

SYNERGETIC

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AUDIO CONCEPTS

newsletter

Volume 17, Number 4

Summer, 1990

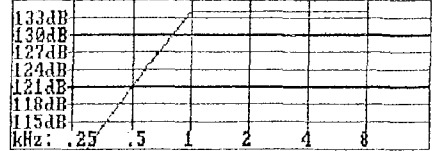
©1990 Don & Carolyn Davis

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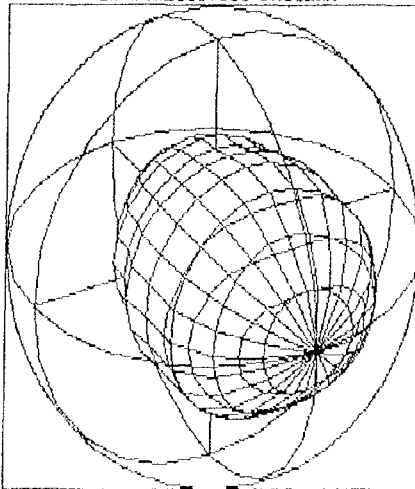
Electro—
Acoustical
Simulator
for
Engineers

EASE DATA BASE: BILL 07-09-1990 DRAW DATA BASE under LOUDSPEAKERS

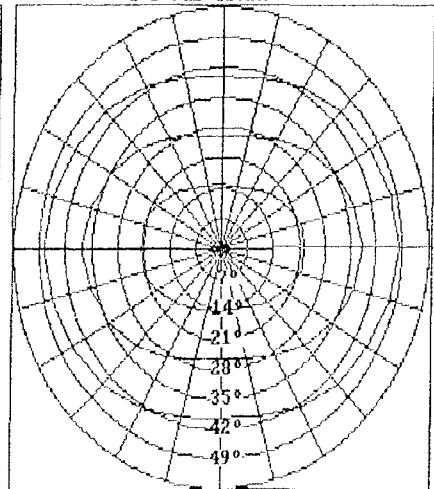
Loudspeaker: C-1 MID/HI
Frequency: 1000 Hz
Directivity Index: 12.4 dB
Selected Sound Level(1m): 134 dB



3D DIRECTIVITY PATTERN



3-6-9dB ISOBARS



EASE: SAMPLE2 BILL 07-09-1990 ENERGY GRID-3D I S 1000Hz, 1/3 Oct
Aud: A1 Lsp: S1 S2

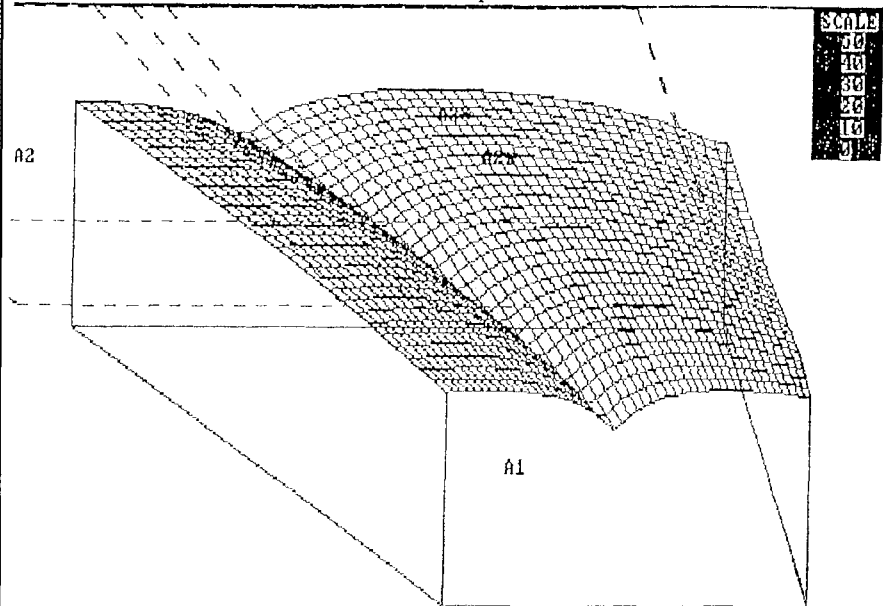


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EXCHANGE OF IDEAS

*I met a man with a dollar
 We exchanged dollars
 I still had a dollar*

*I met a man with an idea
 We exchanged ideas
 Now we each had two ideas*

Synergetic: Working together; co-operating, co-operative.

Synergism: Co-operative action of discrete agencies such that the total effect is greater than the sum of the two effects taken independently.

Editors: Don Davis
 Carolyn Davis

Design & Layout: Dashia Alfonso

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When Do I Renew?

You can check to see when your subscription will expire by checking the mailing label on the envelope in which your newsletter was mailed. In the upper righthand corner, beside the name, a date will appear (i.e. 4-90). This means that you will receive this issue and it will be the last issue sent unless you renew. Renewal notices will be sent at this time. You must renew before the next quarter's newsletter is mailed or your subscription will become inactive.

Electro-Acoustical EASE Simulator for Engineers

- (d) The ETC
- (e) Surface reflections
- (f) Spatial direction to source
- (g) Magnitude vs phase

4. The coverage plots wrap around real space obstacles in the proper manner and the program can see "shading" by balconies etc.

5. Absorption, diffusion and diffraction are accounted for in the virtual imaging process.

The manual for this one is going to be good sized just to tell all that it can accomplish. Again, we had not expected to see a program this complete until late in this decade.

EASE is technically correct, in color, with windows for operator choices, including amplitude and phase and capable of 500 virtual image traces that includes the effect of speaker Q in one minute and 11 secs on my 386-33 IBM clone. It certainly stands as a benchmark for other sound system design programmers. We are currently demonstrating a beta version in our farm classes.

Dr. Ahnert visited us at the farm in June. He shared with us the remarkable events in eastern Europe—which meant a lot to us for we had stood on both sides of The Wall with him in 1988. (We were in Berlin as the guests of the Janssen organization who does so much audio work in Moscow.)

