

SOUND & COMMUNICATIONS

Volume 35 Number 12

December 20, 1989



NIGHTCLUBS AND SOUND INSTALLATIONS

Club installations create their own special problems — from architectural quirks to budgetary constraints to the need for convertible sound. We survey several installations and tell how and what they did to create sound to meet the challenge. Whether it's a renovated theater or a sparkling new building, sound contractors come through with sound to meet the purpose.

24

ECONOMIC SURVEY

The manufacturers of sound and communications equipment have, of necessity, their own agendas and their own vision of the industry. How well do they match the perspective of the sound contractors? *Sound & Communications* magazine presents its annual statistical survey of the numbers behind the products. The Economic Survey is an independent statistical survey of manufacturers sponsored by *Sound & Communications*. Read it and learn. 33

ROAMING THROUGH AES

The late great Audio Engineering Society convention allowed, as always, a view from the top of audio technology. We roamed the aisles and present our impressions of the trends that showed up for the interests of the sound and communications industry. Despite the rain outside and the complaints about dates and setup times from exhibitors, the show was upbeat and interesting — from both a product and paper perspective for those who attended. 18



Happy Holidays!

How one sound contracting firm uses the holiday season to thank its customers and have a good time. It's a seasonal bash to remember and be remembered by, with some good business sense thrown in. 16

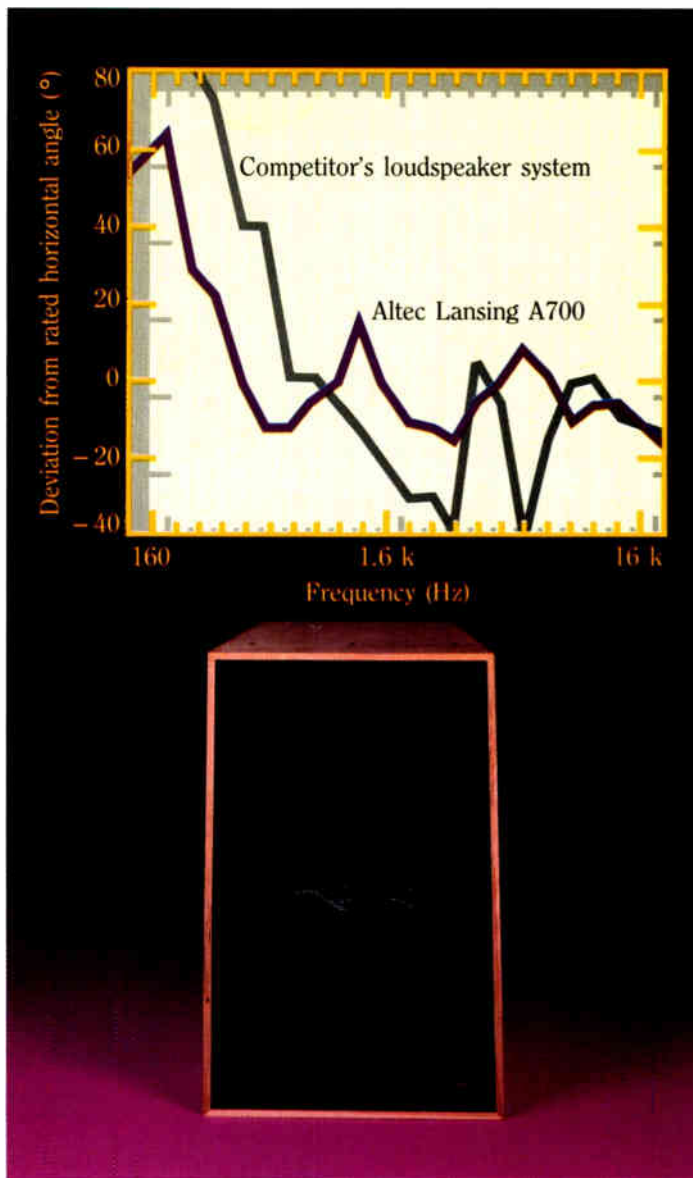
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In loudspeaker systems, uniform coverage equals superior response. The frequency response of a loudspeaker is the acoustic pressure level it will produce with a constant voltage input, over a variety of frequencies. The coverage of a loudspeaker is the angular wedge of sound radiation it produces; that is, the area it will serve in actual use. What have frequency response and angular coverage to do with each other?

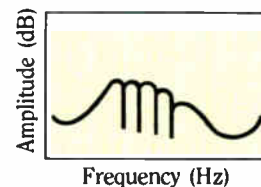
It isn't very difficult today to create a loudspeaker with excellent frequency response directly on-axis. This axial response may actually be one of the less interesting ways to measure response. To know the frequency response most audience members will hear, we must consider the coverage of the loudspeaker. This is especially important in the case of multiple loudspeakers used jointly to cover adjacent areas.

If a loudspeaker coverage pattern narrows down in some frequency bands, listeners outside this diminished coverage hear it as a response deficit: a dip in the response at those frequencies. If a loudspeaker coverage pattern widens at other frequencies, and this loudspeaker is used in conjunction with other similar loudspeakers for wider-area coverage, listeners in the overlap area hear $\sin x/x$ interference, sometimes popularly called comb filtering.



The graph shows deviation from rated horizontal coverage angle, for the Altec Lansing model A700, and for a popular loudspeaker system of approximately the same size and price.

The coverage of both loudspeakers widens at low frequencies, however the A700 exhibits much greater uniformity over this range. Note also the A700's smoother behavior in the critical upper octaves while the competitor's unit allows the pattern to collapse at two frequencies.



Coverage overlap produces interference; reduced coverage produces frequency response gaps.

The designer of a loudspeaker system must take great care that its coverage remains constant over most of its useful frequencies. This way, most listeners in a correctly-designed application benefit from the best frequency response the loudspeaker can produce. Gaps or overlaps in coverage all deteriorate the frequency response the audience will hear.

What is the benefit of uniform loudspeaker coverage? Superior frequency response for all listeners.

Fact.

In Loudspeaker Systems, Uniform Coverage = Superior Response

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World Radio History

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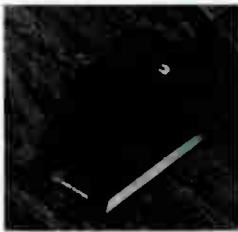
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Model AT871
UniPlate Boundary Cardioid



Model AT857AM
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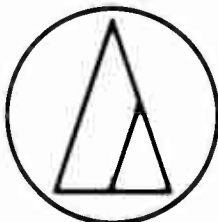
full freedom of movement to the participants, yet the microphone is almost unseen.

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Whether your customer's sound system is solely for sound reinforcement, or is also used for radio/TV or tape recording of the service, UniPoint microphones improve the sound quality while remaining almost invisible.

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LETTERS

CLARIFICATION

We received the October issue of *Sound & Communications* and were pleased to see a series of articles on various stadium projects that are in progress around the country. We were also pleased to have been mentioned in the opening article entitled 'Sports Stadiums, What's Happening?' on page 26.

However, I think we need to set the record straight on an incorrect statement made in the article in regards to our participation in the new sound system installation at the Houston Astrodome. The article mentions "Ford Audio designed the system currently being installed." This is incorrect. The sound system was designed by Randorff and Associates of Houston, Texas. Ford Audio was the contractor for the project.

James A. Ford

Ford Audio-Video Systems, Inc.

CELLULOSE GONE

Please correct two errors in the article on Sports Stadiums in the October issue of *Sound & Communications*: The home of the Dallas Cowboys is Texas Stadium, which is owned by the City of Irving, Texas, not Dallas. I did not say that the reverberation problems are now virtually gone. I said that the sprayed cellulose is virtually gone after some 18 years. Reverberation time is in excess of 12 seconds in the lower frequencies. It is not gone nor will it ever be. The design of the sound system took this fact into account and works with it to produce even sound coverage (± 2 dB at 2 kHz), full range musical frequency response and very high intelligibility.

Kenneth Dickensheets

K.R. Dickensheets & Associates, Inc.

SCHOOLING AVAILABLE

I was interested in the "Viewpoint" article in the July issue of *Sound & Communications* by Michael E. Lamm. Of course, I, being from an educational institution, agree with his premise. I also agree with his comments regarding self education by professionals in the audio engineering field. My comments are directed at individuals who intend to go to college for a bachelor's degree and are interested in the fields of audio engineering, recording engineering, acoustics, musical acoustics, etc.

To my knowledge there are no *accredited* courses in Audio Engineering offered in the U.S. I have had a number of students tell me this. They are frequently surprised when I tell them that they can study a number of courses at the University of Washington that will prepare them for a career in audio engineering.

True, we don't offer a degree in Audio Engineering, but there are several paths available here at the University of Washington (and I suspect at other institutions) that provide the basic education that they seek. However, for someone to find the path he wants to take requires that the individual must be ready to hack their way through a jungle of obstacles.

Actually, the obstacles are not all that big, but students usually are not aware of the opportunities that are available. The reason for this is that these paths are the "paths less traveled by." Usually a student will pick up a catalog from his or her favorite institution of higher education and he will see all the prescribed degree plans offered by degree granting units such as: Electrical Engineering, Mechanical Engineering, Physics, Music, Business, etc., but he will not notice that there are

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paths for a Bachelor of Arts in independent studies or a Bachelor of Science in independent engineering studies, either of which (at U. of W.) can be tailored to provide the basic training in physics, acoustics, music, recording, and business that they seek.

The problem seems to be getting this information to prospective students and giving them guidance. It is usually too late when a senior EE student says to me, "I wish I had known about this when I was a freshman." So, if you know someone starting college who wants to study audio engineering, tell him to ask around and find who teaches acoustics at the school that interests him. Usually, this person will be in physics or engineering. Have them contact that person and ask about the opportunities for an independent studies program. It might be that they will recommend a degree in a conventional field (e.g. Electrical Engineering) with as many electives as possible in acoustics, music, etc. This is sometimes preferable, since the student graduates with a degree that is recognized in the outside world.

It is up to the student with the assistance of this advisor to arrange a program that emphasizes the areas in which the student is interested. This may lean more toward music, or engineering, or physics, for instance.

We don't teach Audio Engineering, but anyone who is awarded any of the degrees will be well prepared to follow Mr. Lamm's advice and become a darn good "Audio Engineer."

James D. Chalupnik Professor and Associate Chairman
Department of Mechanical Engineering
University of Washington

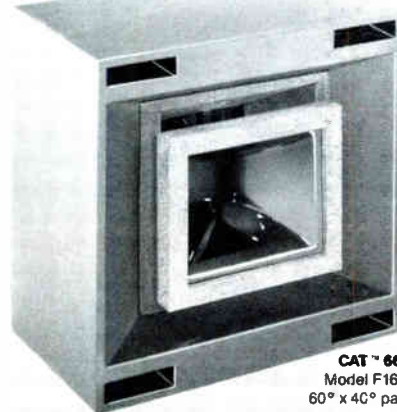
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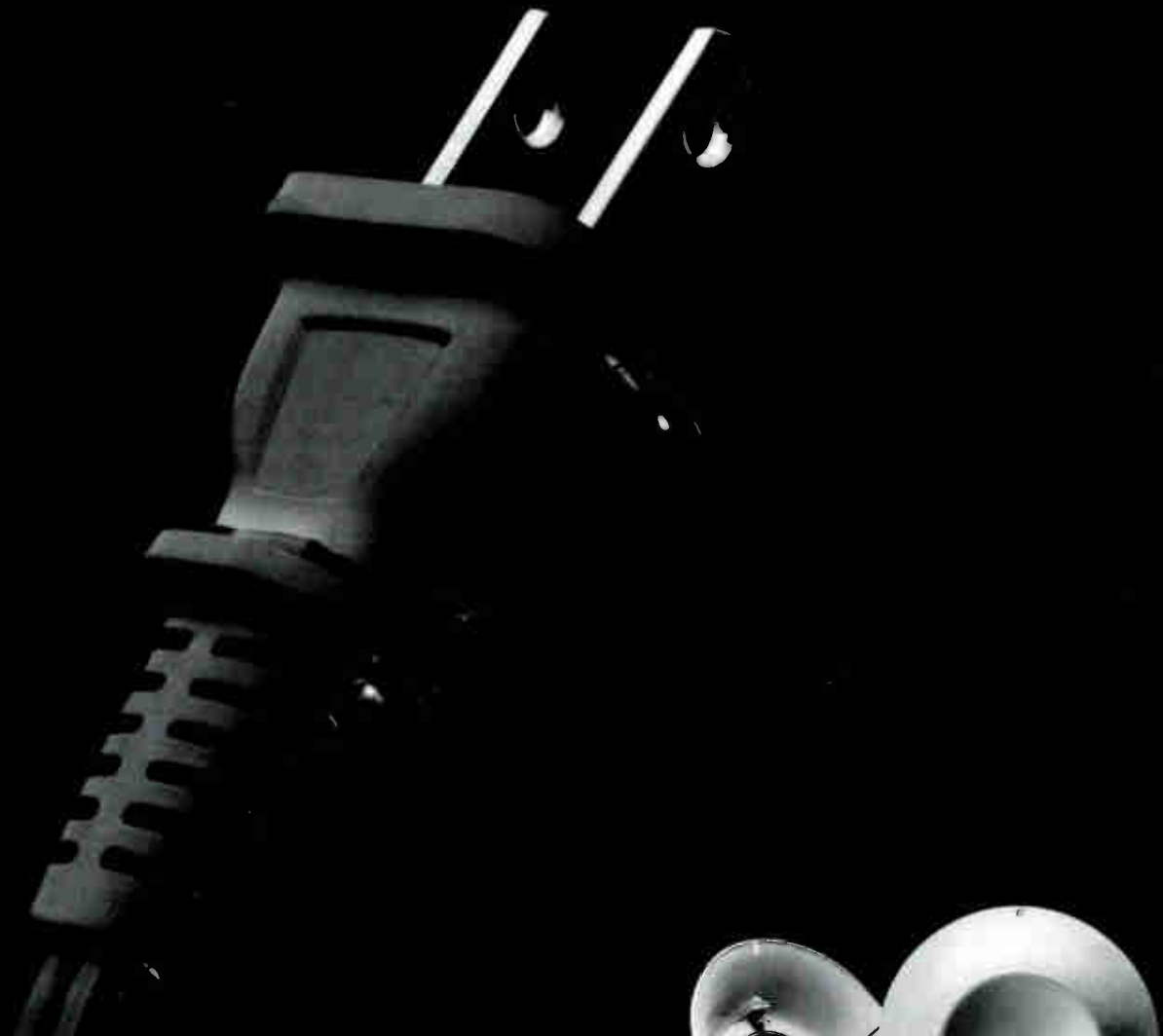
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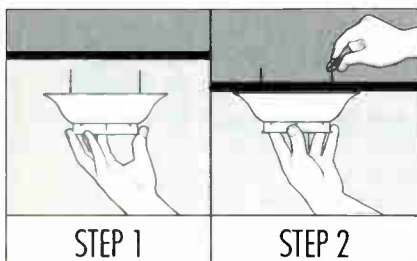


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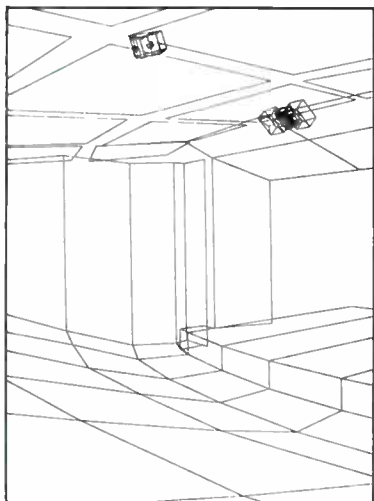


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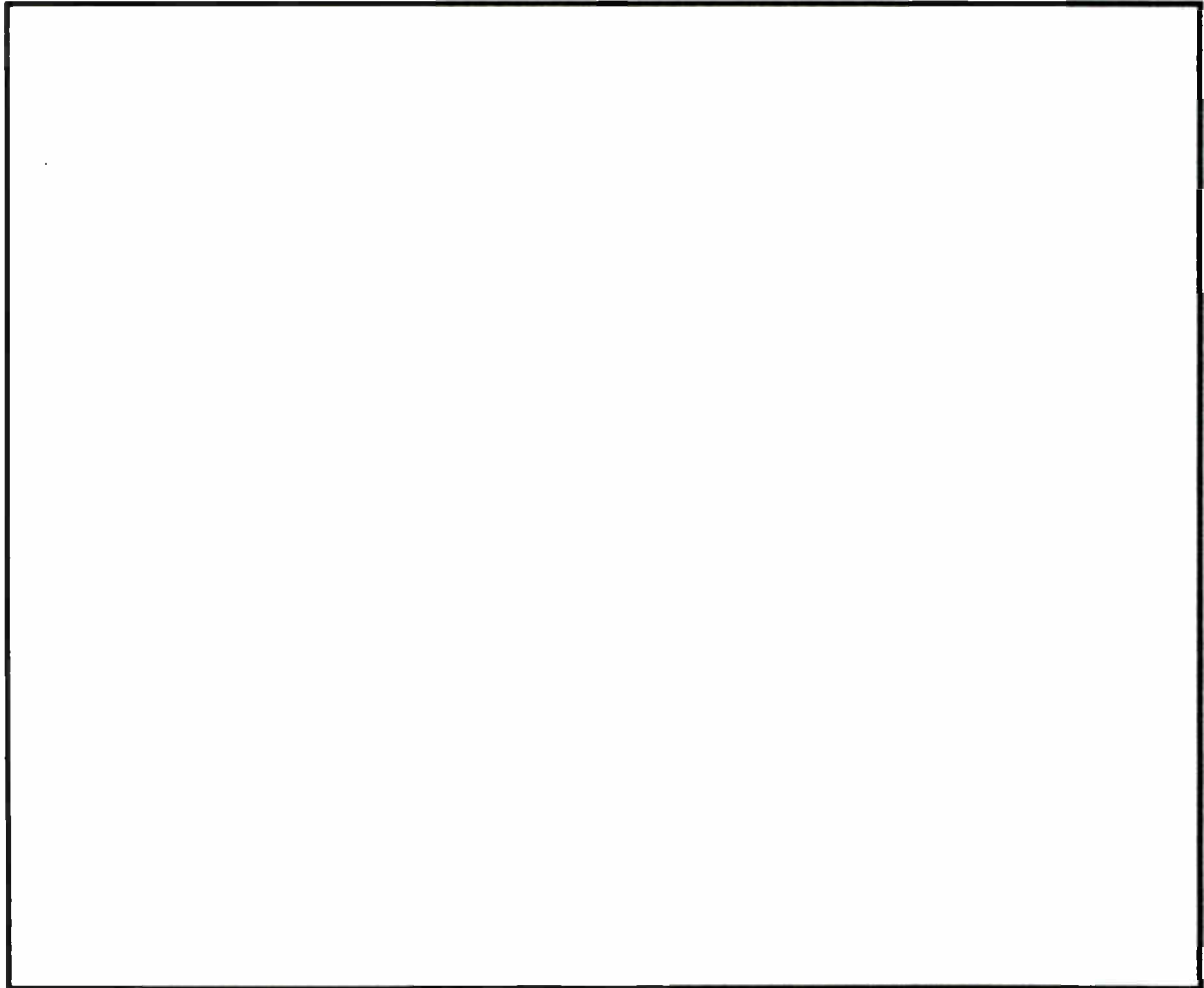
70 **Ad Index**

SOUND COMMUNICATIONS

Coming in January

The latest in the world of loudspeakers and Boardroom Design; and much, much more.

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NEWSLETTER

BLONDER-TONGUE SUPPLIES WHITTLE

Blonder-Tongue Laboratories has received a contract to provide modulators and distribution amplifiers for use in the Whittle Educational Channel. A total of 6,000 installations will be made during the first phase of the contract. The contract was awarded by Radiation Systems, Inc., SatCom Technologies Division. The controversial Whittle operation, for which Magnavox is providing the VCRs, is a commercially sponsored news show to be presented nationally to schools, for which Whittle is providing the equipment.

NO MONTREUX

PAEG, the Professional Audio Exhibitors Group, made up of several European Manufacturers, has issued a press release following up on their presence at the AES Convention. The release states that the group will not exhibit at the Montreux AES, and that AES has given them assurance that its convention will not conflict with SMPTE.

PATENT AWARDED KARAMON

John Karamon, VP Marketing of Soundsphere, has received a patent, along with Daniel W. Gravereaux, for a "Method and system for synchronization of an auxiliary sound source to motion picture film, video tape, or other picture source containing a sound track." The system allows compact disc stereo systems to work with current theatrical projection equipment.

SONY AND GML TALK

Sony Professional Audio is engaged in discussions with George Massenburg Labs to offer the GML Moving Fader Automation System as a high-end option on Sony's line of MXP-3000 Series consoles.

CEDIA PLANS MEETING

CEDIA, the Custom Electronic Design & Installation Association, which was officially formed in September, is planning its next meeting during the Consumer Electronics Show in Las Vegas in January. The association, which concentrates on residential installations, is dedicated to "promoting the industry and developing standards of service" in addition to "establishing ties with architects and the building trades." Tom Danner of The Music Room in Redmond, Washington was elected president of the group.

NECT FORMED

NEC Technologies, Inc. has been created by the merger of NEC Information Systems and NEC Home Electronics. The resulting company, with over \$1 billion in revenues, is responsible for the development, marketing, manufacture and distribution of a wide range of computer, peripheral, audio/video and home entertainment products. Included in the products of the new entity are DataSmart data projectors and monitors, and other presentation equipment from its Professional Systems Division.

TIE REPORTS LOSS

TIE/communications, Inc., reported a third quarter loss of \$4,541,000 before preferred stock dividends and accretion, compared to a loss of \$6,509,000 for the third quarter of 1988. Sales for the third quarter of 1989 were \$51,771,000 compared to \$64,712,000 in the third quarter of 1988.

NEWSLETTER

BURLE MAKES PURCHASE

Burle Industries, Inc. has purchased Robot Industries, a 60-year-old company which will become Burle's "skill center for access control hardware." According to Burle, the purchase is part of the company's overall corporate strategy to expand its product line and become a complete security system supplier. Currently the skill center is manufacturing a line of security turnstiles, gate operators, and barrier gates. Robot also offers application analysis, design and technical assistance, and custom manufacturing to customer specification.

PROTOTYPE DSP

TOA Electronics' SAORI digital signal processor, shown in prototype form at the 1989 AES convention, "performs the functions required between the mixing console output and the power amplifier." The company says a single Saori replaces two 30-band equalizers, two constant directivity horn compensators, two four-band notch filters, two four-way crossovers and eight digital delays in a five-rack space chassis. The signal is kept in the digital domain through these processes. The system is expandable. Upgrades and additional functions can be added via ROMS or module cards.

