puts your reputation and integrity on the line. People depend on you to create a complete solution to their audio needs; to put together just the right components to satisfy the job requirements and hold up over the long haul.

Specify products from ASHLY. You have our commitment of at least Five Years of trouble-free performance.* At ASHLY, every product

we manufacture is hand constructed right here in the USA from the finest components available, and 200% quality controlled before ever leaving our plant. Designed to be the best possible investment in professional audio equipment.

Whatever your audio application, design in reliability and system integrity. Design in peace of mind. Design in ASHLY.

ELECTRONIC CROSSOVERS
COMPRESSOR/LIMITERS
NOISE GATES • PREAMPS
PARAMETRIC EQUALIZERS
GRAPHIC EQUALIZERS
POWER AMPLIFIERS • MIXERS

ASHLY

AUDIO TOOLS FOR THE TRUE PROFESSIONAL

*All ASHLY products are covered by our exclusive Five Year Worry-Free Warranty. Contact ASHLY AUDIO directly for full details.

ASHLY AUDIO INC. • 100 FERNWOOD AVE • ROCHESTER, NY 14621 • TOLL FREE (800) 828-6308 • (716) 544-5191 • FAX: (716) 266-4589

Circle 246 on Reader Response Card



Wharfedale brought its speaker line including the Programme 20.

BGW made an unusual entry. The amp supplier has developed rack panels designed for easy installation of electrical sockets, fans and other paraphernalia.

And loudspeakers again were the major category of products being exhibited. Tannoy made a major new product introduction with its CPA line.

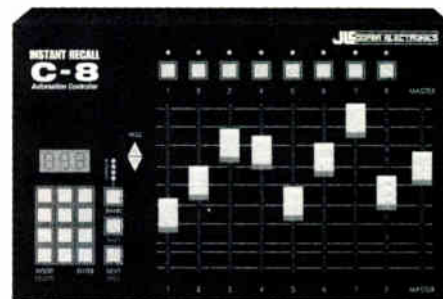
Atlas showed its new Strategy Series of six-inch speaker systems. Yamaha gave a full demo of its YST signal processed speakers. And Videolink introduced wall speakers that include the Dinky Link, which provides universal infrared remote control for program sources in multi-room systems.

B.E.S.T. has developed a system that includes a Stewart Filmscreen.

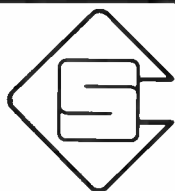
Applications for new technology were shown at some booths. Ramsa discussed



Javelin JO400 Mini-Matrix.



J.L. Cooper Electronics introduced its automation system for churches, boardrooms and other applications.



CAL SWITCH

CALIFORNIA SWITCH & SIGNAL, INC.

Makes Buying Easier

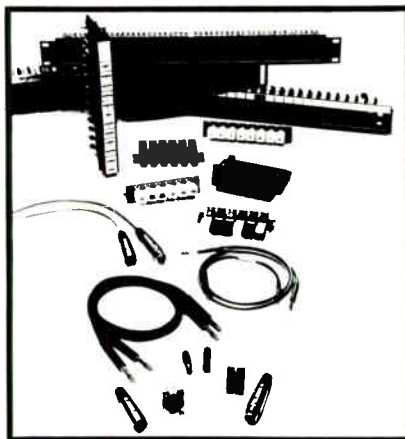
With

Switchcraft®

A Raytheon Company

Adapters
Connectors
Jack Panels
Jacks
Plugs
Switches

** We Stock The Complete
Switchcraft Line **



We Offer
Fast Delivery
Custom Assembly
Custom Engraving
Custom Modification

Call (800) CAL- SWCH Today !

13717 South Normandie Avenue · Gardena, California 90249 · (213) 538-9830 · FAX: (213) 327-2741

Scoops and Service:

NSCA-TV NEWS ON-THE-AIR IN CINCINNATI

NSCA-TV News was once again on the air on location servicing the convention and expo of the National Sound and Communications Association.

The television show, now in its sixth year, was on view in major convention hotel rooms and on the exhibit floor via

Mark IV's apportionment of the Dynacord lines to both Altec Lansing and Klark-Teknik (for pro audio and M.I.). (At last year's NSCA convention, NSCA-TV News broke the news that Mark IV had acquired Dynacord.)

Judy Morrison, Editor in Chief of Sound & Communications, who is also the Editorial Director and writer of

events they might have missed, and to get a central focus to the show.

Judy Matthews, Emmy-award winning director of TV Productions for Testa Communications, said, "This year's NSCA-TV News was the most comprehensive we've ever done at this show. Our camera work and coverage was on a level with the finest professional productions."

NSCA-TV cameras caught Bob Pabst, president of Mark IV Audio, and Dave Merrey, president of Altec Lansing, in their traditional Blues Brothers performance during the reception for Mark IV contractors and reps. The camera crew also attended the Contractors Caper and the West Penn Wire Appreciation Party. Nancy Davis, Testa Communications Director of Sales and Marketing, who also reported for NSCA-TV News, said, "I think the reporting of the industry's light hearted moments add to the coverage of the convention as a total event. Our news coverage is a prime vehicle for the serious information of the convention. But it's always fun to give a view of the lighter side of the business in motion — as only television can."

NSCA-TV News is produced as a service to the industry. It is the only news medium produced at the convention. Vincent P. Testa, publisher of Sound & Communications, and executive producer of NSCA-TV News, said, "The 1991 edition of NSCA-TV News was, I think, the best we've ever done. The news was timely and important, and it gave convention attendees a chance to see the faces and products that they might have otherwise missed displayed in a graphic way that only television can make happen."

All editions of NSCA-TV News are available for purchase through Testa Communications.

Other television programs produced by the company include CES-TV News, AES-TV News, NAMM-TV News, and NAB-TV News.



Clockwise from left: NSCA-TV News Videographer Ben DeLuca, NSCA-TV News Director Judy Matthews and NSCA-TV News' videowall at the convention.

monitors and a videowall at the entrance area.

NSCA-TV News is produced on-site during the convention in order to give convention attendees an informational, daily, up-to-date news medium that tells of the news being made at the convention. It's estimated that virtually 100 percent of NSCA convention attendees view the show at some time during the convention.

The news program is produced by Testa Communications, the publisher of Sound & Communications, and is written and reported by the magazine's staff.

News items on the first day of the show included JBL's acquisition of the Audio/Digital product lines, Altec Lansing's acquisition of Intelix technology,

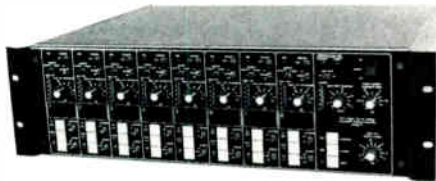
NSCA-TV News and other television programs of Testa Communications, and Mike Klasco, technical editor of Sound & Communications, hosted a segment called Product Preview in which they showed products of note culled from the exhibit floor. Morrison said, "As Jay Johnson [president of NSCA] has pointed out, if a convention attendee spent five minutes at each of the 340 booths, 28 hours would be needed to see the expo exhibits. Since the exhibit hall is open for only 21 hours, one can sense the importance of an on-site television program that demonstrates new products."

In addition, interviews with manufacturers and with officials of the National Sound and Communications Association allowed contractors to view exhibits and

its Toolworks Utilities for applications using its Pro-DAT. The utilities program, which will be available in June, will provide computer control customized for any application ranging from theme park audio to background music. Gefen Systems showed its software package for CD changers along with an NSM 100-disc changer. The program allows for up to five separate playlists.

And Lexicon demonstrated at the Clarion Hotel its LARES system which has gathered a great deal of interest within the last year, since its installation by Neil Muncy at the Elgin Theatre in Toronto.

After the exhibit floor had closed, partying was appropriate. West Penn Wire again hosted its gala Appreciation Party to which the entire convention was invited. And the entire convention seemed to have shown up for the food, drink and festivities.



Dan Dugan's new mixing controller marketed under Dan Dugan Sound Design.

Several rep organizations sponsored the Contractors Caper on the eve of the convention. Once again, it was a needed networking and convivial event.

Part of the retrospective thoughts of the convention include: "We got through it: the planning and preparation, the shipping and receiving, the information overload." But the main thought has to be that the NSCA Expo has grown up and is now a serious forum for the industry, and a growing one in a time when many related conventions are faltering or cancelling. It's a tribute to the industry itself, and to the people who run the association.

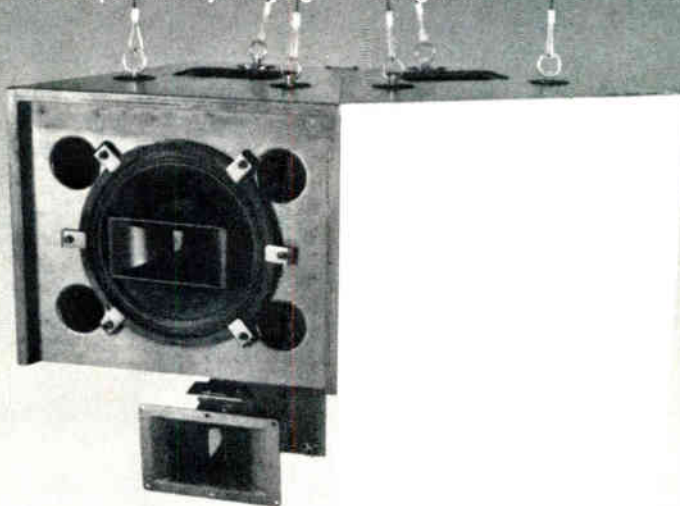
This report, written as it is at deadline time, is only an overview. Sound & Communications will be following up in subsequent months in more depth and with wider coverage of the new programs and products that came out of NSCA Expo '91. Next year it's Anaheim — for Expo '92. ■



Left to right: NSCA officials Barry Glick, Jay Johnson and Mel Weirenga man the NSCA booth.

YOU ASKED FOR IT!

- 60" x 30" horn for farfield coverage
- L-Pad for nearfield horn
- Fully adjustable 90" x 40" horn for nearfield coverage
- Trapezoid shape for easy arraying
- Integral hardware for easy rigging
- Choice of side panels to match decor
- Choice of grill colors to match decor
- Can be used in single or multiple configuration



C-1

OAP Audio, Inc.
310 Peachtree
Industrial Boulevard
Buford, GA 30518
Phone: 404/945-1028
FAX: 404/945-1843



Sound Factories

How Contractors Deal with the "R" Word in Offices and Factory Work

BY MALCOLM HOWARD

If American critics of The President's Fast Track Trade Bill with Mexico are correct, contractors who install sound in factories may want to start driving south into Mexico more often. Some say the bill, which would allow the president to negotiate trade bills with less Congressional involvement, will make it easier for Mexican cities to steal manufacturing might from U.S. cities.

Whether that's true or not is now being debated on the floors of Congress. One thing that's not being debated among sound contractors who rely on U.S. manufacturing for work is that choice factory and office jobs are fewer and farther between.

Contractors say they're exploring outside their traditional territories for facilities in which they can hook up paging, background sound and security systems.

"We find ourselves on the freeway a little longer than we normally do," says Don Bethune, president of GMF Sound Inc., a full-line sound contractor in Orange, California. "Of course, I like to do things that are easiest and best for me, but I'll go where I have to. 'Have screwdriver, will travel,' as they say."

Because there's never a shortage of local contractors in all U.S. cities, taking the tool kit on the road won't solve everything. As competition for plum jobs gets tighter, contractors are also accelerating their marketing efforts. Some are offering services — such as maintenance agreements — while others are simply working and selling harder for bigger jobs. Overall, contractors are less choosy these days as

offices and factories go for basic systems with less fancy frills than in the past.

"THINGS ARE FILLED UP."

In Orange County, in which Bethune's home city of Orange is one of many municipalities, the residential, office and industrial zones are still growing. But like many American counties surrounding major cities, Orange County is not rising with the same ambitious curve that made it one of America's fastest-growing counties in the '80s. "Of course, things are fairly filled up now," Bethune said of the local real estate market.

In other cities, the opposite is happening. Many developers overestimated the real estate boom of the '80s and office buildings from New York to L.A. have vacant floor space, contractors say. So what are they doing to beat these trends?

Although local aerospace firms such as McDonnell Douglas regularly call for emergency paging and security systems, factory work in Orange County has been put on the back burner, Bethune said.

"People say that Southern California is probably the last to feel a recession and the first to bounce out of it," he said. Nevertheless, until Southern California leads the country out of the mire, mid-sized, bread-and-butter jobs such as basic paging systems are carrying Bethune's company through the slow period, he said.

Case in point is a recent job at a warehouse that handles the main distributing center for Mervins Department Stores. GMF installed a multi-zone paging system with University horns, as well as a security

system, Bethune said.

RELOCATING THE RECESSION

Though some say the "R" word is getting too much press, most agree that office and manufacturing growth has steadied, if not stopped.

Still, the recession isn't affecting everybody equally. While it seems to be hitting big cities hard, major corporations are hitting the road to look for tax breaks, land deals and other incentives that bigger, northeastern cities find hard to offer, many in the South and midwest say.

These corporate relocations, which many see as an increasing trend in recent years, are boosting business for local commercial sound contractors.

In Dallas, for example, new headquarters for GTE, J.C. Penney and Exxon Corporation have created major jobs (plus the promise of continued expansion) while the number of small jobs has decreased, says Sam Stage, director of sales for AVW Audio Visual Inc., of Dallas.

"I think most people in this business indicate that the business is a little soft right now. However, there are several large projects that are coming to the market," according to Stage. Those bigger projects, he said, have been a long time in planning, and are less affected by regional and national bad times. Most importantly, they are "allowing people to stay somewhat busy."

While the oil economy of the mid '80s fueled big and small businesses alike, low oil prices have meant tough times for the Texas economy in recent years.

Is There A Point When Out Of Control Becomes Complete Control?



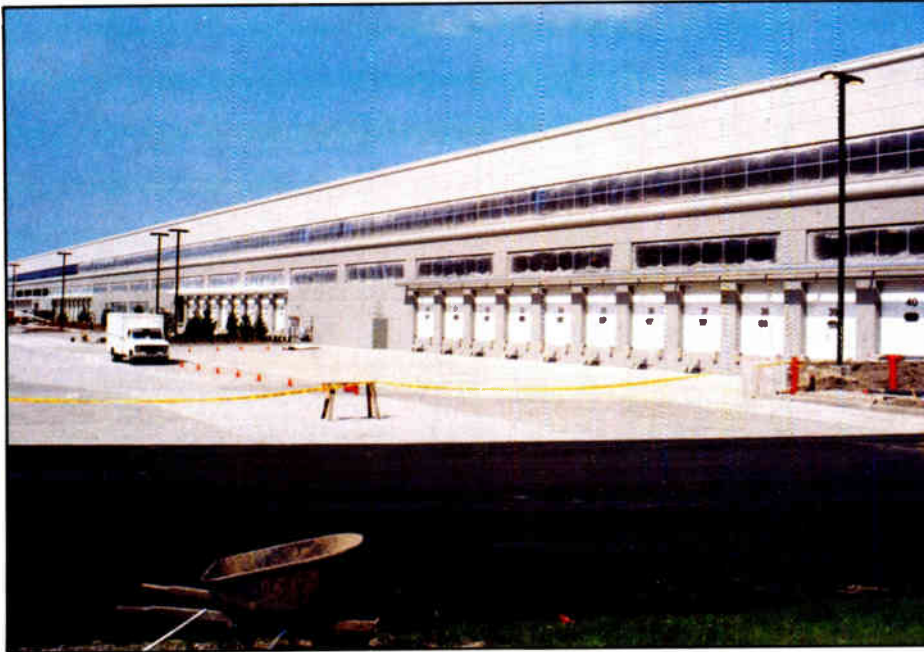
Yes.
The Moment You Plug In
The New CEX-4L[™]
From Peavey
Architectural Acoustics®

When we say complete control, we mean it. The CEX-4L from Peavey Architectural Acoustics is a totally programmable, all digital audio processor that redefines the role of a multi-way sound system controller. The CEX-4L provides ultimate control of even the most difficult rooms, with surprising options you never thought available in a crossover at this price — or any price, for that matter.

The versatility of the CEX-4L will amaze the most discriminating sound engineer. For example, the CEX-4L may be configured as a crossover — four-way, two-way stereo, three-way with a fourth full range (or band limited) delayed output — or it can become a one or two input multi-tap delay. In either application, each of the four outputs can be delayed, equalized, peak limited, and /or bandwidth limited with a choice of six filter selections, including eighth order Linkwitz-Riley filters with 48 dB per octave slopes. An adjustable horn EQ, a one band parametric EQ, or low and high frequency shelving filters can be selected for each output. Precise peak limiters provide driver protection while maintaining musicality to system performance. The selective “linking” feature allows the limiters to track, preserving the spectral balance. Set-up and functionality come quickly and intuitively. The control panel is simple and straightforward with labeled buttons for the various features and a 20 x 2 backlit LCD display. A “data entry wheel” has been included for rapid system calibration, plus a built-in security lock, selective polarity reversal, and muting on each of the four outputs. The totally software-based CEX-4L also allows for essentially effortless field upgradeability, meaning that the CEX-4L will never become obsolete. Yet, we saved the very best for last...audio integrity comparable to high performance DAT recorders. The new CEX-4L all digital audio processor from Peavey Architectural Acoustics. The technology is here. The time is now. Experience the feeling of control...COMPLETE control!

Circle 213 on Reader Response Card

PEAVEY[®]
ARCHITECTURAL ACOUSTICS[®]



London's installation at Nintendo — a building almost 900 feet long with 40 truck bays.

One side effect keeping local contractors busy now is that the three major companies moving into Dallas erect temporary headquarters, which also need paging, security and other systems installed, even before moving into their permanent homes, Stage said.

"In Dallas, sometimes business action is improved by a slow economy," Stage said. "Because there are great leasing conditions [and] prices are down on land — all the factors folks look at in picking a new home — most of the big projects are [new corporate offices]."

Still, Stage notices that from the big office jobs down to the small ones, clients are much more price sensitive.

"For instance, there's a tendency to perhaps purchase a lower model of video projector than otherwise. People are looking to bigger ticket items [to save on]. While I might quibble over whether I should buy one mic or two, they're spending over 10 grand on one product and looking at [those bigger ticket items] to see if they can reduce that."

"It's more of a freeze on expenditures," Stage added. "People are simply not spending so much. They're doing repairs and upkeep, taking care of what they have, and maybe minor accessories are being purchased."

While upkeep provides some profits, it's not great fuel for growth. So what is AVW's strategy?

"I think anyone [in this position] has to look outside our immediate geographical location to other areas nearby," he said.

"That's one thing we're doing. Also, we're just being very aggressive in pursuing larger projects on a bid basis."

Although Stage said his company is now involved in several such bids, AVW recently finished a four-part audio visual project at interim offices for Exxon Corporation, which is relocating its HQ from Manhattan to Dallas.

The project included a presentation system in the board room, an executive conference area, an AV services area, and a media room where execs can record programs off the air waves.

"The biggest challenge was that it had to be done in about 16 weeks; it was a very

fast-track project," said Stage.

Oklahoma contractor Ford Audio Video Systems isn't seeing much new corporation work in its home base of Oklahoma City. But because its sphere of influence extends throughout the south, the contractor has benefitted from corporate work.

"[The South West economy] is probably going to remain somewhat stable; in Oklahoma we don't see a lot of growth but you don't see it declining a great deal either," said Jim Ford, president of Ford Audio Video Systems.

Ford said he's seeing a lot of corporate relocation work out of state — from Texas to Louisiana — but not much in the way of new manufacturing plants.