Dr. Ahnert showed us a very advanced computer program developed by Dr. Ahnert and Rainer Feistel of Rostock (formerly East Germany).

EASE

Electro—Acoustical—Simulator for Engineers is the name given this new effort. This is the first acoustic design program we have seen that answers almost all the requirements we feel are fundamental to useful application of such programs to the prediction of what real systems might do when installed.

Just a few of the highlights are:

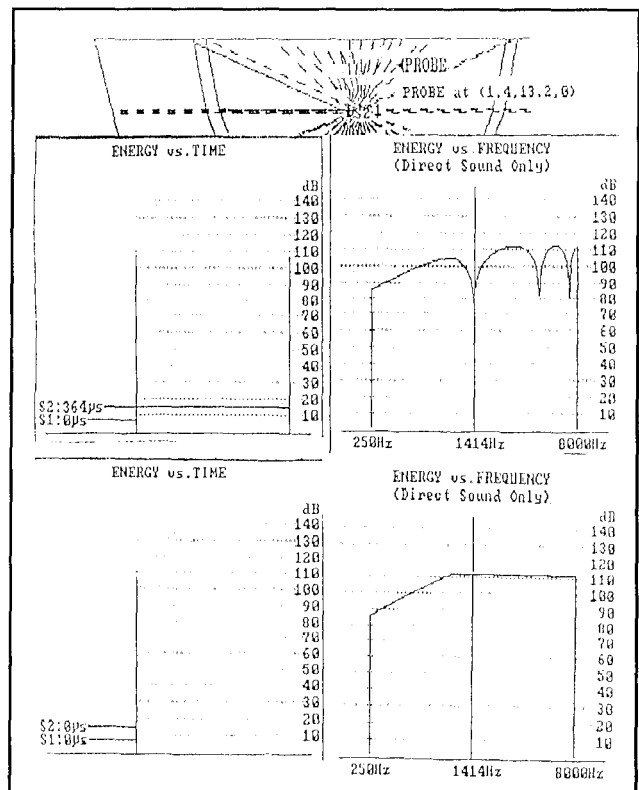
1. When multiple sources are turned on and are out-of-alignment,

the windowed frequency response curves superimposed on the drawing of the space show the appropriate comb filters.

2. Normal polars, both horizontal and vertical, can be called up in 1/3-octave intervals and the Q of the loudspeakers is taken into account during the virtual image tracing.

3. You can call up an icon called the "probe" and move it on the room perspective to any measurement point desired and see:

- (a) The RT₆₀
- (b) The RASTI and %ALcons
- (c) The C7, C50, C80, C100 etc.



This measurement provides the ability to see missynchronizations at the drawing board stage and to dial in the appropriate precision delay corrections.

Renkus-Heinz To Distribute EASE

Renkus-Heinz has purchased the rights to EASE and will have it on the market in September if all goes as expected. (Harro Heinz and Dr. Ahnert were born in villages only a few miles apart and have been friends for several years.)

Dr. Ahnert will be in Los Angeles for the AES (with his wife, which gives us great joy for we suffered with him when she was not allowed to travel with him.) EASE will have an open data base and Renkus Heinz is encouraging others to supply their

data.

Dr. Ahnert and his associates are proof once again that good men, even under a totally depressing regime can maintain their mental integrity and, even without proper material tools, use their minds as free men.

Perhaps the West Germans best realize this inasmuch as they are putting their money where their mouth is to include the east back into the whole Germany.

We have no doubt that such men must exist everywhere and the world needs to find them. □

Vaclav Havel, the new president of Czechoslovakia, speaking before our Congress, said:

"The...totalitarian system..has brought us horrors that fortunately you have not known."

"It has given us something positive, a special capacity to look from time to time somewhat further than someone who has not undergone this bitter experience. A person who cannot move and lead a somewhat normal life because he is pinned under a boulder has more time to think about his hopes than someone who is not trapped that way."

Renkus—

Heinz

Inc.

A New

Sponsor

Syn-Aud-Con's newest sponsor is the Renkus-Heinz Inc. of Irvine, CA.

We have known of Harro Heinz since his days at Fisher Radio where he was chief engineer. We became personally acquainted when he headed up Rauland Borg. We had worked with Jonas Renkus in our Altec days (Jonas was at LTV Research with John Hilliard.)

Renkus-Heinz Inc. has come a long way in the 11 years since Jonas Renkus and Harro Heinz founded the company. Jonas is no longer with the company and the company is no longer just another small manufacturer of horns and drivers.

Today, Renkus-Heinz is a full line manufacturer of horns, drivers and associated signal processing equipment, plus a broad line of both passive and active speaker systems. Renkus-Heinz is a leader in the development of Processor Controlled Systems and holds several key processor design patents. One covers their exclusive SPT (spectral power transfer) circuitry that actually shifts the systems crossover point to provide protection against over-excursion. Another patented circuit protects the loudspeakers against sense line failure or interruption.

Harro recognized the importance of the world market early in the company's history and the company has been active overseas for a number of

years. As a result, they are widely recognized overseas as one of the leading US manufacturers of professional audio equipment.

They also are one of the first manufacturers who recognized the relevance of the PHD computer program to their distribution and got behind it to insure that their dealers were capable of accurate room and array design work.

As a result of that experience, they were equipped to appreciate the remarkable jump forward the Dr. Ahnert EASE program represented. Bill Gelow's superb AES paper (Fall 1989) on measuring array parameters put him in the position of knowing a superior approach when it arrived.

Renkus-Heinz recognizes the importance of training and regularly sponsors 3-day System Design Seminars for their worldwide dealer organization. The seminars are also open to other interested parties and include guest lectures. The next Seminar is scheduled for next January immediately following the NAMM Show in Anaheim. We will be on hand to participate in the program.