NEW COMPANY DISTRIBUTES ARIES

Newly formed C-Level Distribution Group has been awarded exclusive distribution rights for Aries consoles. C-Level president Ed Bigger commented, "I've been working with the product for the past few years, and it's gaining a good market share." A service support program is expected to be announced.

ICIA LOBBIES FOR REPEAL

The International Communications Industries Association has asked Congressional leaders to repeal the "estate tax penalty." According to the ICIA, Section 2036(c) of the IRS code eliminates some of the most commonly used methods of passing a small business from one generation to another.

CONNECTOR ANALYSIS PUBLISHED

"Connector Market in the U.S." is a 283-page analysis recently completed by Frost & Sullivan, which predicts that by 1993 the current connector consumption will rise to almost \$6.1 billion, up from \$4.4 billion in 1988. Connectors employing emerging technologies such as fiber optics and composite materials are held not likely to impact the market until after 1990, according to the study. "The development and increased use of complex ICs by all sectors of the electronics industry is placing new demands on suppliers for high density and miniaturized interconnection products."

INCREASED REVENUES, DECREASED EARNINGS

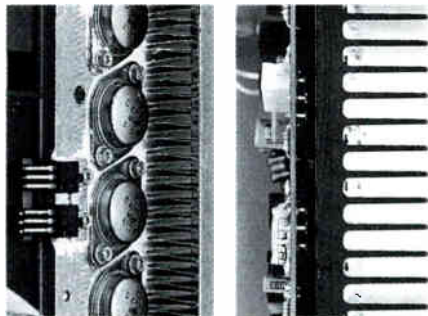
Gentner Electronics has reported an increase in revenues and a decline in earnings for its first quarter ending September 30, 1989. First quarter revenues rose by 23 percent to \$1.25 million compared to \$1.02 million for the first quarter last year. For the same quarter, the company incurred a loss of \$17,780 compared to last year's net income of \$64,401. William V. Trowbridge, chief operating officer, stated, "Our first quarter results are in line with initial projections."

Warning: To Avoid Risk Of Shock,

Ignore This Amp-To-Amp Confrontation.

Let's be frank. We're out to change your idea of what—and who—makes a professional power amplifier. So if you just bought a Crown MacroTech, turn the page — this comparison won't be a polite one. But it will stick to the facts.

A look inside these two amps will give you a better idea of why BGW amps like the GTB Grand Touring Amplifier are built like no others in the world. And raise some questions about Crown MacroTechs.



Left: The MacroTech uses mostly air to dissipate heat, not metal. The closely spaced fins are vulnerable to airborne dust and dirt.

Right: BGW uses ten pounds of aluminum to absorb thermal transients, extending power transistor life.

TAKING THE HEAT

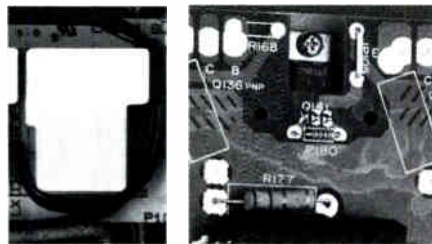
If the MacroTech heat exchanger reminds you of an air conditioner, you've grasped its design. This approach works, at least until dust and dirt clog the fins. But as soon as the air flow slows or stops, temperature rises. Soon after that, the Crown shuts off — it could even fail.

The GTB uses massive extruded aluminum heat sinks with widely spaced fins. The

mass of metal absorbs thermal transients without straining the fan. And without quick changes in transistor temperature. That's important: Transient musical loads put the worst kind of stress on power transistors. The effects of thermal cycling fatigue may not show up until after the warranty, but they can destroy lesser amps. Meanwhile, BGWs keep right on delivering clean, reliable power.

REAL SPEAKER PROTECTION

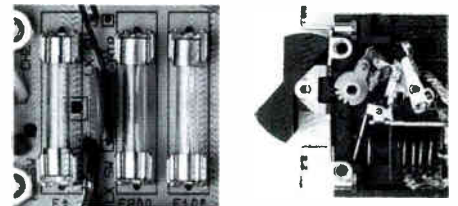
Most amps today are direct coupled, so a blown output transistor (the most common failure) connects the power supply directly to the speakers. Earlier MacroTechs had no protection against DC. Now Crown has learned their lesson — or have they? The sensing circuit and relay they now use shuts off the power transformer, but allows the filter capacitors to discharge stored DC energy directly into your drivers — risking real damage.



Left: Crown uses a slow-acting, less reliable relay. It can allow the filter capacitors to discharge stored energy directly into your drivers.

Right: BGW's modular power output section protects your speakers against DC damage with an instantaneous Thyristor Crow Bar. And the module is easily replaced in the unlikely event of failure.

BGW pioneered DC speaker protection in 1971. We stopped using relays years ago, when they no longer met our reliability standards for BGW amps. The GTB, like all BGWs over 200 Watts, uses solid-state Thyristor Crow Bars to keep DC from ever reaching your valuable speaker cones or compression drivers.



Left: Time is money, and with Crown's MacroTech you can lose plenty of both: You have to pull it out of the rack every time a fuse blows.

Right: The GTB's power switch is also a rocker-actuated magnetic circuit breaker. You can reset it in a second if power lines hiccup.

MAKE YOUR OWN COMPARISON

Before you buy or spec your next power amp, call us at **800-468-AMPS** (213-973-8090 in CA). We'll send you tech info on BGW amps and the name of your nearest dealer: He can arrange a demo of any BGW model against any amp you choose. Then you'll be able to appreciate the advantages of BGW engineering with your ears, as well as your eyes.



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World Radio History



A Modest Proposal

By Clifford A. Henricksen

Proposal for Teaching Sound to the Citizens of America so that the Most (or at least second most) Important Communication Medium is not Totally Omitted from our Public Education and Personal Understanding.

Why is acoustics considered an esoteric and almost alchemy-like discipline? Why do buyers and users of sound equipment, such as high school directors, arena managers and presidents, home users and musicians; profess an almost universal ignorance of the way sound equipment works and behaves? Why do professionals and students in our own field (sound reinforcement) have such a difficult time learning and understanding acoustics? I believe it is because of our complete lack of primary and secondary education in this subject. We are faced with learning acoustics, a major medium for communication today, at a time when the most fertile period of learning and education has passed. I believe that the study of acoustics is as easy as any other scientific study, but not when you start out after high school.

So then, why is the teaching of sound and its characteristics not addressed by our primary and secondary public education system? Why is chemistry, for instance, taught both in lecture and lab and not acoustics? Is chemistry more relevant in 1990 than sound? Is it because acoustics deals with "the invisible" and such studies as chemistry, physics and art are clearly visible? It almost seems to me to be a gigantic blunder to ignore the early study of acoustics in an age when communication is such an important

part of our daily lives and sound accounts for at least half of the communication presented today. There should be at least *some* exposure to it, but to practically omit sound from the education of the next generation seems unfathomable. True, most, if not all, educators do not understand acoustics (not to mention many people in our own field). This may entirely account for this unbelievable omission, but is this a valid reason to put it off any further? I believe not.

". . . to practically omit
sound from the education
of the next generation
seems unfathomable."

Here, then, is a proposal for teaching grade school through high school students about sound. It is a patterned after the teaching of light and tools which use light (paint brushes, projectors, lights, pens, paper, etc.) in conjunction with art education. Equipment required will be high quality loudspeakers, microphones and digital playback equipment (DAT, CD and digital samplers or computers with this internal capability, becoming more common every day):

Kindergarten. Identification of ranges of musical and natural sound, that is, treble, bass and midrange. For instance, birds and bats produce a lot of high frequency information, voice contains mostly midrange information, and large drums produce bass. Also, identification of sources with various

ranges in a complex signal, like an orchestra with triangle, double bass and trumpet. Identification of individual instruments, especially with respect to the frequency range of presentation. Development of early awareness of the hazards of ear damage from high SPL and how to protect one's self from this.

Grades 1-3. Continuation of ear training with respect to ranges, further identification of frequency ranges of pure tones and ear health/protection. Identification of common musical instruments and their predominant frequency ranges in orchestral and popular music.

Grade 4. Continuation of frequency-dependent ear training and an introduction of the decibel as a unit of loudness. Beginning of ear training in relation to SPL levels; loud (above 80 dB), moderate (65-80 dB) and quiet (below 65 dB). Beginning of quantified education as to how hearing can be damaged by high SPL.

Grade 5. Continuation of frequency and level calibration of each student's ear, with more daily practice in SPL identification. Students here should be able to guess within 3-5 dB of the presented level. Intro to pink noise and bands of it regarding identification.

Grade 6. More frequency- and level-sensitive ear training (daily). Beginning of listening to loudspeakers, human voice and musical instruments in rooms. Listening for reflections and reverberation and ear training to identify reverberation times and sources of reflections. Beginning of training in the proper use of loudspeakers, mixers, amplifiers, equalizers and microphones for public speaking, including when not to use sound reinforcement

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Model 9003



Model 9006 rear view (top). Model 9012 front view

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Our 9000 Series of mixer/amplifiers offer you the choice of 30, 60 or 120 watts in a versatile package. Each unit has six plug-in module slots. You can customize your input configuration by selecting the precise number and type of inputs. Chose from: transformer coupled mic or line level, XLR or screw terminal inputs. We even offer a 600Ω output module with separate level adjustment, and an FM tuner module. All front panel controls are tamper proof, and two separate mute busses enable increased flexibility in design. There is even a barrier strip for installing a remote master volume control.



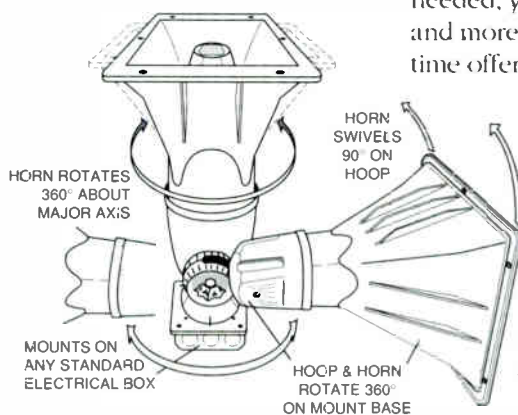
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Our new PA430, a constant directivity paging projector, employs technology perviously available only in large format horn/compression driver configurations. The specially designed swivel base can be instantly aimed and locked to distribute sound in the 2 kHz to 10 kHz range *exactly* to the desired 60° by 40° area, reducing the number of horns needed for an installation. With less materials and less time needed, you can be more competitive and more profitable – and at the same time offer technological innovation.



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and how to optimize public speech over a sound reinforcement system.

Grade 7. Continued frequency- and level-dependent ear training, including identification of frequency of feedback and use of narrow-band filters and other digital techniques to minimize feedback. Begin the theory of electronic musical instruments (guitars, organs, bass, synths; digital and analog; samplers, etc.) and loudspeakers, and the inseparability of the two as a single instrument. Continue with listening to and identification of the sources of architectural acoustical problems and the reduction thereof, with common tools such as absorbers, diffusers, active elements, etc. Begin the calculation of attenuation of sound due to absorption and time delays due to architectural effects such as solid boundaries.

Grade 8. Continue daily ear training and advance the students' ability to locate and identify all kinds of acoustical phenomena. Begin training and awareness of the directivity of things so that they can be used more effectively; musical instruments, voice, loudspeakers of all kinds, etc. Continue with advanced sound reinforcement techniques such as multiple close microphone techniques, complex mixing, the effects of reverberation, proximity and directivity on intelligibility, etc. Determine the proper SPL for a given event and provide an appropriate level to an audience.

High School, grades 9-12. What I propose here is various levels of Acoustics and Electronic music courses as alternatives to Physics/Chemistry and "regular" music programs. These are based on the education received from grades K-8. I dare say the latter course of study will see the traditional music programs, left in droves and possibly a similar trend in the former (Shouldn't education be fun?). New equipment needed: TEF or similar analyzer, SPL meters, calibrated mics, sampling or ROM-sound resident computers, commercial or resident MIDI sequencing/recording programs.

Acoustics I. Physics of sound. Attenuation, propagation, directivity, time delays and reflections. Lab: Measurement of directivity of things and plotting polar curves. Frequency-response and difference measurements to explain common phenomena.

Acoustics II. Loudspeakers. Theory and use, listening. Lab: design, build and test/listen to vented bass, CD horn and integration with active crossover as a system.

Acoustics III. Acoustical elements. All kinds (see Olson/Beranek). How to calculate and use them in daily life, like changing the acoustical environment of the home and designing a high-pass muffler for the grounds crew's tractor or lawn mower.

Electronic Music I. Physics of the electric guitar, bass, analog synth, digital and ROM/hybrid synth, samplers, etc. Also the use of speakers and how they become part of the instrument.

Electronic Music II. Digital sound modelling and composition. Sampling, sample editing, MIDI recording and playback, music theory applied to MIDI composing programs. Prerequisite: music theory.

Electronic Music III. MIDI composition. Do a full score and perform or play it back for final exam. Prerequisite: EM II.

Electronic Music IV. Band. Possibly too much fun. Adults may not like it. This could be a cream-of-the-crop fallout from EM I through III, but everyone will want to be in it.

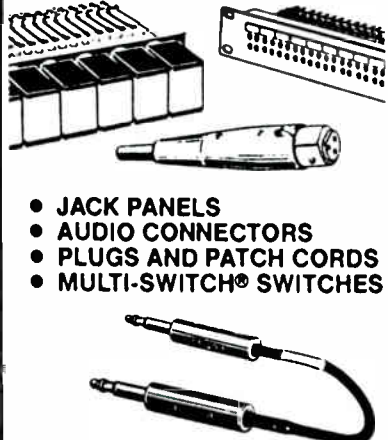
Ambitious? Start this program in your school district next semester. Where do we get the textbooks? Where do we get the teachers? Who will do all this? I wish I had the answer, but it doesn't take a genius to see that this is a big project.

I'm sure some are saying, "Golly, I don't know half the stuff here." Welcome to the club campers; me too. The point here is, if we start early, students will breeze through the high school courses with an awareness developed at an early age. They won't have the problems you and I had because we started to learn this stuff much later in life. They won't wonder why there's feedback and no intelligibility at the weekly assembly. They won't be strangers to speaking into a microphone. When they grow up and manage big sports arenas, they won't trust someone else to tell them what they need for a sound system and what it should sound like. When they grow up and enter our profession, they won't be enslaved by data. ■

Cliff Henricksen is the Director of Engineering at U.S. Sound.

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Christmas in Florida; Spotlight on Island Audio Works



How does a company keep its customers happy? By doing good work at reasonable prices? Yes, of course. But it doesn't hurt to give the customers a good time once in a while. That's the philosophy behind Island Audio Works' Christmas in Florida party, now engaged in its fifth year.

Island Audio's first party five years ago culled eleven people. This year the bash will draw over 280 at last count, with two bands — putting it over the brink of the house party that Pam and Carlos Gonzalez, Island's principals, had at first envisioned. The Christmas party, complete with tree, is planned for the Marriott Orlando World Center Resort in Orlando. And the big draw is the primary band — Blood, Sweat & Tears. How does Island plan its party?

With a lot of thought — and with help from some of its suppliers. Among the helpful companies are: Sony, EAW,

the scope of the philosophy. "It gives the customers a chance to talk directly with the manufacturers," says Pam Gonzalez. The Marriott was chosen partly because there was still room there when the party switched from the Gonzalez's home, and partly because, "We like to do functions where we do business. We're doing some work at the Marriott," says Pam. "We're bringing our own system in and working with our sound and lighting guy. We're starting to get into lighting."

Numerous Party Goers

Who's coming to the party? The Island Audio customers include such luminescent venues as Disney World, Trump, Resorts International, Carnival Cruises, Sea World, Lockheed, along with a slew of recording studios, government operations and others.

How It All Began

The company was founded in 1984,

“It doesn't hurt to give the
customers
a good time once in a while.”

Motorola, Shure Brothers, Ram-sa/Panasonic and BGW. This adds not only to the scope of the bash, but to

and the Gonzalezes attribute their growth over the past few years largely to word of mouth advertising. Resorts

SALES AND MARKETING

International in Atlantic City introduced them to the entertainment people at Resorts in Nassau, which led them to dealing with Carnival Cruise Lines at the land-based operations in Nassau. "In this industry, people move from place to place and from casino to casino. A lot of our work has come from people we deal with just moving up the corporate ladder into a better position.

Recent and current jobs include both residential and commercial installations. The Crystal Tower Suites in the Trump Castle in Atlantic City prices out at \$500,000 and is expected to be complete by year end. The Carnival Crystal Palace in Nassau priced out at \$700,000 and included ballroom sound, showroom sound, surveillance system

and portable sound system. A large portion of the business is located in the Caribbean and Puerto Rico; there is some export business done; and a Las Vegas office may be in the offing in the next year.

Meanwhile, is Donald Trump coming to the Christmas party? At press time, there was no word on that.

The Management and Staff of
Island Audio Works
cordially invites you to our

Fifth Annual Christmas Bash

This year's Bash will be held December 9, 1989
at the Marriott Orlando World Center
in Orlando, Florida, Grand Ballroom
Cocktails and hors d'oeuvres will be served from 7:30 p.m.

The evening's entertainment will be

Blood, Sweat & Tears with **David Clayton-Thomas**

Please R.S.V.P. no later than **November 15, 1989** by calling
Pam at Island Audio Works 407-452-9338

Please advise Pam if rooms and/or
travel arrangements are necessary

Due to the security necessary for this function, no one will be
admitted without this invitation and confirmed reservations

Dress is Semi-Formal



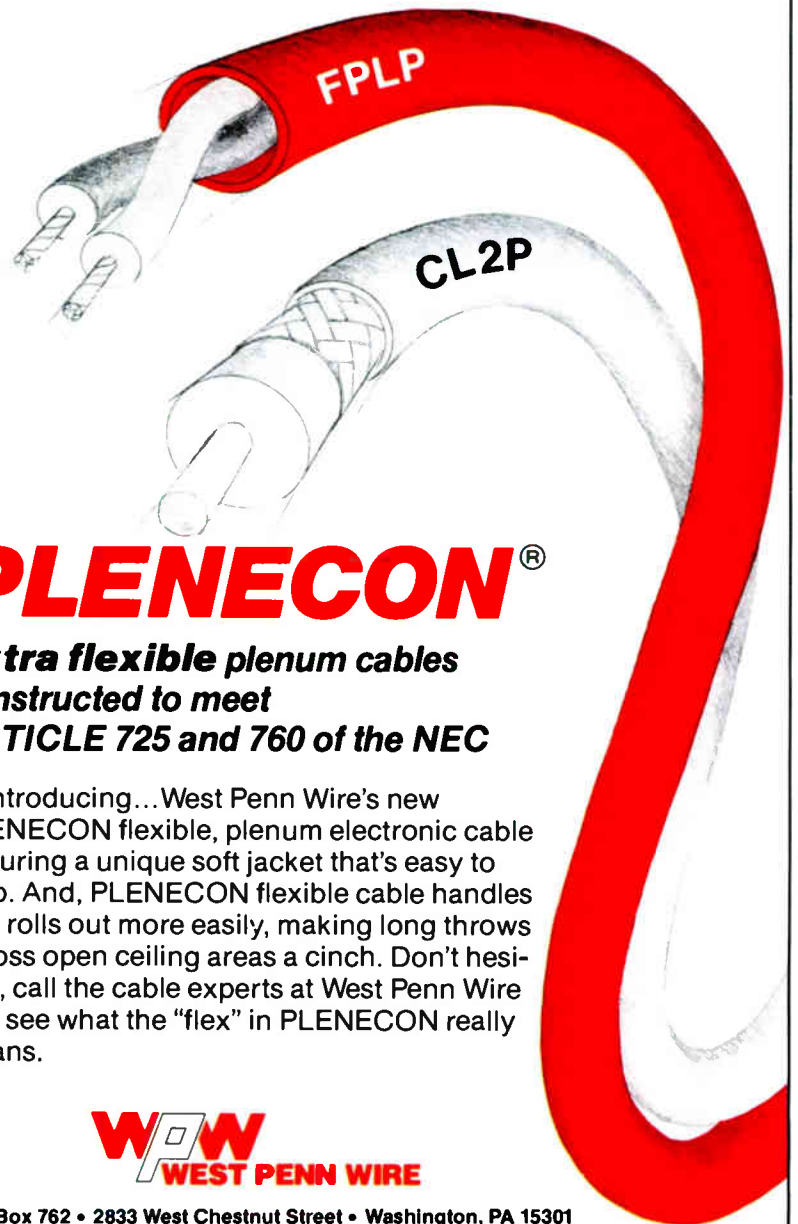
The invitation to Island Audio's Christmas party was printed in four-color and was sent out to a slew of entertainment venues, recording studios, government operations and others.

They remember Island Audio and we follow them."

Operating with a small staff, the personnel of the company in addition to the Gonzalezes are Dale T. Lackey, project coordinator; James Black, technical assistant; Joyce Duncan, finance manager. A couple of staff additions are planned for the next few months. Black arrived recently from the Sands Hotel & Casino in Atlantic City.

The company recently moved to a renovated house in Merritt Island, Florida, which houses the corporate of-

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TRENDS FOR THE FUTURE

The 87th AES Convention in New York

The 87th convention of the Audio Engineering Society was upbeat and heavily attended. Although there was some grumbling from some exhibitors about timing and venue, even the exhibits in the Sheraton basement ghetto area were packed. The convention was

sessions and new product introductions. This convention didn't disappoint in the indications for the future.

A strong emphasis was given to the sessions and workshops on stereo imaging and the perception and recreation of acoustic space, including modeling tech-

effects as well as empirical measurements. Complex lobbing and cancellation effects are the last barriers to accurate sound system performance prediction. With the advent of accurate predictive software the more severe interactions can be minimized. Renkus-Heinz has commercialized their array prediction program, and another program is available on a "shareware" basis (see the *Sound & Communications Blue Book*). Bose has decided not to sell ArrayCAD, their array effects simulation program. A paper from JBL provided astute guidelines for array designers based on their recent study of interference effects in touring sound speaker system configurations (angled enclosures should be tight-packed or the spaces in between filled with solid wedges, checkerboard flat arrayed boxes — that is, flip alternate enclosures — and add more proportionally high frequency elements for very large arrays).

A number of papers and products based on hard disk systems for recording studios and post production were talked about in the sessions and shown in the exhibit area, but this technology has not "trickled down" to products for sound contractors, just yet. *(continued on page 22)*



Photo courtesy AES.

held October 18 through 21 at the New York Hilton and Sheraton Centre hotels. Although a good chunk of the show was oriented towards recording studio, post-production, or acoustics people, or was just too esoteric to be of practical use to sound contractors, there still were a great deal of new products that were of interest to *Sound & Communications* readers. While we can't cover everything from the show, we can touch on some of the important new trends and the most exciting products.