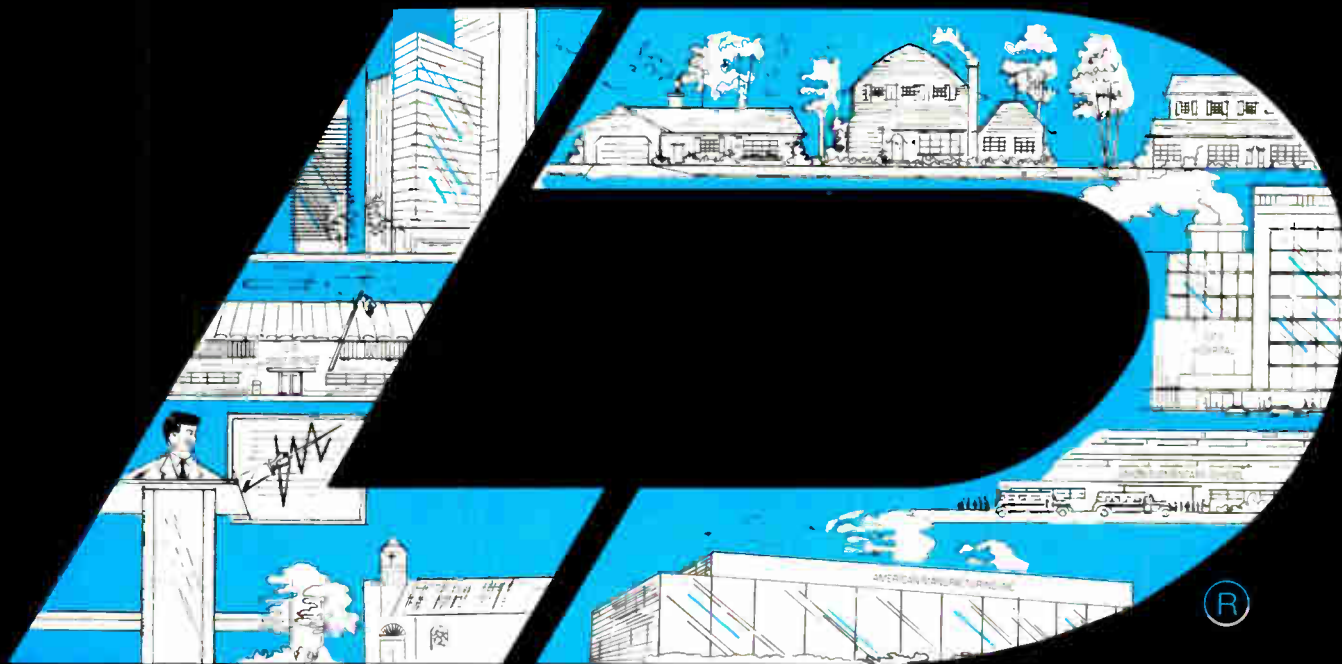
"In Oklahoma we're not manufacturing based, we're oil based and agricultural based," he said. "Consequently, we don't have any significant industry to have growth . . . Since the early '80s, when the price of oil plummeted . . . the South did not see much growth."

Ford said clients are being conservative on how they spend money and already conservative markets are consolidating. The best defense, Ford has found, is his company's track record. "I'd say the big-



London Controls installed the training rooms and noise masking for SpaceLabs, a medical equipment company.

Innovations In Communications™



Since 1955

Wherever people have the need for better communications, safety and convenience, you'll find a **LEE DAN®** intercom system hard at work.

For over 34 years, we've been manufacturing intercoms for homes, apartments, townhouses, offices, factories, schools and hospitals. Our experience can help you turn a complicated specification into a simple, profitable solution.

Our large product line, teamed with our quick, affordable, customizing abilities, can help you meet your equipment needs, schedules, and profit margins.

Next time you need an intercom, call **LEE DAN®**. Our sales staff will assist you in equipment selection. We'll provide a detailed written quotation (not a lump sum price) with literature, spec sheets, wiring information, and anything else you need to put together a great system and a winning proposal.



We're here to help. Call us toll-free.

N.Y. (800) 231-1414
U.S.A. (800) LEE DAN-1

(516) 231-1414
FAX (516) 231-1498

155 Adams Avenue, Hauppauge, New York 11788-3699

INTERCOMS • NURSE-CALL • MAILBOXES • DIRECTORIES • ANNUNCIATORS • WIRE & CABLE • CCTV

Circle 206 on Reader Response Card

gest thing that helps us is that we're entering our 19th year," Ford said.

Beyond that there are few magic formulas. Ford says he's pushing harder to get both the smaller and bigger jobs because "in a market like this, you take what you can get."

That pushiness paid off recently. Ford Audio Video installed an IED com-

puterized paging system, with pre-recorded digital messaging, in Houston Intercontinental Airport last year.

Most of the 90-odd miles of cables used for the job ran in tram lines already built before Ford's team arrived. All the speakers were JBLs — mostly 2365 horns with 2445 drivers — and Crown Com-Tech series power amps, he said.

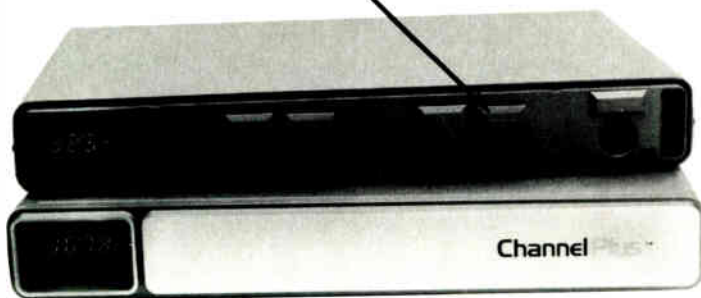


Steve London of London Controls Inc., Seattle, Washington.

Channel **PLUS**®

MULTIROOM VIDEO

Push buttons to select channels



Model D2V—modulates 2 video sources

PICTURE PERFECT CUSTOM VIDEO SYSTEMS

ChannelPlus modulators put each video source on a different UHF or cable channel so that your customers can watch VCRs, satellite receivers, CCTV cameras, cable boxes, etc. on every TV. Create private cable head-ends quickly and economically. For each video source select the desired output channel number by front panel controls. From 1 to 24 channels can be combined with antenna or cable service.

Write, Call, or FAX for free brochures and application notes.



multiplex®
technology, inc.

3200 East Birch Street, Brea, CA 92621-6258, U.S.A.
714-996-4100 • 800-423-0584 • FAX 714-996-4900

Circle 250 on Reader Response Card

© 1990 Multiplex Technology, Inc., Brea, CA 92621

World Radio History

"The biggest problem completing that job was when the Iraq war started," he said. "That really complicated things due to all the security measures being implemented at the airport."

In industrial eastern cities, many contractors also rely on corporate relocations. But as manufacturing expansion levels and the real estate boom of the '80s tapers off, aggressive sales work and new marketing ideas are the most important thing on the assembly line.

"All expansion plans are kind of on hold," said John Mulford Jr., office manager TCSI Inc., a contractor in Bear, Delaware. "Since we do most of our work on new systems, we're trying to develop more guaranteed maintenance agreements."

While Delaware's manufacturing economy is somewhat stable due to Dupont and W.L. Gore, makers of GoreTex fabric, there's also been an influx of banks, which are seeking new business licenses in Delaware because of the state's favorable tax status, Mulford said.

Still, this hasn't alleviated all of Mulford's concerns.

"I was real hopeful that things would pick up when the war ended, but it's been a slow start, I think because the recession was stressed too heavily," Mulford said, adding that there's a lot of office space in Delaware up for sale or lease these days.

Although there's a risk that maintenance agreements will overtax the technical support crews while creating no new cash per visit, he says the idea has given the sales team a new lease on life. "It's a gamble, but it's sort of like being an insurance actuary," he said. "You may lose money on one particular account, but overall, you're not going to lose money."

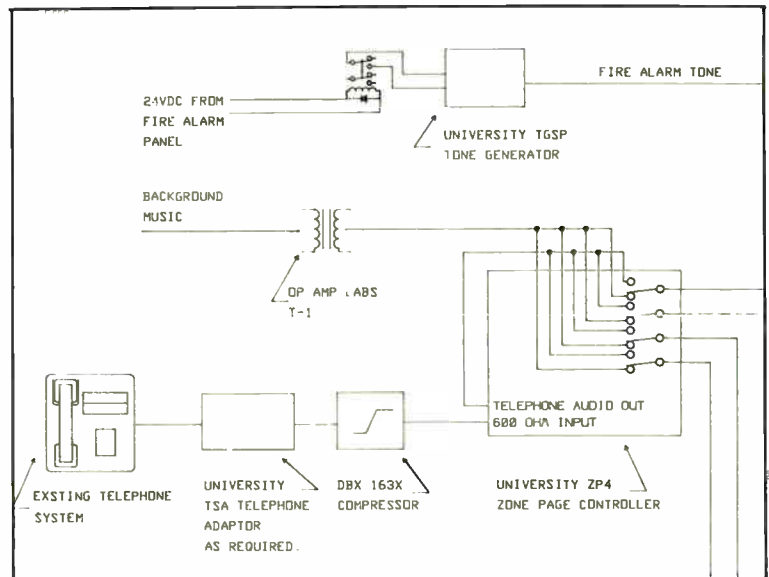
Although some of the big jobs that are coming into town are scaled down because of an overall cash shortage in the economy, there's hope for the future.

"A lot of times, companies are only putting in phase one and getting by with the basic needs — and they'll just install the wiring for phase two," said Mulford.

TCSI Inc recently finished installing an emergency paging system in W.L. Gore's Appleton North facility in Elkton, Maryland. The system uses explosion-proof Soundolier horns and Class II Plenum cables that are also able to withstand a blast, he said.

While large telepaging systems in office buildings are still good jobs when you can get them, many companies see office electronic training and classrooms as the emerging growth area.

A section of Mervyn's Ontario Distribution Center public address system blueprint from GMF Sound in Orange, California.



"Training rooms is where it's at," said Benny Young, who handles electronic training installations for Allied Telecommunications, of Richmond, Indiana. Most of these jobs are designed to handle audio conferencing, with dedicated mics feeding into an ATI machine then to a phone line, he said.

Across the country, there are pockets of resistance to the recession. In the

Pacific Northwest, Seattle appears to be one of those areas.

Although Seattle is still one of the country's fastest growing cities, business in the city is now just "holding its own" compared to the boom of the '80s, says Steve London, owner of London Controls. Because the town isn't overgrown like many eastern and California industrial centers, there still room for a contractor to grow.

MAXIMUM SUPPORT



Sliding Shelf

Perhaps the heaviest duty sliding shelf on the market (call for specs), the SLS-1 locks out in two positions, ensuring that an accidental bump doesn't put your valuable equipment on the floor. Occupies a single rack space and comes with front and rear rack ears. Two-space rear rack rail also provided.

One and two space fixed shelves and a variety of other rack accessories also available. CALL, FAX or WRITE.



P.O. Box 417, Riverside Station
Paterson, NJ 07544-0417
(201) 523-1425 • FAX (201) 523-1658

Tek-Micro Care Series NC-300 Nurse Call
Micro-processor based audio-visual nurse call system for hospital, nursing home and health care related facilities.
Fully supervised multiplex wiring format.



1331 South Killian Drive
Lake Park, FL 33403
Telephone (407) 844-2383
Toll Free Order Desk (800) 327-8466
Fax (407) 845-1587

Like many local contractors, London has benefitted for more than a decade from work from Boeing, which plans acres of new plant sites in the next five years. Nintendo Corporation also recently moved a large U.S. distribution center into the area, he noted.

Work for Boeing ranges from paging systems in airplane hangars and produc-

tion sites to training rooms with public address and an increasing amount of television integration. Work at Nintendo is similar, but with an increased emphasis on video training rooms, as well as closed-circuit TV security and employee monitoring.

'A lot of people are asking for integrated training, and programming rooms with

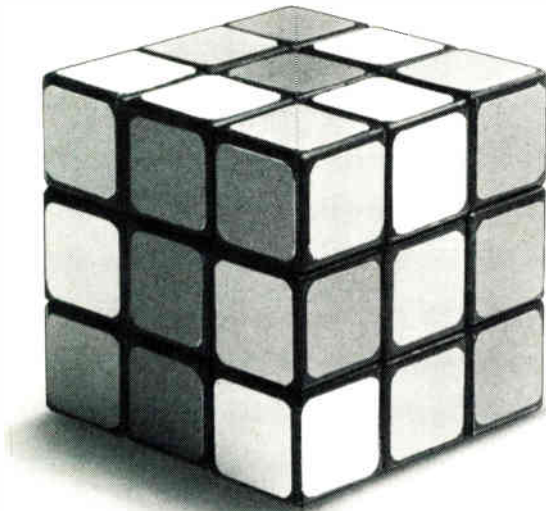
teleconferencing or, another thing we're seeing more frequently, is people using TV cameras instead of those old overhead projectors,' London noted. The advantages to television in training rooms is that the projected material doesn't have to be converted to a transparency, that the cameras have a nicer aesthetic look than the old gray overhead projector.

At Nintendo's distribution center, London installed interior and exterior closed circuit TV systems. A unique appendage to that job, however, was a string of 11 half-inch Javelin CCD cameras lining the roads leading to and from the plant. With these cameras, workers can monitor the progress of trucks coming and going for purposes of inventory management as well as security. The cameras were linked to the factory with three miles of fiberoptic cable, London said.

'The biggest challenge was aesthetics,' said London. 'The architect didn't want to see big ugly TV cameras on top of light posts.' In order to hide the cameras, the contractor used a two-foot-wide dome housing painted dark to match anodized lamp posts.

Seattle is still a pretty small world as U.S. cities go. But with huge companies such as Boeing, one challenge to keeping a competitive edge is getting to know the many electrical contractors involved in each new plant expansion. It is often these contractors who dole the work out to the sound contractors in these cases, he said. But there are also hundreds of budget officials who oversee spending on each new facility. Finding and maintaining relations with all the decision makers 'is kind of a detective job,' but it's crucial in getting the big jobs, he said.

While London says there's always been competition from out-of-town firms, he said it's still rare that outsiders win out over the local 'good old boy' network. The only time locals lose out, he said, is when a national retail chain needs its Seattle branch to look and sound just like the one in L.A. In those cases, the chain might import talent for the sake of consistency. ■



OUR RMX-44 OFFERS ALMOST AS MANY COMBINATIONS.

Zone control and routing problems can be puzzling. You could spend a lot of time trying to get the right combinations. Or you could get the RMX-44 and save yourself a lot of trouble.

With it you can select or mix four input sources and route them to as many as four different outputs. And you can make your selections remotely using simple contact closures. The RMX-44 can eliminate patch bays or mixing boards, but mostly it gets rid of your problems. Our RMX-62 has six inputs and two outputs where you need a slightly different mix. No matter what your switching or routing problems, call Oxmoor for all the right combinations.



THE OXMOOR RMX-44 MIXING MATRIX SYSTEM

Oxmoor Corporation, 2111 Parkway Office Circle, Birmingham, AL 35244, Telephone (205) 985-7040

Circle 247 on Reader Response Card

How easy is it to install a complete
**AUTOMATIC
 SOUND SYSTEM ?**

made in USA



This easy!

Lectrosonics has integrated sophisticated automatic mixing with EQ and amplification in a single, affordable package . . . the AS100.

Six Channel Automatic Mixer:

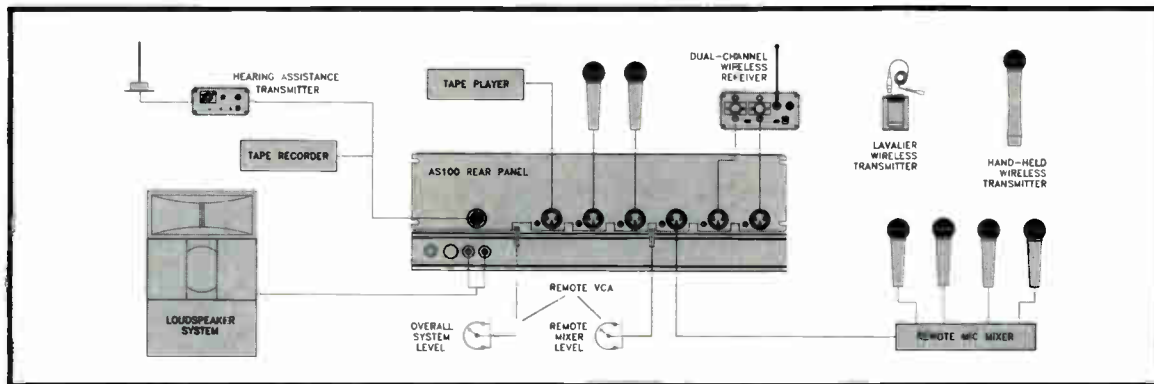
Unique non-gating attenuation circuitry • Inputs adjustable from mic to line level • Phantom power selectable for each channel • "Last Mic Hold" function eliminates "pumping" and "breathing" • Remote VCA control for each input channel and on main output • Automatic or manual turn-on threshold adjustment

Constant Q Equalizer:

Adjustable low frequency roll-off • 10 band constant-Q, 1/3 octave EQ, 315Hz to 2.5KHz • 2 Bands Constant-Q, 1 Octave EQ at 5KHz and 10KHz • "Pre/Post EQ" jumpers for each channel • Security cover resists tampering

Power Amplifier:

100 Watts RMS at 4 Ohms • Less than 0.25% THD (20Hz-20KHz) • Built-in peak limiter to prevent clipping and protect speaker system • Fully protected against shorts and highly reactive loads



This diagram illustrates one example of the versatility of the AS100 system. Each channel can be jumpered pre or post EQ. Remote VCA level control is provided for each input and on the main output. Each input may be operated in an "auto" or "direct" mode.

Call now for more information!
 Toll-free 1 (800) 821-1121



LECTROSONICS, INC.

P.O. Box 15900 • Rio Rancho, NM • 87174
 581 Laser Rd. NE • Rio Rancho, NM • 87124
 (505)892-4501 • (800)821-1121

FAX (505)892-6243

Command Central

New England Telephone Creates a Paragon of Multi-Media Centers

BY DANIEL KUMIN

Information overload. We've all experienced it, this unwanted child of the high-tech era. Particularly in multi-media environments, where we're required to access, select, route, and assimilate the ever-growing river of audio, video, and data that modern life pours upon us. It can quickly become an overwhelming flood.

Now put yourself in the shoes of New England Telephone, one of the largest of the Bell Operating Companies. You must manage a gargantuan telecommunications network with millions of customers spread throughout a five-state region. This entails an info-flood of truly deluvian proportions: At a moment's notice you must be able to monitor the screen of any of the nearly 60 Sun and AT&T Unix-based minicomputer workstations that serve your network-management team as windows on the system. You must also keep abreast of live video from satellite, broadcast, cable, and in-house sources, and audio from any of these as well as local paging and intercommunications networks. What's more, it's imperative that you are able to zero in on a crisis situation by sending a particular source to a "breakout" or conference room where top technicians or teams of corporate brass can make the lightning decisions that keep all of our phones (faxes, video, data, and audio links, and who knows what-all else) up, running, and generating revenues. Finally, for technical and marketing presentations, you need to

Daniel Kumin writes about professional and consumer audio, visual and musical topics for a number of publications.

be able to call up media such as local VCRs or 35 mm slides.

What to do? Design a state-of-the-art Network Operations Center command room. Incorporate a state-of-the-art, multi-media system. Make it interactive, distributed, and deceptively simple to operate. Put it all in your just-completed Customer Support Center in Framingham, Massachusetts.