Harro, Carl Dorwaldt and Bill Gelow have put together an outstanding team that you should get to know better. If you aren't already acquainted with them, give them a call at 714-250-0166. □

In-the-Ear (ITE)TM Microphones Now Available from Etymotic Research for \$2,500 per Pair

After two years of work, Etymotic Research now has the new ER-7D (the D is for Davis) microphone system for sale to those desiring to do advanced recording work. These are new, quieter microphones employing very small, very soft silicon probes. Each system consists of dual battery powered preamps with DFI filters included, two microphones, and interconnecting cables. Probes may be purchased in lots of 50 for \$25. These new microphones sell for \$2,500 for the pair.

The ER-7D dual microphone system installed in a superior human head and connected to a Sony Pro

DAT-10 or equivalent makes up a totally portable, totally battery operated state-of-the-art recording system. It is our opinion that this combination has no rival priced under \$25,000.

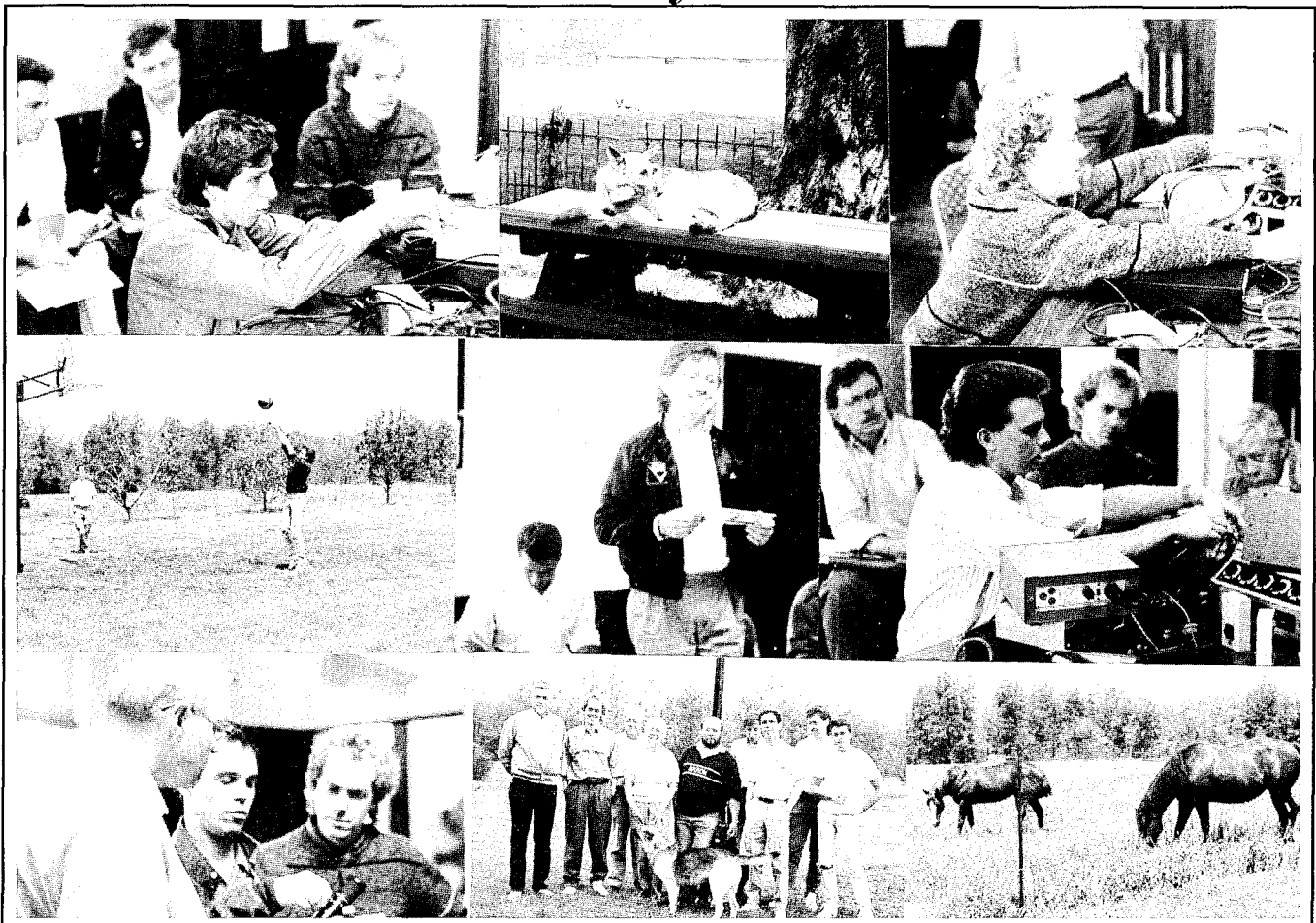
We are especially pleased with the stronger probe connection that allows greater freedom of movement for the wearer of the microphones. As ENG Stereo TV develops, we expect to both *hear* and see the excitement of the future.

Contact Etymotic Research at 61 Martin Lane, Elk Grove Village, IL 60007. Phone 312-228-0006. □

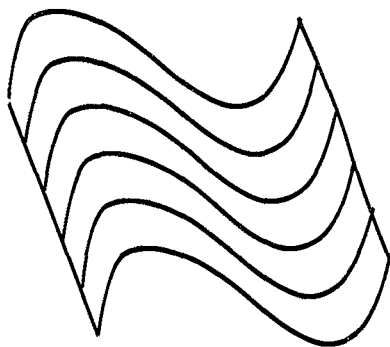


Tom Zorn wearing the Etymotic Research microphones for a recording at Troy Music Hall

The Farm—May 10-12, 1990



Altec Vari Intense Horns



We were pleased to see Altec has introduced two new horns labelled "Vari Intense™." One is the VIR, variable intensity—rectangular and the other is the VIT, variable intensity—trapezoidal.