The most exciting aspect of any AES convention is in the trends for the future that can be discerned from the technical

niques for recreating sound fields in headphones, living rooms, concert halls and other large spaces. These papers covered topics ranging from micing and mixing techniques, to ambience extraction and synthesis on playback. With Dolby Surround Sound, multi-channel encoded televised live broadcasts, and even a paper on a home THX sound system, can popularity of multi-channel sound field control systems for night clubs, discos and restaurant/bar sound and video systems be far behind?

The special session of the Sound Reinforcement Committee focused on computer prediction speaker array interaction



Left to right: Bill Gelow, Harro Heinz, Steve Armstrong of Renkus-Heinz, introducing their new products.

1200 WATTS, FOUR INDEPENDENT CHANNELS, FLEXIBLE, 2/3/4 CHANNEL SELECTABLE...



Four independent channels for multi-speaker and/or multi-zone systems or bi-amping... Switch to the *two-channel mode* for high power-600 watts per channel @ 8 ohms per channel... or to drive two 70-volt distributed line systems.

Three channel mode is ideal for systems with a subwoofer, or where tri-amping is desired.

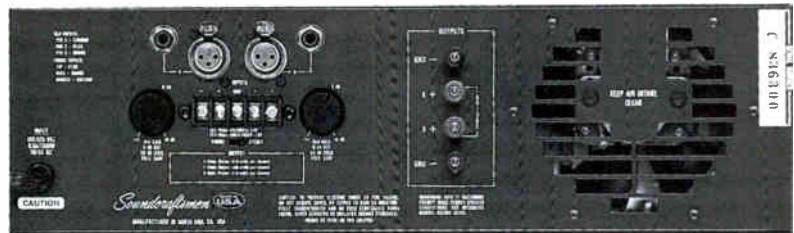
The 300X4 has two completely independent power supplies and power transformers. It is completely protected against short circuits, open circuits and input overloads. Thermal protection is provided by Multi-Sensor Phase Control Regulation as well as two multi-speed cooling fans, and Automatic Resetting Thermal Sensors.

The front panel features extremely accurate clipping indicators for each of the four channels, as well as six Mode indicators for two, three or four channel operations.

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PROFESSIONAL PRODUCTS by *Soundcraftsmen* MADE IN U.S.A.

(continued from page 18)

PROGRAMMABLE SIGNAL PROCESSORS

Programmable signal processors took on various shapes and types, including 1/3 octave and parametric equalizers. A number of devices were stand alone, others were MIDI controlled and/or PC based. A few systems offered the capability of equalizing during the actual performance, using the music and speech program as the test signal.

TOA introduced a digital signal processor (SAORI) that should intrigue sound contractors. It's sort of an all-in-one programmable signal conditioner with wide and narrow-band EQ, limiting, 4-way electronic crossover, and other useful stuff such as sweep and noise generators for sound system testing. Additional plug-in modules will be made available. Although a little expensive, this type of device will certainly become a popular product category in the future.

TOA has been experimenting with an adaptive signal processing speaker system which analyzes the program signal from the console and compares this signal to the speaker's output that is picked up by a microphone, determines the system's transfer function (frequency and phase response) and then applies correction. While the SAORI product does not attempt to be self-adjusting (at least not yet!), a device that had offered this capability was the dbx analyzer, but this product slipped through the cracks when dbx was cut up and sold in pieces. Most of the dbx pro-audio products have reappeared in the dbx division of AKG. Meyer Sound pioneered the application of using program material as a test signal through the use of their parametric equalizer and high resolution dual channel spectrum analyzer. John Meyer recently gave a paper on this technique at the Acoustical Society of America convention in St. Louis. A similar technique is Apogee's Correq EQ which was first detailed in the June issue of *Sound & Communications* in the report on the Grammy Awards. Apogee announced that the Correq EQ System now

interfaces directly to the Apogee speaker signal processors. Both the Meyer and the Apogee equalization systems require a specially trained operator. Incidentally, Orban, now an AKG division, displayed a programmable parametric equalizer which is an integral element in a high resolution self-correcting real time equalization system.

Yamaha introduced a programmable signal processor that may bring digital into the mainstream for sound contractors. The new DDL 3, which appears to be a three tap delay line, but actually is also a programmable signal processor system including a choice of a three way electronic crossover with time compensation for each driver or a three band parametric equalizer. What made this product unique was that the price was substantially less than separate (analog or digital) components.

Other examples of this technology that emerged at the show:

product line new programmable equalizers were unveiled.

- BSS showed its high performance electronic crossovers, limiter/compressors and MIDI-controlled signal processors.

- Roland showed a number of digital signal processors that might be of interest to sound contractors, including digitally controlled equalizers and reverbs.

DIGITAL AND FIBER-OPTIC SNAKES

A workshop on fiber optics, including a tutorial on the process and a demonstration of multitrack recording, was well attended. Of more interest to sound contractors is the application of fiber optics for use as a mic snake. Although these high-tech snake alternatives have been discussed or shown previously, a number of what appeared to be real products were introduced at the convention. Potentially, these products will offer freedom from



TOA's prototype SAORI integrated sound processor.

- Alesis showed its line of mid-priced electronic reverbs, equalizers, and MIDI-controlled signal processors. A new dual-channel 1/3 octave room EQ system was introduced.

- DOD displayed its cost-effective delays, reverbs, EQ's, limiters, and compressors. A new real-time 1/3 octave analyzer was introduced. In the DigiTech

ground loops, EMI and RF interference from lighting and video systems, improved audio quality and ease of set-up and installation.

Klotz of West Germany was represented by Electronic Systems Laboratory (ESL). Up to 64 channels could be sent up to 6000 feet at 44.1 kHz or the more popular 48K rate. The Klotz system consisted of a rack

mount sender unit, receiver(s) and an IBM AT compatible computer. The options and price list is comprehensive, but the ballpark price for a 40 channel system to the end user is over \$20,000.

Lester displayed its Digital Snake/Soft-patch System, a 16 channel send/receive package that operates at the 48 kHz bit rate for distances up to 3000 feet.

With the advent of fiber optics reaching into high end sound reinforcement installations, what will happen to the high performance cable companies? Monster Cable's answer is its Opto Digital Designs division, which is offering its Lightspeed 12. This is a 12 channel (multiples may be used) send/receive system intended for stage, studio and broadcast. Line and mic levels may be sent and the 48K bit rate is used.

Wadia Digital provided the demonstra-

(continued on page 45)



Soundcraft's Delta 200 console features individual group modules and a separate master section.

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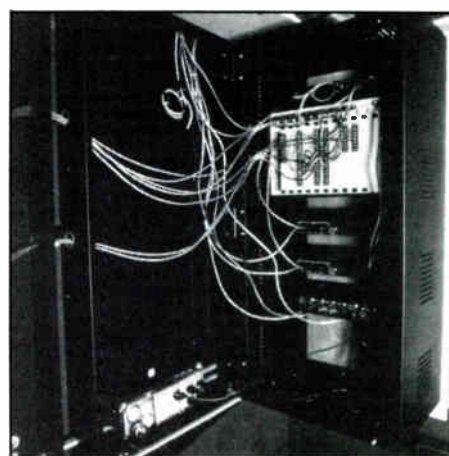
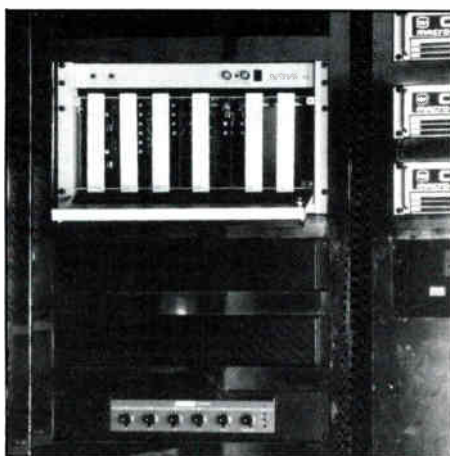
SEPARATE PROCESSING PATHS HANDLE DISC AND LIVE MUSIC AT A TALLAHASSEE DANCE CLUB

When a Tallahassee restaurant was expanded to handle dancing, its owners asked us to design and install a dual soundsystem: one that carries either a disc jockey's input of music and speech or the input of a live band. We have set up separate signal paths for each. The paths converge just past the distribution amplifiers, which route the signals from either source to a single set of speakers.

The restaurant/dance club is called Mugwumps. On most nights, its DJ plays contemporary, top-40 dance music through the house mixer (a Biamp DJ-5001), whose input comes from turntables, compact discs and tape decks with a mic for announcements, and a tape deck that plays background music when there is neither a DJ nor a performer in the house. The performers play through their own mixers, which they plug into our circuitry. The owner feels that both the disc and live sound have been excellent.

A system set up for recorded music only is likely to sound unnatural in live-music reinforcement. Mugwump's is set up for both, to meet the differing requirements of headroom power-bandwidth and coverage. In both paths, the signals flow from mixer to equalizer (live music only) to stereo compressor/limiter to distribution amplifier. Our distribution amps are Industrial Research Products, Inc. (IRP) System 41 modules, which all slide into a 10½-inch-high mainframe cabinet.

In the disc-music path, the left-channel signals move into a DJ-4118 distribution amplifier, which feeds four sets of speakers; and the right channel signals move into a DJ-4118 distribution amplifier, which feeds four sets of speakers; and the right channel signals move through a second DJ-4118. In the band-music path, the



The IRP System 41 mainframe cabinet (left) has screw terminals in the rear (right).

CHOOSING LOUDSPEAKERS FOR LIVE AND RECORDED MUSIC APPLICATIONS

Finding a speaker well suited to live music and playback applications can be a challenge: especially when high performance is demanded and constraints are placed on size, price and appearance.

For the installation at Mugwumps, we needed a single set of speakers suitable for very high level dance music playback, high-level live music reinforcement, and intelligible speech reinforcement. The speakers could not exceed 28" in height, and needed a very controlled coverage pattern: broad (horizontally) in the front hemisphere, with uniform attenuation in the rear.

We have previously installed Community CD-70's in Panama City's Spinnaker dance club for the same owners, and were very impressed with their abilities in that context. They had the "right sound" for dance music without need for equalization, and their sensitivity is 105 dB, one watt/one meter.

However, since they were to be placed very near the performers on stage, we undertook to measure their polar performance in order to safeguard against any possible surprises in the way of feedback trouble.

All of our measurements were made with our Techron TEF System 10 analyzer. First, we made a "Polar 3-D" measurement. This consists of a series of TDS frequency response measurements made while rotating the speaker on a turntable. We then converted these to Polar FTC's to get a better view of uniformity of rear attenuation. Finally, we translated the data into the traditional polar display using Techron's "Polar" software. We also made some basic measurements of harmonic distortion, frequency response, phase response, and blue response, just to make sure there were no surprises.

—D.T.M

left and right-channel signals share a single DJ-4101 distribution amp, which has six outputs (three left channel and three right-channel) to each of three sets of speakers. The distribution amplifiers' settings fit the requirements of live vs. disc. The feed to the bass amplifier, for example, is lower on the live-music path than it is on the disc path, to help give the performers a more natural sound.

The floor plan shows where the speakers are deployed. Disc-music comes from the main speakers (at the 16-foot ceiling, above the edge of the stage); the sub-woofers (built into the stage directly beneath the main speakers); the side-fill stage speakers (bringing disc-music to customers who dance on the stage, and acting as monitors for the live performers); and the speakers at the rear of the dance floor. They surround the dancers with sound. The band- music signal path avoids the rear speakers, which fire at the stage and would cause feedback.

On the disc-music path, the "main" signals from the two DJ-4118 distribution amplifier modules move into IRP DJ-410 crossovers (also part of System 41), which bypass the signal at 120Hz. Crown MA-1200 power amplifiers feed our main and rear speakers, Community CS-70 three-way units. Each contains four 12-foot mid-woofer drivers, two 2-inch-throat midrange compression drivers and three piezo-electric tweeters on a focussed-array horn.

In each of the two sub-woofers (carrying the sub-120 Hz sound), two JBL 220H 18-inch low-frequency drivers in Community boxer bass horns are fed by a Crown MA-2400 power amplifier. Through another power amplifier, the signals to the side-fill monitors at each side of the stage.

The dancers get a fully encircling sound from the sub-main-rear-side speaker combination, which carries the output of the disc path. The rear and side speakers carry the full range because we don't want the bass to come only from the sub-woofers. When live performers are on stage, we compromise on the encircling: the IRP DJ-4104 distributes the live music to all but the rear speakers. Series wiring is used to sum the outputs of the live



Mugwumps restaurant/dance club, Tallahassee, Florida.

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music distribution amp with the corresponding outputs from the disc music distribution amps, without need for additional circuitry or switches.

The System 41 mainframe cabinet has an aluminum door with a key lock that keeps out unauthorized hands (greatly increasing the system long-term stability). We also like the screw-terminal connections (more reliable than a plug system) on the back of the modules. The cabinet has 13 slots, of which we're using only six, so far: three distribution amplifiers; two crossovers; and, on the band-music path, a DJ-4119 limiter module, which contains two independent compressor-limiters, one each for the left and right channels. We ex-

pect to add more System 41 modules as this entertainment center expands its sound system.

MUGWUMPS EQUIPMENT LIST

IRP DJ-4100 Locking Module Mainframe
1 IRP DJ-4104 Modular 2 x 6 Dis. Amp.
2 IRP DJ-4118 Modular 1 x 4 Dis. Amp.
1 IRP DJ-4119 Stereo Compressor/Limiter
2 IRP DJ-4108 Modular Two-Way Crossover
1 BGW 250 Power Amplifier
2 Crown MA-1200 Power Amplifier
1 Crown MA-2400 Power Amplifier
1 Rapco PRO 24 in, 4-out 100' Snake w/Split
1 Rapco 6-Ch. Snake 100'

2 Technics SL-1200Mk-II Turntable
2 Stanton 680EL Disco Cartridge
1 Numark DM-1900 Disco Mixer
1 Biamp DJ-5001 Disco Mixer
1 Shure M-268 4-Ch. Mic Mixer
1 Shure M-268R Rack Mount Kit
2 E-V PL50-N/D Microphone w/Switch
1 Crown PIP-XOV Low Pass Filter
2 EAW FR-122 Side Fill Monitors
4 Community CS-70 Three-Way Speaker
2 JBL 22040H 18 in. Woofers
8 Omnimount 300WA-BC Speaker Mount
800 Ft. West Penn #227 12 Ga. Spk. Wire
2 Soundolier 320-42 Wall Mount Cabinet

—David Menasco
Stereo Sales, Inc.



The dance floor at Mugwumps. The ceiling-suspended main speaker cabinets flank the stage; behind them are the side speakers. The rear speaker cabinets are at left, foreground and background.

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puts in a full
week of school,
and still finds
time to sing
in the choir
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THE SOUND SYSTEM AS A PUZZLE

The main problems in high output club sound systems usually come down to space, acoustical properties, and budget. Keeping these factors in mind, designing a sound system becomes more like a puzzle. We, at Maxtech, have been doing sound for 17 years and understand the sound needs of the club owner and the puzzle of his room.

To detail the problems in club sound you first have to understand all the demands put on the system, itself. You need extremely high-output capabilities, intense sub-bass, smooth mids and lots of sizzle. The next demand on the system is cosmetically placing it on today's high-tech-

looking dance floors. In the past, achieving this sound meant large-horn-loaded projection-type cabinets whose sound would fill the dance floor plus the entire

“Sharkey’s is a 7500 square foot, one room complex with three bars.”

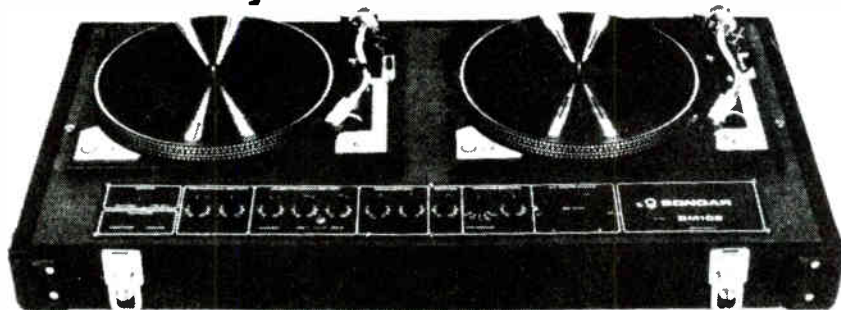
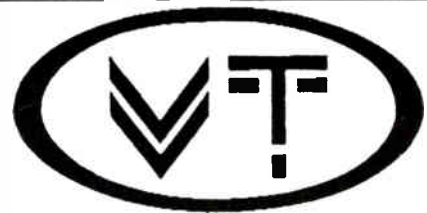
bar area. In today's clubs the bars want their patrons to socialize, so the sound contractor has to control the environment, radically, from place to place. We then

must remember that we have to accomplish this feat within the budget of the clubowner.

Given all the pieces of the puzzle, this is how Maxtech puts it all together. Today's latest project is Sharky's, located in Williamsville, N.Y. Sharky's is a 7500 square foot, one room complex with three bars. Ceiling height in bars is 12 feet with an 18-foot ceiling over the 25- x 16-foot dance floor. For the main dance system we are using two EAW SB-528 dual 18 sub-systems built into the center of the floor on the outside wall. The reasoning for this is:

1) We couple the drivers for higher
(continued on page 58)

ANNOUNCING: Sondar DM102 Disco Console Manufactured By



SPECIFICATIONS

- Inputs:**
- 1: Turntables
 - 2: Auxilliary radio or tape cassette
 - 3: Microphone
- Outputs:**
- 1: Output to power amplifier
 - 2: Headphone output

- Controls:**
- 1: Volume controls for all inputs
 - 2: Overall bass and treble controls
 - 3: Voice compensation control for mic.
 - 4: Mute switch with silent action
 - 5: Master volume control
 - 6: Turntable power switches

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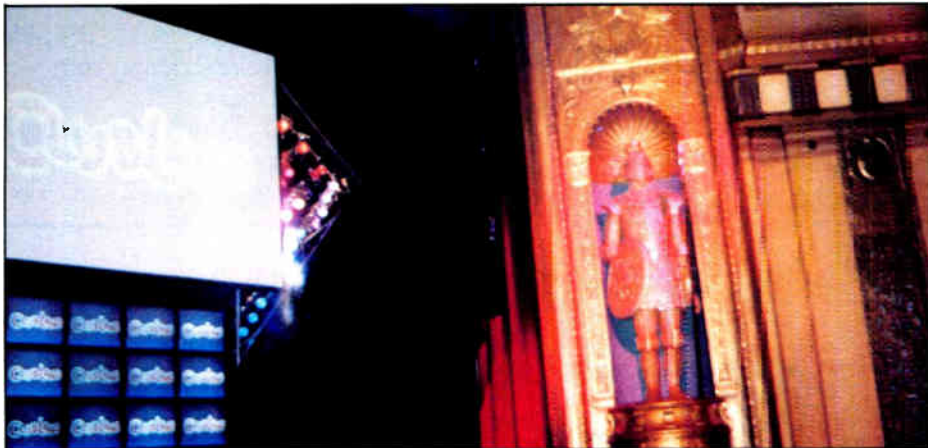
One of the main escalators at the Minneapolis Convention Center; Saunders Miller (Minnesota Committee for Growth) gives a seminar on HDTV (Inset).

MINNEAPOLIS HOSTS THIRD ANNUAL EXPO

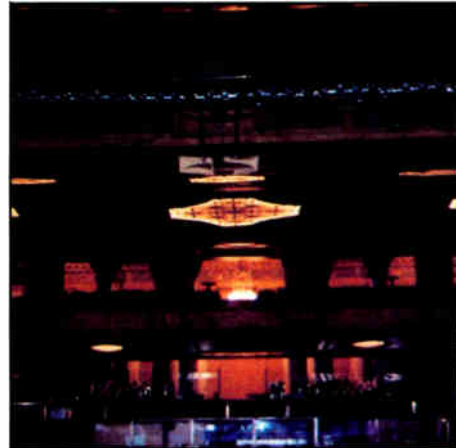
A VC Systems and Video Midwest, the audio and video equipment sales divisions of Vaughn Communications (Minneapolis, MN), recently showcased their new installation at the new Minneapolis Convention Center, as sponsors for Audio Video Trends '89, the Third Annual Expo for Audio & Video Professionals, which took place on October 27th and 28th.

Formerly known as "Sound Stage," Audio Video Trends '89 was host to some 60 professional audio and video equipment manufacturers, associations, and educational institutions who displayed their equipment and services at the show. More than 350 buyers from major corporations, local recording studios and production houses attended the show. According to Michelle Sahlin, marketing supervisor of Vaughn Communications, the show has changed its target audience in its three years from lower-medium to medium-high performance users, with the addition of more pro audio and video vendors.

Many of the twenty seminars at Audio Video Trends '89 were well attended. Rupert Neve held a seminar on the audio industry from a historical perspective that was enlivened by anecdotes of his career. Dan Marchetto of Shure Teleconferencing spoke on multi-microphone systems for teleconferencing which drew attendees from corporate communications users. The High Definition Television seminar given by Saunders Miller of the Minnesota Committee for Growth dealt with the state of HDTV and its political ramifications. —Steve Jacobs



The MT-4 system is suspended from each side of the stage area.



A look at Clubland from the stage.

STATE THEATRE IN DETROIT BECOMES CLUBLAND

"The best party in the free world" is the philosophy behind ClubLand, a chain of nightclubs specializing in transforming old urban theaters into dance and entertainment venues.

The latest endeavor of the company is the Detroit ClubLand, which began life in 1925 as the State Theatre with vaudeville acts and silent film showings.

ClubLand, with clubs also existing in Chicago and Houston, fashions its distinct atmosphere with a philosophy of providing a high level of audio, according to the company, and dealing effectively with the sometimes difficult

acoustics of the older buildings with vast spaces that lead to problems for the sound staff.

dB Sound in Des Plaines, Illinois did the installation for the Detroit ClubLand, a 3,000 capacity theater featuring a balcony and rotunda-like ceiling.

Harry Witts, president of dB Sound, supervised the installation. For speakers, Witts chose Electro-Voice "Manifold Technology" and DeltaMax systems. "You don't ever want to be in a situation where the band says the system isn't good enough and wants to bring in their own equipment. Bands like this system," says Witts. That consideration directed much of the thought behind the installation, since the club

is used for recorded and live sound and had to be optimized for both uses, while discouraging any finessing or restructuring by any band playing there.