New England Telephone's massive new system does all this and more. It's located in the telecommunications giant's imposing new facility, designed by architects Juniper Russell and Associates of Newton, Massachusetts; the facility represents an overall investment in up-to-the-minute technology of something on the order of \$20 million (and you wonder where your monthly phone bills go). In the heart of the building is the Network Operations Center Command Center, an inner sanctum that feels in atmosphere not unlike the war room from a classic WWII film. It was conceived to "put the workstation on the wall" via projection video, while at the same time supplying tremendous audio-video control with unprecedented ergonomic ease and flexibility.

The room is a roughly semi-circular operations theater perhaps 100 feet by 60. Distributed about its perimeter are 15 large rear-projection video monitor screens displaying an ever-changing selection of workstation graphics such as maps, flow diagrams, and data, as well as live video such as news and weather. Below these are a bank of 30 33-inch CRT color monitors. Filling the floor space are sta-

tions for 26 technical personnel; each is equipped with both Sun and AT&T Unix-based workstations.

Consulting on the extensive audio-video design issues involved in a project of such complexity was Nick Browse of Harvard Massachusetts Nicholas Browse & Associates. Browse designed a system that would implement New England Telephone's functional needs while meeting some very strict standards for quality and performance. The equipment itself was supplied and installed by H.B. Communications, Incorporated of North Haven, Connecticut and Needham, Massachusetts. H.B.'s Manager for Display Systems, Kevin Collins, performed point-man duties as project manager; Don Akerblom was the site manager.

The resultant installation's primary job is to provide powerful A-V capabilities for the Network Operations central command room, where a coterie of network management experts watch over the phone system's status 24 hours a day. Here, they are able to observe network conditions across the full spectrum of modes, in real time. Equally important, different specialists can share information by simply looking up at one of the 15 screens, rather than requiring a query-and-wait routine on their computer monitors. Finally, the system is able to select an individual screen and send it to one or more of over a dozen remote locations. These include several "breakout" rooms, conference rooms, and two fully equipped amphitheatres. Each of these remote rooms is equipped with its own controls and can call up sources —

central or local — on demand.

The command room workspace is divided into four quadrants dedicated to the center's main functions (Electronic Systems Assistance, Data Technical Assistance, the Data Voice Center, and the Network Management Center). Built into each group's central desk is an audio/video master controller of unusual power and flexibility that furnishes system-wide control of every A-V element. These touch-screen controllers are in fact the only visible manifestations of what is arguably both the heart and the nervous system of New England Telephone's A-V setup: multimedia controls. These are manufactured by Crestron Electronics Inc.

Crestron's CTP-1000EL touch-screen controller is an essentially knob-free, nine-inch electroluminescent flat-screen panel. The screen itself is just the front end of the system. The intelligence behind it resides in a 3U rackmount custom 8088-based microprocessor, the CresNet-2; New England Telephone's system also employs Crestron's optional link to an MS-DOS PC for programming, monitoring, and diagnostics. The hardware controls an A-V network that is distributed throughout the installation; in the case of the New England Telephone center, this includes the Network Operations Center command room itself as well as more than a dozen additional remote rooms. The network runs its own custom operating system — "CresNet" — that communicates via RS-485 links. A secondary, RS-232 communications link is also provided to interconnect the Crestron system with various A-V hardware, administering direct component controls.

Crestron's touch-screen display is a hierarchical, icon-based system. The default welcoming screen presents a number of options. Simply touch an on-screen "button" or symbol with a finger, and a new screen with new options appears, and/or the commanded function commences. The principal advantage of such a concept is that each installation may run custom software, implemented by Crestron to customer specs or configured by the customer himself on-site, using a

set of very simple programming tools supplied. The result is a high order of ergonomic elegance and self-evident operation. There need be no superfluous command options or graphics on any screens; little-used functions can be relegated to lower-hierarchy screens; and each display can be configured to match individual requirements.

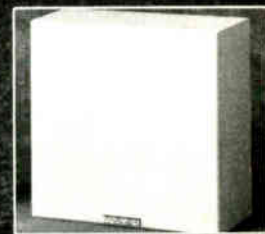
The command room workspace is divided into four quadrants dedicated to the center's main functions.

For example, Gerry McGrath, the Customer Support Center's Staff Director and one of New England Telephone's point men on the A-V project, wanted a sort of master screen. While admittedly overly dense from an ergonomic viewpoint, this would supply every major control on a single panel for diagnostics, tests, and use by sophisticated everyday users well-versed in the system. Early in the design phase, McGrath sketched out what he wanted — literally on a napkin. In a matter of days, Crestron had the panel implemented.

The Crestron design can integrate virtually any and all A/V sources: live video; tape or disc; graphics; Video-Show; slides; film; computer data, even overhead-projectors. (It also can display extensive text on its own touch-screens, including automated timing and teleprompting, and can even open a window for information from an outboard computer.) In the New England Telephone installation, the principal video sources are high-resolution workstation computer graphics, computer data, and broadcast, cable, and satellite video and audio for news and weather monitoring. (While it may seem curious to see CNN or a ball game up on a big screen

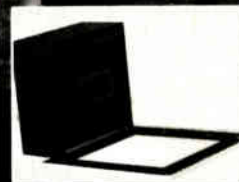
Install the Very Best...Specify Frazier CAT™ 40

- Dual horn, Point Source Alignment
- Coherent phase & time domains
- Smooth 90°X90° Speech pattern
- Full band width 65Hz - 17kHz

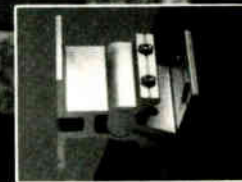


New Decorator white

Coincident
Aligned
Transducers



State of the art 2'X2' alternate to ceiling Co-Axes



Mounting Bracket

When you specify and install FRAZIER CAT™ 40's you've done your very best! Our CAT™ design establishes point source accuracy and signal alignment. Smooth, controlled energy ... excellent gain before feedback ... for reverberent spaces ... That's the CAT™ 40.

FRAZIER

Route 3, Box 319 • Morrilton, Arkansas 72110
(501)727-5543
Toll Free 1-800-422-7757
FAX (501)727-5402

Circle 275 on Reader Response Card





The Crestron media control system and touch screen control serve as the nervous system for N.E. Tel's vast A/V setup.

Images are displayed from Barco 800 projectors on 15 rear-projection screens.

in the Network Operations Center, keeping abreast of the news and weather is vital to stay one jump ahead of the network's needs and conditions.)

In addition to its network monitoring duties, the greater AV installation also serves an important secondary function for supporting marketing and training presentations. So VCR audio and video, Video-

Browse designed a system that would implement New England Telephone's functional needs while meeting some very strict standards for quality and performance.

Show graphics, as well as slides and overheads, are also integrated into the system. These are most often exploited in several remote conference rooms and theaters; here, the Crestron design provides wireless infrared control links, for hands-off operation by the presenter. The principals among these remote rooms are each furnished with their own Crestron CTP-1000EL panels as master controller's; there are a total of 10 touch-screens in the New England Telephone installation.

Back in the Network Operations nerve center, images on the 15 rear-projection screens are displayed by Barco 800 projectors, a component chosen only after careful scrutiny. New England Telephone brass and consultant Browse examined



several top contenders, and chose the 800 — after a final “shootout,” and a visit to Barco in Atlanta — for its ability to render computer graphics with superb legibility at the required size-distance ratio. According to McGrath, the new Sony CRTs have also yielded excellent ageing performance and reliability — better than expected.

The projection screens themselves were also the subject of careful evaluation. The chosen design is Stewart Lumiglass 130, selected as the best overall, particularly in the wide-angle viewing conditions in the command center. The 15 screens in the Network Operations Center command room itself are 6' 6" by 4' 10" on ¼-inch glass substrate; others of various size are used in the remote rooms. While the Barco projectors are capable of automatically syncing up the disparate video sources used by the New England Telephone system, the process compromises source-to-source convergence accuracy a bit. The solution came about thanks to the Crestron system's built-in intelligence, and the Barco's ability to store different user-setups in memory. When a command to change sources is received from the sys-

tem by a particular projector, a simultaneous command goes out over an RS-232 comm-link between it and the Crestron system, recalling the setup calibrated for the particular source to be displayed. Aiding overall system calibration is a high-performance RGB test-pattern generator made by V.I.I. of Ohio. This can be called up from any Crestron panel and displayed on any screen in the entire facility to check monitor alignment.

Below the Barcos are an arc of 30 Mitsubishi XC-3310s arrayed across the full perimeter. These multi-syncing 33-inch color monitors are currently hard-wired, used to monitor raw workstation data arriving in its pre-graphics format. Future system enhancements are planned that will put the Mitsubishis to work, on a secondary matrix switch, monitoring several video sources as well as data.

Switching a thicket of high-bandwidth signals as dense as the Network Operating Center's workstations proved an unprecedented challenge. The answer comes from San Diego CA's Dynair, a vendor selected for its track record of experience and expertise in wideband graphics: a 70

Sharp presents two new LCD Color Video Projectors.

They're both brighter and lighter.



XG-1500 ceiling mount



XG-1100 portable

LCD PROJECTION SYSTEMS

SHARP VISION™

Now you can brighten up your presentations with two new convergence-free professional LCD video projectors from Sharp.

Both the XG-1100 (portable model) and XG-1500 (ceiling-mount model) are brighter, lighter and more compact. And, because they are Solid State LCD, they also set up in seconds.*

The XG-1100, with its top-mounted carry handle and optional carrying case, is a smooth traveler. And the XG-1500, with its back-lit wireless remote and space-efficient design, is a natural for any ceiling, wall or even shelf-mount installation.

Both models incorporate industrial-type BNC video inputs as well as an S-Video terminal, so they connect easily to a wide variety of sources—including many PCs. Plus, for improved compatibility, the XG-1500 also features built-in RGB.

With both XG-1100 and XG-1500, you also get a 20"-100" zoom lens, a convenient scan reversal switch (for rear-projection use), as well as 3-wire (grounded) power cord. And, with a readily available long-throw lens, VGA or Mac II™ graphics interface, these projectors are all set for almost any special multimedia application.

*Sharp's Twin-TFT Solid State LCD technology means absolutely no technical set-up

Contact your local authorized Sharp Professional Products dealer for a demonstration. Or call (201) 529-8731 or FAX: (201) 529-9636. Once you do, you'll see why Sharp Solid State LCD color video projectors leave CRT 'tube' projectors in the dark.

Simulated screen image



SHARP.
FROM SHARP MINDS
COME SHARP PRODUCTS™

© 1991 Sharp Electronics Corporation, Professional Products Division, Sharp Plaza, Mahwah, NJ. 07430-2135

Circle 207 on Reader Response Card

× 30 RGB video matrix switch with tremendous bandwidth — 70 mHz. (A secondary 30 × 10 40-mHz RGB matrix, and a 10 × 20 audio matrix, are also employed.) The Network Operations Center is the first commercial application to switch such wide-band workstation computer graphics in this way. The bandwidth involved also required video EQ for all cabling between switchers, sources, and monitors; this was also supplied by Dynair. The computer interfaces themselves are Extron RGB-106Es and RGB-104s.

Crestron's touch-screen display is a hierarchical, icon-based system.

According to designer Browse, one of the more interesting technical challenges encountered on the Network Operations Center job was presented by the Network Operations Center command conference room. This is an enclave set into the long wall of the larger command control room, which it overlooks on three sides. It includes its own Crestron CTP-1000EL touch-screen panel, a projection monitor and screen, local A-V sources and extensive communications link-ups, including the ISDN network that is implemented throughout the facility. (This conference room is also meant to serve as a master crisis center in the event of emergency.)

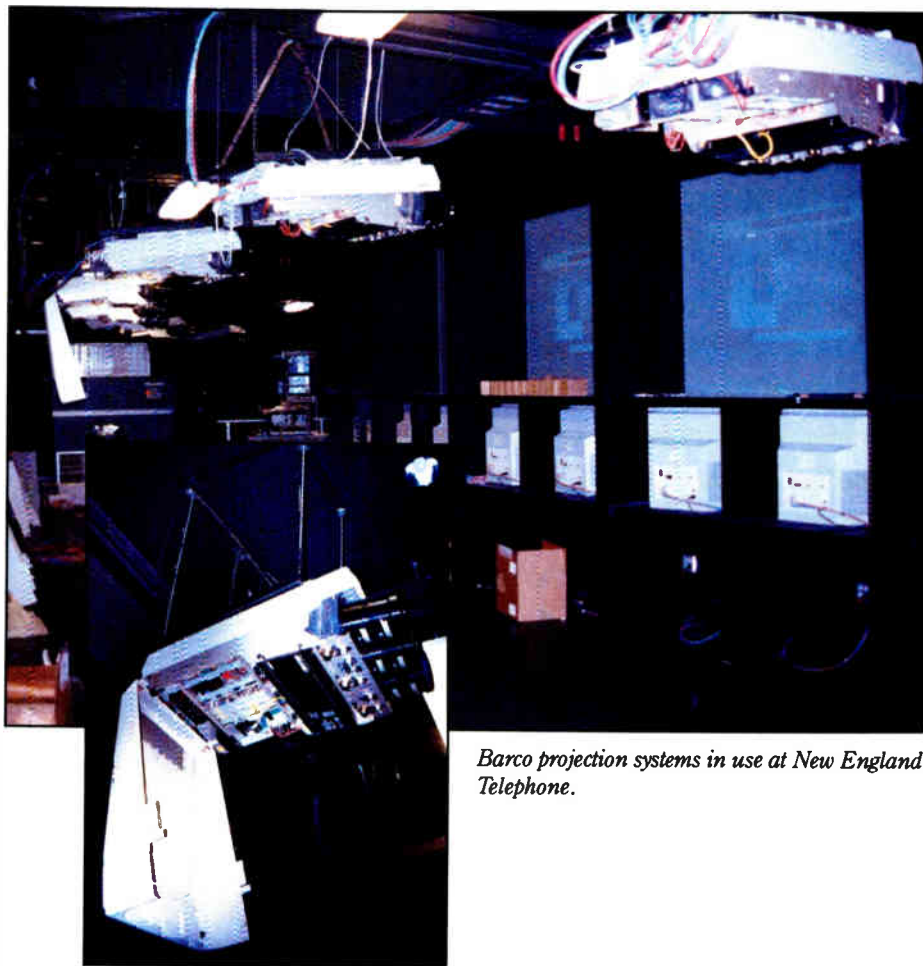
The conference room is walled almost entirely with Artifex "electronic" glass; LCD material within sandwiched panes is opaque when "off"; perfectly clear when "on," revealing the overlook to the command center. The technical puzzle arose from the glass' shuttering frequency, which was line-based at 60 Hz. This, of course, created interference patterns when viewing the Network Operating Center's screens. The solution involved lowering the switching frequency, and designing and building a custom, high-power current-driver for the shutter controller.

While audio definitely plays second fiddle in New England Telephone's Network Operations Center system, it's a crucial

element of the news and weather information that is continuously monitored in the command center. Each workstation position includes a small, built-in speaker (a rather inexpensive consumer model, in fact, chosen by Browse for quality in spite

The firm had a variable crew sometimes numbering as many as six on the site full-time for six months.

of its humble origins). Audio (if any) follows the video, and is not independently switchable. An extensive voice paging network is also incorporated. This permits any of the Network Operations Center desks to page out to four exterior zones, via a push-to-talk microphone-speaker within the desk. Each work position also includes two-way communication with the overlooking central conference room. Primary audio power is provided by IRP amplifiers. A number of TOA mixers and auxiliary amplifiers are also utilized.



Barco projection systems in use at New England Telephone.

Not surprisingly, a project of this magnitude took some little time to proceed from the taxiway to full flight. Browse & Associates commenced work on the New England Telephone design in December of 1988, and H.B. Communications received the specification in September the following year. According to H.B.'s project manager Kevin Collins, the firm had a variable crew sometimes numbering as many as six on the site full-time for six months. Two technicians — Dave Coccia and Scott McDowell — were on the job throughout.

While the bulk of the system was completed by autumn, 1989, the New England Telephone project is an on-going thing. The next phase, soon to be instituted, involves integrating security monitoring into the system. Live on-site security video will become a display option on the Mitsubishi 33-inch monitors located below the Network Operating Center's 15 projection screens, and will be fully integrated into the Crestron control system. Another soon-to-be addition is that of a direct weather-satellite down-link; this will be available on any big screen throughout the system.

Because of the flexibility of the system conceived by New England Telephone and Browse Associates, refinements are implemented with relative ease. For example, plans exist to convert the two "corner" screens in the Network Operations Center to four-pane multi-image screens. Should it become necessary as the system grows, this would accommodate up to six additional sources as they evolve.

In the final analysis, the NET system has been a great success, both for the customer and for those involved in its design and implementation. Success — as it always does — brings with it a good deal of attention. Telecommunications services

The conference room is walled almost entirely with Artifex "electronic" glass.

are an aggressively marketed commodity in this competitive age, and to maintain its edge NET makes liberal use of the new system for marketing presentations. While this was an expressed element of what the system was designed for, presenters often also display with pride the futuristic new multimedia Network Operations Center command center, as graphic, visible proof of their company's cutting-edge technology. Consequently, a fairly steady parade of people, including gaggles of representatives of the Federal and State government agencies that make up a large segment of NET's clientele, is kept trooping through the operations center.

The final analysis by those involved in the nuts-and-bolts issues is universally positive. Kevin Collins termed the experience, "Wonderful; a great team of people both from the designers [Browse & Associates] and the clients. Very understanding, and a lot of fun to work with."

And how did the customer feel about the end result? Gerry McGrath put it this way: "Terrific. At the outset, we demanded absolutely everything. And the great thing is that we got just about all of it." ■

Install Quality

The SHM 20. As a contractor or consultant, you're faced with increasing client expectations. When providing audio equipment for a conference room, church, auditorium or any demanding situation... installing quality is a must.

The SHM 20's high sensitivity, tight polar pattern, outstanding gain-before-feedback and sleek design provide just that.

Ultimately, installing quality mics says something important about you—let beyerdynamic's worldwide reputation for quality and phenomenal long-term value speak for you.

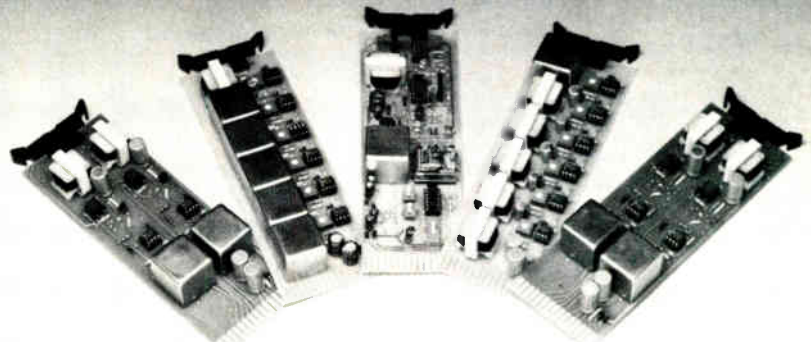
For more information call or write for our 94 page full-line catalog.

SoundContracting **beyerdynamic**

5-05 Burns Avenue, Hicksville, NY 11801 Tel. (516) 935-8000 Fax (516) 935-8018

Circle 271 on Reader Response Card

DEAL YOURSELF A WINNING HAND!



Card frame systems are rapidly becoming the equipment choice of the 90's. And the INTEGRA III SYSTEM from PROTECH AUDIO is rapidly becoming the choice in card frame systems.

Why? Because we offer our dealers more products, more design support, and more market protection. We work to help our dealers develop the competitive edge.