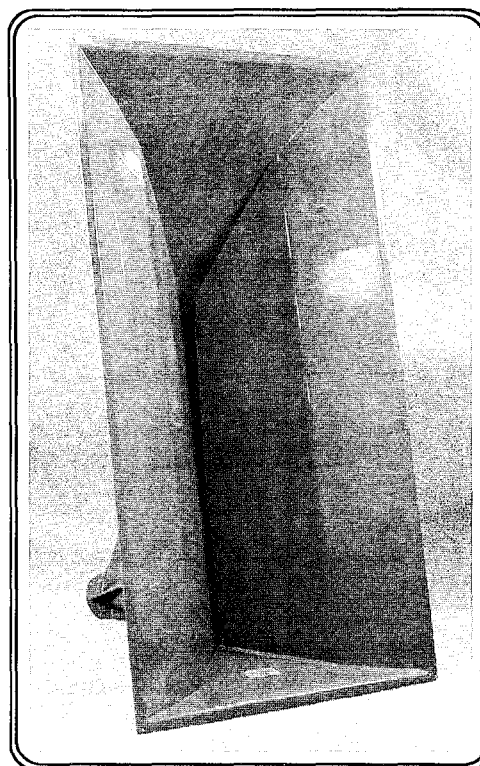
As readers of these Newsletters are well aware, we wholeheartedly support the concept of looking at de facto audience areas and mapping back to what would be an ideal device for covering that area.

We have not had a chance to test these horns but have little doubt that they will distribute acoustic energy more effectively to the two types of areas named. Since, in a freefield, the sound pressure squared level and the acoustic intensity level (watts per square meter expressed as a level) are directly related, the achievement of one should establish the other provided the sound pressure squared level remains frequency independent at each point of observation.

While this concept can provide excellent uniformity of coverage for a given geometry, one must always consider that the reason for using multiple sources in some spaces isn't because a single source couldn't cover it, but because it couldn't cover it and provide speech intelligibility.

Always checklist the acoustic triad before selecting a given sound source:

1. Coverage



The VIR and VIT makes it possible to tailor horn coverage to the shape of a particular seating area.

2. Intelligibility
3. Acoustic gain

All three must be satisfied.

Our congratulations to the team at Altec that decided to address this kind of fundamental solution to our everyday problems.□

Syn-Aud-Con Pet Peeves

Innocent ignorance is excusable. If any of the following claims are innocently made, our apologies and our incredulity.

Falsity in advertising is as ancient as the art, but when what is being advertised is a claimed or implied technical truth, we object. The following list of claims is particularly offensive and we pray no Syn-Aud-con grad gets caught in their nets:

1. Claims for audio cables at audio frequencies that only occurs at RF frequencies,

2. Equalizing room parameters,
3. Computer games disguised as design programs,
4. Claiming 'Q' doesn't count,
5. Taking the RT₆₀ measurement in small "dead" rooms,
6. Arrays that are called "point source" (an oxymoron),
7. Claims for cabinet shapes controlling directivity when the frequency range under discussion is covered by a horn,
8. Claiming coherence for corrupt sources,
9. Lining up the woofer and midrange in a loudspeaker cabinet and calling it in alignment,
10. Calling sensitivity efficiency.

These are but a few of the current attempts to rewrite the laws of physics.□

Measuring the Magnitude of the Frequency Response

Most of us were raised with frequency response curves that had a vertical scale in dB and a horizontal scale that was logarithmic frequency.

With the advent of FFTs we began to use linear frequency scaling because of the inherent constant bandwidth filter characteristics of such devices.

Both forms of scaling have advantages with logarithmic useful for looking at filters and linear for seeing signal delay effects. We have suggested, since the advent of the first TEF analyzer, a three decade measurement with linear frequency scaling of each decade. We did this recently on the TOA enclosure with the 4' speaker that we use in Syn-Aud-Con class demonstrations.

Low Frequencies

Since we can, with ease, work down to 200 Hz in the laboratory in the

old farm house, we decided to make the frequency range from 20 to 200 Hz a nearfield pressure measurement by placing the microphone about 1 inch (2.54cm) from the loudspeaker. Our frequency resolution was 14Hz. We then measured out to 250Hz and later trimmed the result back to 200Hz with a pair of scissors.

High Frequencies

We then backed off to 3.28 ft (1.0 meter) and ran the frequency range from 150Hz to 2500Hz in order to get a detailed 200 to 2000Hz record. Here our frequency resolution became 250Hz.

We then did 1500Hz to 25,000Hz in the same manner. The results of the three measurements joined together can be seen in Figure 1.