In the ClubLand facility, the stage area, which is 60 feet by 20 feet, performs double duty as the main dance floor when bands aren't performing. Easy, quick conversion from a concert facility to a dance facility was deemed essential. Even if a band is playing, when the music is over, the stage needs to be quickly cleared for dancing until closing time. The sound system, therefore, had to be mobile, with the speakers changing direction from the concert audience to the dance



The video control board at ClubLand.



ClubLand uses the E-V MT-4 (upper left), DMT 2181 (center) and the DML-1152 for the audio for dancing.



floor-stage.

Two sets of Electro-Voice MT-4s were suspended on each side of the stage, about eight feet from the floor. dB rigged each MT-4 set so that it can be pivoted in the desired direction within a few minutes. The pulley and rope arrangement is simple enough for any club staff person to operate; and it works, according to the club.

Cables attached to a series of motors allow several blocks of video screens to act as a backdrop for dancing. "The entire stage area has been set up so that a concert situation can be converted to a dance club in a matter of minutes," says Witts. The video system has three large screens with three additional blocks of direct view monitors — twelve screens per block.

The entire audio system is controlled

by a Ramsa 8112 mixer. Visiting bands interface their own mixer with the Ramsa, allowing ClubLand to control the output of the system.

The Electro-Voice MT system, which includes two MT-high/mid (MTH) and two MT-low (MTL) cabinets on each

Equalization for the DML systems is provided by a Klark-Teknik DN-360 unit, with processing coming from two DMC-2181s in stereo.

It took two dB Sound staffers only one day to install the total package. Lighting, which was installed separate-

“The club is used for recorded and live sound and has to be optimized for both.”

side of the stage, is powered by three Crown Macro-Tech 2400 amplifiers and two Crown Macro-Tech 1200 amplifiers. Two of the Macro-Tech 2400's are used to power each MTL cabinet, with the remaining Macro-Tech 2400 powering the midrange transducers for both of the MTH units. The two Macro-Tech 1200's power the high frequency units.

Because of the sound pressure levels developed during the dance configuration, the top MTH units are turned off to prevent them from blasting sound in the relatively small dance floor area. However, the top MTH units help provide full coverage for the balcony area during concerts.

A Klark-Teknik DN-300 provides onboard EQ. Crossover is done by an Electro-Voice MTX-4, which is modified with a 9.5 dB gain. From there, mixing is via a Klark-Teknik DN-504 four-channel mixer.

The sound of the MT-4s is enhanced on the stage floor by two DML-2181 speakers which serve as monitors, placed on each side of the floor. Four DML-1152 speakers are located in the rigging above the stage area, aimed directly at the stage. The DeltaMax systems are used only for dance music, completely surrounding and flooding the stage area with sound.

ly, was installed by Pete's Lights of Elk Grove Village, Illinois.

Terry Shaughnessy, technical director from the entire ClubLand operation, plans to have any technical problems with the system handled by ClubLand technicians, but "So far, we haven't had one ounce of trouble. ...We haven't even adjusted our EQ since opening night."

Shaughnessy, along with Al Kilpatrick of KVPS in Los Angeles, installed the video equipment before the audio was in place. It took several days to install, and includes a JVC 2500 SEG, two Alta Cygnus TBC units, and a Knox K-100 Chromafont, for some creative video shows at the club.

HAMES SOUND INSTALLATION AT HUGUENOT CHURCH

Hames Sound, Inc. (Gaffney, SC) completed a sound system installation for the historic French Protestant Huguenot Church in Charleston, SC; a church that has seen more than three centuries of South Carolina history.

The present incarnation of the church, which opened in 1845, and survived Hurricane Hugo with little damage, had the unique problem of needing an effective sound system

(continued on page 58)

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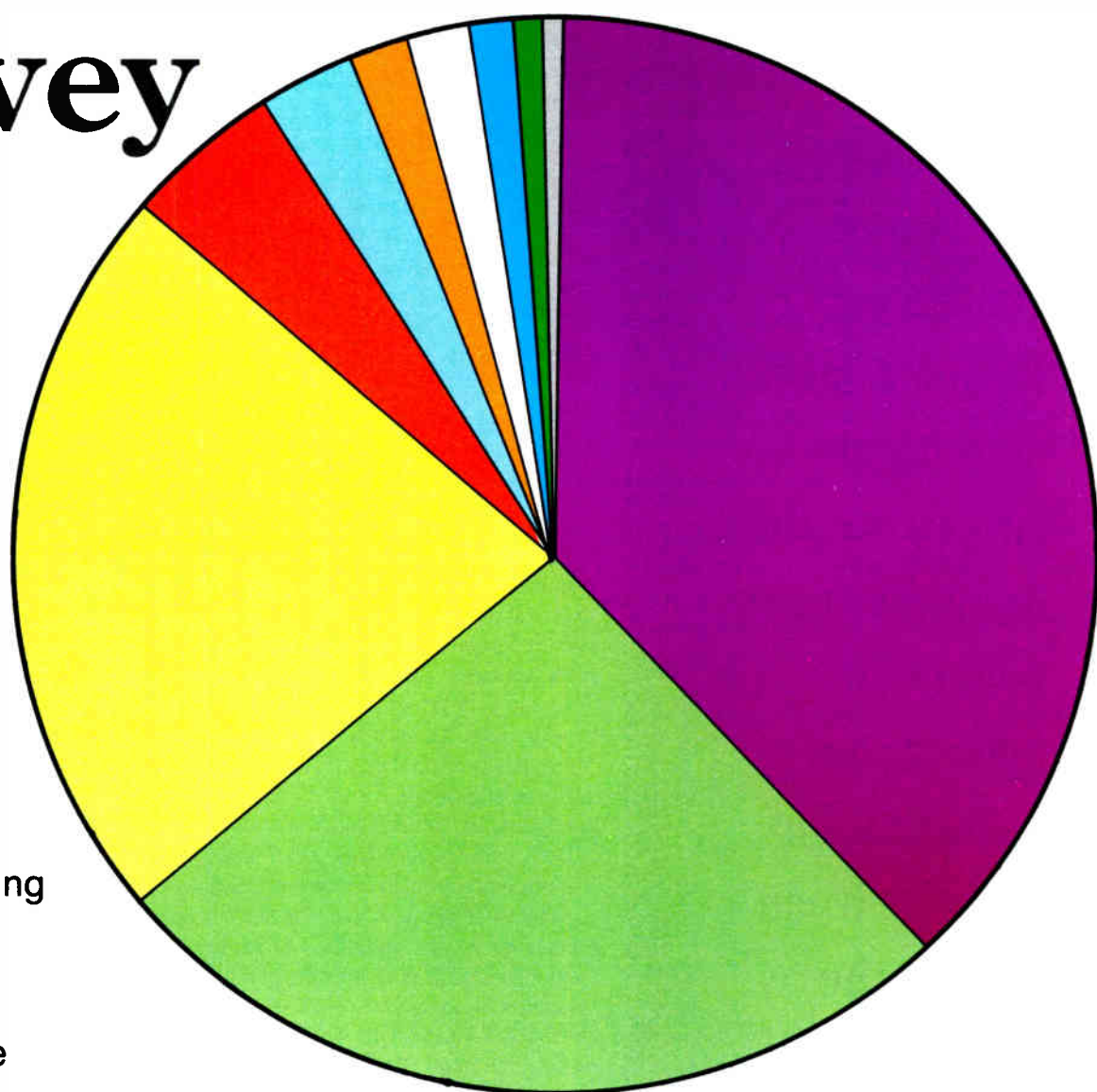
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SOUND & COMMUNICATIONS

1989 Economic Survey

- Total Audio
- A-V
- Background/
Foreground
- Cabinets
- Headphones
- Intercom
- Security
- Sound Masking
- Testing
- Wire & Cable



ECONOMIC SURVEY

What do manufacturers think of you, the sound contractor? In our annual statistical survey we find manufacturers generally upbeat, but secretive, in their attitude toward the industry.

What can the sound and communications industry expect of manufacturers in the coming year? How did they fare in the last year? What is the state of the market from the view of these manufacturers? *Sound & Communications* magazine presents its annual Christmas present to the industry — The Economic Report.

How did we do it? A questionnaire was sent in October to a random sampling of manufacturers known to be active in the sound and communications industry. Answers were anonymous and were sent back to an independent market research firm, Survey Analysis in Palm Beach Gardens Florida. We at *Sound & Communications* have no idea who responded specifically. We do know the responses give a good grounding in the knowledge of manufacturers' expectations and where they will drive the market in the coming year. It's up to our readers to decide if the manufacturers are on the right track. There was a five percent response — proving what we always knew: Manufacturers like to keep things close to the vest and don't in general want to let the industry know what their plans or status are.

We'll editorialize a little here, and say that our offices — and from what we know, the offices of all other business publishing companies — get a plethora of inquiries from manufacturers requesting market information, wishing to make projections for the future — and having little hard data to go by. The need is there, the desire for

the needy to do their part in fulfilling that need isn't always there.

The users of the products those manufacturers make — the contractors, consultants, specifiers — can use the insight manufacturers have. So we offer some here.

What do manufacturers think of you? Of the market? Of specifiers? Of their own products' future and of individual market segments? Read on.

There's an anomaly at play here. The headlines of the business pages of the newspaper lately feature gloom and doom, and we won't question their accuracy. ('The Peek-a-Boo Recession' — *Newsweek*; 'Date Are Signaling Bad Slump' — *The New York Times*). The Hope Report predicts a downturn in the A-V industry, and says that that market (a narrower one than the sound and communications market) is often the first indication of economic trends since it reflects corporate spending trends. And our respondents themselves were far from Pollyannish on expectations for the future.

However, a very positive aspect was presented for this industry. Perhaps one can look at its diversity as providing a measure of flexibility and consistency in maintaining sales and profits, at the relative smallness of the companies that can allow them to turn on a dime and follow — or lead — the direction of a market.

First of all: How are manufacturers doing business? To whom are they selling? Watch out, contractors: For the fourth year

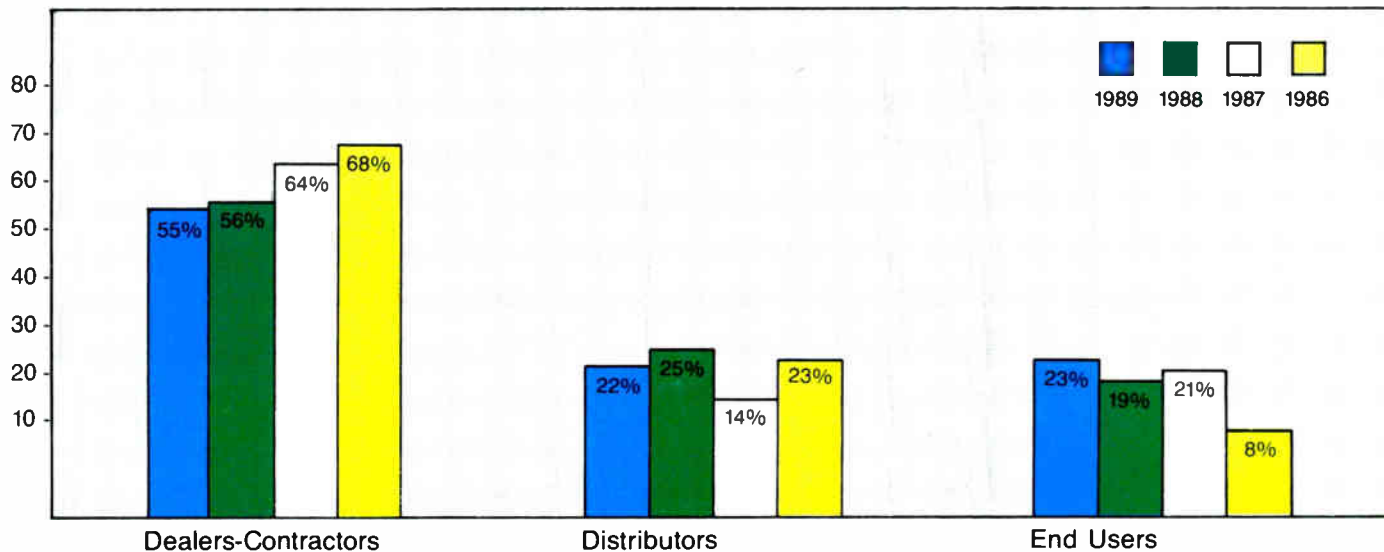


Figure 1.
Distribution
of Sales

in a row, sales through dealers-contractors have declined from a high of 68 percent in 1986 to a low of 55 percent in 1989. The decline between 1988 and 1989 was less precipitous than that between 1987 to 1988 (1 percent versus 8 percent), but it's there nevertheless. And where is the slack being filled? After a decided increase in sales through distributors between 1987 to 1988 (14 percent to 25 percent), sales through distributors declined to 22 percent, almost exactly where it was in 1986. But the sales directly to end users were up to 23 percent in 1989 — a decided increase from 1986's 8 percent. (See Figure 1.)

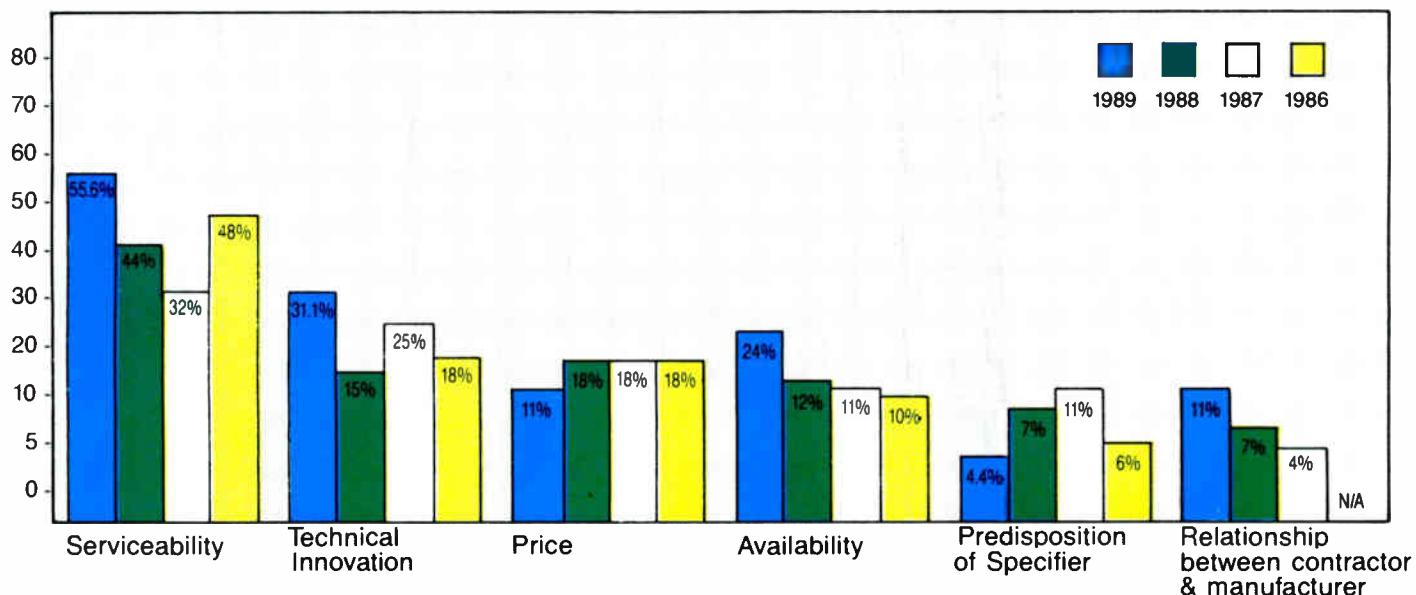
Why is this happening? A look at the perception of manufacturers as to what qualities sell their product may give a clue. Respondents were asked to rate the im-

portance, as they see them, of various criteria in the choices their customers make. (See Figure 2A.) "Relationship between contractor and manufacturer" came in with a paltry 11 percent of respondents considering this criterion most important. Admittedly, the rating was up from 1988 (7 percent), but it lagged far behind other criteria. But don't fret: Consider the position of the specifier in the manufacturer's eyes. Only 4.4 percent of the respondents considered the predisposition of the specifier of prime importance (down from seven percent last year). And a full 16 percent considered the predisposition of the specifier of *least* importance. (See Figure 2B.)

What is the most important factor contributing to a purchase, in the manufac-



Figure 2(A).
Perceived
Customer
Criteria
(Most important)



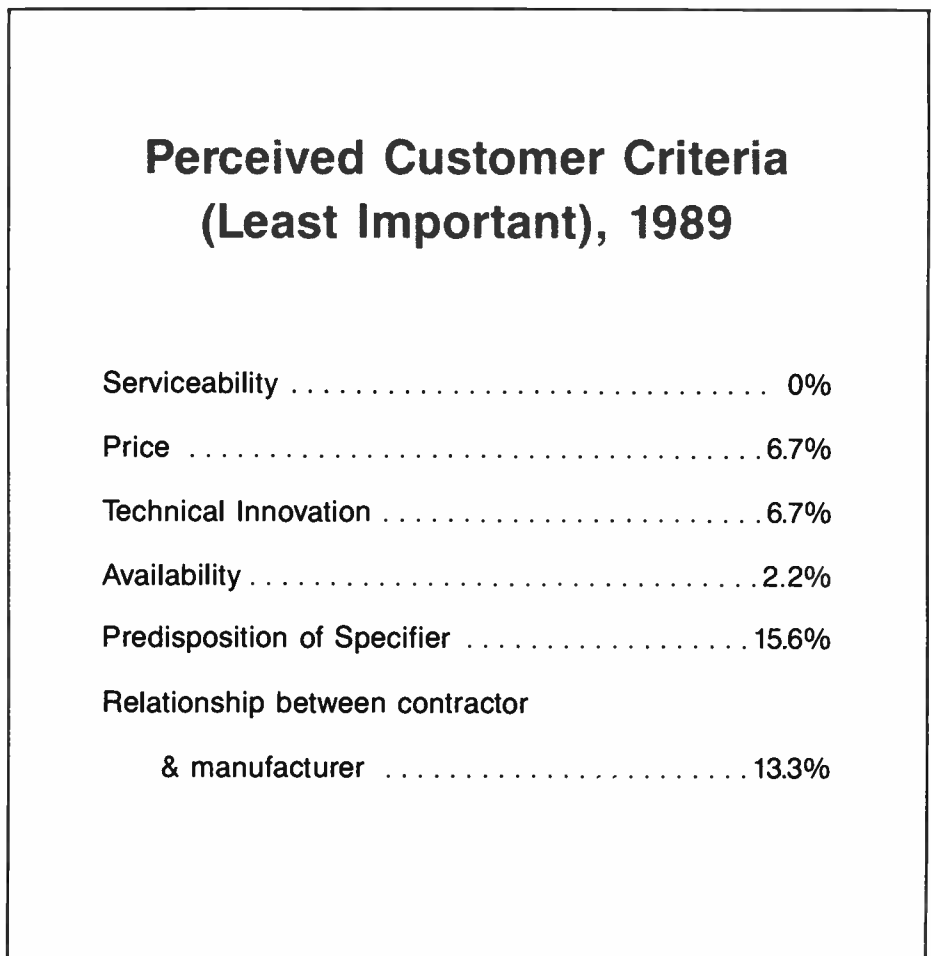
turer's eyes? Serviceability and reliability of the product, without a doubt. Fifty-six percent of the respondents considered this factor the most important, up from 41 percent last year. Technical innovation came in a strong second, with 31 percent of the respondents considering that the most important criterion (up from 15 percent in 1988). Availability went from 12 percent in 1988 to 24 percent in 1989. And price lost ground from 18 percent (1988) to 11 percent in 1989. What does that mean? Presumably we can expect more technically innovative products in the coming year, with more attention to service and reliability, and better availability. But don't look for price cuts, since that seems to be perceived as a less important criterion in a purchase than it was last year. And

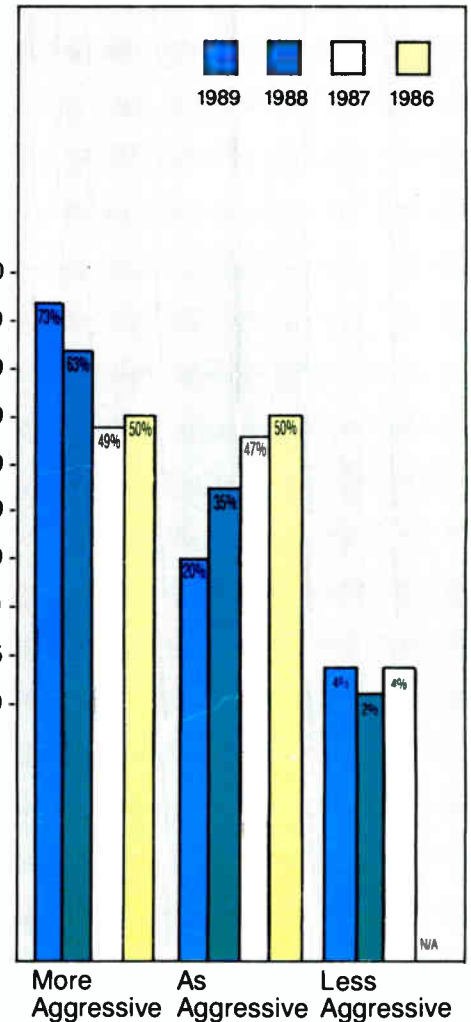
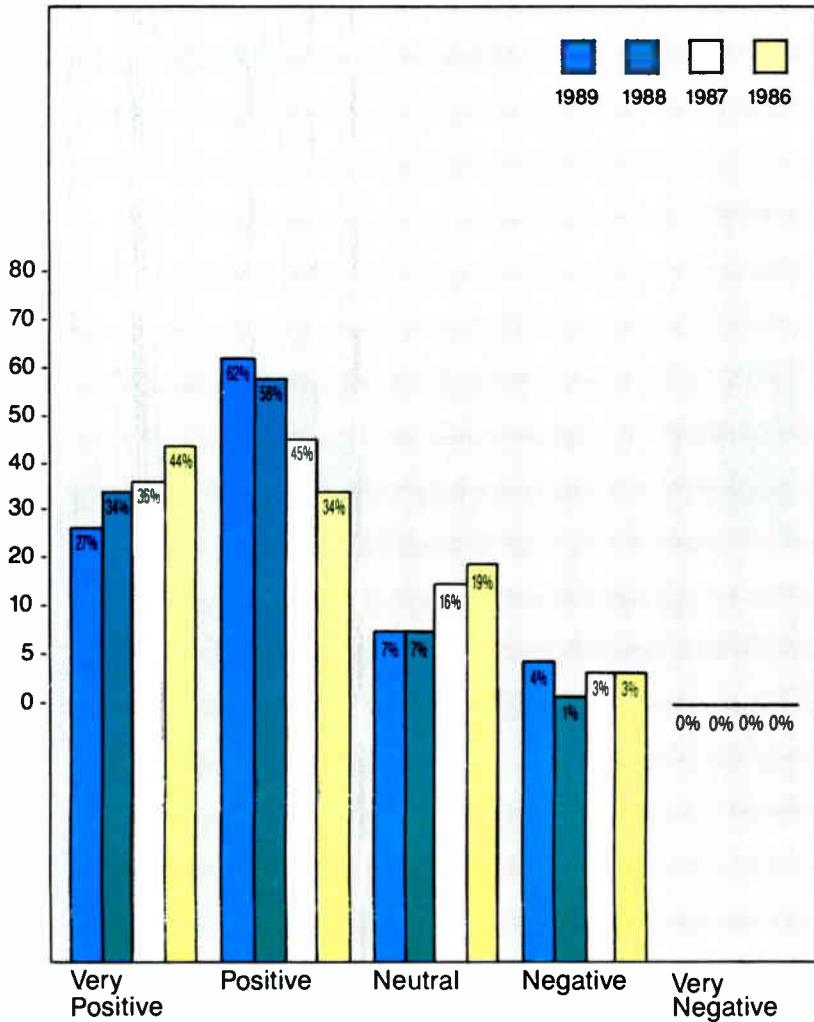
perhaps you can expect more coddling from the manufacturer — at least from the 11 percent who thought the contractor was most important.