Our dealers find they can offer

their customers a dependable product line, with extensive factory support. From initial system layout, to after sale support, we strive to give our dealers a reliable source for professional audio equipment.

Get the competitive edge! Become one of a limited number of authorized INTEGRA III SYSTEM dealers. For the winning story, call or write today!

PROTECH®

Protech Audio Corporation
Flowerfield Building 1
St. James, New York 11780
516-584-5855

Circle 273 on Reader Response Card

TRENDS AT NAB '91 WILL HAVE A LASTING EFFECT

By Allan Varela

NAB '91 was how it was billed, and what a show it was. The annual convention took place in April in Las Vegas, and the broadcast industry came out in force to show the world the new and exciting. The aisles (and they were endless) were crammed with more equipment than you could shake a stick at, and audio was very well represented, with the audio elite showing their wares.

All the glitter of the fancy looking equipment; all the imposing and sometimes daunting nature of the large control boards; all the fascination with complex computer data images dancing on hi-res screens, however, were overshadowed by the current trends in the market. These trends will have a lasting effect on the Sound & Communications business as equipment usually thought of as in the high end post production or recording studio domain will now impact the corporate and education markets.

One trend is tremendous production power for very little cost — always a winning combination. The other is the further blurring of the lines between companies that essentially serviced other markets (e.g., the musical instrument market), and the more “traditional” high end audio companies. This provides the heated competitive environment to drive the

power/cost equation.

This revolution centers around Digital Audio Workstations (DAW) and the recognition by video companies that sound is the final frontier for bells and whistles to offer customers. A digital audio workstation is a recording device whereby sound is digitized and stored on hard disk as opposed to tape. The advantage here is the ease of editing the recording and conforming the final tracks to video or film. This method of recording and editing was toyed with by the adventurous up until Spring of 1990, and then the flood gates opened up and every recording facility jumped on the DAW band wagon.

The hard disk systems run from as little as \$2500 (for the system — not the computer) to well over \$200,000, with the higher priced models having dominated the market under the guise of *more expensive* = more goodness. But, as the studios became familiar with the editing methods, less expensive systems became attractive as they provided enough features to accomplish particular projects. The Macintosh computer is the current platform of choice, either as the central processor or as the controlling platform.

**AS OPTICAL SYSTEMS
GAIN ACCESS SPEED
MORE OF THIS TYPE OF
EDITOR/RECORDER WILL
BECOME AVAILABLE.**

One problem with the very affordable systems was lack of tracks — there were only two; to jump to four or more became a big money jump. This year, at NAB, the money jumped the other way while the number of tracks leapt upward. Another problem was with the features deemed necessary to accomplish editing, such as

level control, panning (left and right sound orientation), EQ, traditional compression and limiting, and time compression and expansion. The latter feature allows, for example, a 61-second track to be time conformed to a 59-second picture without changing the pitch of the track (as would happen if you sped up an analog tape machine to make up for the time difference). If you wanted this capability, you paid for it.

In the corporate and education world, the buzz word used to be desktop publishing, now it is desktop video (which is still by and large a dream), and, more importantly, multimedia. Multimedia presentations run the gamut from international teleconferencing to mixed computer driven overhead presentations with sound and video elements. Gone are the days where the tired looking report and the equally tired looking presenter can win the day for a project. This leap into the future of mixed sound and picture still carries a large price tag, and most companies still order out for their presentations. As of this NAB, however, the stage is being set for new stars.

Center stage is Digidesign and its Sound Tools system. This system plugs into one of the expansion slots of a Macintosh computer and allows the user to have a stereo digital recording system on his desk. The features list grew from simple cut and paste editing in the beginning, to all of the above mentioned capabilities plus on board synthesizer cards and sample cards (very short form digital recording) where the sampled sound can be triggered by a keyboard, or any MIDI trigger or sequencing program.

At this year's NAB, however, life changed in the DAW market with the release of Digidesign's new four track system. The system resides in a rackmount

case, rather than in the Macintosh, but still retains the Mac interface. The good news is that several units can be stacked for even more track power. The better news is that Avid has entered into an OEM agreement with Digidesign and is featuring this advanced audio system with their video editing systems. The Avid 200 of-

THIS MERGING OF AUDIO AND VIDEO UNDER ONE ROOF ELIMINATES THE PROBLEM OF SYSTEM INTERFACING.

fers, according to Avid, better than VHS picture quality, low cost storage, up to 24 tracks of CD quality audio (with the Digidesign system), and the ability to import graphics and titles. The Avid 2000

system offers, according to Avid, full resolution picture quality, professional audio mixing, integration of graphics, titles and sound effects, and direct output to tape.

This merging of audio and video under one roof eliminates the problem of system interfacing that always seems to plague the industry on the top end (hence the high price for systems and engineers) and makes cost effective production a nightmare for the non-professional or non-full time user, driving them to order out for productions. Avid is not the only player in this game; at least two other companies, as yet un-named, are OEMing the Digidesign system. This is significant as video is recognizing the general audio trend and demand, and meeting this demand with affordable yet powerful systems.

Another system from an MI source is the new system from Roland. The system

THE MACINTOSH COMPUTER IS THE CURRENT PLATFORM OF CHOICE.

is a stand alone DAW but can be controlled from a Mac. The system, called the DM-80, can be had in four or eight track configurations with the eight track weighing in at around \$8,000, according to Roland. Added storage capacity, either with SCSI drive hard disks or optical media, is available. The unit links to SMPTE time code and has a remote controller, the DM-80R, and a fader unit, the DM-80F. Multiple units can be run as one with the Macintosh software package. The impact here is the tremendous flexibility of the system for a very affordable price, and that affordability will drive more corporate and educational system installations.

"...WITH SOUNDSPHERES...EMPLOYEES ARE PLEASED THAT THEY CAN ACTUALLY HEAR THEIR PAGES."

For a warehouse (high, open ceiling) type set-up, these speakers are ideal and with an acoustical ceiling, the sound is even better.

Michael Marusevich/Director of Field Operations. Pergament Home Centers, Inc.

Matt Maloney/Telecommunications Manager writes:

About two years ago, Pergament was seeking ways to improve the clarity and coverage of the sound systems in our stores. At that time, the Spring Valley N.Y. Pergament store was under construction. Our NY MUZAK representative, Bob Lauro, proposed using Soundspheres there, and guaranteed in writing to replace them with twice as many wall baffle speakers if we were not satisfied.

At that installation and at each new store since, Soundspheres have provided Pergament with significantly improved sound quality, improved dispersion of sound around high and heavily stocked store fixtures, and quicker system installation than with conventional speakers as less Soundspheres are needed.

We never did consider taking MUZAK up on their replacement guarantee.

Write or call direct for further information.

SOUNDSPHERE A PRODUCT OF
SONIC SYSTEMS, INC.

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



Three other products of note for this trend come from the MI manufacturers as well. The first is from Alesis. Alesis introduced the new Alesis ADAT digital recording system at NAMM, and was introducing it now to the NAB market. The basic building block for the system is the ADAT eight track digital audio recorder with the locking of up to 16 ADAT units for a total of 128 digital audio channels. The system records eight tracks of 16 bit digital audio onto SVHS tape, yielding approximately 40 minutes of recording time per cartridge. Variable sampling frequencies from 42.7 kHz to 50.85 kHz are available. The system has a full function remote control, the BRC, and runs from SMPTE and MIDI time code. Link this system to one of the hard disk editing systems and you have a very powerful editing and storage package.

The second unit is from Akai. Akai showed their DD1000 system optical disk recorder/editor. The DD1000 uses rewriteable 650 megabyte magneto optical disks as the storage medium for the audio. The DD1000 is a dual stereo unit and comes with a built-in editing system and can be controlled with a Macintosh com-

THIS REVOLUTION CENTERS AROUND DIGITAL AUDIO WORKSTATIONS.

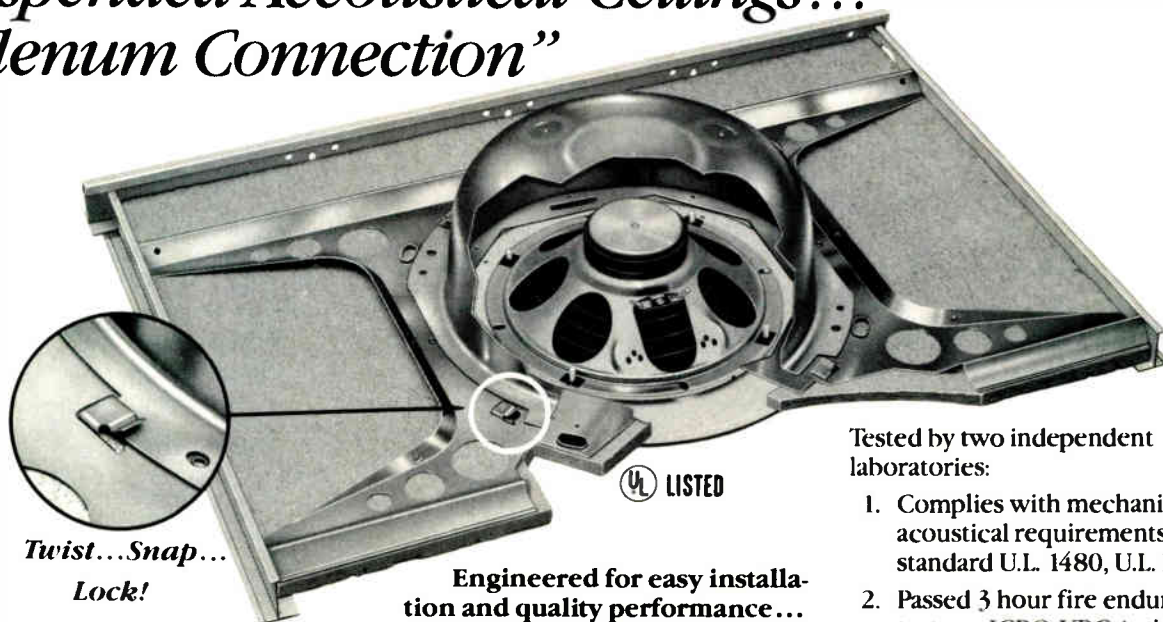
puter. This is the first all optical system on the market, and as optical systems gain access speed more of this type of editor/recorder will become available.

Third, but not last, is Mark of the Unicorn. Performer Version 3.6 was featured.

Performer is a music MIDI sequencing program for the Macintosh computer. More importantly, it is a powerful tool for sound effect positioning as well as MIDI control for mixing consoles. The MIDI Time Piece and the Video Time Piece (VITC) are significant products that supply powerful features, and provide strong links to the video world with low cost. The whole world of MIDI and the tremendous amount of gear that MIDI represents, from the high end and the low end, can be successfully interfaced with video with these products.

Power to the people was a clarion call of the 1960s. The computer industry at large and companies like Digidesign, Roland, Alesis, Akai, and Mark of the Unicorn are delivering this power, and creating new business for the Sound & Communications world. ■

One System Fits All Suspended Acoustical Ceilings... "Plenum Connection"



*Twist...Snap...
Lock!*

**Engineered for easy installation and quality performance...
Designed to get building inspector approval and maintain the integrity of air-return acoustical ceilings...**

Tested by two independent laboratories:

1. Complies with mechanical and acoustical requirements of safety standard U.L. 1480, U.L. listed.
2. Passed 3 hour fire endurance test per ICBO-UBC Article 43-7.

The "plenum connection" enclosure/bridge system is in stock and ready for immediate shipment.

For Details Call or write.



FOURJAY
INDUSTRIES, INC.

3400 STOP EIGHT ROAD • P.O. BOX 14617 • DAYTON, OH 45413-0617
TELEPHONE (513) 890-6444 • FAX (513) 890-1692

Fourjay Quality — American Made

TRADE SHOWS

DJ EXPO DRAWS DANCE CLUB COMMUNITY

By Mike Klasco

I just returned from the 1991 International DJ Expo West. The three-day-long Expo held at the Sheraton Universal in Los Angeles was organized by DJ Times, a sister publication of Sound & Communications, and one of the Testa Communications magazines. DJ Times is written for DJs, the music industry, and club owners and installers. The show was well-attended with over 2,000 participants.

While I never have been a DJ, I certainly have been involved with "disco" and dance clubs for over 20 years. Since high school I had been working part time for Harvey Sound (then Harvey Radio) where I was selling music systems for the basement dance clubs for the local Jamaicans. In the late 1960s disco mixers consisted of Sony mic mixers with Shure phono preamps and the Shure Solophone headphone preamps for cueing. About this time Alex Rosner (a sound installer and Sound & Communications contributor) convinced Rudy Bozak to convert one of his church mixers into a disco mixer, although at \$600 this product was too expensive for most of my clients. During my last year of

Mike Klasco is the Technical Editor of Sound & Communications.



Mike Klasco at one of the many panels at the expo.

undergraduate work at New York University, I decided to start a disco equipment manufacturing company. My company, GLI, began, in 1972, making speakers and disco mixers. The company grew and I sold GLI in 1977, but stayed on as R&D director until 1982 when I moved to the west coast and began Menlo Scientific, my consulting business. So much for my sordid disco past; let's get back to the show.

The DJ Expo is reminiscent of the Billboard Disco Shows of the late 1970s, with exhibits of pro audio and lighting gear and lots of seminars on music, audio, lighting, video, and business. About 1980 Billboard prematurely gave up on this end of the market with the headline "Disco's Dead," abruptly followed by dropping their

disco section. From time to time various attempts have been made to restart an industry show and magazine, but none of these efforts had staying power. DJ Times on the other hand, is now into its third year and has progressively expanded its coverage of commercial sound equipment for dance music applications. And now DJ Expo is on to its third show — in Orlando, October 14-16.

The DJ Expo booths included many exhibitors familiar to Sound & Communications readers, as well as lighting, video, and laser karaoke suppliers who might be unknown to sound contractors who are not in the club installation business. A quick tour of the show follows:

Bose had a separate demo room and was demonstrating its full pro line. Their big sellers are the 802-II and 402 portable speakers, and the 302 subwoofer. The 12 foot long Cannon subwoofer was displayed and demonstrated. The Acoustimass Professional Powered speaker system was also demoed, and this product has always intrigued me. It is a fairly compact system with very decent sound that includes a built-in 12" subwoofer, power amp, and 6 units of Bose's 4.5" extended range cone speakers. Unfortunately, its \$3,500 per speaker system price tag has limited its acceptance.

BGW was showing not only its power amp line, but also a full product line of racks and rack hardware. Some time ago BGW invested in an automated sheet metal manufacturing facility and apparently they have found a new use for this equipment. Aside from the nicely finished racks, a few slick accessories such as rack mount fan cooling units and UL (pending) power distribution accessories were on display. BGW has done strongly and has had strong brand recognition in the "disco" market

since the early 1970s.

Cerwin-Vega is another brand that has been well known in dance clubs since the early 1970s. Although Cerwin-Vega has introduced amplifiers and even a disco mixer from time to time, their greatest strength has been high output speakers. A new line of speakers for sound reinforcement and playback applications was introduced at the show.

Community was best known for their all fiberglass enclosures and horns in the early disco days. Community's current product line still uses the same high quality fiberglass construction on the horns, but the cabinets are now carpet covered wood stock. Community offers high efficiency and high power handling at cost effective pricing. More than a fiberglass shop, Community speakers feature innovative technology, from ferrofluid cooled woofers, passive crossovers with sophisticated protection circuits, and even a few processor controlled speakers, like the VBS212/RS220.

Numark has gone upscale over the years and now offers medium and high range products and has pioneered mixers featuring digital sampling. Other products include fast starting and easy to cue turntables, power amplifiers, speakers and dual transport CD players that are cueable with pitch shifting speed controls.

Denon might be familiar to the audiophiles among us, or those of you who are also in the broadcast business. Denon displayed its DN-4000F dual transport CD player which it first introduced at the last NAMM show and competes with the Numark players. This component looks more like a video editor than a CD player and allows the DJ to cue cuts, beat match by changing the speed, while maintaining the pitch, and has other capabilities through digital signal processing.

Technics displayed the ubiquitous 1200 MKII turntable, and their cueable CD players (1200 and 1300), along with a DAT recorder.

TASCAM (TEAC) showed a cueable CD player with seamless looping (a little pricy at \$2,000) and semi-pro production equipment useable for DJs.



Warner Bros. recording artist Ultra Nate performing at Arena during a DJ Expo showcase.



A DJ spins at the Vestax booth on the exhibit floor.

JBL displayed its SR4700 series speakers which has replaced the Cabaret series and the Urei 1620 club mixer. In layout and user operation, the 1620 is a direct descendent of the original Bozak mixer and is preferred by many DJs who favor rotary controls.

Some of the suppliers of low cost products have expanded their lines into the medium price range as well as having expanded the range of product offerings. Gem Sound originally manufactured only disco speakers, now offers mixers and speakers. Gemini, known for inexpensive mixers, now has digital sampling models, power amps, and speakers. Vestax has expanded its mixer line with a "scratch"

mixer series as well as a digital sampling model. An outboard sampler is also available. MTX, the speaker company, has moved upscale with its new models. If you did clubs a while ago you may remember their AAL Blasters product line. MTX has recently bought Soundcraftsmen which has a few power amps specifically targeted at the DJ market.

Peavey appears to have finally gotten comfortable with the mobile DJ and club markets and has a separate line of mixers, speakers, lighting systems and DJ accessories.

Samson's wireless mic equipment is popular with DJs these days. They had

(continued on page 57)

*"People love to sing and
Pioneer Laser Karaoke
offers the ideal venue."*

*Trent Esperti, Barwinkles
Long Beach, CA*



*"Pioneer has the best and
most reliable equipment."*

*Susan Apple Manegold
Apple Entertainment
Seattle, WA*



*"Pioneer Laser Karaoke has
increased our business 100%."*

*Jon Spradlin, Cat's Meow
New Orleans, LA*

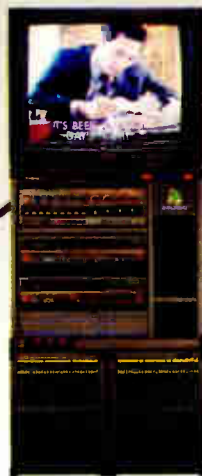


INSTALL LASER KARAOKE AND CLIENTS WILL SING YOUR PRAISES.

It's not often that an installation leaves bar owners and hotel managers singing.

But then again, it's not often that they see a crowd-drawing money-maker like Pioneer Laser Karaoke.

Now it's your turn. Install Laser Karaoke and let their praises be music to your ears. And put an extra ring in your cash register.



For more information, call (800) 421-1404 and ask for Laser Karaoke. And be one step ahead of your clients when they call to ask what's new and different.

LaserKaraoke[®]

PIONEER
The Art of Entertainment

© 1991 Pioneer Laser Entertainment, Inc.
2265 East 220th St., Long Beach, CA 90810

World Radio History

Circle 212 on Reader Response Card

THE CONSULTANT'S OWN OFFICE. SETTING UP THE WORKPLACE

By Steven J. Orfield

Orfield Associates is a professional consulting firm in Minneapolis which has been performing professional services for about two decades.

Our areas of consulting include acoustics, lighting, daylighting, audio, video, human factors and design management. Since our emphasis has been on providing extensive testing services, the firm has been slowly growing from a consulting firm in architecture (including A-V) to a practice split between architecture and research. Having expanded to the limit of our facilities, we were faced with the decision to either limit our growth or to expand into a full research laboratory within our fields; since there are currently no multidisciplinary labs that we are aware of crossing our many fields in North America, there was some risk in the strategy.