Figure 2 is a comparison of the

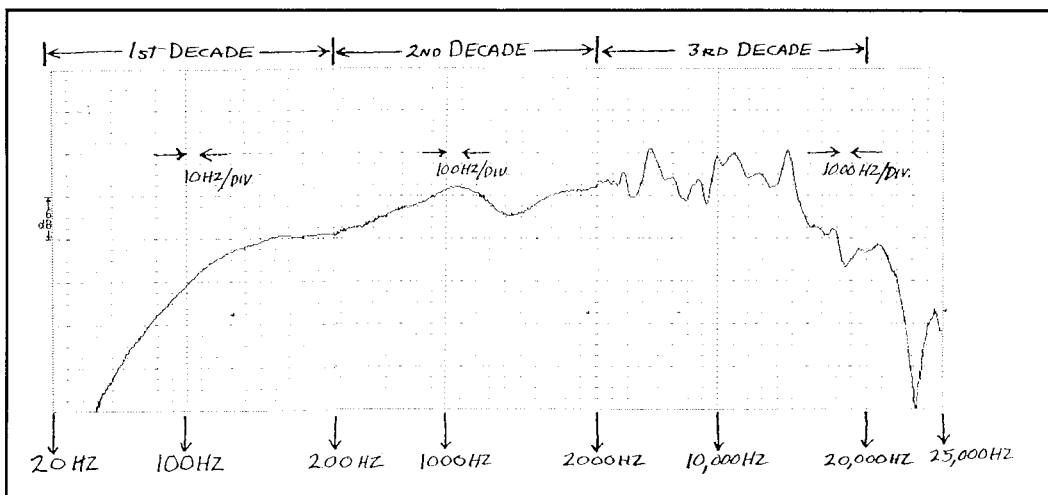


Fig. 1—The three decade measurement of a TOA 4" in an infinite baffle

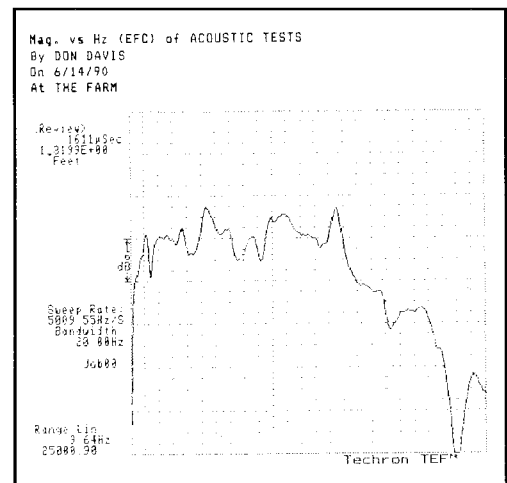


Fig. 2—Linear scale frequency response 10 Hz to 25,000 Hz, 250 Hz resolution

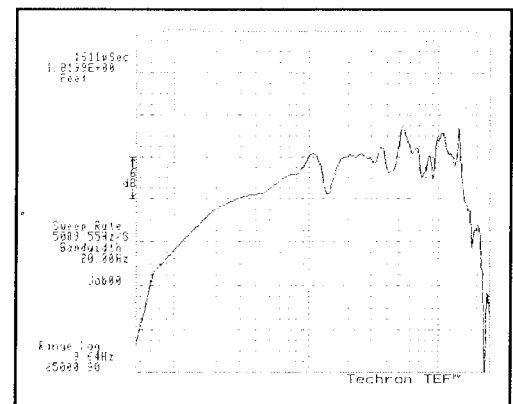


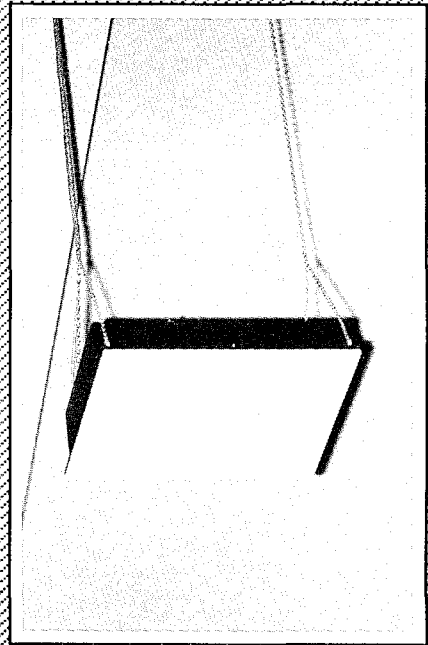
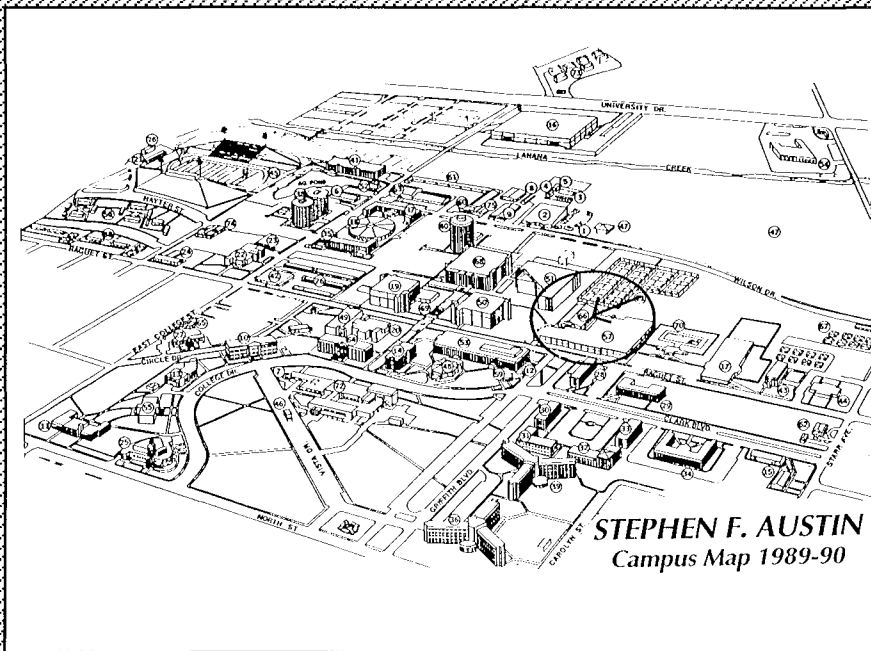
Fig. 3—Log scale frequency response 10 Hz to 25,000 Hz, 250 Hz resolution

range 10Hz to 25,000Hz with a 250Hz resolution on the linear scale. Figure 3 is the same measurement on a logarithmic scale.

We would be the first to agree that there is always more than one way to do a measurement. I think the three decade, linear scale per decade overview is near ideal as a first look at the main audible variations in the magnitude of the frequency response (especially if the accompanying phase response contains no singularities).

This will be a measurement that we will request when we certify an LEDE room. □

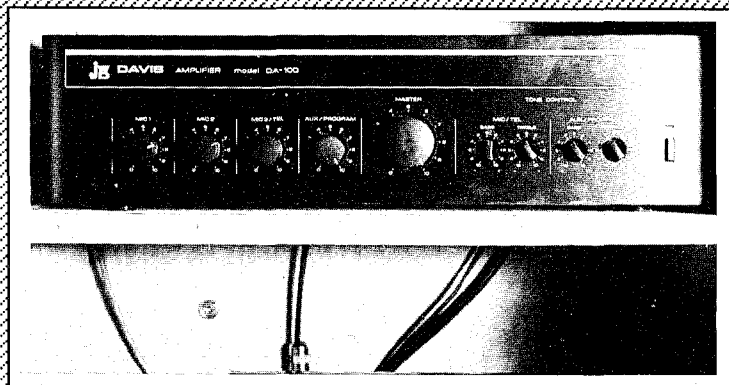
J. W. Davis CCS-50 Ceiling Loudspeakers Installed in the Shelton Gymnasium