What's least important to you, according to the manufacturer? No one — zero percent — thought that serviceability and reliability were of least importance. But nearly seven percent thought that both price and technological innovation were of least importance. And two percent thought that availability was of little importance. But a full 13 percent thought that the relationship between the contractor and manufacturer was of least importance.

What are manufacturer marketing and product plans for 1990? Twenty-seven percent are very positive towards future sales in the coming year — a downturn from the

Figure 2(B).
Perceived
Customer
Criteria
(Least important), 1989





34 percent who were similarly disposed last year. As a matter of fact, the “very positive” classification has consistently declined from 1986. But conversely, more people have rated their attitudes positive each year between 1986 (36 percent) and 1989 (62 percent). In other words it all balances out, with 89 percent of the manufacturers feeling positive towards future sales. However, there has been an increase in negative feelings — four percent, up from one percent last year. But the good news is no one felt “very negative.” Or perhaps the very negative people were too negative to fill out the survey. (See Figure 3.)

These positive-feeling manufacturers in the main intend to make a lot more noise next year. (See Figure 4.) Nearly three

quarters of them intend to be more aggressive next year (only 50 percent did in 1986). Twenty percent intend to be just as aggressive (50 percent did in 1986). And — somewhat of a surprise to us — four percent intend to be *less* aggressive.

Not that anyone is intending to discontinue lines. Zero percent said they would delete a product line this year (versus three percent for each of the previous three years). Actually, most of the responses in the “Priorities for the Coming Year” question (see Figure 6A) were relatively stable year-to-year, with a consistent trend toward a decreased emphasis on product updates and an increased emphasis on new product lines. Zero percent intended to introduce *fewer* new products.

Where will those products be: roughly

Figure 3. Attitude Towards Future Sales

Figure 4. Selling Posture in Coming Year

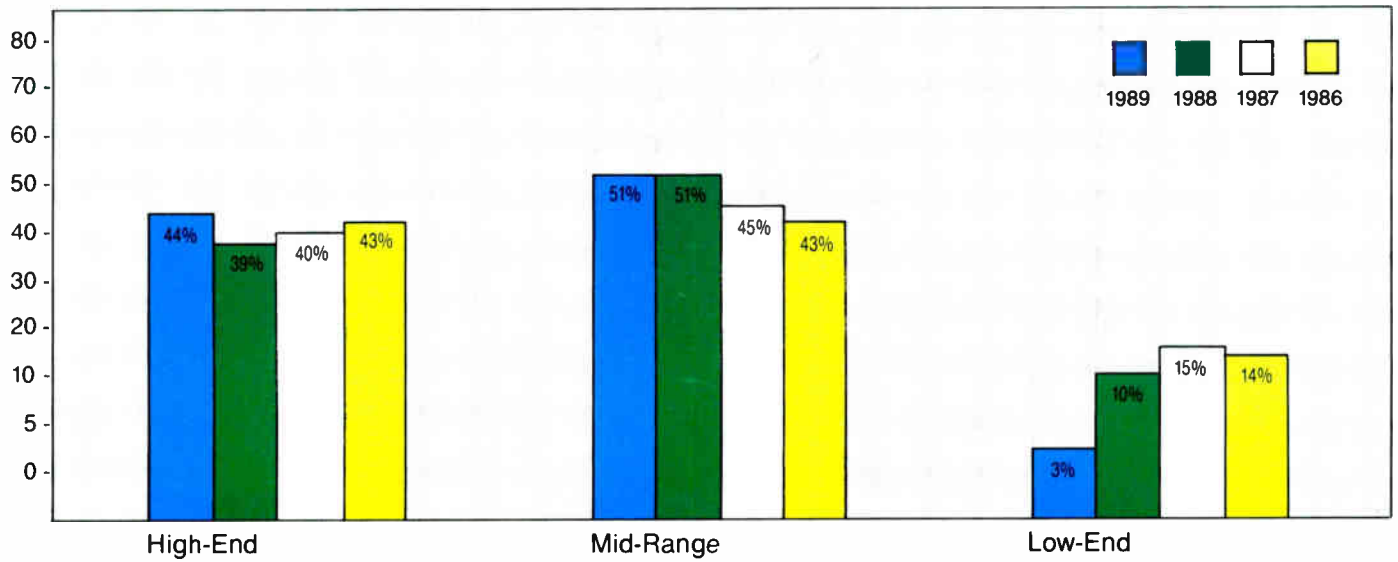


Figure 5.
Product Line Emphasis

akin to last year's choices. Forty-four percent of respondents intend to emphasize the high end, a steady 51 percent will emphasize the middle range. But only three percent intend to concentrate on the low end. Two percent of the respondents refused to answer that question. (See Figure 5.)

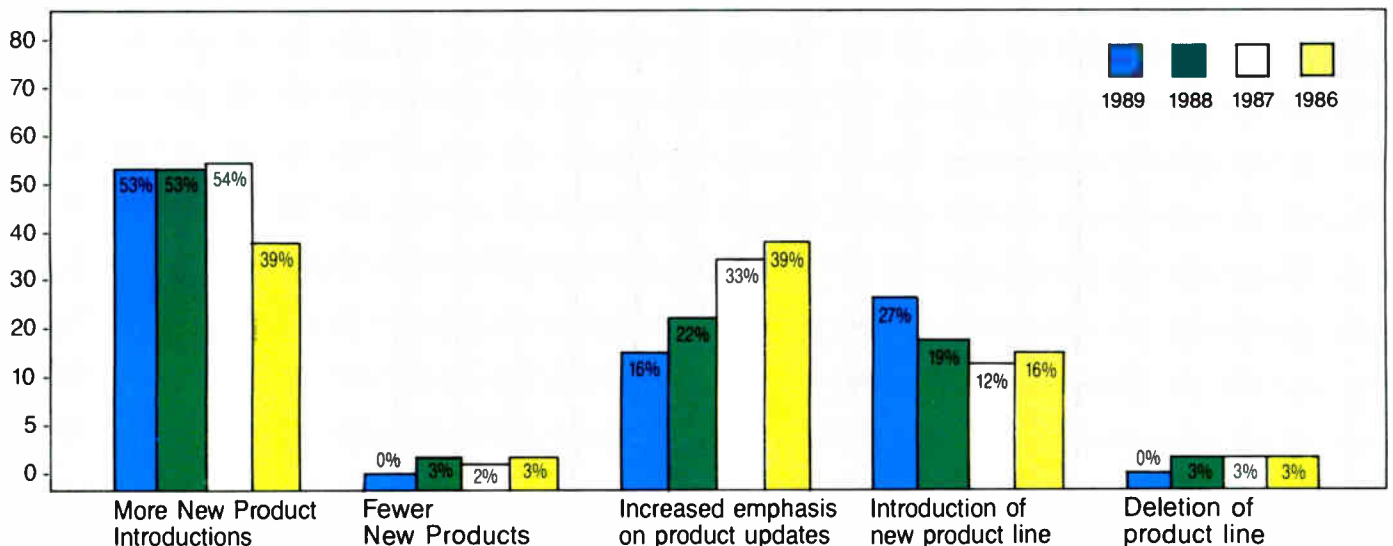
While those figures may indicate a philosophy of going for the big bucks, respondents expected *unit* sales to be up this year. As a matter of fact over 93 percent expected to show increased unit sales for 1989, with only four percent expecting a decrease. This question was not broken out as to product categories; but it gives some indication as to the positive expect-

tations of these people.

In what segments of the market will new products be found? Our question on that subject was not quantified, and was a fill-in question. Answers were therefore dependent on the specific orientation of the respondent; but they give an indication of where manufacturers are seeing growth opportunities. Answers ranged from an intriguing "new patented items" to all-encompassing subjects such as "fire protection" and "audio/video conference rooms." Interestingly, no respondents filled in specifically audio-oriented subjects, although that by far is the segment in which most respondents expect to see an expansion.

As a matter of fact, the market

Figure 6(A).
Priorities in the Coming Year (Most important)



Priorities in the Coming Year (Least Important)

Fewer New Product Introductions	33.3%
Introduction of another product line	15.6%
Deletion of product line	53.3%
Increased emphasis on product updates	6.7%
More new product introductions	4.4%

segments in which respondents expect to see the biggest increase in sales for 1990 are in audio classifications, with acoustical treatments bringing in a whopping 53 percent expectation of growth. The good news is that projections were for everything going up. The only market segment that was seen in a downturn for dollar sales expectations were industrial/school intercoms. However, all other intercoms were up an average of 18 percent, bringing a final projected sales increase of 8.6 percent for all intercoms. Projections for wire and cable were up a healthy 12 percent.

Wire and cable, as a matter of fact, represents nine percent of the sound and communications market, according to our

survey. Audio is by far the largest segment — 36 percent of the market. Security is 29 percent; and all intercoms represent 23 percent.

What does this all mean? To the sound contractor, it means that manufacturers, while not quite seeing his importance as a prime partisan, do see the sound and communications industry as upbeat for the foreseeable future. Projections for both unit sales and dollar sales are up, plans for increased product lines and technological innovations are up, and a positive attitude infuses the community. It's up to the sound contractors to a large extent to translate that optimism into solid sales and installations, to market their services and the manufacturers' products.

Figure 6(B).
Priorities in the
Coming Year
(Least important)

Figure 7.
Unit Sales
1989

Unit Sales 1989

Increase in unit sales	93.3%
Decrease	4.4%
Same	0%

Figure 8. New Markets and Applications.

Dual-channel Audio	Fine Protection
Video, Security, Audio Switching	Microwave Connector Users
Recording Studio	Audio Analyzers
Mid-range Market	Video Interface
MIDI instrument products	Cable-Medical
Speaker & Enclosure Parts	Broadcast, Film
Security Communications	New Patented Items
Concert Touring Systems & Arena Systems	Audio/Video Conf. Rooms
Home/Consumer	Broadcast, Theater, Post Production
OEM Security Products	Interconnect
	Nurse Call Systems

Figure 9. Biggest Increases Expected.

Acoustical Treatments	+53%
Loudspeakers	+34%
Mics	+23%
Mixes	+26%
Power Amplifiers	+32%
Signal Processing	+20%
Recording Equipment	+42%
All Intercoms	+8.6%
A-V	+39%
Telecommunications	+20%
Headphones	+48%
Wire & Cable	+12%

Figure 8.
New Markets
and Applications

Figure 9.
Biggest
Increases
Expected

Figure 10.
Product
Involvement of
Survey
Participation



We'll see what sound contractors are thinking in our May issue of *Sound & Communications*, when we present our annual Sound Contracting Survey. The success of any industry depends on all segments working in concert.

And the success of the nineties will no doubt depend on a rational market remaining innovative.

Figure 10. Product Involvement of Survey Participation

Total Audio	36%	Testing	7%
Security	29%	Cabinets	7%
Intercom	23%	A-V	5%
Headphones	10%	Background/Foreground	1%
Wire & Cable	9%	Soundmasking	.04%

corded and played back by a magnetic head that is at the end of what serves the same function as a turntable tone arm. Hard disk drives can access data faster and have greater storage capacity than floppy drives.

Hard disk drives were introduced into the personal computer market by IBM when they introduced their XT computer. Early devices had only 5 or 10 megabytes of memory and had poor reliability and high prices. Manufacturers have increased the capacity manyfold and dropped the prices, but have been able to maintain the poor quality control!

Currently, a garden variety 20 meg hard drive and controller card will cost about \$250. Some specifications you will see on drives, besides storage capacity, are speed, recording encoding method, and size format.

All the new sound system design programs require hard drives. For example, the software developers of AcoustaCADD assume you will have at least a 20 meg drive. While a 20 meg drive may seem a little extravagant at first, considering it will hold the same data as almost 60 floppy disks, it won't for long. The AcoustaCADD program, sample jobs, speaker directivity data bases and other related files take up 5 meg, while the remaining space is left for your designs and other programs. If you use AutoCAD, you will use another 5 meg, and after you load a word processing program like Word Perfect 5.0 and a desktop publishing program such as Ventura 2.0 you will have run out of space. Considering that a slow 20 meg drive and controller card costs about \$250, and a fast 65 meg drive with a high performance controller card will set you back only about \$550, moving upscale shouldn't be too painful on your budget.

AcoustaCADD is organized into a series of modules that share a common set of data files. The use of multiple modules, only one of which is loaded and running at a time, allows a large block of RAM memory (that is your 640K of memory) to be used for the large data arrays required by ray tracing and high speed, high resolution graphics. The window's user in-

terface used by CADP II and NexoCAAD also require much of the program to remain on the hard drive rather than loaded into RAM memory for similar reasons.

This type of disk intensive approach in software is okay, but then a very fast hard disk drive becomes critical. There are a few approaches to get fast response from a hard drive without spending a fortune,

and we will explore some of these techniques here. If you do not have an appetite for hard core computer talk, you will want to skip over to the next section!!

One way to speed up hard disk operation is controller cards. All hard drives use controller cards that plug into the computer's buss. Their function is to control and transfer data from the drive into the



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R-431 Graphic Equalizer (top) R-830 Graphic Equalizer (bottom)

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computer. The controller card can have a significant effect on the overall speed that your hard disk can access and transfer data into the computer.

"IBM compatibility is a different problem."

RLL vs. MFM encoding: There are two common data recording techniques for hard disk drives. These encoding techniques are — MFM (Modified Frequency Modulation) and RLL (Run Length Limited). RLL is a newer and higher density encoding scheme which results in 1.5 times more data being stored on the drive and 1.5 times faster data transfer rate from the drive to the computer's buss, than MFM. Special RLL controller cards are required and the drive must be RLL certified (to be able to accurately handle the

higher data density on the disk and the faster data transfer rate in its electronics). Early RLL cards and drives had more than their share of problems, but their reliability is now closer to the MFM approach (which is still less than wonderful). An RLL controller card will typically cost between \$100 and \$200, while the MFM version of the card would be about 20 percent less. Another approach to interface, less often seen in IBM compatibles, is the SCSI (Small Computer System Interface), which is standard on the Macintosh.

Interleave: Interleave is rated by 1:1 or 2:1 or 3:1. This is the number of times the hard disk cylinder must revolve in order for the data to be picked off by the head. Hard disks all revolve at 3600 RPM, and a 3:1 interleave (typical for an XT computer) requires three revolutions of the magnetic disk for a single track of data to

be fully transferred. Some AT buss controller cards allow 1:1 interleave, that is, all data is caught in one pass. Of course, getting all the information in one pass is better than taking three passes! The combination of RLL and 1:1 interleave in a controller card is much faster than an MFM controller with only a 3:1 interleave, by a factor of 4.5 times.

Two examples of controller cards that are RLL and 1:1 are the Adaptec 2372B and Western Digital WD1006. Still another technique is the use of cache memory in the controller card, so data that are often asked for are looked for first in this "buffer" memory. It is much faster to access the data in the buffer memory than to access the data from the magnetic media. The WD1006 has a small cache memory (32K). More serious cache memory controller cards are available at more serious prices, starting at about \$800. Both the Adaptec and WD1006 controller cards are less than \$200, or about twice the price of garden variety controller cards.

Access Time: The hard drive, itself, has a significant effect on the speed that data is located and transferred to the computer. Speed is specified by access time. Low end drives may be as slow as 65 ms, or even 80 ms. Medium range drives are about 40 ms and high performance drives are 28 ms, down to 14 ms.

Splitting the drive: Some drives can be "split" into two "virtual" drives. For example, the Seagate ST-277-1 R, which is 64 meg, can be configured as two (drive C and D) 32 meg drives. As a 64 meg drive, the 277-1 R has an access time of 28 ms, which is fast; but as a split system, it has an access time of 14 ms, which is a screamer. Will you notice a 14 ms (millisecond) difference? Actually, yes, as many seeks are required each time the drive looks for data. The Seagate 277-1 R drive costs less than \$500. The earlier 277 R had only a fair reputation for reliability, but the 277-1, aside from being faster, is also more reliable.

Hard disk drive setup is hard work. Often the instructions for the controller

(continued on page 68)

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Circle 266 on Reader Response Card

(continued from page 23)

tion at the workshop, although their direction is more for studio multitrack applications.

LOUDSPEAKERS

At the other end of the audio chain was a trend toward signal processing loudspeakers. Many manufacturers were showing systems that promised higher performance, increased reliability, and smaller size (and higher prices) than conventional a la carte approaches.

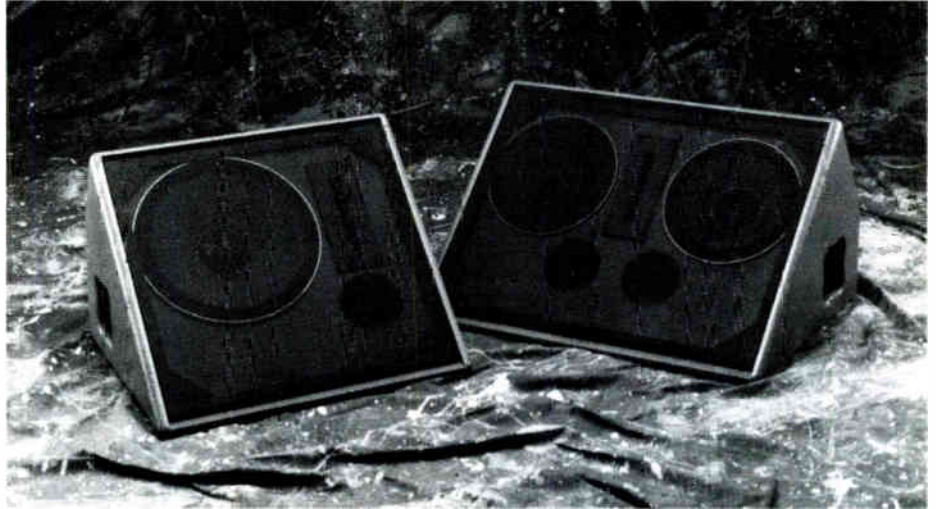
This breed of product could be seen at the exhibits of Apogee Sound, Community, Altec, Meyer, EAW, PAS, E-V, and Adamson.

- Adamson Acoustic Design of Canada showed its signal processing concert speaker system featuring acoustic waveguide horn design.

- The Altec Lansing booth was grouped together with the other Mark IV Audio booths and was featuring the new Alpha 700 audio processing/amplifier/speaker system for sound reinforcement applications.



The Intersonics Contra Bass servomotor subwoofer with ServoDrive design.



JBL 4835A (left) and 4832A Concert Series Diffraction Monitors.

- Apogee Sound showed its line of high performance signal processing speaker systems for pro sound applications and related flying hardware accessories. A new lower priced speaker system, the AE4 was featured.

- Community Light and Sound displayed some of its new signal processing one box speaker systems and a coax version of the very high output M4 horn/compression driver system.

- EAW had a big display of its one box concert speakers featuring "Virtual Array Technology"; and some signal processing speakers were also shown.

- Electro-Voice displayed in the Mark IV area and showed the DeltaMax signal processing speakers, some new Manifold Technology, "plumbing" adaptors (for dual compression drives) and raw speaker components. The high energy magnet compression drivers received a lot of attention.

PC-BASED TEST INSTRUMENTATION

Personal computer-based test equipment (and the manufacturers themselves) are not only becoming mature, but also accepted by the audio industry. PC-based instruments for electronics and acoustics, for the field, test bench, and research laboratory, are becoming commonplace and mainstream.

- ACO Pacific showed its precision calibrated microphones for measurement systems. A new mic preamp was shown that would be ideal for use as a front end for the new PC-based acoustic test instru-



Crown's SASS-P (Stereo Ambient Sampling System) features two PZM microphones mounted on boundaries, with a foam barrier dividing the mic capsules.

ment plug-in boards from Ariel and DRA.

- Amber Electro Design, the Canadian test equipment company, showed its product line including some interesting IBM-based systems using the new AudioCneck2 software. Applications ranged from quality control for manufacturers, to proof of performance testing (of amplifiers, equalizers, etc.) before installation, for sound contractors.

- Ariel demonstrated its PC-based audio DSP systems including the SYS-ID



Telex Communications' FMR-25P portable sound system with wireless mic capabilities.

which is gaining recognition as a test system for measuring loudspeaker systems. The SYS-ID can be installed in an IBM compatible lap-top if it has at least one slot, and can be used to test frequency response, distortion, time alignment, and for acoustical analysis such as capture of the energy/time curve.

- Bruel + Kjaer Instruments demonstrated its new PC-based automatic electro-acoustic test system (although production line testing seemed to be its strength), as well as B + K's dual channel FFT analyzer, RASTI meter for intelligibility measurements, and numerous other instrumentation.

- DRA Laboratories was demonstrating the MLSSA acoustical measurement system. Using the maximum length sequence technique, this approach has been of keen interest to much of the audio industry as an answer to inexpensive PC-based, simple, and robust measurement

of sound reinforcement systems for frequency response, RASTI and STI, and RT 60. The MLSSA can be installed in an IBM compatible laptop computer if it has at least one slot.

- Ivie displayed, at the Mark IV Audio area, its portable test equipment including the laptop computer based products. MS-DOS communication capability was shown for the laptop computer as well as new software for measurement of reverberation time.

- Sound Technology showed updated test instrumentation, including PC-interfaced gear for testing, maintenance, and quality control of mixers, amplifiers, and signal processors.