One problem faced by a growing consulting firm is the potential need to demonstrate the strength of their beliefs by insuring that their own facility is a high quality demonstration of those beliefs. After some discussion among the members of the firm, it was decided that in order to support the research orientation which we have so strongly encouraged among our clients, the only logical decision was a full expansion of facilities and staff, and this article is intended to show one view of what constitutes an appropriate consulting environment. Many of the ideas incorporated in this facility have been discussed in 25 articles which our staff has assembled for *Sound & Communications* since 1986.

In staff meetings, an outline was made of a minimum set of necessary facilities.

Figure One

Practice	Facility
Acoustics & Audio	General Lab
	Anechoic Chamber
	Acoustic Simulation Room
	Studio/Auditorium
	Reverberation/TL Lab
Lighting, Daylighting & Video	General Lab
	Measurement Range
	Lighting Simulation Room
	Rear Screen Control Room
	Video Studio Facility
Human Factors Ergonomics Thermal Comfort Vibrometry	General Lab

Since Orfield Associates has been performing research and testing for many firms within our fields of expertise, it became quickly apparent that the design of our own facility could be the basis for the design of similar spaces for some of our clients. Thus, a number of our labs were design efforts partially sponsored by man-

ufacturers interested in the use of our technologies and psychophysical demonstration facilities. With these views in mind, we began to consider the issue of a new facility versus the conversion of an existing building. Most of our needs suggested that a new facility would be most economical, and thus, we began a search for a site which was to last over two years. During that search, something unpredictable occurred; an existing facility quite suitable for our use was offered for sale. This facility, Sound 80 Studios, was built in 1970 and became the world's first digital multitrack recording studio under sponsorship from 3M, the inventors of multitrack digital audio. Since that time, the studio has brought national recording artists to Minneapolis, including Bob Dylan, Cat Stevens, Leo Kotke, John Denver and Roberta Flack. (A recording of the St. Paul Chamber Orchestra at the Orchestra won a Grammy for this collaboration.)



Minnesota Video Productions' videowall (see p. 52).

While the Sound 80 facilities were well designed, recording studios have changed considerably since that time. There are many facilities which can not afford the luxury of a fully acoustically isolated facility. While the main studio was being rented for \$150 per hour 15 years ago, there are now a proliferation of studios in the local and national market renting for far less even with considerably more investment in recording capabilities. Thus, the Sound 80 facility was offered for sale for two years after it closed with most potential buyers only interested in converting it to some other use, such as office or storage facilities. Thus, the facility was both suitable for our specialized practice and considerably less expensive than a new building. A contract was signed in the fall of 1990, and our firm moved into the new

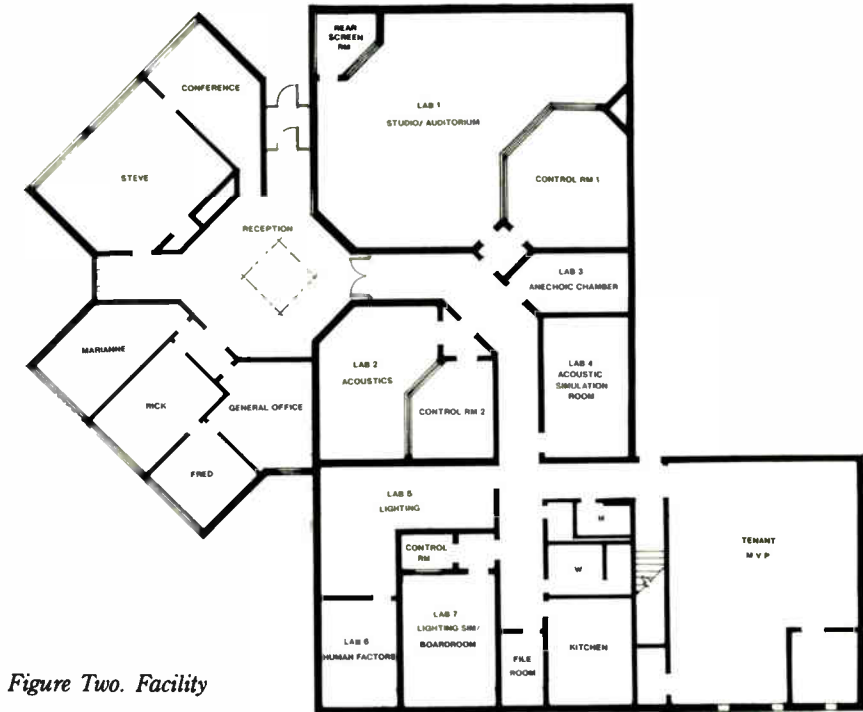


Figure Two. Facility

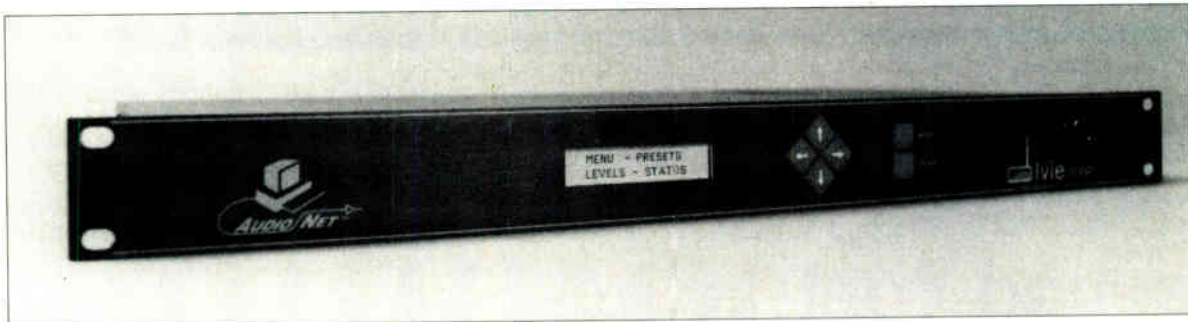
facility during December of the same year. The basic design of the facility was not altered, but the use of the former recording studios was altered considerably. (See Figure 2)

FACILITIES

The building originally was equipped with four main studios, along with an engineering department, a mastering room, record distribution offices and executive

ULTIMATE FLEXIBILITY!

INNOVATIVE DESIGN SOLUTIONS FROM Ivie



PROGRAMMABLE MATRIX MIXER

WE COULD TELL YOU ALL ABOUT THIS MIXER WITH A 4 PAGE AD, BUT THAT WOULD BLOW OUR WHOLE ADVERTISING BUDGET! WHY NOT JUST CALL US, OR COME BY AND SEE US AT NSCA, BOOTH 526 FOR COMPLETE INFORMATION. WE'D LOVE TO HELP WITH YOUR DESIGN SOLUTIONS.



1366 West Center Street • Orem, UT 84057 • Phone: (801) 224-1800 • Fax: (801) 224-7526

Circle 253 on Reader Response Card

offices. Each of these rooms, with the exception of Studio 1, are being used in new ways. (See Figure 3).

Figure Three

Area	Former Use	Current Use
Studio 1	Main Studio	Lab 1: Studio/Auditorium
Studio 2	Smaller Studio	Lab 2: Acoustics
Electrical Room	M & E	Lab 3: Anechoic Chamber
Studio 3	Smaller Studio	Lab 4: Acoustic Simulation Room
Engineering Department	System Design	Lab 5: Lighting
		Lab 6: Human Factors
Studio 4	Smaller Studio	Lab 7: Lighting Simulation Room

Thus, the facility, without any substan-

tial architectural changes, fit the intent of our program, with excess spaces being used for potential tenant rental to businesses in the A-V field. (Our first tenant is Minnesota Video Productions, a video production firm which specializes in developing programs and renting video wall systems.

SPECIFIC LABS AND PROJECTS

Currently, most of the laboratories in the facility are complete and under use for architectural, research and verification applications. Some of the specific projects will be discussed below.

LAB 1: Studio/Auditorium

Lab 1 will be used for three distinct purposes. First, this space is the only one in

the facility which is large enough for some of our lighting and acoustic testing. For example, we are shortly beginning the first evaluation we are aware of in the area of video visibility. During this study, our Capcalc system [See Sound & Communications Feb and Mar 1990] will be used to evaluate the visibility and clarity of large rear screen video computer graphics (nominal 60" x 80" images) via independent testing of screens and projectors. Lab 7 will be used for smaller rear screen studies.

Secondly, Orfield Associates has been investigating binaural recording for some time [See Sound & Communications, Sept and Oct. 1990]. This room will shortly be under use to record music under low reverberation conditions for later use in product performance simulation in Lab 4.

Menlo Scientific, Ltd.

Acoustical Consulting and design services for sound contractors

Contact Michael Klasco

Menlo Scientific, Ltd.
39 Menlo Place
Berkeley, California 94707

(415) 528-1277

FAX (415) 526-8087

Circle 251 on Reader Response Card



Lab 1: Studio Auditorium

Additionally, most recording experiments and our work with binaural A-V listening juries will occur in Lab 1.

Finally, we have been invited by many of our clients to provide technical seminars. With the installation of rear screen video and slide capability, this room will be suitable for use as a 50 — 60 person auditorium modelled on similar capabilities at the Minnesota World Trade Center, a project completed recently [See Sound & Communications Jan 1990].

LAB 2: Acoustic Lab

The acoustic laboratory is essential to our research work and contains the majority of our fixed testing systems (acoustic testing in other rooms can be routed to this room via an extensive wire cabling system). This room is equipped with some of the most sophisticated acoustical test instruments available anywhere, including one of the largest collection of Bruel and Kjaer instruments in private use worldwide.

Recent projects in this room include the development of quality standards and intelligibility standards for a large user of intercom systems nationwide. This project represented a three year evaluation of speech intelligibility and jury testing as well as objective testing of intelligibility, and the development of a new set of control strategies for these systems. This was also one of the first projects to use binaural torso simulators as the voice source for listening experiments on this product type. [See Sound & Communications, Sept and Oct 1990, Sound and Vibration July 1987]

A second project in this room involved product noise in residences. A large consumer supplier had become aware of products being developed in Europe and in

Asia which were considerably quieter than those which the manufacturer produced. Extensive sound pressure and sound intensity mapping [See Sound & Communications July and Aug 1989] were performed on the existing product, and a set of acoustic and psychoacoustic standards were developed as design goals for a multiyear prototype and new product development project. Also, a set of binaural recordings were made of competitive products for later listening reference.

Finally, we recently had the chance to test two different test systems for time-based testing (B & K 2012, TEF 12+), a program which will be developed into an article later this year.

LAB 3: Anechoic Chamber

While much is said in the audio press about "so called" anechoic testing via TDS, etc., there are still many scientists and practitioners involved with and interested in anechoic or "dead" testing chambers. We have already installed one

system in our facility (a 7' x 7' x 7' Eckel Chamber) and will be installing a large chamber (a 20' x 20' x 15' Eckel Chamber) later this year along with a large reverberation room. These chambers are being used for audio testing, audiological testing, product testing and test equipment verification.

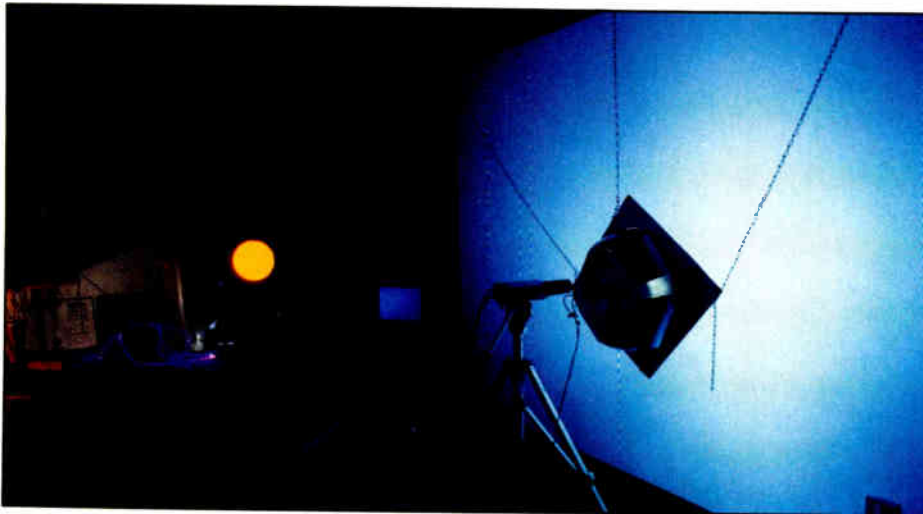
Currently, a project is underway for one of the major U.S. defense contractors to provide testing verification of an FAA communications control console. For this testing, the basic transducers are installed in the anechoic chamber for sensitivity testing; after this is complete, the entire console is installed in Lab 4 for jury intelligibility testing.

LAB 4: Acoustic Simulation

The ASR Room, a joint project with Yamaha Professional Audio, has been set up for two purposes. [See Sound & Communications Dec 1990, Mar 1991.] First, the room is programmable to simulate any architectural space or any type of noise, product to environmental, for the purposes of comparison with and development of project and research goals. Secondly, this room is designed to use as a jury room for such uses as consumer listening juries (product development) and audio-video juries (via the use of auditory and visual cues). Interestingly, even clients from other parts of the country who cannot visit our facilities benefit from binaural tapes



Lab 2: Acoustics



Lab 5: Lighting Laboratory

made in these facilities.

Currently, this room is being used for jury intelligibility testing, for the development and demonstration of quality for a music school and for the demonstration of sound system and acoustic room quality for an aviation hangar for one of the major airlines. It has also been used to demonstrate the acoustical benefits of specialized sound system design for one of the major athletic stadiums.

LAB 5: Lighting Lab

The lighting laboratory follows on earlier work with luminance photometrics, visibility, visual comfort and color contrast evaluation. [See *Sound & Communications* Feb and Mar 1990, See *Lighting Design and Application* Jan 1990]. On one hand, luminaires can be evaluated in this lab via the only video photometer system in consulting use worldwide. This system will map out 250,000 luminance values in about $\frac{1}{30}$ of a second. Additionally, many types of standard photometry equipment are also housed here for testing evaluation.

One of the principal interests of the firm in the lighting field is in visibility analysis, and many projects are ongoing in this field. Starting with expert witness consulting for vehicle accidents and moving through to the evaluation of the ease of viewing on computer monitor screens, many new standards are being created in this lab. Additionally, this lab is used to analyze the performance of new and existing lighting systems as well as lighting prototypes.

LAB 6: Human Factors Lab

While much of our work falls roughly under the rubric of "human factors," specific areas of interest are housed in the

Human Factors laboratory — from the evaluation of repetitive trauma to the hand (carpel tunnel) via Vibrometry to whole body vibration to basic audiometric tests for hearing acuity (for intelligibility testing) and on to ergonomics and thermal comfort evaluation.



Lab 3: Anechoic Chamber (see p. 55).

LAB 7: Lighting Simulation Room

The lighting simulation lab has been designed on the same theory as our ASR room (Lab 4) in that it is intended to provide demonstrations of perception responses to lighting and visibility. This space, which doubles as a rear screen boardroom, has been partially sponsored by a number of lighting suppliers as a prototype for a room which they are considering for replication in their own facilities.

This space has installed within it a set of ceiling lighting systems which are controlled by a computerized, disk-filed dimming system. In addition, there are specialized lighting systems installed behind the rear screen for daylighting simulation, and there are four system controllable outlets for demonstration of any lighting system desired. This room will be programmed with hundreds of lighting demonstrations from auditoriums through indus-

trial applications. It will demonstrate not the lighting systems but rather the lighting performance via such metrics as visibility, visual comfort, luminance, luminance ratios, illuminance, etc. It is intended that this room will be used principally to demonstrate the value of lighting standards prior to the inception of a design or research project.

The first use of this room will be the implementation of a study of rear screen visibility, via installation of a variety of rear screen systems on which are projected computer graphics for test and jury evaluation. While manufacturers in this field have long rated their products for luminance, resolution, etc., there has been little research on the question of visibility of this type of visual display. Thus, it is currently true that a video designer may select the finest of products with no assurance that the viewer can clearly see the information on a given display.

CONCLUSION

Via the development of this facility, Orfield Associates has defined and redefined our views of the consulting process. While firms practicing in our fields often make many claims to clients regarding their philosophy, we were very concerned that we might resort to the same premise as most new office moves; that is, the preparation of a space based on the aesthetic solutions and not the solutions relevant to performing services as a consulting firm.

As a result of our internal discussions, we have opted for the opposite view of what constitutes a reasonable move. Essentially, no budget was allocated for office or lab "decoration"; all funds were dedicated to the creation of a facility which would answer the essential questions of the high quality client. First, "Is the consultant staffed, experienced and equipped to perform high quality services in the field?" Second, "Underlying their work, is it obvious that the consulting firm really believes the premise which it promotes to its client base?" Finally, "Can the consulting firm demonstrate its recommendations perceptually, or must we simply 'have faith' in their work?" ■

DJ EXPO

(continued from page 48)

both UHF and VHF band products on display. Wireless mics were either too expensive or not good enough when I started with clubs, but now they are so common that most off-the-shelf DJ consoles come with a cutout for the wireless receiver.

Roland was demonstrating esoteric products such as workstations for music production work, down to drum machines and rhythm controllers. The concept of "DJ as creative artist" is accepted now, and the hardware for signal processing and remixing from Roland, Yamaha and others is supporting this trend. Some of these products are for real time use, while other devices are best used in pre-production with the mix mixed in and played back, perhaps with a DAT machine, during the evening.

Lighting companies were everywhere; you just followed the smoke from the fog machines. American DJ Supply, ETA Lighting Systems, Meteor, Omnisystems, Ness/Optec, LSS, Kupo, Tracoman, and High End Systems all displayed controllers

and lighting fixtures and related hardware.

Other accoutrements for DJs included purpose-built equipment consoles from Island Cases and Genesis. For DJs using both turntables and CDs, Genesis had some ingenious configurations that were compact yet comfortable to work with. Galaxy was offering speaker enclosures for DIYers (do-it-yourselfers).

THE DJ EXPO IS REMINISCENT OF THE BILLBOARD DISCO SHOWS OF THE LATE 1970s.

"Super-Suppliers" offering one stop shopping included American DJ Supply, Exodus Sound, Pro-Sound and Stage Lighting, and Towards 2000.

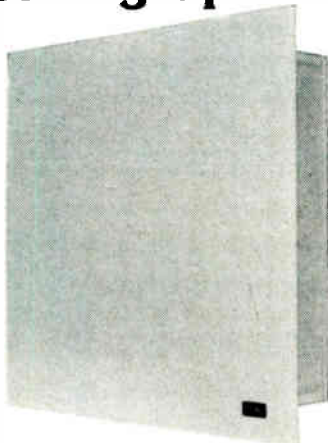
Aside from mobile and club DJ equipment there was Karaoke and automated CD jukebox products. Pioneer had laser disk video projection TV karaoke systems which I have been entertained with in sushi bars. In Japan the bar patrons are typically the performers, but in the U.S. often a couple will do most of the live sing-along

performing in exchange for a sushi dinner (a modern day sing for your supper arrangement). Nikkodo was another exhibitor of laser karaoke systems and also demonstrated a CD-based graphic system. A few other systems have recently been introduced to the U.S. market and an upcoming issue of Sound & Communications will survey these products.

Gefen Systems, which has been marketing a CD jukebox system, has introduced a Macintosh computer based product call Mac-jukebox. It is a background music system using their 100 disk CD changer mechanism with a touch screen Mac for software programming control.