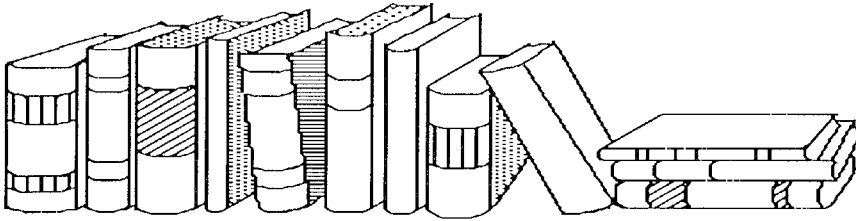
The J.W. Davis CCS-50 Ceiling Loudspeakers were installed in a gym used for intramural athletics. This is an excellent choice where wide range music is required in support of aerobics, dance, volleyball etc. The nine speakers are mounted about 25' above the gym floor. The speakers can be mounted in 2' x 2' ceiling grids, but where that is not possible the speakers can be hung from the ceiling using their own enclosed baffle.

William Aikin of the Maintenance Department at the Stephen F. Austin State University installed the system and is delighted. He says that the intelligibility and coverage is excellent.

The CCS-50 lends itself to easy installation and superb performance for full fidelity reproduction.



Inventor's Guide to Successful Patent Applications



Don Heavener in Miami is a prolific inventor. He has shared several of his ideas with us, one which we have shown in class several times (the pressure zone loudspeaker). Because he hasn't patented the ideas, they get used by others.

The patent process through lawyers is an expensive proposition. Don has a new product that he has invented that he wants to see developed. A book was recommended to him by a lawyer friend which he is using to patent his new idea.

The book is *Inventors Guide to Successful Patent Applications* by Thomas E. DeForest. ISBN 0-8306-9335-1. Tab Books \$15.00. □

Coaxially Mounting Large Horn Components

There is a saying that nothing can stop an idea whose time has come.

The coaxial concept, mounting a separate high frequency horn in the mouth of a horn-loaded, low frequency cabinet, was developed in 1982 by Dr. Patronis for the J.W. Davis company (the Pataxial 150 and the Pataxial 75).

The staff from American Audio in Ruston, LA has published a very interesting history of the bridge that American Audio built between the Pataxial and the new coaxially mounted large horn components now marketed by Community, Frazier and Renkus-Heinz. The article was published in the September 1989 issue of *Sound & Video Contractor*. It is a story about a product whose time has come. It makes fascinating reading. For an earlier story on Patronis' involvement in the project, see *Syn-Aud-Con Newsletter* Vol. 15, No. 3, pp. 9 & 10 for the original publication of the experimental data.

Figures 1 and 2 from the article illustrate an important asset of coaxially mounted loudspeaker components. □

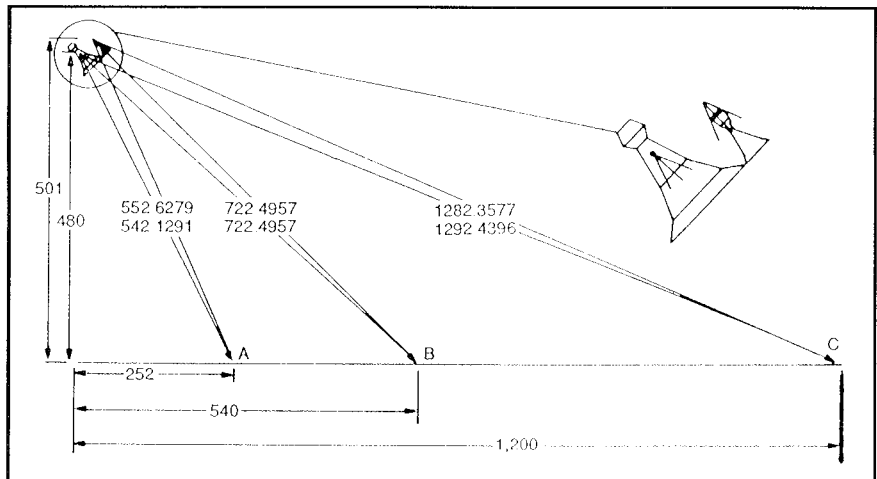


Figure 1. This traditional cluster arrangement may at first seem fairly easy to align for the seating area. However, as shown, the misalignment of the acoustic centers cannot be corrected with a delay because the difference between the apparent acoustic center moves as the listening position changes front to rear in the seating bank.

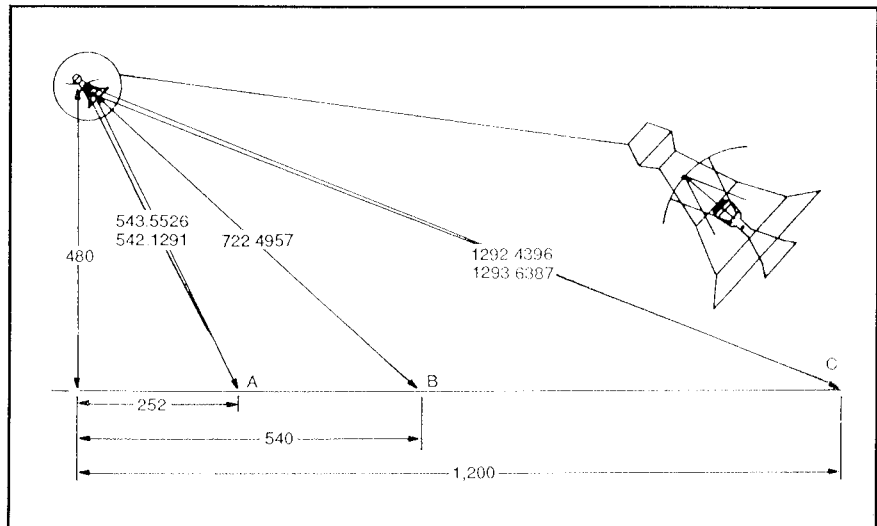


Figure 2. The Hi-Q Concept. This configuration provides increased directivity in the lower midband, space savings and the sonic advantages of the coaxial. Notice how the coax stays aligned throughout the seating area.