While this article can't be a comprehensive rundown of everything included on the exhibit floor — you had to be there to at-

AB International introduced a new 1400 watt per channel modular power amplifier. AKG continued its direction into digital signal processors and digital workstations. Amek/Tac, generally known for recording studio consoles, showed a super console for sound reinforcement. Anchor Audio displayed their small but high performance battery and AC powered speaker systems for lecterns and audio visual applications. Of interest to contractors that do custom installation work was Apex Systems' remote controlled VCA (gain control) including a wall mounted version. Ashly Audio expanded its MOSFET power amplifier line and noise gates. Audio/Digital introduced a new delay line. Audio-Technica showed wireless mics and a four channel mic power supply. Audio Teknology introduced a new live mixing



Turbosound's TXD Series for "applications where near-to-medium projection and wide dispersion are required."

tempt to see everything — there were many exhibitors displaying equipment of general interest to sound contractors and consultants. An abbreviated rundown follows.

console with an unusual internal system architecture.

BASE introduced a stereo sound processor which is essentially a single ended spatial enhancement device. Beyer in-

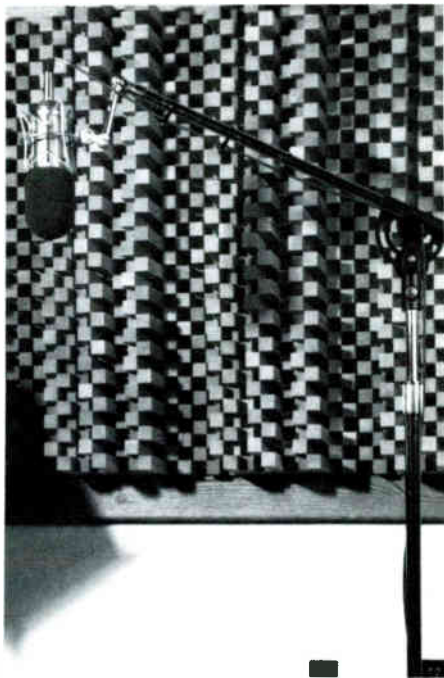
troduced some new mics featuring high energy magnets. BGW added the Compact Grand Touring Amplifier to the Compact Grand Touring line. Bryston showed its power amps and some other devices including a digital remote gain control.

Canare Cable showed its cable which is claimed to provide improved shielding from EMI and RF noise. Crest Audio exhibited some cost effective power amplifiers for permanent installations, and the Gamble high end sound reinforcement mixing board.

HM Electronics expanded its intercom systems line.

IED showed its ambient analysis system (for automatic level control). IED's product line of automated sound system equipment for schools, arenas, airports and the like was displayed. Intersonics demonstrated their unique motor driven subwoofers.

JBL Professional showed its new vented gap cooling woofers which have low power compression and higher power handling. New very small subwoofers (Triple



Systems Development Group's Aⁿ Diffuser comes in two small sizes which interlock.



Meyer Sound showed its HD-1 speakers. Left to right: Walter Becker, Helen Meyer, Roger Nichols, John Meyer, Herbie Hancock. Photo copyright Ebet Roberts.

Chamber Bandpass) were introduced for near-field monitors that would also do well for medium sound level permanent installation.

Neutrik is expanding its test equipment line and now has both acoustic analysis equipment and electronic test sets.

Oxmoor showed its routing switchers, signal distribution and control devices.

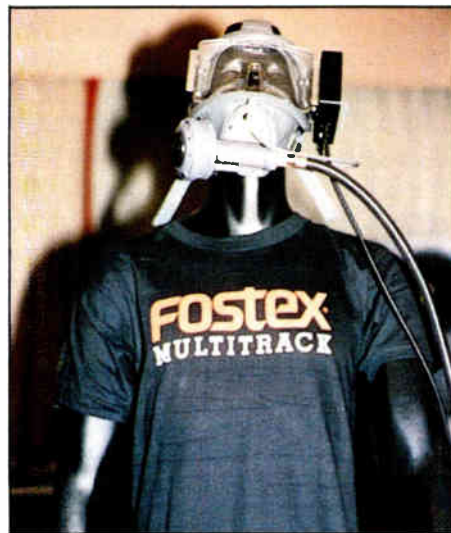
Panasonic Industrial/Ramsa displayed its consoles, amplifiers, speakers and signal processors. A new subwoofer and satellite speaker system was shown, and some new consoles.

Rane introduced programmable equalizers, new limiters and new mixers. Renkus-Heinz displayed its new wedge shaped ceiling speakers and new coaxial high output compression driver/horn system. RPG Difussor displayed its acoustical room treatment devices including new transportable and free-standing equipment.

Shure showed a new diversity system. SoundCraft displayed its consoles including some sound reinforcement and foldback models. The new 200 Delta replaces the 200/200SR and uses some of the improved circuitry from the upscale 6000 series.

Yamaha introduced a multitrack digital mixing console integrated with a digital recorder. Of high interest to sound con-

tractors was another surprise from Yamaha — the PM 1200 series sound reinforcement consoles, which should be very popular in applications where the PM 3000 series is too expensive.



Fostex's Underwater Communications System on exhibit.

Many other companies exhibited intriguing products, and some of the companies already mentioned had other products of great interest. The convention was generally rated successful by the attendees — those of us who go to see and hear who is doing what.

—Mike Klasco

COMPUTER AIDED MECHANICAL DESIGN PROGRAMS FOR PREPARING SPEAKER CLUSTER PRINTS

BY MIKE KLASCO

This month in CAD Topics, we'll look at some of the various choices for preparing the mechanical design and working drawings of the speaker cluster. Generally, this data package includes frame drawings, link lengths, mounting hardware locations and (hardware) type, center of gravity, cluster weight, and other relevant information. Incidentally, JBL has published a very practical manual on rigging hardware, and every sound contractor should have a copy of it.

Typically, the actual working drawings of the cluster are prepared by manual drafting techniques or with a mechanical CAD system. If you have used a sound system design program, you will find that some of

these programs provide minimal help in the actual construction of the cluster, while others provide a soup-to-nuts approach. On the minimalist end, you may try to use the coordinates of each speaker from your sound system design program to locate the horns and enclosures, but you will soon realize that real speakers have size and shape, and the coordinates given are for a point in space.

Some sound system engineering programs have "sketch" or drawing program modules, and some of these can export your cluster designs to mechanical CAD programs in order to finish up the mechanical drawings. As of yet, none of the sound system design programs are able to export data or cluster drawings into

mechanical CAD programs; touch up, fine tune or otherwise modify the drawings; and then import these revisions back into the sound system design program. The benefit of this would be to re-run the performance simulations reflecting any changes that were made in the mechanical CAD program as well as for archival and documentation purposes.

AutoCAD

The de facto standard in Architectural computer-aided-drafting is AutoCAD. This program has grown in sophistication and has gone through endless refinement. Earlier releases had somewhat limited 3-D capability, but the current release (version 10) is extremely powerful, with wireframe,

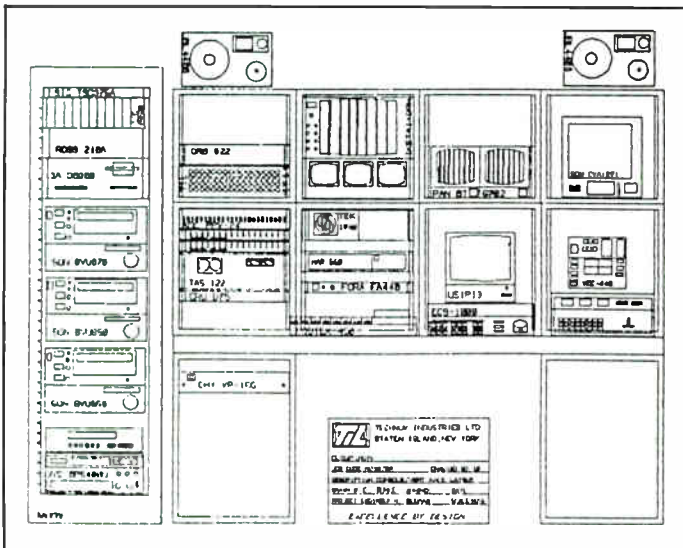


Figure 1. VDP rack elevation.

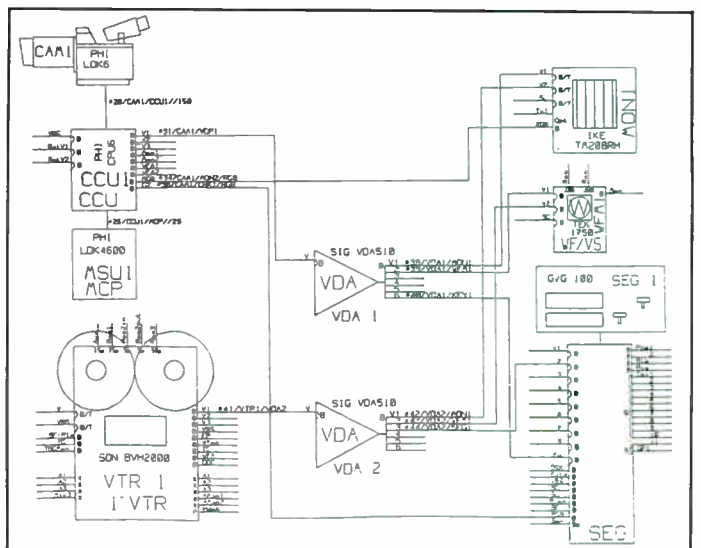


Figure 2. Complete system diagram

shading, and even animation (with optional enhancement programs). If you work with architects, then you are probably familiar with AutoCAD and most likely receive your drawings on floppy disks rather than on paper. AutoCAD grew up with the IBM (MS-DOS) computer, but the inroads made by the MAC II into architecture and engineering prompted Autodesk (AutoCAD's publisher) to develop and release AutoCAD for the Mac II.

“Some programs provide minimal help in the actual construction of the clusters, while others provide a soup-to-nuts approach.”

AutoCAD is an extraordinarily comprehensive mechanical design program and there are many schools, users clubs, magazines, and third party software enhancements for this program.

VDP

VDP is one firm that specializes in AutoCAD enhancements for audio and video applications (VDP can be reached at 503-524-8959). VDP has file libraries for both MS-DOS (IBM) and the Mac of pre-drawn audio and video equipment (AutoCAD and VidCAD). Cable routing and cable labeling programs have also been developed. The depth of these libraries is enormous, and they were originally intended for the TV and radio network broadcast engineering departments. The cost is steep (a software package for the Mac with both AutoCAD and VDP's software libraries can cost over \$5,000, although the IBM package cost is somewhat less. VDP is presently developing a much less expensive package for sound contractors, and we hope to review it early next year.

Competing mechanical design programs to AutoCAD universally offer compatibility or at least file interchange with Auto-

CAD (know as DXF format). Generic CAD is similar to AutoCAD, offers file interchange capability, and is much less expensive than AutoCAD release 10, although a stripped down version of AutoCAD release 9 is available for about \$100.

Once you have exported your data (or drawing) to AutoCAD, you have access to the program's very comprehensive ability

of interfacing with such peripheral equipment as color printers and plotters (including large format D and E size devices), graphics tablets, and a mouse or trackball, as well as manipulative capabilities of panning, zooming, rotating objects, and the optional capabilities of shading 3-D solids and even animation (vibrating woofer cones!!)

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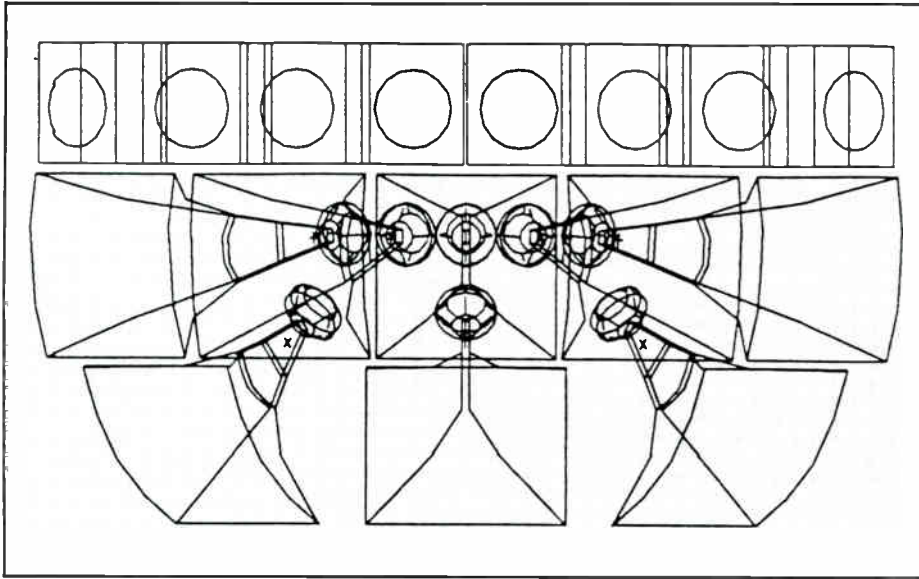


Figure 3. Cluster prepared by CADP 4.5.

If you do not want to deal with AutoCAD, but you still want large (B and C size) printouts, then you can use a graphics utility such as Pizazz, Graphics Plus, or similar programs for IBM compatibles with some of the sound system design programs that provide a mechanical design module. Two C size (11" x 24") large format printers are the JDL 850 (for IBM compatibles) and the IBM + Mac compatible ACT Accel 500.

JBL's CADP

JBL's CADP has a very basic cluster mechanical design program. Some appealing aspects of the CADP mechanical design module are the automatic 3-D sketching of all views of the cluster from the coordinates previously entered and the automatic calculation of the center of gravity of the speaker components. Aside from

"I WOULD RECOMMEND THE SOUNDSPHERE SYSTEM TO ANYONE.."



Built just after the turn of the century, St. Mary's Church in Monroe, Michigan recently completed an extensive repair and rebuilding program. Fr. Brian Chabala, pastor of St. Mary's, was faced with a completely obsolete sound system since the new facility incorporated a vaulted ceiling. People complained constantly, and various sound adjustments did not make any difference. Echo was a large problem, especially with the people who were seated in the rear portion of the church building.

The sound problem was eliminated totally after the installation of one Soundsphere #2212-2 upon completion of the renovation project. Fr. Chabala stated, "I would recommend the Soundsphere system to anyone having sound problems. I can't speak highly enough about it...in fact since its installation there has not been a single complaint about hearing, even when some of the softest readers serve as Lector at Liturgy."

Last July, former Miss America Kay Lani Rafko was married at St. Mary's before an overflow crowd in the refurbished church. The sound operated perfectly and the Soundsphere helped contribute to the beauty of the occasion.

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the ability to draw new components, JBL provides a library of drawings of some of their horns and a few enclosures. E-V and Renkus-Heinz have made available the data and CAD drawings for their components for CADP. The program suffers from low resolution, but version 4.5 (yet to be released) promises high resolution (EGA and VGA). The program still does not have speaker component collision indication, no hidden line removal; and other shortcomings somewhat limit the aesthetic appeal and practical application of this aspect of CADP. (This program was discussed in depth in January and February issues of *Sound & Communications*, and the significant enhancements of release 4.5 were discussed in the July CAD Topics.)

A new third party file interchange program, "XLATE", was featured in JBL's

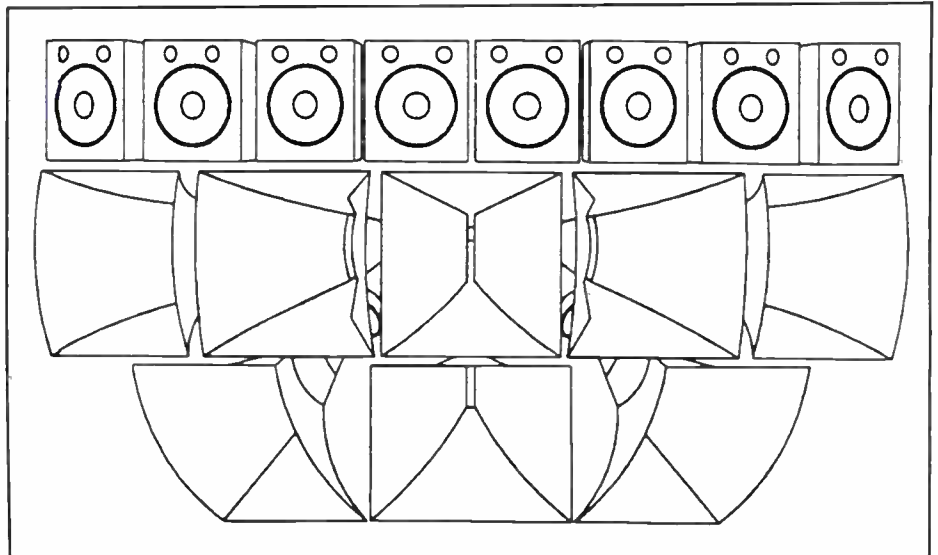


Figure 4. Cluster after tracing to remove hidden lines and augmentation with arcs and polylines in AutoCAD.

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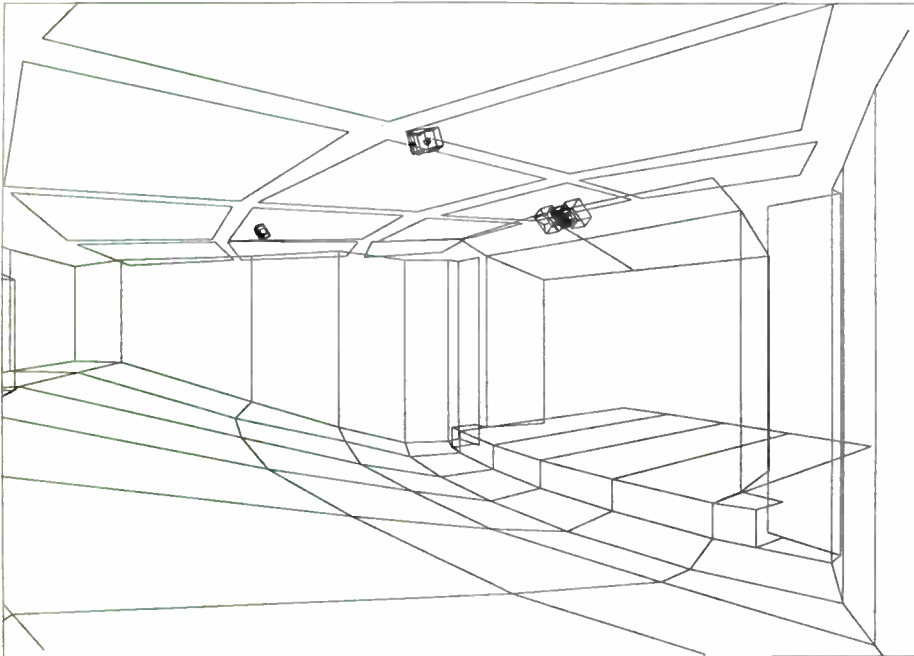


Figure 6. Cluster within room. Bose Modeler.

April 1989 CADP newsletter. XLATE can export, only, from CADP to AutoCAD. Once in AutoCAD, cluster designs can be accurately scaled, dimensioned (you can also toggle between metric and english units), alignment between components can be more efficiently implemented, and hidden line removal can be done manually. AutoCAD also allows large format print-outs for architectural drawings.

CADP II

JBL's replacement for CADP promises enhanced mechanical design capabilities, including file interchange (tentatively both import and export) with AutoCAD. This as-yet unreleased program (probably mid-1990) offers VGA (high resolution) graphics and will be available for MS-DOS and, eventually, Mac computers.

MARK IV's AcoustaCADD

Mark IV's AcoustaCADD promises file interchange (export only) with AutoCAD and boasts high resolution graphics. Initially, only coordinates of speakers can be exported to AutoCAD. An AutoCAD shell is planned of pre-drawn 3-D components. Locations of speakers and selection of components are determined from within AcoustaCADD, and this would allow for semi-automatic drawing of clusters using the pre-drawn components. This AutoCAD cluster construction module will not be provided in release 1.0. AcoustaCADD, an MS-DOS program, has spent years in the developmental stage and is just now being released.

THE PHD PROGRAM

The PHD Program does not provide any cluster mechanical drawing function. The program's developers feel that mechanical drawings should be done instead within CAD drafting programs. The loudspeaker coordinates determined within the PHD Program can be manually entered directly into CAD programs.

THE BOSE SpeakerCAD GRAPHICS PROGRAM

The SpeakerCAD Graphics Program is Bose's second program in their Sound System Software series. SpeakerCAD is a tool for mechanical design of loudspeaker hanging systems and additionally shows clients how the proposed sound system will appear in the room.

When Modeler was introduced, one of the criticisms was that there was not any mechanical design function within the program to depict the speaker cluster configuration. Some paint and drawing programs have file interchange with Modeler, but this is limited to pulling up the image and erasing or drawing on it. Rotating or otherwise manipulating the image was not possible.

With SpeakerCAD, a comprehensive library of pre-drawn JBL, E-V, Altec, Community, Bose, Renkus-Heinz, and various other components are supplied. The 3-D drawing "toolkit" allows sophisticated and

(continued on page 55)

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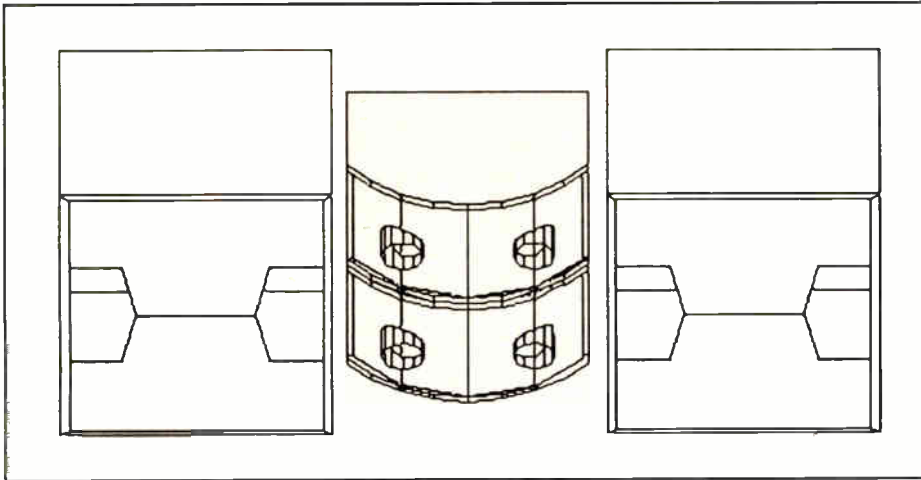


Figure 6a. Close-up of cluster. Modeler.

detailed drawings of new components to be prepared. Aside from creating component drawings and cluster drawings, the clusters (or lone speakers) can then be placed within the room drawing itself (which is created in the Modeler program). "Photos" of how different views will appear from within the room can be taken and printed out; in fact you can even specify the camera lens! Individual components can be rotated, or otherwise manipulated, and the entire cluster can be "dragged" to various locations without any additional data entry. Other desirable features of SpeakerCAD are automatic hidden line removal and collision detection.