If you have gotten this far then you should be reading DJ Times, which provides extensive coverage of the seminars held at the DJ Expo, and also covers the new audio, video and lighting equipment being used for dance clubs. The next DJ Expo is planned for October in Orlando, Florida and will feature exhibits and seminars — plus special equipment workshops sponsored by Sound & Communications. ■

The KSI 8081-CS Ceiling Speaker



The 8081-CS is a cost-effective, high-fidelity ceiling speaker system which mounts in a standard 2X2 grid. An 8" bass-midrange, 3/4" mylar dome tweeter, and a 10" passive radiator yields unsurpassed performance. Comes complete with white or black grill, back box, mounting rings and FR construction. Saves labor, time and money for fast and easy installation.

For more information, call:



KARIBU SOUND INDUSTRIES, INC.
3500 Parkdale Avenue
Baltimore, MD 21211
301-383-2167 Fax 383-7573

Circle 277 on Reader Response Card

LOOK WHAT ^{else} QUAM HAS FOR YOU!



SOUND MASKING LOUDSPEAKER SYSTEMS

- Provide excellent conversational privacy as well as freedom from distracting machine noise
- Two basic enclosures, choice of BX or cable connections, five loudspeakers, both 4- and 8-inch, and five transformers, with and without internal switches, provide 360 combinations!

Ask for FREE Tech Spec TS-23A

Quam-Nichols Company

234 East Marquette Road, Chicago, Illinois 60637
Phone: 1 312 488-5800 • FAX: 312 488-6944

Circle 282 on Reader Response Card

PEOPLE

Aiphone Appoints Williams; Panasonic Names General Manager

Marketing at Aiphone

Aiphone Corp. has appointed Joseph Williams to its newly created position of manager of marketing development. Williams coordinates market research and develops national accounts out of Aiphone's New Jersey office.

Williams has 27 years of experience in the field and has previously held positions with ADT, TOA and Racal-Chubb Security Systems, Inc.



Williams

Cove at Panasonic

Panasonic Company has appointed Jeff Cove General Manager for Sales and

Marketing Division. Cove is directing sales and marketing efforts for the company.

Cove joined Panasonic in 1983 and has served in a number of capacities including Assistant General Manager for the company's



Cove

Video Home Division and National Sales Manager for Technics audio products.

SoundTech Appoints Lierly

SoundTech has named Mark Lierly its National Sales Manager. Lierly is responsible for managing SoundTech sales representatives, developing new accounts and organizing promotions.

Lierly has worked as an independent sales representative for a number of pro audio lines, and has a background in the physics of audio and electronics and their proper application.



Lierly

Wild at Euphonix

Andy Wild has been named VP Sales and Marketing at Euphonix, Inc. Wild had been VP Western Operations at SSL since 1984. Wild's previous experience has been with the BBC in London and Virgin's London Townhouse studio.

Wild is involved in the marketing of the Crescendo-CSII, a recording and mixing system and is establishing a sales and service center in Los Angeles.



Wild

Freeform

Bite?
This bit is no pussycat!

FREEFORM FLEXBIT
Ask For It.

Check Our Prices!

35 ft. Stainless Steel Carpet Snake Available.

NEW! TRY THIS!!
New High Speed Steel Product with Hole in Bit End!

Call or write for additional information
Freeform R&D, 1539 Monrovia Ave., #23
Newport Beach, CA 92663 714/646-3217

Circle 280 on Reader Response Card

Linkage.

LED signs that network.

From high-traffic retail settings to industrial communication, LaBelle offers a network that can work alone or with existing audio systems to help any business broadcast information better, faster and to larger audiences than ever before.

Find out how selling LED networks will increase your profits.
Call 1-800-558-9526.

LaBelle
Display Sciences Group

Circle 279 on Reader Response Card

VP of Manufacturing

MultiLink, Inc has named Frank B. DiPasquale Vice President of Manufacturing. DiPasquale is responsible for production operations related to the company's line of audio teleconferencing systems.

DiPasquale has over 25 years of experience as a manufacturing executive. He joins MultiLink from Concord Data Systems where he was Director of Manufacturing.

Nelkin Named Manager

Panasonic Company has named Andrew Nelkin Assistant General Manager, Home Audio Division. In this position Nelkin is directing all product development and national marketing efforts for the company's audio products, including Technics hi-fi components and Panasonic home audio systems.



Nelkin

Nelkin previously served as National Marketing Manager for the Home Entertainment Division, where he directed national marketing efforts for the company's line of audio rack, mini-component and table-top systems.

VSC Names Macaluso

Andre Macaluso, Vice President and General Manager of Audio Plus Video International/International Post, a Video Services Corporation company, has been named Group Vice President for VSC.

In this position, Macaluso is retaining his APVI/IP responsibilities and is also overseeing the operations of two additional VSC companies: Atlantic Satellite Communications, Inc. and Waterfront Communications Corporation.

Puritano at Northern Telecom

Northern Telecom has announced that Vincent Puritano has joined the company as Vice President, Government Relations.

Puritano is responsible for legislative, regulatory and international trade activities with the U.S. Federal Government, and will be located in Washington, D.C.

Anixter Names Millholland

Anixter Bros., Inc. has appointed Bill Millholland to the position of Vice President of Advertising and Public Relations. In this position Millholland is concentrating his efforts on U.S. advertising and public relations.

Millholland has been with Anixter since 1986 and has most recently held the position of vice president—training and development.

Digital Sound Appoints President/CEO

Robert T. Knight has been appointed President and Chief Executive Officer of Digital Sound Corp. Knight, who had been acting in this capacity, has also served the company as vice chairman and has been a member of the company's board of directors.

As President and CEO, Knight is responsible for "defining Digital Sound's corporate mission" and leading the company's long-term marketing strategy.

Sales and Marketing at Genesis

Stephen L. Borcich has been appointed Vice President of Sales for Genesis Electronics. Borcich was formerly Director of Customer Account Management. Borcich manages Genesis' sales force and its Sales Engineering, Sales Support and Order Administration departments.



Borcich

He has been with the company since 1987.

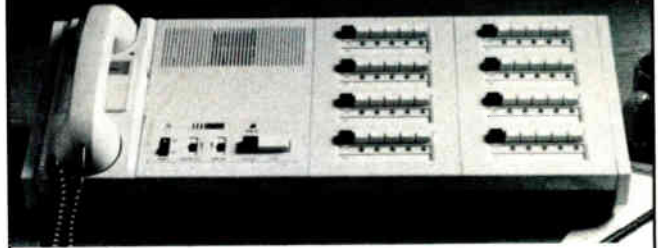
In addition, Robert D. Drescher has been named Vice President of Marketing and Product Development. Drescher had been Genesis' Vice President of



Drescher

Technical Operations and earlier served as Director of Marketing. He joined the company in 1987.

Loud and clear.



Now here's a sound idea. An intercom built for rugged industrial conditions.

The NEM is expandable to 100, 200, 300 stations! And it can be packaged with video cameras. Emergency call buttons. Keypads. Card readers. You call it.

Then call Aiphone at (206) 455-0510

AIPHONE

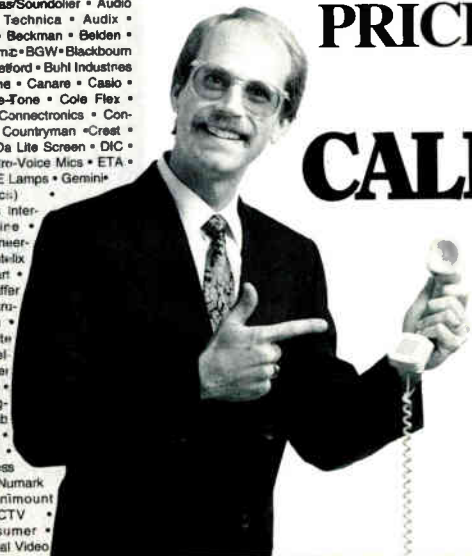
Communication systems
for business, home & industry.

Sight • Sound • Security

Circle 278 on Reader Response Card

WHOLESALE PRICES

CALL!



1-800-828-0509

FULL DISCOUNT WHOLESALE

AUDIO • VIDEO • LIGHTS

Local Phone: (608) 273-5488 Madison, WI

Circle 283 on Reader Response Card

NEWS FROM AROUND THE INDUSTRY

Special Olympics Planned; Home Theater Travels

Special Olympics Planned

The International Summer Special Olympics take place this year July 19 through 27 in Minneapolis/St. Paul. It's estimated that this year over \$2.5 million will be donated in equipment and expenses for the event's sound reinforcement needs. Companies already committed to aid in the event include Atlas, BBE, Biamp, dbx, Goldline, JBL, Klipsch, MMA, Rane, Rapco, SoundTech, Stanton, Tascam, Telex, TO, Ultimate Support, West Penn, Whirlwind, White Instruments, Yamaha, Zoom, and of course Crown, which has long spearheaded the effort. The summer 1991 games are expected to attract over 6,000 athletes and 2,500 coaches from 90 countries. Preparations are being made for the arrival each day of over 50,000 spectators.



EIA Home theater demonstration at Atlanta home show.

New Mark IV Group

Mark IV Audio has formed the Mark IV Audio Broadcast/Production Group. The new strategic group is responsible for coordinating all Mark IV Audio marketing and product management efforts in television and radio broadcast markets, as well as film and television production, multi-track recording and other related markets in the United States. The group is directed by Gary Stanfill, president of Vega, a Mark IV Company. Other Mark IV Audio companies participating in the group include Electro-Voice, Klark-Teknik and DDA. Rick Sanchez has been named marketing specialist for the new group. Sanchez was previously a production coordinator for Walt Disney Corporation.

Maxon at Desert Storm

Maxon's 49-F5, 49 mHz two-way radios provided communication between the flight deck and hangar of the aircraft carrier USS John F. Kennedy, which was deployed in the Persian Gulf during Desert Storm. According to the company, the Maxon units reduced turnaround time in servicing the Forward Looking Infrared Radar (FLIR) systems which assisted the destruction of SCUD missile launchers.

Home Theater Travels

To promote the concept of home theater to consumers, The Consumer Electronics Group of the Electronic Industries Association is sponsoring a traveling home theater that is appearing at home shows in Atlanta, southern California, and Washington, D.C. The EIA home theater is composed of components provided by member companies.



Maxon radios went to war.

Official U.S. Navy Photograph

FEEDBACK ELIMINATOR

RACOM MODEL 1601 SINGLE CHANNEL SOLID STATE VOICE ANNOUNCER

The Racom Model 1601 SINGLE CHANNEL ANNOUNCER with option SP2 automatically records then rebroadcasts public address messages eliminating feedback.



OTHER APPLICATIONS:

- On hold announcing
- Alarm announcing
- Station identification

FEATURES:

- 19" Rack mountable
- Completely solid state
- 12 VDC/AC or 117 AC operation
- Up to 5 min. storage time
- Telephone line answer

Dealer and Rep
Inquiries Welcome

CUSTOM CONFIGURATIONS
CALL
FOR SPECIAL INTRODUCTORY PRICING.

RACOM
PRODUCTS INCORPORATED

5504 State Road • Cleveland, Ohio 44134-2299 • (216) 351-1755

Circle 284 on Reader Response Card

Stentofon Goes to Reps

Stentofon's new sales and distribution program includes manufacturers representatives covering all of the U.S. The program is managed by Frederick Hall, national sales manager, and four regional sales managers. The reps appointed include:

Brian Trankle and Associates, Cartwright & Bean, Dimension/Point IX, Humble and Associates, LCA Sales Inc., Levy, Grams, and Lassers, Pearson and Pearson, R.W. Kunz and Associates, R.W. Sales, Roger Ponto and Associates, Weller Electronics Sales.

Avcom Reps Audio Control

AudioControl Industrial has appointed Avcom Inc. as its representative for Ohio, West Virginia and western Pennsylvania. Jim Umstead and John Opal represent the line. Avcom also represents Atlas/Soundolier, Beyer Dynamic, Cornell Products, Mackenzie, Radio Design Labs, Sonic Systems, TOA Electronics and Vicon Industries.

William Ray and Associates Gets New Line

William Ray and Associates of Smyrna, Georgia has been appointed to represent Bag End in Georgia, North Carolina, South Carolina, Tennessee, Alabama and Mississippi.

Aiphone Meeting

Two rep groups have won Aiphone's highest award. Texas-based Graham/Davis, Inc. and Hutto Hawkins Associates (now Hawkins-Frederickson) of Florida have been honored as new members of the Aiphone Club of Excellence. Hawkins-Frederickson was also named Representative of the Year. Gordy DuVall, representative for the Great Lakes region, was presented with the Bent Oar Award for exceptional efforts. Special achievement awards went to Pusecker Sales, Forti Associates, System Solutions, Burcaw Company, Bassett Sales, Audio Marketing Associates, Repworks, and Alby Currant Sales.

RF Technology Appoints

RF Technology, Inc. has made the following appointments: Bob Millice of Atlantic Marketing Services to represent the company in north Georgia, North Carolina, South Carolina, Tennessee and southern Virginia. Dave Goldsmith of Provideo Systems for Michigan, Ohio and western Pennsylvania. John Schneider of RF Specialties of Washington, Inc. for Alaska, Oregon and Washington. Jim Kubit of Comlogic, Inc. for California and Nevada.

Green-Wissler Gets Line

Aiphone Corp. has named Green-Wissler Sales, Co., Inc. as its representative for the south-central Midwest area. Company president Raymond Green and five outside sales representatives have a combined 60 years experience servicing the sound and security industries in Indiana and Kentucky, according to Aiphone.

White Names Rep

White Instruments has appointed PCM Marketing as its representative in northern California and northern Nevada. Jeff Van Ryswyk, sales manager for White, said, "Paul Morris and his staff will be a fine asset to our sales efforts on the west coast."

White Radio Appointed

White Radio has been appointed the exclusive Canadian representative for Omnimount Systems. White is located in Burlington, Ontario.

Community Meeting

Community Light & Sound presented awards for sales efforts, including: Representative of the Year was awarded to Bencsik Associates. Honorable mention went to Evans Sales and Marketing. Additions to the Community sales force include Marshall Berenson (Northeast), Charlie Eaton (upstate New York), Jim Starin and Joe Stopka (northern Illinois and eastern Wisconsin), and Mike Pappas (northern California and northern Nevada).

Bierut to New England

David J. Bierut, who has resigned his position as national sales manager for Washburn International, has started a rep firm in the northeast. The new firm's name is "Nor-East Marketing." Its location is 6 Freedom Drive, Collinsville, Connecticut. Bierut previously held management positions with Tascam, Panasonic and Ovation, in addition to his stint at Washburn where among other accomplishments he instituted the priority dealer program.

Rolls Appoints Distributors

The Rolls Corporation has appointed Sinec to handle distribution, marketing and sales of its line to the Swiss musical instrument and live sound markets. In addition, Maxi has been appointed to the Spanish market, and Pro-Gros Aps has been given the Danish market.

Seminar for Designers

A two-day event for interior designers at the 200 Lexington design building in Manhattan featured a two-hour seminar held by Paul Krauth of Integrated Media Design in New York. The seminar, held in the showroom of Planum furniture, focused on the home theater. Krauth's



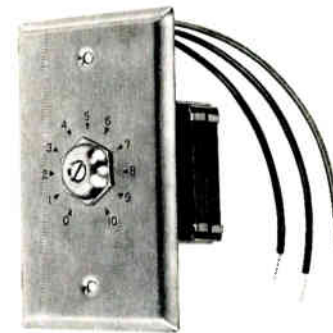
Paul Krauth holds seminar for interior designers.

setup included equipment by Vidikron, Carver, Audioaces, and Luxman among others. A six speaker array was made up of left, center, right and rear speakers, plus a subwoofer. Dolby Pro-Logic surround was demonstrated. Although 20 interior designers were expected, over 100 attended the seminar. Krauth deemed it extremely successful. "I tried to give them a familiarity with what is possible. They want to know what to do and what to consider, such as speaker placement," he said. "They asked question after question and were clearly impressed enough to talk to their clients and plan for the integration of home theater into their design schemes."

Disaster Relief

American Electric is offering disaster relief to utilities by providing an emergency storm stock from its Blackburn product line. The new service features a 24-hour hotline and next-day delivery. The dedicated inventory includes automatic splices, wedge clamps, hot line camps, service entrance connectors, split bolts, H-frame compression connectors and other products. All orders must be storm or disaster related to qualify for access to the emergency storm stock. American Electric is also the manufacturer and supplier of brands such as Steel City, Kindorf, Superstrut, Perfect-Line, Holub, Hazlux and Indoor/Outdoor Lighting Products.

LOOK WHAT ^{else} QUAM HAS FOR YOU!



WALL MOUNT AUTOTRANSFORMER ATTENUATORS

- Control the output level of a single loudspeaker or a group
- 10 steps of attenuation
- Use with either 70.7 volt or 25 volt lines
- Limited access and priority relay versions available

Ask for FREE Tech Spec TS-15B

Part No. QL-10LA

Quam-Nichols Company

234 East Marquette Road, Chicago, Illinois 60637
Phone: 1 312 488-5800 • FAX: 312 488-6944

Circle 281 on Reader Response Card

Automated Home

The Bright Home, a public working display of CEBus technology, has been constructed in Indianapolis by Indianapolis Power & Light Company and PSI Energy of Plainfield, Indiana. The Bright Home links a variety of electronic equipment and appliances into a common intelligent-control system. CEBus, the Consumer Electronics Bus, is the home automation standard being developed by the Consumer Electronics Group of the Electronic Industries Association. The system allows a building block approach.

In other news, the infrared and twisted pair sections of the CEBus standard have been approved as interim standards covering the transmission of signals to integrated CEBus products.

CALENDAR Upcoming Events

JULY

ITS (International Teleproduction Society) Forum & Exhibition: New York, NY: Contact: (212) 629-3266. July 12-15.

Communication Networks West: San Francisco, CA: Contact: (508) 879-6700. July 15-18.

Nomda/Southeast: New Orleans, LA: Contact: (800) 228-9772. July 17-20.

Syn-Aud-Con Seminar: Norman, IN: Contact: (812) 995-8212. July 25-27.

Image World Chicago: Rosemont, IL: Contact: (914) 328-9157. July 29-August 2.

AUGUST

Advanced Acoustic Measurements Workshop: Norman, IN: Contact: (812) 995-8212. August 5-7.

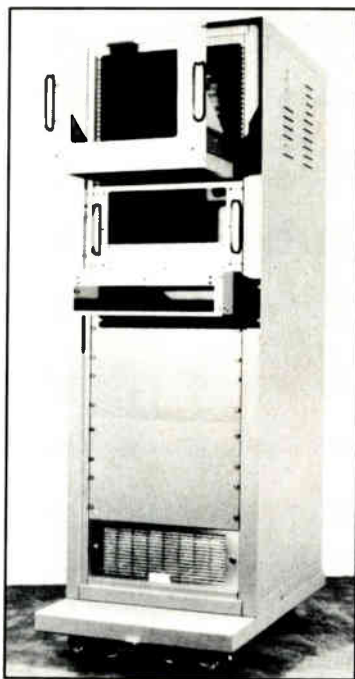
NESDA/ISCET (Nat'l Electronics Sales & Service Dealers Assoc./Int'l Society of Certified Electronic Technicians): Reno, NV: Contact: (817) 921-9061. August 5-11.

Surface Mount: San Jose, CA: Contact: (800) 223-7126. August 27-29.

ISC East (International Security Conference): New York, NY: Contact: (708) 299-9311. August 28-30.

University Installed

University equipment has been installed in three major facilities in Japan: Narita Airport, Chinguko Train Station, and the Tokyo Metropolitan Gymnasium. University paging systems are placed throughout the airport, while more than 100 different Musicaster 100 compact speaker systems are installed in the train station, one of Japan's busiest. The Gymnasium has installed 11 University UW-30 underwater loudspeakers in a swimming pool for synchronized swimming. Yamaha Sound Technologies installed the speakers in the complex. Robert Sandell, president of University Sound, said the commercial sound business is maturing in Japan, and he expects sales for University products to grow in diversified marketing niches.