We have been using the Benchmark MIA-4x4+ mic preamp for the playback of our In-the-Ear recordings (plus a special black box that Allen Burdick - president of Benchmark - made for us.) Allen wrote us a letter recently that I would like to reproduce in part because it reflects the joy that Allen gets from his business of producing outstanding products.

Dear Don:

I am very pleased that you have been using the MIA-4x4+ mic preamp to good success. I now have over six CDs that were mastered with our preamps by Telarc, including some Beethoven piano sonatas that are simply magnificent, and two CDs from the Connoisseur Society with more coming. There are others that I have not yet had a chance to get,

including one Horowitz piano CD on Deutsch Grammophon, and some jazz CDs from Chesky records. WGBH in Boston, in addition to owning a unit of their own, recently took one of our MIA 4x4+s, some B&K microphones and an R-DAT recorder to Rumania to record the music of Trans-Sylvania. The producer for that expedition, Mr. Joel Gordon, commented that he had fallen in love with these mic preamps, particularly after comparing them in listening tests to a very popular transformer input product and had thus decided to purchase them himself.

Studio Sonics in the Chicago area works with the Minneapolis Symphony. They noted that, compared to everything they had listened to, the MIA-4X4+ has the clearest, most transparent sound.

So as you can see, I get a great deal of pleasure from this one aspect of our business.

If you haven't received Benchmark's catalog of their full line of quality products, write: Benchmark Media Systems, Inc. 3817 Brewerton Rd., North Syracuse, NY 13212. 315-452-0400.

New York, NY—October 16-17, 1989



SYN-AUD-CON

1990 SUMMER SEMINAR SCHEDULE

3-Day SEMINARS

The Farm in Indiana, 1990

August 23-25—Dr. Eugene Patronis, Assistant Instructor

September 13-15—Kurt Graffy, Assistant Instructor

October 11-13—Peter Mapp, Assistant Instructor

Registration Fee

At the Farm—\$525 for three days

Intelligibility Workshop II

October 7-9, 1990

In October Syn-Aud-Con is again going to lead the way into very new and very exciting insights into system design for speech intelligibility and its correct measurement. New tools include:

1. Advanced quieter ITE microphones with new easier-to-use probes.
2. The best in DAT recorders.
3. Predictive programs undreamed of a year ago.
4. The new TEF 20 and Ariel Sysid measurement systems.

The 30 individuals fortunate to be a part of Intelligibility II will receive unique training and calibration. We will use the facilities of the Indiana University Speech & Hearing Department to make a complete hearing evaluation - including air and bone conduction pure-tone testing, speech audiometry, middle-ear impedance measurements, acoustic reflex testing and ear impressions or molds of the outer ear and ear canal, and pinna

measurements of all attendees.

They will have experienced what others received at their cardrums and where they stand in the hierarchy of listener acuity so far as speech intelligibility perception is concerned.

*The 30 Individuals
fortunate to be a
part of
Intelligibility II
will receive unique
training and calibration*

Dr. Larry Humes at Indiana University, Peter Mapp from Great Britain, and Don & Carolyn Davis are the instructors. This is a serious scientific inquiry into the variability of listeners and the proper design and measurement compensations that this forces.

Many in the acoustics community

recognize the inexorable link between intelligibility measurements and successful design. The cause and effect relationships found while measuring the problems leads to a deeper understanding of how to avoid such problems at the design stage.

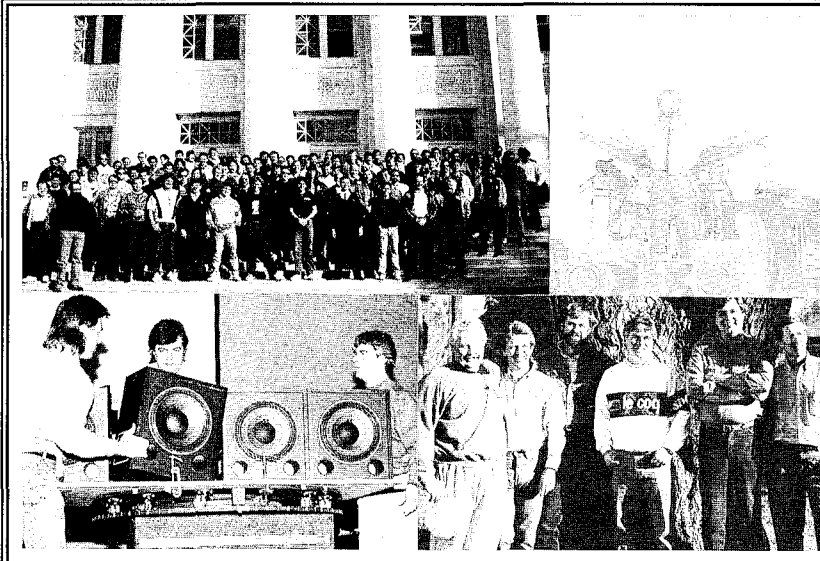
On the other hand, reading a majority of the industry magazines quickly reveals a massive ignorance of either how to measure or what to measure.

Those attempting to imitate Syn-Aud-Con's work in this field need to think through a very important basic fact: Syn-Aud-Con did not imitate anyone. Therefore, if the effort is merely to duplicate earlier efforts with less care and understanding of the problem, they will always find themselves in the position expressed by a dying entrepreneur to his heirs about his so-called competition:

"They copied all they could follow, but they couldn't follow my mind. So I left them sweating and stealing a year and a half behind."