SpeakerCAD can import from Modeler, but cannot export back to Modeler. SpeakerCAD does not have file interchange with AutoCAD.

CASE

Still under development, this program promises file interchange with a number of mechanical CAD programs, including AutoCAD. Release of this program is anticipated sometime next year.

NEXOCAAAD

Announced a few months ago, this program from France was still being revised before its formal U.S. introduction at the AES convention. Comprehensive mechanical design functions, such as room modeling, can be prepared from within the

program, although I have not seen any cluster construction module yet.

UMBULUS

Umbulus was reviewed in the June and July issues of *Sound & Communications*. Only a sketch module is provided and the low resolution monochrome graphics is limiting. AutoCAD file interchange is planned, but is not available in the current release. As with the PHD program, speaker coordinate data can be used to prepare working drawings in dedicated CAD programs. Center of gravity and speaker component weight of clusters is automatically calculated. Hidden line removal and automatic detection of collisions is not provided, but the sketch modules let you visually inspect for collisions. A unique and desirable feature of Umbulus is that the program automatically packs the cluster and maintains proper alignment, as well as allowing manual control of packing, trading off tightness for servicability. Another appealing feature of the program is the ability to generate the cutting list for the hanging link hardware.

FUTURE DEVELOPMENTS

The mechanical design capabilities of sound system engineering programs will be significantly expanded as third generation programs such as JBL's CADP II, Altec's Acousta-CADD, Source Phoenix CASE, and NEXOCAAAD are finally re-

leased. The only complete next generation program now available is the Bose Modeler 3.0 and Bose SpeakerCAD programs. Mechanical design capability has been generally considered an enhancement rather than a "launch" requirement by most program developers, so expect to see the mechanical design modules limited or even missing in the initial releases of third generation programs, but with advanced capabilities following in later releases. Autodesk, the publisher of AutoCAD, has more than 100 full-time programmers working to constantly expand the program, so expect an ever widening depth of features from this mechanical CAD program. In the last few years 3-D wireframe has been introduced, followed by shading (Autoshade), and more recently, animation.

COMING SOON

Early 1990 will see the release, and a review, of Altec's AcoustaCADD, a sophisticated program for MS-DOS/IBM compatible computers.

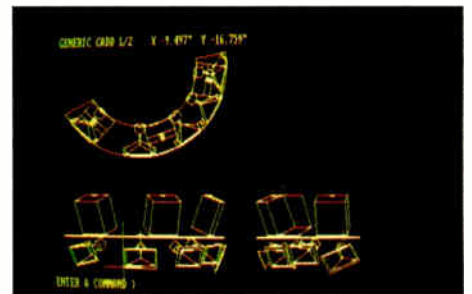


Figure 7. Umbulus. Low-frequency enclosures are added to the top of the chassis.



Figure 8. Front view of a completed array based on Umbulus as installed in The Church of the Risen Savior, Burnsville, MN.

SAN FRANCISCO'S BIGGEST BLOCK PARTY

BY WENDY BLATT

When it comes to a challenge, Production Manager Solomon Rosenzweig (of San Francisco's Event Technologies) has handled one of the toughest: a formal event for more than 12,000, including nearly 750 performers (more than 40 bands) on 17 stages, involving more than 75 Bay Area restaurants and food vendors spread throughout six buildings (some of them government offices), assorted tents, and the streets in between.

Rita Barela & Associates, event planners who've handled the Black & White Ball ('San Francisco's Biggest Block Party') throughout the 80s, turn to Rosenzweig to coordinate all sound, lighting, and staging for this enormous project.

The Black & White originally started in 1956, but was put on hiatus in 1969. Revived in 1982, the event has run bi-annually since 1983. The Ball has grown into one of the largest and most financially suc-

cessful fundraisers in America, which benefits the San Francisco Symphony. With an operating budget of over \$1 million, 1989's Ball was the biggest yet, and may be as big as it gets.

'We have reached what we feel is capacity with our current locations,' notes Rosenzweig, 'We've looked at some other buildings for next time, but the verdict's not in yet. We'd like [the Ball] to get bigger, but we don't know that that's going



A unique venue: The California State Building.

to happen. There are really not a lot of other spaces we could use close by.”

Dance music of all kinds—from swing, big band, Latin acts and the symphony to R&B bands, rock acts, tap dancing and the UC Berkeley marching bands—was ever-present. The music is coordinated by theme with the food and decor at each venue.

Rosenzweig designs set-ups, finds contractors, schedules and supervises each company’s portion of the work, coordinates with other departments, and is generally responsible for everything that must happen for the event to go on.

His 35-page equipment list and schedule barely scratch the surface of the event’s requirements: “There has to be coordination between the various sound and lighting crews and the decorators. My crews lit the buildings, so we had to light their decor. It’s a huge undertaking, and requires an incredible amount of advance planning. On the actual night of the event there’ll be crews from the different contractors, stage hands, equipment loaders, sound engineers, lighting contractors, and so on. I’d say there’s upwards of 70 technicians specifically dedicated to operating the stages. We use over 100 stagehands to set up, but that’s spread over 3 days. All together the immediate workers probably [number] close to 1,000 people, plus another 1,000 catering people. Most of the equipment and staging goes in that day.”

The Veteran’s Building, War Memorial Opera House, and Davies Symphony Hall, all of which are symphony and opera performance spaces, have stages and main room acoustics well-equipped for musical performances. However, many of the other venues were never intended to be used as live performance spaces. Each building had bands playing in the lobbies and on mezzanine level landings. And the California State Building is an office building, with a large interior courtyard (tented over) and brick/stone floors. City Hall has a 3-story central rotunda and marble everywhere.

“There are certainly some challenges to the project,” Rosenzweig admitted, “A lot of these spaces are not designed as



Behind the board at the Black & White Ball.

performance areas, so it was really up to the contractor to provide a sound level that was suitable. At the Opera House, for instance, a lot of the stages were located in marble hallways. The California State Building was another unique venue, where the tent [over the interior courtyard] created another entire sound challenge.

“City Hall, being an historical building, is architecturally very difficult and very sensitive. We spent many meetings with the decor people and [the City Hall people] trying to work things out. City Hall is a wonderful space, but a difficult space. Sound checks in marble rooms? You just don’t. You set your levels, and then you reset them. There’s no other way to do it. Civic [Auditorium] is the largest, but not the easiest. It’s rock and roll, and for that reason is the most demanding. Rock and rollers want what they want, and we try to give it to them.”

According to Rosenzweig, each venue is bid out as a separate job. “We had stage managers at each stage, a total of 17,” Rosenzweig explained. “I supervise the contractors, design basic set-ups and lay-outs for each part of the event, but the suppliers are responsible for the details of the actual equipment used.”

With the exception of a few generators that were brought in from Los Angeles, everything else—sound and lighting equipment, staging, searchlights, food, all the catering equipment—was provided by local suppliers. “We had 14 bidders,” said Rosenzweig. “The criteria we use to pick vendors are the size of the budgets and the ability to do the job. Could they supply what we needed, could they organize it in a way that would effectively work? If you gave a small company too big a piece of it, no matter how hard they tried they would choke on it.”

Eric McDougall, project manager/designer for FM Productions (which handled lighting and staging for five of the buildings) describes their work as “guidance counseling and production services.” Having handled many of these buildings for several previous Balls, FM doesn’t see any one part of the project as bring particularly stressful or difficult anymore: “It’s standard theatrical stuff all around,” said McDougall, “What makes it a challenge is the number of locations.” FM alone had 15 trucks at the scene.

“For [the California State Building] we work around the tent company,” McDou-

gall continued, "since they're doing a rather unique job putting up a tent in that structure in the courtyard. Then we do a very standard, rock and roll, outdoor type of set-up using scaffolding, staging, and lights that we flood up on the towers. City Hall is actually a very basic lighting job, which just included putting lights up on the balcony level focused down on the items we were required to light."

Problems? "Things went so smoothly I couldn't believe it. There were times our walkie-talkies were so quiet I thought the batteries had died."

McCune Audio-Visual, sound contractor for five of the venues, also found no problems throughout the evening. Pat Oagrave, McCune's liaison with the Ball, notes that this starts with the planning: "Solomon really gives us precise, accurate descriptions of what each of the acts needs, or if there are any peculiarities to each site. He tells us what he wants, and we fill the bill with equipment we have."

Hal Soogian, McCune's head engineer, concert sound, is responsible for the sound in all McCune's five buildings at the event. "It is an extremely demanding show," he notes, "and it requires a great deal of gear and class operators. But we

have no problems. As project manager, I stand in the warehouse and with my crew, personally test every piece of equipment and watch the way it is packed. In all the years I've been doing this, the only problem I've had was the one year that one amp channel went down. Mixers don't go down, mikes don't go out, set changes are done properly."

Soogian normally mixes sound for all Symphony performances, "but for this event it's more important that I oversee all the venues. For City Hall I used our Medium Sized McCune Concert System, along with delayed speakers. Our speakers work really well in there. Basically you're fighting crowd noise, so you have to come across with a proper amount of quality to cut through the crowd noise. But that's in the design of the speakers (rather than the set up at the hall), and we have no trouble making the violins heard. It's challenging in the sense that several of the buildings (City Hall, Davies Hall, Veteran's Building) are reverberant, but my operators know how to not push unnecessary instruments such as trumpets and trombones. They bring up the vocals and things that aren't carrying far, as opposed to just blaring the band over vocals. I use all custom

McCune-built loudspeakers, mixers ranging from 12 input ranges to custom-input McCune boards. I use a combination of Shure, Electro-Voice, ATM, Sennheiser, and AKG microphones. All snakes are custom-built by McCune, and with the exception of digital processing, all crossovers and electronics are McCune."

When pressed for an overall assessment of the event, Soogian says "It was just another busy Black & White. It was just another big event that went in smooth, went well, and we were done by 6:00 a.m. We go in the day of the event, as opposed to Sound on Stage who does the Civic. They go in four days in advance and get to set up speakers and EQ and all that. We don't. We go in that day. Our crew is under a lot of pressure, but we just do it."

"The whole event went off without a hitch," Rosenzweig notes with some amazement. "Any time you're dealing with 12,000 to 15,000 people you wait for surprises, and we didn't have any. It's a tribute to the contractors, really, and the preparation involved. It was flawless."

Blatt is a freelance writer based in New York, NY.

CONTRACTING CLOSE-UP

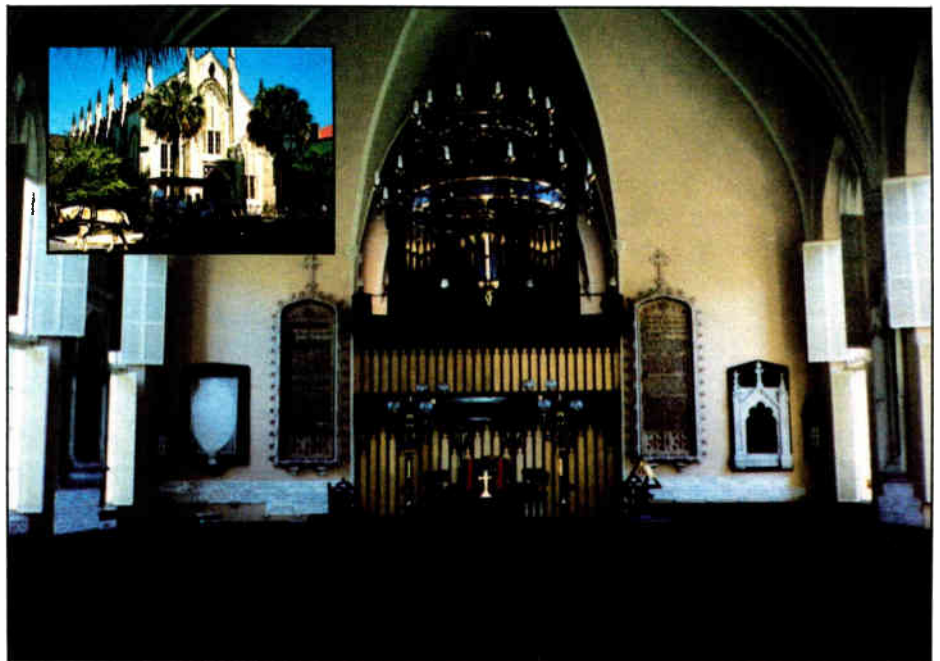
(continued from page 32)

that, at the same time, was aesthetically pleasing and cost-efficient.

The sound system, itself, had to be designed for use in vocal performances, and in the recording of services for home-bound members. In addition, provisions had to be made for the future addition of monitor speakers on the floor and condenser choir microphones in the rear balcony.

Randall Hames, president of Hames Sound, Inc., addressed the problem of a quality system versus aesthetic appearance within a \$5000 budget by installing the Electro-Voice 100M dual powered mixing console and an Aiwa AD-R40 quick reverse cassette deck in a custom built locking cabinet in the pipe organ well. Hames Sound was able to conceal the E-V FR-12-2 single source point speaker system by installing it in the pipe chest balcony above the pulpit.

Microphones used in the installation



Interior of The French Huguenot Church

included the Astatic Model 827 electret condenser pulpit microphone, the Nady 201LT dual diversity wireless

lavalier mic and two Nady 201HT dual diversity wireless, handheld vocal mics.

—Steve Jacobs

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News from around the Industry

Sony Starts New Division; Mark IV Concentrates Engineering

UL Listing

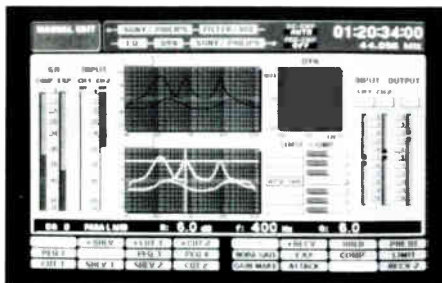
Ashly Audio has announced that its FET-2000C and FET-2000M MOS-FET power amplifiers have met Underwriters Laboratories' testing requirements and are now U.L. Listed under the "Commercial Sound Equipment" category. Ashly Senior Vice President Bob French adds that "We have also been approved for inclusion in Lucasfilm's THX movie theater installations."



Sony Conferencing Division

Sony Corporation of America has formed the Video Conferencing and Satellite Systems Division, with T.C. Browne named vice president and general manager. "Video conferencing and satellite television broadcasting are growing businesses in which Sony is committed to becoming a major player," said Donald Haight, president of the Video Communication Systems Company. Browne was previously director of marketing and sales support for Private Satellite Network. Products marketed by the new division will include the PCS-S1100 conferencing systems controller, a roll-about video conferencing system, and a range of still video image capture and interactive video systems.

Sony has been providing video conferencing equipment in Europe and Japan since 1986.



Digital Audio Effector

Sony Professional Audio's SDP-1000 Digital Audio Effector, designed for professional mastering applications, enables sound engineers to digitally create, shape and enhance audio material. The unit permits 32-bit internal signal processing with 24-bit and 20-bit I/O word lengths. An equalizer section provides digital four-band parametric equalization, high/low shelving and low/high cut filtering; a dynamics section consists of a limiter, expander, compressor and noise gate. There is a built-in timecode reader for SMPTE/EBU timecode.

Hurricane Helpers

In the wake of Hurricane Hugo, which struck South Carolina in September, several companies have news of their efforts. InteCom's Integrated Business Exchange, a digital PBX that supports simultaneous voice and data communications over two-twisted pair wiring, remained in operation during the disaster with the aid of its Technical Support Center.

Dial Page's voice pagers and Messagewriters, in Charleston, were restored soon after the storm, when the transmission tower and their local office were repaired. Dial Page also

restored service within 24 hours to Myrtle Beach and within three days to Florence, S.C.

In addition, Klein Tools, Inc. and its Vaco Products Division, through the National Association of Wholesalers, has donated a variety of tools to restoration workers in the Charleston area, aiming to restore power and communications capabilities.

Showroom and Modular System

New York Disco Systems of San Francisco has opened a showroom and demonstration facility for the purpose of introducing "reduced obsolescence concept" system, which is a modular, building block system built around the Gauss coaxial loudspeaker.

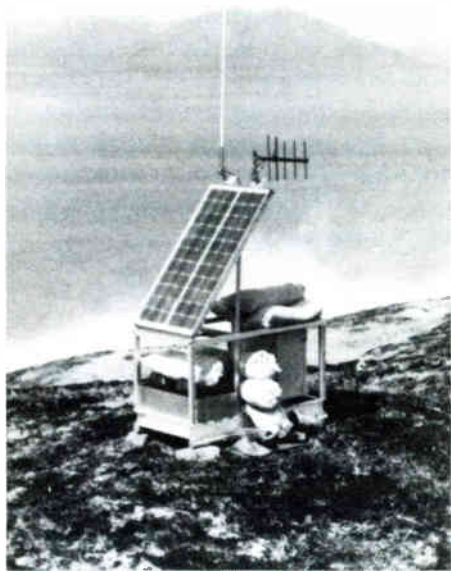
The system is aimed at the club owner with a limited budget. The club owner can buy the basic coax monitor system and later add the complementary bass units and tweeter arrays to make a quad-amped system. The system offers sustained SPL's of 117 dB at 12 ft. with no audible distortion.



Blister Packed Intercom

Aiphone Corp. is offering five of its two-station intercom systems in blister

packaging. The Aiphone Entry Security, Door Answering and Entry Control intercom systems are residential units, with the Entry Control allowing hands-free operation, and the Entry Security system offering an optional electrical door release button. The AP-405 and LAM-1SP are used primarily for room-to-room communication.



Radio Aids Clean-Up

IWL Communications, Inc., the Houston Based firm, aided in the Valdez cleanup after the Exxon oil spill by customizing the company's Rapidly Deployable Radio Repeater stations to extend Exxon's communications during the emergency. The first nine units of the repeater station network were built, shipped, and operating in less than a week. Once the unit is on site, it can be set up and operating in less than 20 minutes. The solar powered design weighs less than 100 pounds, with the power and radio systems in weatherproof enclosures connected by umbilical cord and mounted on an aluminum frame.

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December 1989 61

Mark IV : Profits Up; Engineering "Concentration" and Expansion

With Mark IV income for the second quarter of fiscal 1990 up 66 percent and Mark IV Audio having "record sales and profits" (the quarterly reports don't break out the component figures), the companies grouped under Mark IV Audio are undergoing continuing restructuring and "concentration," in keeping with a strategic five year plan.

The creation of a 25,000 square foot engineering center at Electro-Voice headquarters in Buchanan, Michigan, along with other market developments, created a design for restructuring engineering efforts at the component companies of the new legal entity of Mark IV Audio: Altec Lansing, Electro-Voice, University, Gauss, Ivie.

The company intends to increase its total engineering budget for next year by six to eight percent.

According to Bob Pabst, head of the newly formalized Mark IV Audio, historically Altec, for instance, has done 60 percent of its business in electronics. Electro-Voice of course has always had its strength in acoustics. The original proposition to Gulton (the former owner of Electro-Voice) to acquire Altec, included, according to Pabst, a strong consideration starting out that they would avoid building wasteful duplication. That was in 1985, and of course that concern has continued.

In 1989 that concern over duplicated efforts has led to a restructuring of engineering staffs, with Altec Lansing concentrating on electronics, and Electro-Voice concentrating on acoustics in its research and development. Although according to Pabst there has been a disappointing response to the few transfers that were requested, additional staff appointments are being made — with several new positions created on the engineering staffs.



"We could have put all the engineering in Buchanan. But that would be too difficult. We need highly focused management and staff." Clearly this affects Electro-Voice and Altec, but also other companies in Mark IV. "If an engineering project is electronic, then it will go to Oklahoma [Altec's home base]. If it's acoustic, it will be in Buchanan."

The establishment of priorities will remain with individual managers.

Although Mark IV Audio Inc. is now a legal entity, it has no assets, and was created as an operational conduit. As time goes on, the individual heads of the Mark IV component companies will also be vice presidents of Mark IV Audio.

Consolidation and avoidance of duplication has been a trend for the company, with the company's Redmond Washington electronics manufacturing facility closed down and moved to Altec facilities in Oklahoma.

AcoustaCADD, the computer aided design software program is jointly owned by Electro-Voice and Altec Lansing and will be jointly marketed. Both operations put up the funds for its development. Since John Lanphere of Altec has been the driving force behind the development, the "focal point" of AcoustaCADD is in Oklahoma. AcoustaCADD is a Mark IV Audio product, the only one planned right now and maybe the only one ever. Pabst says there are absolutely no intentions to create any products under the Mark IV Audio marque.

Although there may be a leveling

taking place in the professional market in general, Pabst feels that will not be simultaneous in all portions of the market. Of the Mark IV companies, University Sound has been the strongest in terms of sales growth. Part of that has been caused, according to Pabst, the recent energy put behind the company, with the acquisition and efforts started a year ago.

Health Care Growth

A new report published by FIND/SVP says that the health care industry will be a major growth market over the next five years for providers of hardware, software and transmission services of electronic data interchange. The report says that the value of hardware and software dedicated to the market will climb from roughly \$79 million in 1988 to \$116 million by 1992.

Secondary Audio Added

Metro New York public television station WNET has launched Thirteen FM, a separate audio program channel offering descriptive narration and simultaneous language translation via stereo television. This is the first major use of the available SAP channel in the New York area and was premiered on the PBS presentation of "Show Boat" in October. The descriptive narration for "Show Boat" was produced with the Paper Mill Playhouse audio describers and its Advisory Board for Visually Impaired Services. Support for the channel was given by Stereo Review magazine and Sansui Electronics Corporation.

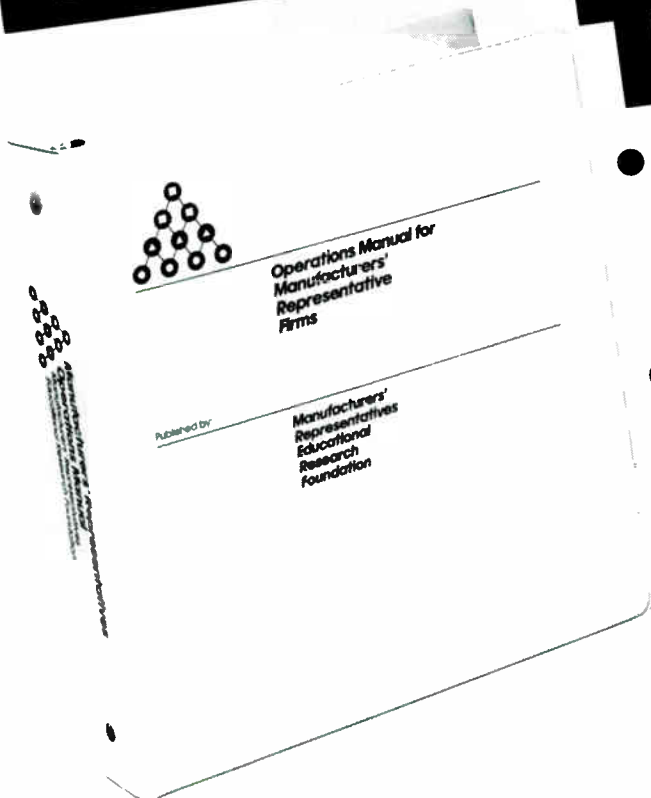
Rep News

Pefco Appointed

Panduit Corp. has appointed Pefco, Inc. of Honolulu, as Panduit's exclusive sales representative of the full product line in Hawaii. Michael French is principal of the firm.