Engineering Design Services

Equipto Electronics Corporation is offering free engineering services on its electronic enclosures and workstations, including phone consultation, design service, layouts and field visits. Full CAD support is available. According to the company, the design service "can be as simple as planning the proper panel space and accessories or as complex as a total custom electronic enclosure." Two of the company's engineers are specialists in RFI/EMI and Tempest shielded enclosures.



Standing, left to right: Kevin Mills, owner Larrabee Studios; Bob Todrank, Roland Pro Audio/Video Group national sales manager; Paul Young, senior product specialist for RSS. Seated, left to right: Mike more, OR-N-MORE; Jon Gass, mix engineer/producer; Orfeh, OR-N-MORE.

Roland RSS Sales

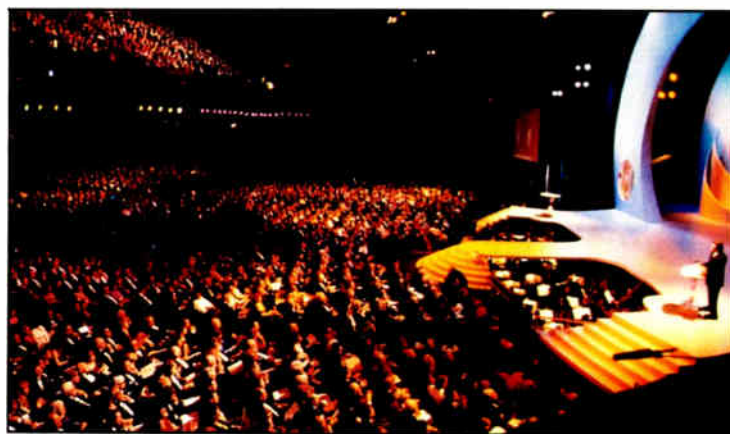
Roland's Pro Audio/Video Group has announced the sale of two Roland Sound Space Processing Systems to Larrabee Studios in California. Introduced at the 1990 A.E.S. convention, the RSS Processing System is a sound encoding technique that enables a three-dimensional aural environment to be reproduced on a conventional two-speaker stereo system for playback. Curtis Chan, general manager of Roland Pro Audio/Video Group, said "We are very pleased we've begun shipping the RSS System, and that the systems are already in use at one of the best mix facilities in the country." Larrabee Studios has recently completed a \$3.5 million refurbishing of its Universal City facility, and now offers a total of four mixing rooms at their Universal City and West Hollywood studios, with a Roland RSS system at each location.

University Promotion

University Sound has launched a customer promotional program called "The University Spotlight," to give dealers special pricing and sales incentives. The promotional program includes a monthly informational newsletter that spotlights particular equipment and offers special pricing. Five products were featured in the inaugural promotion: US658L and US658H microphones, 9003 modular mixer/power amplifier, ZP-4 zone page controller, MA-1506 shelf-mount amplifier, and the US650N/D dynamic microphones.

Neotek Delivered

Two Elite consoles by Neotek have been sold to Kenneth Copeland Ministries in Texas, one for a remote truck and the other for a permanent facility. Denmark Radio is also using Elite for broadcast production.



Burns Audio provided the sound for the Academy Awards.

Burns at Academy Awards

Burns Audio again did the sound for the annual Academy Awards show, providing live sound to the Shrine Auditorium while delivering it to television. Bruce Burns, president of the company, said, "The main challenge of this particular Academy Awards show was to provide a system powerful enough for the music that also

delivered clean sounds for vocals during presentations." The equipment at the Awards included a Ramsa WR-S840 monitor console, Ramsa WR-852 front-of-house console, high clarity Apogee Sound speaker system and Apogee Correct equalization system.

IMPORTANT!!

1 9 9 1
INTERNATIONAL



We are pleased to offer a special hotel discount rate of \$130.00 per night (single/double) **EXCLUSIVELY** for DJ EXPO attendees, available from Friday, October 11 through Saturday, October 19.

You **MUST** identify yourself as affiliated with the INTERNATIONAL DJ EXPO in order to qualify for this special discount room rate.

*Regular room rates are \$200.00 & up

CALL NOW!!

For Reservations, please call the Walt Disney World Dolphin toll free at (800) 227-1500.

Reserve now. Limited rooms are available.

LAKE BUENA VISTA, FLORIDA Monday — Wednesday, October 14, 15, & 16, 1991 Walt Disney World Dolphin

Return this form below before September 30, 1991, and your badge and tickets will be waiting for you at the Pre-Registration desk at Walt Disney World Dolphin.

Discount airline information will be sent to you within 10 days of receipt of your show registration.

I am a . . .

- Club DJ
- Mobile DJ
- Radio DJ
- Radio PD/MD
- Sound Contractor/Installer
- Lighting Installer/Designer
- Club Owner/Manager
- Architect/Designer
- Audio Equipment Dealer/Distributor
- Lighting Equipment Dealer/Distributor
- Record Tape, CD Retailer/Distributor
- Record Company
- Independent Promoter/Manager Agent
- Artist
- Media
- Manufacturers Rep
- Other

YES! Register me now for the 1991 DJ Expo East in Orlando (October 14, 15, 16, 1991)

<input type="checkbox"/> EXHIBITS ONLY Before August 30 Free	XXX
(All 3 days) After August 30 \$25.00	
<input type="checkbox"/> DAILY PASS Tuesday \$85.00	
(Includes workshops and exhibits) Wednesday \$90.00	
Thursday \$60.00	
<input type="checkbox"/> FULL EXPO (Register by August 30) \$115.00	
(Show up to all workshops, exhibits, and special events) (Register by September 30) \$155.00	
On-Site Registration (\$215.00)	TOTAL \$

Make Check Payable to: 1991 International DJ Expo
25 Willowdale, Ave., Port Washington, NY 11050
(516) 767-2500 Fax: (516) 767-9335

or Call for more information

Please photocopy for your files or if you need additional forms.

- Check or money order enclosed. US funds only, please.
- Charge my MasterCard/VISA account

Card Number _____ Expires Day _____

Signature — required for charge orders

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

COUNTRY _____ POSTAL ZIP _____

Daytime telephone _____ (include country and city code if outside the USA)

FAX number _____ (include country and city code if outside the USA)

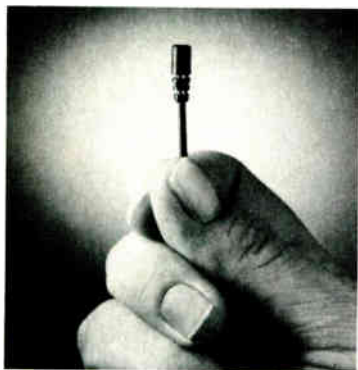
PRODUCTS

Telex Intros Lapel Mics; JVC's Digital EQ

Lapel Mics

Telex Communications, Inc. has introduced a series of sub-miniature electret lapel microphones. The ELM-22 omnidirectional is .2 inches in diameter and .3 inches long with sensitivity of -56 dB and spl of 138 dB. The ELM-33 unidirectional, which measures .2 inches in diameter, .75 inches in length has specifications that include 142 dB spl and -65 dB sensitivity.

Circle 1 on Reader Response Card



Digital Controller/Equalizer

JVC Professional Products Company has introduced the DS-LC900U digital parametric controller and equalizer, a system designed to emulate the feel of an analog equalizer. The unit uses an FIR type digital filter. Twenty-eight fixed frequencies are available over four overlapping bands that provide a total of 54 eq points/In addition to shifting center frequency, response sharpness and level boost and cut can be varied by the user.

Circle 2 on Reader Response Card



High-Resolution Video

Toshiba Video Systems has introduced two high-resolution, black and white video monitors designed for closed circuit and preview/playback applications.

The model TVM-1201 contains a 12-inch picture tube for more than 700 lines of resolution. The TVM-901 also has 700 lines of resolution but has a nine-inch picture tube.

Additionally, Toshiba has introduced the CM1300K 13-inch color monitor for security and professional video applications.

Circle 3 on Reader Response Card

9-Inch Monitor

The Closed Circuit Video Equipment Division of the Panasonic Communications & Systems Company has introduced the ST-900Y, a 9-inch diagonal, S-VHS compatible color video monitor.

The ST-900Y provides in excess of 300 lines of horizontal resolution with a .5mm dot pitch. The unit's viewing mode is switchable between color and monochrome. Two of these units can be mounted in a standard EIA 19-inch rack.

Circle 4 on Reader Response Card



Mixing Consoles

Soundtracs has introduced the Megas line of "low cost" mixing consoles including the Megas Mix, a general purpose console designed for a variety of audio applications where a maximum of four group busses is needed.

In addition, the Megas Stage is a dedicated eight bus sound reinforcement console with full VU metering and six mute groups. It's available in four frame sizes which can be loaded with both mono and stereo inputs.

Circle 5 on Reader Response Card



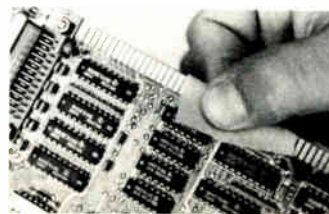
Powered Mixers

Electro-Voice has introduced the 61PMX and 81PMX powered mixers. The two models are electronically identical with the 61PMX offering six input channels and the 81PMX offering eight.

The models provide 200 watts onto four ohms, have digital reverb/delay and 40-watt phantom power. The MOSFET amplifier is "beefed-up" and has efficient heat dissipation.

Other features include reverb to main and monitor which allows a "wet" stage monitor mix for vocalists and a nine band graphic equalizer.

Circle 6 on Reader Response Card



Gold Conditioner and Protector

Cramolin's ProGold 100 is formulated to improve conductivity and protect gold and base metal surfaces. ProGold 100 is a non-abrasive, non-corrosive formula that conditions gold connectors. It also coats the connector surface, and is available in spray, liquid, dispenser, wipes and pen applicators.

Circle 7 on Reader Response Card



Stereo Mixers

Three new ATUS stereo mixers have been introduced by Audio-Technica, U.S., Inc which incorporate a sound effects generator and inputs for a number of audio and video equipment. The three models, SM502, SM505 and SM509, also include dual VU meters and a phone jack with volume control that monitors any one of the inputs independently, regardless of program mix settings. A five-band graphic equalizer and a BBD electronic echo circuit are included in the model SM509.

Circle 8 on Reader Response Card



Close-Up Zoom Lens

Audio Video Supply has announced a "lower-cost" version of the close-up zoom lens. The 18-108mm lens operates and looks the same as the previous model. Working distance is four to 12.5 inches and the focus tracks with zoom.

Circle 9 on Reader Response Card

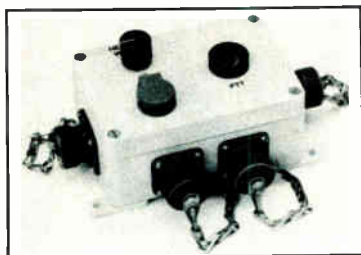


Circle 10 on Reader Response Card

Stereo UHF Modulator

Multiplex Technology Inc. has added a stereo modulator to its line of digitally tuned UHF modulators. The DIV-ST enables an installer to convert a baseband stereo video/audio signal to a UHF channel. The user can receive the signal on any stereo TV in the house by selecting the appropriate channel.

The modulator broadcasts in MTS stereo with dbx noise reduction.



Circle 11 on Reader Response Card

Intercom Interface

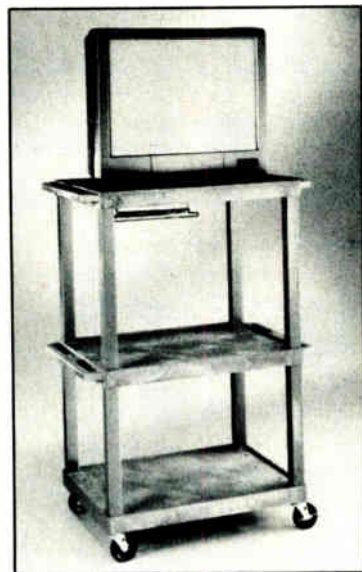
David Clark Company Inc. has introduced the U3815 headset station/radio interface module, designed for the series 3800 communication system. The unit connects to the intercom system and allows access to a two-way radio. When the radio transmit button on the U3815 is depressed it keys the radio allowing only the headset plugged into the module to transmit on the radio. The other headsets in the intercom system can monitor the radio while maintaining intercom capability.



Circle 12 on Reader Response Card

Cable Jacketing

Montrose Products Company has introduced flexible jacketing for its line of plenum rated premises cabling which combines voice, data and fiber optics fabricated into one cable. Montrose Peneflex Jacketing is UL approved to NEC CL2P or CMP requirements.



Circle 13 on Reader Response Card

Video Tables

Tuffy II Video Tables from Wilson are designed for classroom, training and group presentations that require televisions with screen sizes up to 31 inches. The tables have tubular steel reinforcements molded into the underside of each top shelf.

Noise Dose Meter

Bruel & Kjaer has introduced the 4436 noise dose meter with 40 fixed setups plus a user definable setup which allows measurement of noise exposure. Three, 4 and 5 dB trading rates, selectable threshold level and simultaneous measurement of rms and peak provide data necessary to evaluate potential noise induced hearing damage. Environmental noise measurement can be made while cumulative distributions and histograms of noise levels based upon one second Leqs are also available.

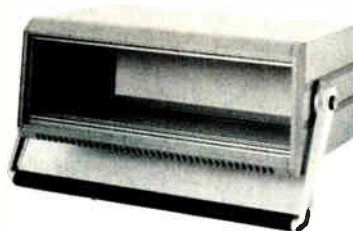
Circle 14 on Reader Response Card

Access Control and Monitoring

Casi-Rusco is now shipping its Picture Perfect access control and alarm monitoring system. Picture Perfect includes identifiable icons combined with a relational database management system and distributed intelligence.

The first release of Picture Perfect operates on the IBM PS/2 model 80 and supports up to 128 readers.

Circle 15 on Reader Response Card



Circle 16 on Reader Response Card

Tip-Up Handle

Schroff Inc. has introduced an adjustable tip-up carrying handle for its line of "Cardpac" electronic system cases. The handle can be set for 30-degree increments by depressing the single button on the handle. The load carrying capacity is 54 pounds.

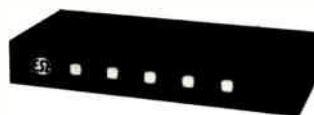


Circle 17 on Reader Response Card

Card Access Control

Amtel has introduced the Voidex-4000 card access control system. In an independent mode this system consists of a master control panel and up to four readheads.

Programming for the system is performed on a built-in keypad mounted directly in the master control panel.



Circle 18 on Reader Response Card

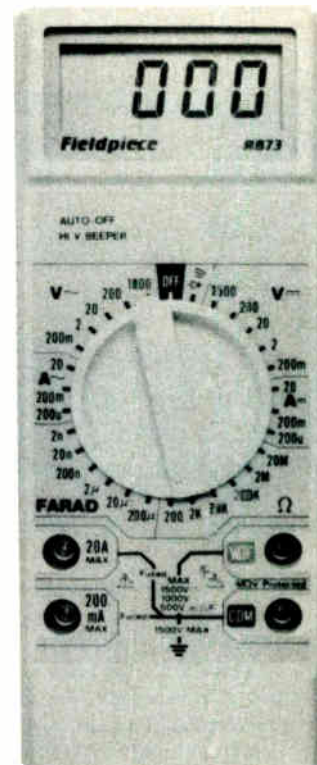
Camera Display

ESE has announced the ES-305, a camera mounted "countdown to air" display. It features five orange LEDs which extinguish one at a time to count down from five to one. The unit also provides a "flash" mode, in which all five LEDs blink on and off for five seconds prior to countdown, to inform participants which camera is up next.

Power Supply

System Engineering International (SEI) has introduced the DP-10 48V power supply designed for ISDN CPE applications. At full load, the DP-10 will provide 10 watts of power with 30 minutes of battery reserve. In a single station operating configuration battery reserve will be in excess of one hour.

Circle 19 on Reader Response Card

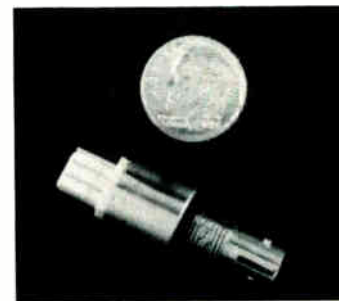


Circle 20 on Reader Response Card

Field Service DMM

Fieldpiece Instruments has introduced two full sized "heavy duty" digital multi-meters for service technicians. The meters feature a single rotary switch for function and range selection.

The HB71 and HB73 incorporate Valox housing, "O" ring seals to protect against contaminants, 600V fusing on all current jacks and MOVs to protect against transients.



Circle 21 on Reader Response Card

CCTV Micro Transmitter

Meridian Technologies has introduced the PT-100u, a fiber optic CCTV transmitter that measures 1.5 inches (length) x .5 inches in diameter. The unit is powered by the camera or 12VDC, 55mA supply.

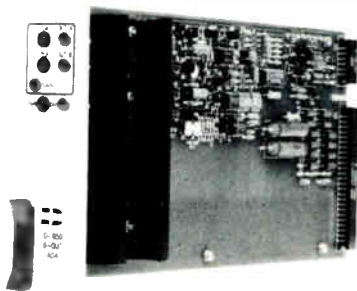
Designed for atmosphere filled housings the system has a 15MHz bandwidth and 67dB signal-to-noise ratio.



Circle 22 on Reader Response Card

Software Demo Package

National Instruments has announced the LabView 2 demo package. The free package gives a 30 minute guided tour of the LabView 2 instrumentation software system. The LabView 2 demo package summarizes the capabilities of LabView 2, shows the user how to build a virtual instrument (VI) and examines a completed VI and its components. The demo requires a Macintosh with at least 2 megabytes of RAM, 2 megabytes of hard disk space and a 13-inch monitor.

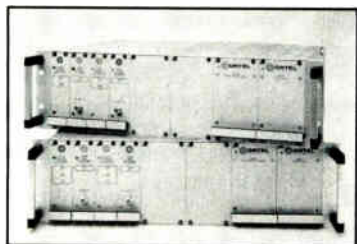


Circle 24 on Reader Response Card

Audio Distribution

Datek has introduced the D-850 single-channel audio distribution amplifier designed for use with Datek's D-800 series 10 x 1 switching modules which provide six resistive split outputs from a balanced or unbalanced bridging input.

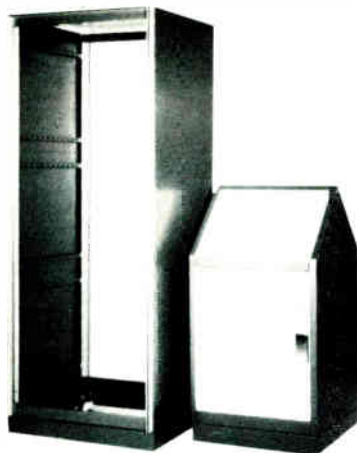
The output level of the D-850 is +28 dBm into a 600 ohm bridging load and +34 dBm into 150 ohm bridging loads, or +26 dBm into 600 ohm terminations.



Circle 25 on Reader Response Card

Fiberoptic Link

Ortel Corporation has introduced the 10005A TVRO fiberoptic link. The 10005A is used to transmit the LNB output from a satellite earth station antenna to a remote receiver or headend over distances up to 15 miles with a single fiber cable.