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People

Thomas at Shape, Inc.: Sony Appoints Rhodes



Electro-Voice P.R. Director

Keith Clark has been named public relations director for Electro-Voice Inc. Clark comes to Electro-Voice from the Juhl Agency in Mishawaka, Indiana, where he served as an account executive.

Marketing Manager at Sony

John Rhodes has been appointed marketing manager for video conferencing products and systems for the Sony corporation. He will concentrate on developing new products and integrated systems solutions for Sony's video conferencing markets.

Rhodes, began his career with the Panasonic Industrial Company and later served as marketing manager of Sony's Professional Video Division.

Shape Chief Operating Officer

Michael Thomas is now chief operating officer of Shape Inc., responsible for operations, sales, and marketing activities.

Thomas began his career at Shape in 1986 as Vice-President of manufac-

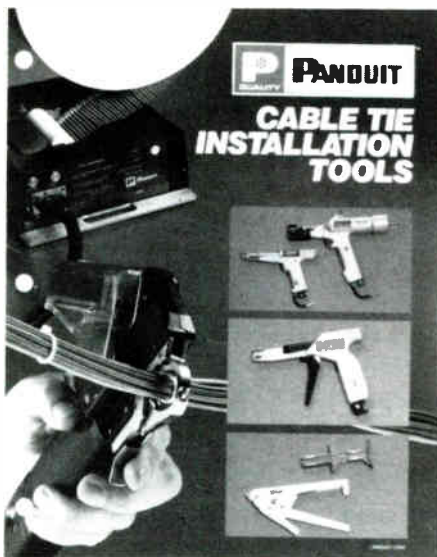
turing and became the Vice-President of the Computer Products division a year later. After Shape filed under Chapter 11 in 1988, Thomas became Chief Operating officer.

Over the past 27 years, Thomas has worked for companies such as Fairchild, Memorex, Teledyne, and the Intersil division of General Electric where he was international operations manager for U.S. and worldwide manufacturing operations.

Pomerance Appointed at Unisys

David M. Pomerance has been named President of Unisys Healthcare Systems. Pomerance, who joined Unisys earlier this year, was formerly Vice-President and General Manager. He will replace T. Doyle Perry who announced that he will retire later this year after a 33 year career with Unisys.

Literature



Installation Tools

A 16 page color brochure describing the complete line of Panduit cable tie installation tools is available free from Panduit. Included are photos and descriptions of the PAT fully automatic

installation system; PSA semi-automatic installation system; tool controlled tension and cutoff tools; operator controlled tension and cutoff tools.

Circle 5 on Reader Response Card Javelin Brochure

A six page brochure from Javelin Electronics outlines its capabilities in the area of security management systems. High technology systems are broken down by size, cost, capabilities and applications. A selection guide to Omni II systems is included. Typical applications in the brochure include: transportation facilities, government installations, correctional institutions, casinos and hotels, and commercial/industrial sites.

Circle 6 on Reader Response Card



Custom Case

Star Case Manufacturing Co. is distributing its new Custom Case Reference Guide, 100 pages giving information on layout of case and container types, styles, optional attachments, interior treatments, shipping costs and time estimators. A chapter is included on "Measuring, Templating and Design Conception."

Circle 7 on Reader Response Card

Jensen Tools

A catalog of cases and shipping containers is available free from Jensen Tools Inc. The full color 32 page catalog offers the largest collection of cases and containers for electronic equipment ever offered by Jensen.

Circle 8 on Reader Response Card



Products

New Headset Stations

Telex Communications has added two belt-pack headset stations to its Audiocom intercom line. Although Audiocom is a balanced line intercom system, the BP-1 single channel and BP-2 two channel belt-packs are compatible with unbalanced systems via a select switch concealed under the rear cover. These models also have light signaling capabilities compatible with both the Audiocom 20 kHz and the Clearcom dc systems, according to Telex.

Circle 9 on Reader Response Card



Audio Snake

The StageMaster Multipair Audio Snake by Pro Co Sound is available in fan-to-box and fan-to-fan models with a number of connector configuration options. The product's fan end features Neutrik NC3MX/FX connectors with channel identification numbers

stamped onto the barrel of each connector. The enclosure is made of an extruded aluminum chassis with a steel top and steel end caps.

Circle 10 on Reader Response Card

Tube Amp

The Model T100S all tube power amplifier from ADA, is available. The 50-watt per channel amp is housed in a two-space rack mount package, and incorporates 6CA7 and 12AX7A vacuum tubes. It matches the mp-1 MIDI Tube Preamp. The T100S has a switch-selectable output impedance of four, eight or 16 ohms. Each channel has an independent input level attenuator.

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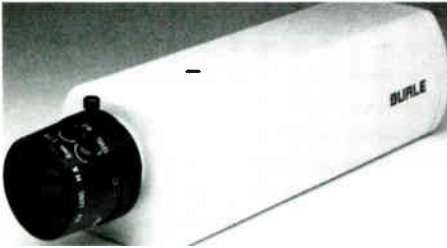
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amplification. A separate BNC allows them to genlock to composite video, composite sync or black burst. They will operate in temperatures from -20 to +50 degrees Centigrade.

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CCD Cameras

Burle Industries has added the TC250 and TC250X series of solid state color cameras to its line of CCD cameras. The half-inch format models have concealed controls and are styled to blend into modern installation sites.

The models require three lux of illumination and have "minimal" blooming and transfer smear, and through-the-lens automatic white balance adjust. The variable gain AGC circuit provides up to 20 dB of additional

Circle 13 on Reader Response Card

Bench Power Supply

B&K Precision has announced the availability of a general purpose bench power supply with output variable to 16 volts. The Model 1646 DC power supply has a 10 amp capacity. Coarse and fine voltage controls are provided; two front panel mounted meters permit simultaneous monitoring of voltage and current. The 1646 offers both constant voltage and constant current operation, with automatic mode selection; and automatic overload and short circuit protection.

Circle 14 on Reader Response Card



Portable Sound Level Meter

Goldline has introduced a new portable sound level meter with a seven segment digital numeric display. The SPL-120 includes auto ranging SPL or Highest SPL settings via a two-position switch. SPL's can be read in either flat, A or C weighting. The SPL-120 makes use of ANSI class 11 filters. Suggested retail price is \$199.95, and a special contractor price is available.

Circle 15 on Reader Response Card



Video Test Generator

Leader Instruments is now shipping the Model 408 gen-lockable NTSC video test signal generator which provides over 80 test patterns in composite, S-VHS, RGB and Y, R-Y, B-Y output formats. Channel frequencies and video signal level specifications are set up using a menu driven multi-purpose data control panel.

Circle 16 on Reader Response Card

Zoom Lens

The NL12.5 75AC-4 Zoom Lens has been introduced by Richardson Electronics under the National Electronics brand name. The 12.5-75 mm F1.6 color corrected lens features "quiet motorization," spot filter and auto-iris control.

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A. Total No. Copies (Net Press Run)	15,448	17,272
B. Paid and/or Requested Circulation		
1. Sales through dealers and carriers, street vendors and counter sales	None	None
2. Mail	9,444	9,537
C. Total Paid and/or Requested Circulation (Sum of 10B1 and 10B2)	9,444	9,537
D. Free Distribution by Mail, Carrier or Other Means: Samples, Complimentary, and Other Free Copies	5,340	7,303
E. Total Distribution (Sum of C and D)	14,784	16,840
F. Copies Not Distributed		
1. Office use, left over, unaccounted, spoiled after printing	664	432
2. Return from News Agents	None	None
G. TOTAL (Sum of E, F1 and 2 — should equal net press run shown in A)	15,448	17,272

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Vincent P. Testa
Publisher/Editor

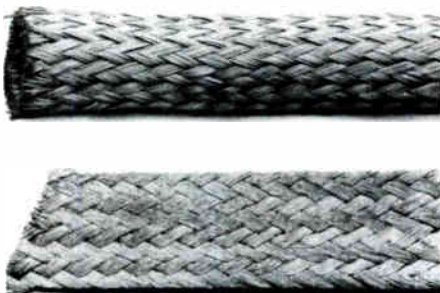
UPDATE



True Diversity

The Model R-42A wireless microphone receiver has been added by Vega to its line of Pro Plus wireless products. The true diversity receiver features Dynex III audio processing, "a third generation design with improved transient response and wider dynamic range." Features include a squelch guard circuit, a zero-crossing diversity switch circuit, and silver plated, four-pole helical resonators.

Circle 18 on Reader Response Card



Copper Braid

A line of flat, oval and tubular tinned copper braid is available from Alpha Wire Corporation. The flat braid has a maximum current carrying capacity of 390 amps. The oval braid maintains coverages of 90 percent. The tubular braid provides 95 percent shield coverage.

Circle 19 on Reader Response Card

PVC Tubing

A new line of extruded PVC tubing for 300 V and 600 V applications is available from Panduit Corp. Made of insulation grade PVC, the all purpose flexible non-shrinkable tubing is available in 39 stock sizes and can be used over a temperature range of -4 degrees F to 221 degrees F.

Circle 20 on Reader Response Card

Sweep Function Generator

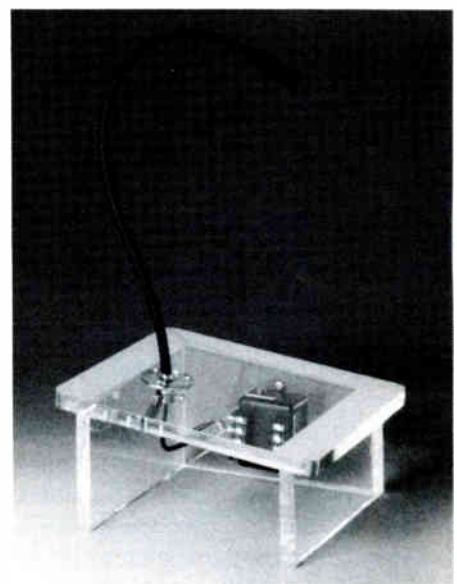
Beckman Industrial has introduced the Model FG3A sweep function generator featuring seven frequency ranges covering 0.2 Hz through 2 MHz and an array of signal outputs including sine wave, triangle wave, square wave, and TTL and CMOS pulse outputs.

Circle 21 on Reader Response Card

UHF Wireless

Sony Professional Audio's WRR/WRT-28 UHF wireless microphone is equipped to operate either in a compressed or linear mode. It operates on a carrier frequency from 947 to 952 MHz, uses two AA-size batteries for four hours of continuous operation and weighs 130 grams. It comes supplied with the ECM-77 lavalier microphone and an adapter cable.

Circle 22 on Reader Response Card



Hidden Mics

TSI has introduced its gooseneck and ceiling microphones, the GNM and the CM-3. The GNM is an omnidirectional microphone mounted with an adjustable gooseneck; it's mounted from underneath the surface of a lectern or desk. The CM-3 is a single gang or double gang wallplate ceiling mic.

Circle 23 on Reader Response Card

NIGHTCLUB SOUND

(continued from page 29)

output.

2) We build them into dance platforms to utilize the space instead of losing it.

3) For the direct radiated sound characteristics of its design, we like its short throw and its solid, punchy bass.

The EAW SB-528-P is a 30Hz bass cabinet, capable of reaching peak levels of 133.0 dB-SPL and 1600 watts of power handling.

To complement the SB-528, Sharky's will get four EAW DS-123HP 3-way compact near-field speaker systems. The DS-123 was chosen for a number of reasons:

1) The size (23.75' x 15.75' x 9.25') allows an unobtrusive installation.

2) The impressive HiFi sound at extremely high output (124 dB-SPL).

3) The outstanding sonic accuracy and its wide 130 dB-SPL coverage over its entire operating range (100Hz-20kHz).

EAW also took painstaking efforts to design and build a complex passive crossover with features like third order 18 dB per octave asymmetrical slopes and a heat dispersion circuit card layout, to enable 1000 watts of continuous power before distortion. Needless to say there is no need for four-way electronic crossovers and four separate amps. This system can be impressively powered by two Crest 8001 amplifiers and reach its full output with plenty of headroom, while being quite cost effective.

The system makes an intense, high-level dance floor environment and rolls off gradually to allow socializing at bars. This will let the remote system take the program into the bar at a reasonable but full conversation level. For the remote speakers, we have chosen eight EAW MS-30C full range monitors. They feature very rich bass, full coverage and high power handling. Again, the direct radiating design enables us to control the ambience.

The head end of the system maintains the high integrity of the system. We utilize the fully balanced features of the Rane MP-24 and follow through all the electronics and amps to ensure a truly quiet system. Maxtech takes this one step further. Because nightclubs always have a massive lighting rig to accompany the sound, we insist on 3-phase power with 3 neutrals, and load the panel to keep the sound isolated to 1-log, including its own neutral.

The finished product, as a system, ends up being an extremely high power, high definition sound system that is reliable for years.

Sharky's Equipment List

2 Technics SL 1200 MK II 1

Technics 1800 CD 1

Rane MP-24 3

HD-15 E.Q. 2 DBX 166 Compressor 2

Crest 8001 Power Amps 3

Crest 4001 Power Amps 2

EAW SB-528 4

DS 123 HP 10

EAW MS-30 1

Brooke-Siren FDS-310 X-over

—Jim Pici
Maxtech, Inc.

HARDWARE

(continued from page 44)

card do not agree with the instructions for the hard disk. Usually, special software is included with the hard disk (such as Disk Manager, or Speed Star) which does not agree with any of the other instructions.

Even if you can not get the best price, find a dealer that will install and (for the faint-hearted) even format the drive for you.

The next generation of personal computer/work stations will offer the option of optical drives and solid state hard drive emulators. While the typical hard drive may have 20 meg to a few hundred meg of capacity, the optical drive has millions of megabyte capacity. The price of an optical drive is not high, and they are available now for about \$1,500, but slow access time, inability to record (or record only once on the optical disk), and limited software has held back this product's success. The NEXT computer (from the new computer company started by Steve Jobs, one of the founders of Apple Computer), already comes with an optical drive.

A solid-state hard drive emulator is a plug-in board that uses either RAM memory or, in special ("hostile") environments, bubble memory. Generally, a hard drive is also used, and when the program is booted up, the entire contents are loaded into the plug-in board's memory. A solid state memory is essentially instantaneous. Similar operation can also be accomplished by using one of the other "RAM Disk" schemes where memory above 640K is supplied on the motherboard on some AT computers, or other extended memory standards. All these approaches are available now and will be very helpful in speeding up the operation of the new sound system programs.

In the next issue of *Sound & Communications* we will continue our discussion of IBM and IBM compatible hardware and peripherals. Topics will include floppy drives, CPU speed, math coprocessors, the Macintosh, and other factors in software development.

You're invited . . .

To respond to this article — or any other in this magazine. Do you agree? Disagree? Have something to add? We'll provide the space. This is, after all, your magazine.

CALENDAR

Upcoming Events

JANUARY

Winter Consumer Electronics Show: Las Vegas, NV. Contact: (202) 457-8900. January 6-9.

ATE & I West (Automatic Test Equipment & Instrumentation): Anaheim, CA. Contact: (800) 223-7126. January 9-11.

SMART V (Surface Mount & Advanced Related Technology): Lake Buena Vista, FL. Contact: (202) 457-4932. January 15-18.

Winter NAMM (National Association of Music Merchants): Anaheim, CA. Contact: (619) 438-8001. January 19-21.

Fiberoptic Splicing and Termination Workshop (FC2): Sturbridge, MA. Contact: (508) 347-7133. January 22-26.

San Diego Electronics Show: San Diego, CA. Contact: (619) 284-9268. January 24-25.

INTERNEPCON Japan: Tokyo, Japan. Contact: (203) 964-0000. January 24-27.

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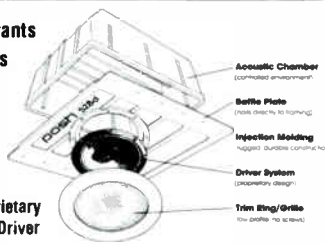
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FIRST PERSON

TRIBUTE TO A FRIEND

As reported last month, Deane Jensen, of Jensen Transformers, died suddenly in October. Gary Davis has written a personal letter to the industry in memory of Deane. Davis's thoughts follow:

Deane Jensen and I met in 1972 when I was working as a technician for Automated Processes, Inc. in Farmingdale, NY. Deane had been sent there as a consultant for Wally Heider Recording Studios to do the final acceptance/checkout on a large recording console API was building for Heider. Deane ended up staying in New York for several months to oversee completion of the console through many bug-fixes and improvements. Due to the length of the unplanned stay, he was invited to move out of the motel and share a house with my roommate, engineer Fred Addison, and I for a couple of months.

I learned a lot from Deane about the application of scientific principles and ethics — at a point in my early career where a lasting impression was made. Our friendship grew, and when I moved to California a year later, Deane helped me get established. Jensen Transformers became one of our first clients, and our relationship was always one of mutual respect.

I especially learned from Deane that there is a best way to do something — that "good enough" is not really an option when perfection is the goal.

Those who did not know him well sometimes thought of Deane as being somewhat aloof. In fact, he was very warm and concerned about his friends. If he thought he said something that might have been in some way offensive, he would often phone back and make sure there was no insult or misinterpretation. He went out of his way to

make sure he was clearly and fully understood. Magazine editors winced at his insistence of a "no edit" policy on anything he wrote, but he refused to have his concepts truncated or mistakenly "improved." This was, perhaps, an extension of his attitude of not accepting anything at face value.

If some equation or theory had always been assumed to be a certain way, Deane would do his own basic research to affirm to disprove it. He seldom took anybody's word about an engineering principle without a grain of salt, and this quality served him well. It enabled him to make breakthroughs in many areas. It is why, for example, he ended up making transformers in the first place. Deane simply thought that better ones could be made, and he wanted to have better transformers to use in the audio circuits he was designing. His true goal was better audio, not just better transformers. Ultimately, he devised new ways of winding coils, and was involved in formulating special new alloys to achieve orders of magnitude improvement in transformer performance.

Deane was dedicated to his work. He was not a *workaholic* in the traditional sense, but he was driven to complete a number of ambitious projects. Many of them involved basic scientific work not specifically aimed at development of a new product. It was this unselfish, persistent, inquisitive attitude that will forever remain my most treasured memory of a good friend.

—Gary D. Davis

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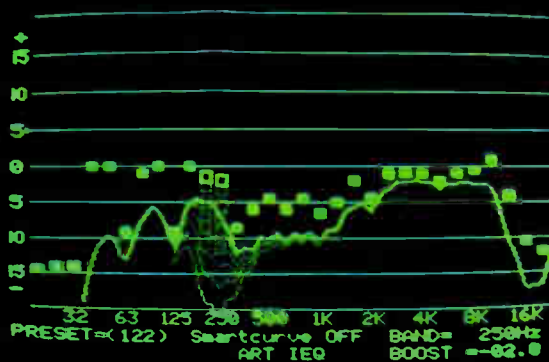
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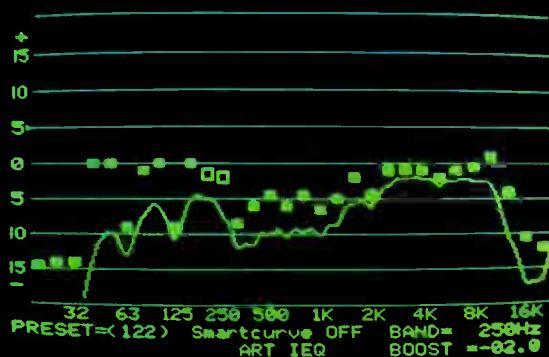
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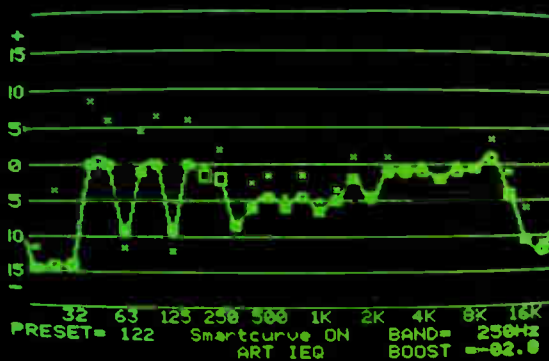
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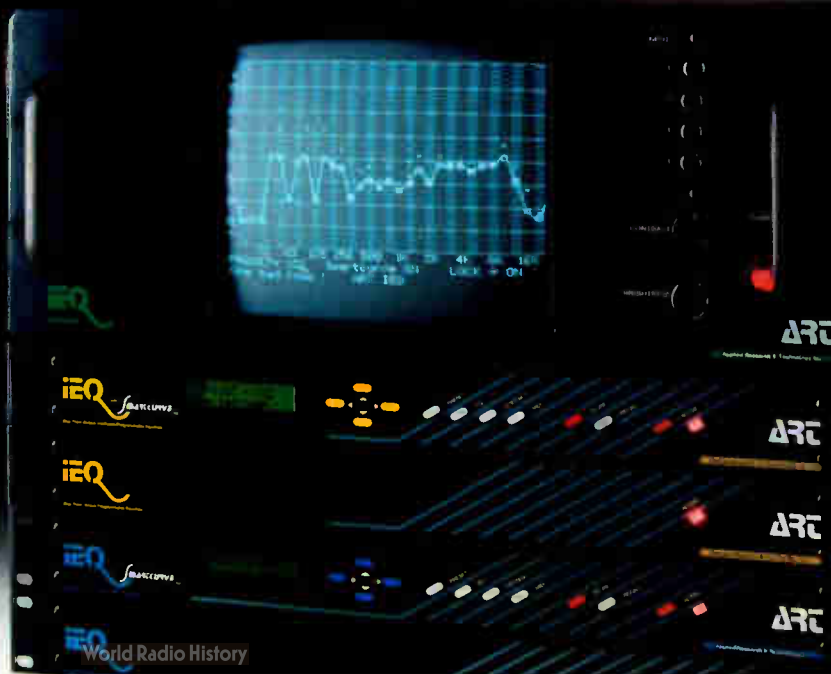
2 Hear the Sound

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