Circle 23 on Reader Response Card

Electronic Enclosures

The "Solid System" line of electronic enclosures from Equipto has welded, non-removable side panels. Vertical racks come in 19-inch and 24-inch panel widths, four depths and 33 heights. Sloped front consoles are available in 15, 30 and 45 slopes and double slopes. Bench top racks are also standard.

LITERATURE

Bud and Emilar Catalogs

Electronic Enclosures

Bud Industries, Inc. has released a six page brochure that includes additions to Bud's product line of 3,000 enclosure and accessory combinations.

New products in the brochure include two open relay/telecom racks in 12 sizes, as well as accessory items.

Circle 26 on Reader Response Card



Tech Specs

A technical specification catalog has been released by E3MC for its Emilar brand product line. A set of technical data on each Emilar product is included, and the catalog is in loose leaf form for the addition of 2000 series products, this year.

Circle 27 on Reader Response Card

Case Study

Microlog Corporation has released its Ontario Hydro case study for the facility's improvement of customer notification procedures. Automation was needed to notify customers about power outages, tree trimming and tree removal activity.

Circle 28 on Reader Response Card

Potting and Encapsulation Compounds

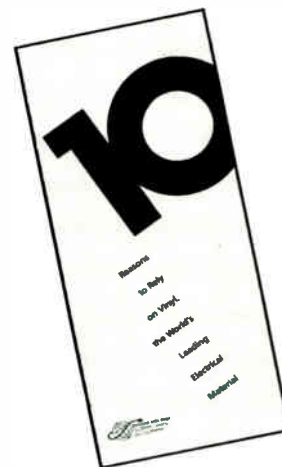
Master Bond Inc. is offering a two page application selector guide on potting and encapsulation compounds. One and two component systems are described. Viscosity, gel time, cure time, service temperature operating range and general descriptions are provided for each grade.

Circle 29 on Reader Response Card

Vinyl in Electrical Applications

The Vinyl Institute Electrical Materials Council has released a brochure that discusses the various performance characteristics of vinyl in electrical applications. Titled "10 Reasons to Rely on Vinyl, the World's Leading Electrical Material," the brochure reviews vinyl's 50-year record, and is available without charge to engineers, contractors and others involved in the specification of electrical materials.

Circle 30 on Reader Response Card



Metal Embossing

An Illustrated bulletin is available from Panduit Corp., Electrical Group describing the company's metal embossing hand-tool system for custom identification in harsh environments.

The tool is designed to emboss letters and numbers onto either aluminum or 430 stainless steel tape.

Circle 31 on Reader Response Card



MARKETPLACE

HELP WANTED

Service Technician

Thompson Engineering Company is accepting applications for the position of Service Technician. Candidates must possess the following knowledge, experience, skills and abilities:

- Factory training, extensive experience and skills in the installation and service of Rauland institutional communications products
- A thorough general knowledge of electronic key telephone systems, television systems, sound systems, security systems and fire alarm systems
- A proven ability to provide exceptional customer service and satisfaction to a wide variety of customer types and personalities

Please send complete resume, documentation, references and salary history to:

Gregor E. Eberhardt, General Manager
Thompson Engineering Company
 3651 Oakley Ave.
 Riverside, CA 92501

Manufacturer's Rep & Dealers Wanted

RACOM PRODUCTS INC. is seeking Manufacturer's Reps and Dealers for our line of Digital Voice Announcers, Feedback Eliminators, Multi-line Paging Concentrator and other related digital voice storage/announcers line.

Call 1-800-722-6664 or Fax: 216-351-0392 for details

DESIGN ENGINEER/PHYSICIST

Louisville Metropolitan Area corporation seeks Design Engineer/Physicist to conduct research activities incident to audio emissions from glass breakage and other phenomenon used to develop residential and industrial security systems. Conduct research incident to phenomenon related to water flow and other activities that also require monitoring in both residential and industrial applications. Write programs for the Asyst Data Acquisition System to accumulate and analyze the information gathered for research. Must design and build functional test equipment for use in manufacturing to insure proper functionality of products prior to shipment. Responsible for assisting Quality Control by performing glass break test to determine to quality of the product currently being produced. Also responsible for assisting design engineers by building and testing prototypes for the above mentioned applications.

Requires a Masters Degree in Physics and one (1) computer experience necessary to transfer sound qualities to computer data base from physical reactions and image processing in Fortran, Basic and C, Pascal, and Assembler computer language.

Salary: \$31,792.00 per year

All interested applicants send resumes to:



Peggy Dostal
 Job Order #229648
 Dept. for Employment Services
 600 West Cedar Street
 Louisville, Kentucky 40202-2396

EQUAL OPPORTUNITY EMPLOYER

SOUND SYSTEM DESIGN AND SALES

for expanding independent Dukane distributor for Michigan and Ohio areas. Seeking individual experienced in the design, layout and bidding of commercial sound systems and nurse call systems. Salary, commission and benefits. Reply to:

Sound & Communications Classifieds
 Dept. 121

25 Willowdale Avenue
 Port Washington, NY 11050

BUSINESS OPPORTUNITY

BUSINESS OPPORTUNITY

Specialized Southern California Altec Sound System Contractor wishes to sell business. Established for 35 years. Many expansion possibilities in a fast growing area. Flexible terms. Please respond to:

Sound & Communications
 Dept. 91
 25 Willowdale Avenue
 Port Washington, NY 11050

How To Place a Sound & Communications Ad

Print or type copy indicating capital letters and bold type. All rates are based on column inch. 1X rate for a classified ad is \$52. (Includes borders, typesetting and company logo if desired.) 1X rate for a marketplace ad (product) is \$80. Frequency discount available. Call for information.

CLASSIFIEDS

- | | |
|---|--|
| <input type="checkbox"/> Business Opportunities | <input type="checkbox"/> Employment Wanted |
| <input type="checkbox"/> Equipment for Sale | <input type="checkbox"/> Facility for Sale |
| <input type="checkbox"/> Help Wanted | <input type="checkbox"/> Miscellaneous |

MARKETPLACE

- All product and services

**Sound & Communications Ads
 Get Results!**

Company Name _____ Name _____

Address _____ Phone _____

Method of Payment Check Enclosed Visa American Express MC

Card # _____ Exp. Date _____ Signature _____

Mail or Fax Copy to

Sound & Communications Marketplace
 25 Willowdale Avenue, Port Washington, NY 11050
 Phone: 516-767-2500 FAX: 516-767-9335

AD INDEX

Company	Page	RS #
Aiphone Communications System	59	278
AKG Acoustics	23	210
Ashly Audio	26	246
Audio Technica	14	270
beyerdynamic	43	271
Cal Switch	27	248
Community Light & Sound	15	255
Crown International	CII	204
DJ Expo	63	—
Electro-Voice	5	205
Forward Innovations	69	230
Fourjay Industries	46	258
Frazier	39	275
FreeForm R&D	58	280
Full Discount Wholesalers	59	283
Huisinga & Olson	69	231
Ivie Technologies	51	253
JBL Professional	CIV	201
Karibu Sound	57	277
Kelvin Electronics	68	232
LaBelle Industries	58	279
Lectrosomics	37	211
Lee Dan Communications	33	206
Mellotone	69	234
Menlo Scientific	52	251
Modular Audio	69	233
Multiplex Technology	34	250
Music Supply Company	69	235
OAP Audio	29	254
Opamp Labs	69	236
OWI	18	272
Oxmoor	36	247
Peavey Architectural Acoustics	31	213
Pioneer Laser	49	212
ProTech Audio	43	273
Quam-Nichols	8,57,61	203,281, 282
Racom	60	284
Ramko Research	21	245
Raxness Metalsmiths	35	290
Seamtech	69	237
Sencore	CIII	202
Sennheiser Electronics	11	214
Sharp PPD	41	207
Shure Brothers	17	208
Sonic Systems/Soundsphere	13,45	249,252
TekTone Sound & Signal	35	274
TOA Electronics	24,25	256,257
VLR Communications	68	238
Wheelock	3	209

FREE INFORMATION

Use the Reader Service Card opposite page 18. Just circle the RS# of products that interest you. Detach, and Mail!

MARKETPLACE

VOICE LOGGING TAPE RECORDERS

Single and Multichannel Recorders
Record Single and Multiline Phones
New and Used (Large Inventory)
Dictaphone, Stencil, Teac, Racal, and More
Reel to Reel, VHS and Audio Cassette
VLR COMMUNICATIONS
Experts in Voice Logging Recorders
2290 Charter Point Dr. • Arlington Hts., IL 60004
708-870-8310 • 800-369-TAPE

Circle 238 on Reader Response Card

AC/DC VOLTAGE
AC/DC CURRENT
DIODE TEST LOGIC TEST
LED TEST GOOD/BAD
5 FREQ RANGES
5 CAPACITANCE RANGES
LOW BATTERY Warning
CONTINUITY TEST/BUZZER
TRANSISTOR CHECKER
20 MHZ FREQ COUNTER

PRO 400
\$69.95
Stock No. 9900R2

2 YEAR WARRANTY PARTS/LABOR

KELVIN Electronics
(516) 349-7620 1(800) 645-9212
FAX (516) 349-7630 VISA M/C



Circle 232 on Reader Response Card

FACILITY FOR SALE

MUSIC STORE

Family owned music store established 1939. Best location for music store in progressive city of 100,000. Outstanding franchises available like Peavey, Yamaha, Ibanez, Crate and more. School band instrument rental program with Selmer and Bundy. Private teaching rooms. Assume 3 year lease on present building with option to buy. Buyer must be willing to maintain family tradition of service and customer satisfaction. Contact:

C.C. Martin at Martin Music
Pueblo, CO
(719) 543-0775

Speaker Hanging Brackets
Aluminum — Load-rated
Custom-built — Rugged to fly
Certification Available
Sapsis Rigging, Inc.
1-800-727-7471

REPAIR SERVICES



We Repair:

Power Amps • Turntables • Mixers • Tape Decks • CD Players • Laser Disc Players
• Musical Instrument & Keyboard Amps
• Receivers • Consumer Audio • Televisions
• VCR's • Projection Television

SPEAKER REPAIR & RECONING
Sales & Service • Rentals
Pioneer Laser Karaoke

Call for Confidential Price List:

1551 Montauk Highway
Oakdale, New York 11769
(516) 589-4424 FAX: (516) 589-4437

EQUIPMENT FOR SALE

FOR SALE: SEALED BIDS WILL BE ACCEPTED FOR AUDIO EQUIPMENT RECENTLY REMOVED FROM THE INDIANA HOOSIER DOME.

Equipment was installed in 1984 and removed in 1990 for the purpose of upgrading the sound system. All equipment is in good to excellent condition. Clusters were flown and never on the road. All compression drivers were recently tested and met impedance specifications, before disassembly. All voice coils are currently manufactured by ElectroVoice. Primary signals were mostly voice and some music. System is available as a complete package or will consider some breakout into smaller packages. Minimum breakout considered would be four bass cabinets and twelve horns per package.

Qty of (72) ElectroVoice large format "HR" Series Horns 6040A w/DH1012A Drivers,
(26) #TL-606D Low Frequency Speaker Bass Cabinets,
(7) HR4020A High Frequency Horns with DH1012A Drivers,
(25) ElectroVoice AT-100 Auto Transformers, and
(59) Crown UMX-200 Transformers.

Drivers are rated at 40 watts, long term average power with a 10db crest factor (over sixty watts with a more typical crest factor of six db). Bass cabinets are rated at 800 watts and include dual 15 inch drivers.

All equipment is to be sold and picked up as is.

Bids are due by August 15, 1991. Please contact Bill Sampson 317-262-3401 should you have a question.

Send Bids To: **Attn of William G. Sampson**
Indiana Convention Center & Hoosier Dome
100 S. Capitol Avenue, Indianapolis, IN 46225

MARKETPLACE

FREE Catalog & Audio/Video Applications



Stereo/Mono Pwr. Ampl.



Video & Audio Dist. Amps.
RGB-Sync Dist. Amps.



250 PRODUCTS

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

NETWORK FEED BOXES

1-in / 16-out Audio/Video
2-in / 18-out Audio
2-in / 24-out Audio
4-in / 1-out Audio/Mixer
Routing Switchers



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

Circle 236 on Reader Response Card

INSTALLERS!



EASY KARY®
Wire Reel Holders



• 3 SIZES
• All Steel Construction

Carry like a briefcase

PUSH-PULL RODS Get cable through impossible places. Extends 45'. Light weight. Flexible



SPEAKER & TILE SUPPORTS



SPEAKER ENCLOSURES



ALL STEEL LIGHT WEIGHT but STRONG for all 4" and 8" SPEAKERS in ALL types of CEILING U.L. LISTED FREE SAMPLES

30 DAY FREE TRIAL

INSTANT OPEN ACCOUNT



The Audio Serviceman's Right Arm. Check the complete sound system from MIC to SPEAKER . . . and much, much more.

CALL OR WRITE FOR CATALOG
MUSIC SUPPLY CO., INC.
809 North Madison • Dallas, TX 75208
ALL 50 STATES 1-800-527-1522
FAX 214-946-9155 Local 214-946-8450

800-527-1522

Circle 235 on Reader Response Card

THE ULTIMATE WRAPPER



FAST • EASY • TIDY
Velcro® Cable Wraps

RIP-TIE®

800-348-7600

Seam Tech

P.O. Box 77394 San Francisco, CA 94107 • FAX 415-777-9868

Circle 237 on Reader Response Card

Check That Sound!

Solve Audio Trouble Fast



PAG-1
PORTABLE
AUDIO
GENERATOR

COMPACT 9 V BATTERY OPERATION
(Put Professional Precision in your pocket)

Check — Distortion and Equalization
Check — For Rattles and Buzzes
Check — Line Impedance, Capacitance and Inductance

— Low Distortion .03% T.H.D. Oscillator
— 18Hz to 22.5KHz in 3 Variable Overlapping Ranges
— Dial Marked 1/3 Octave Segments

****30 DAY MONEY BACK GUARANTEE****

Cost is a Reasonable \$139.00 Plus s/h
Checks, Moneyorders, Mastercard & Visas Accepted

For Ordering and Information Call
TOLL FREE 1-800-866-6264

Or Write To:
Forward Innovations
P.O. Box 9429
Santa Rosa, CA 95405

Circle 230 on Reader Response Card

FLAME RESISTANT ACOUSTIC GRILLE FABRICS

Meeting Fire Code Safety Standards.

ALL FABRICS INVENTORIED AND AVAILABLE FOR IMMEDIATE SHIPMENT

CALL OR WRITE FOR YOUR FREE SAMPLE FOLDER AND PRICE SHEET

MELLOTONE®

Mills: Post Office Box 145 • 108 East Church Street
Blacksburg, SC 29702 • (803) 839-6341
Fax (803) 839-2911

Circle 234 on Reader Response Card

FREE 56-PG CATALOG



Complete line of audio modules and accessories for all engineered sound & broadcast applications

MODULAR AUDIO PRODUCTS
1-800-333-7697 • 516-345-3100 • FAX 516-345-3106
DIV. OF MODULAR DEVICES INC • 1 RONED RD • SHIRLEY NY 11967

Circle 233 on Reader Response Card

How to Publish Your Own Newsletter Without Doing Any of the Actual Work.

Newsletter Marketing for Sound Contractors. Proven and affordable. Exclusive territories are available.

For more information call

(612) 231-2122
FAX (612) 231-1147

Huisinga & Olsen
Publishing, Inc.

P.O. Box 53 Willmar, MN 56201

Circle 231 on Reader Response Card

PRODUCT CHECK: RESTAURANTS

Products used most frequently in restaurant installations . . .

. . . NOW IN PROGRESS

SOUND & COMMUNICATIONS

	FIRST PLACE	SECOND PLACE	THIRD PLACE
Speakers	Soundolier	Bose	JBL
Power Amps	TOA	QSC/Crown*	Bogen/Peavey*
Audio Tape Players	TEAC/Tascam ¹	Carver/Pioneer*	Technics
● CD Players	● Pioneer	● Technics	● Carver
Signal Processors	Rane	Symetrix	JBL/Ashly/Lexicon*
Microphones	Shure	Electro-Voice	Astatic
Mixers	TOA	Electro-Voice	Soundcraft
Video [VCRs, Projectors, etc]	Sony	Panasonic	JBL (Harman Video)

* indicates tie

. . . IN LAST SIX MONTHS

SOUND & COMMUNICATIONS

	FIRST PLACE	SECOND PLACE	THIRD PLACE
Speakers	Soundolier/Bose*	JBL	Quam
Power Amps	TOA	QSC	Peavey
Audio Tape Players	TEAC	Technics/Pioneer*	Tascam ²
● CD Players	● Pioneer	● Carver	● Technics
Signal Processors	Rane	Symetrix	Ashly/JBL*
Microphones	Shure	Electro-Voice	Audio-Technica
Mixers	TOA	Soundcraft	Electro-Voice
Video [VCRs, Projectors, etc.]	Panasonic/Mitsubishi*	Sony	JBL (Harman Video)

* indicates tie

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.

¹ TEAC and Tascam, individually, had an equal number of first place votes in this category.

² An equal number of respondents placed Muzak third.

.2 mV ➔ 5,000 Watts*
Only One Instrument Will Take You This Far!

The Missing Link In Audio Servicing!



The PA81 Stereo Power Amplifier Analyzer!
A Sencore Exclusive!

Introducing the "Missing Link In Audio Servicing" that allows you to measure the level, listen to the audio, and view the audio during all amplifier tests. The PA81 provides everything you need for analyzing signals from microphones to power amplifier outputs fully integrated into one complete package, with:

- Twin Frequency Compensated Autoranged Wattmeters: 250 watts per channel (500 watts if paralleled or 5 KW if using PM82)
- Built-in IHF/EIA Testing Components At Your Fingertips: 2, 4, 8, 16, 32 ohm-zero reactance loads, and all specified bandpass audio filters
- Monitor Sound Quality At Every Step To Prevent Backtracking
- Measure RMS Volts And dB As You Trace Through Circuits: Plus, programmable dB to measure stage gain

- Test Intermittents To Prevent Amplifier Damage: Built-in DC balance test-automatically opens loads
- Test Audio Line Levels To Make Sure The Driver Input Signal Is Correct: Check turntables, AM tuners, FM tuners, TV stereo demodulator outputs, CD players, etc. for standard line levels
- Monitor Stereo Separation To 126 dB: Monitor, troubleshoot, or align AM-FM or TV Stereo separation circuits

*PM82 Power Max™ 5 KW
 EIA/IHF Decade Audio
 Power Multiplier — Accessory
 To The PA81



For More Details Call 1-800-SENCORE ext. 618
 (736-2673)

It Takes Real Guts To Face A Crowd Like This.



Concert Series

They want it all. They expect it. They deserve it. And, frankly, you wouldn't have made it this far if you had delivered anything but your absolute best. Night after night, show after show.

At JBL we share your dedication

and desire to take your music to the top. That's precisely why we invested the time and energy we did into the development of Concert Series loudspeaker systems. Just as every note and word must work together in perfect harmony, every

component in a professional sound system must integrate and function perfectly with each other.

Concert Series has the "guts" to face the most demanding audiences. This fact is underscored by the major tours and concert venues that have selected Concert

Series. From reggae and rock to solo and symphonic performances, Concert Series is helping artists the world over to give their fans the calibre of performance they demand and deserve, night after night, show after show.

We encourage you to audition Concert Series. Do it for your fans. Do it for yourself. Visit your JBL Professional dealer and discover for yourself why Concert Series is hanging around with some of the biggest names in the music business.



JBL

JBL Professional
8500 Balboa Boulevard, Northridge, CA 91329

H A Harman International Company

Circle 201 on Reader Response Card

World Radio History