To those still trying to measure speech intelligibility to the second decimal place in dead rooms, what we are doing will remain a mystery - but then so is what we have done. □

Concert Sound Reinforcement Workshop — 1990

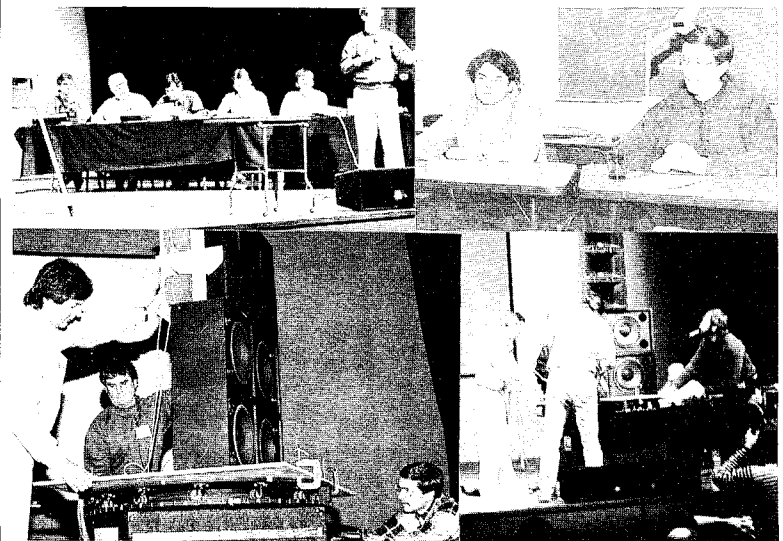


The second concert sound workshop was as heavily attended as the first. Again, a remarkable staff:

Will Parry	M. L. Procise
Roy Clair	David Scheirman
Albert Leccese	Mick Whelan

Attendees came from 5 countries, 24 states, 28 from manufacturing firms, 37 from sound companies, 5 consultants, 2 government agencies, 15 from facilities (auditoriums, etc) 8 from the press, and the staff which meant that there were well over 100 people from an industry they love, sharing and giving during the 3-day workshop at the beautiful Chapman College campus.

Will Parry shared a vast amount of very practical business how to's with the workshop. It is impossible to be with men like Parry without coming away with the realization that these men would have been successful at anything they turned their hand to. Will pointed out that the touring sound industry was about \$50,000,000 a year - less than what General Motors produces in one day. Will said that it is a business that we are in because we love it. And it comes across. If one had to sum up in a few words the message that the staff had for those attending it was: love your client, respect your client, have integrity, give everything you got, and be the best!

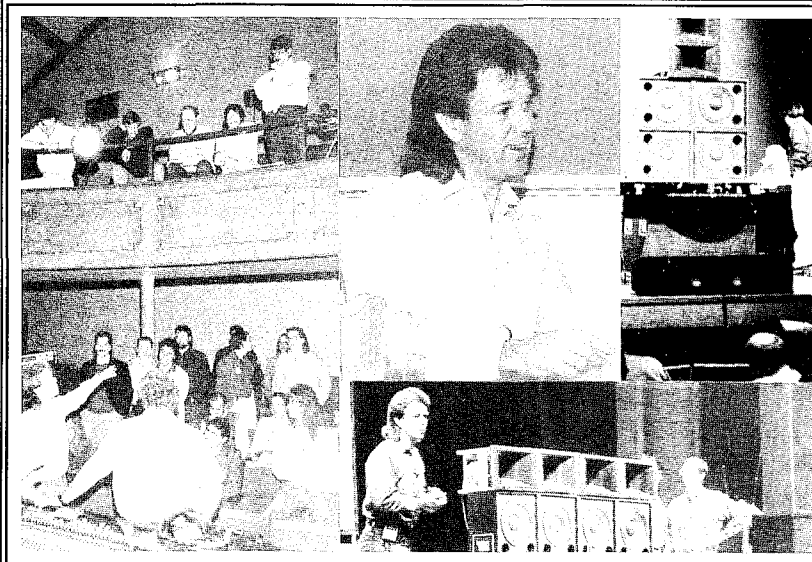


Mick Whelan shared a good deal of his hard won knowledge with the workshop. He is a truly inquisitive and intuitive researcher into the behavior of complex loudspeaker arrays.

Mick brought in a mass of speakers and proceeded to let the workshop hear how each arrangement sounded. After the extensive ear-brain workout he backed up what had been heard with extensive detailed TEF measurements.

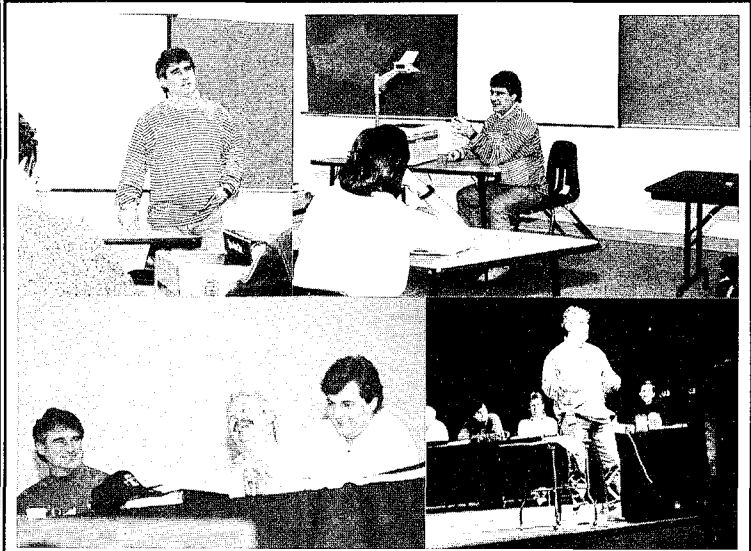
Mick's love of the truth is evident. He wants to know! and nothing short of a full investigation will satisfy him.

At both of our Concert Sound workshops Mick's dry humor and wit entertained as well as educated.



Roy Clair is, of course, a legend in his own right. The workshop benefited from his extensive experience and his ability to generalize his background into a philosophy that, if followed, would help everyone attending the session to advance rapidly in this very specialized business.

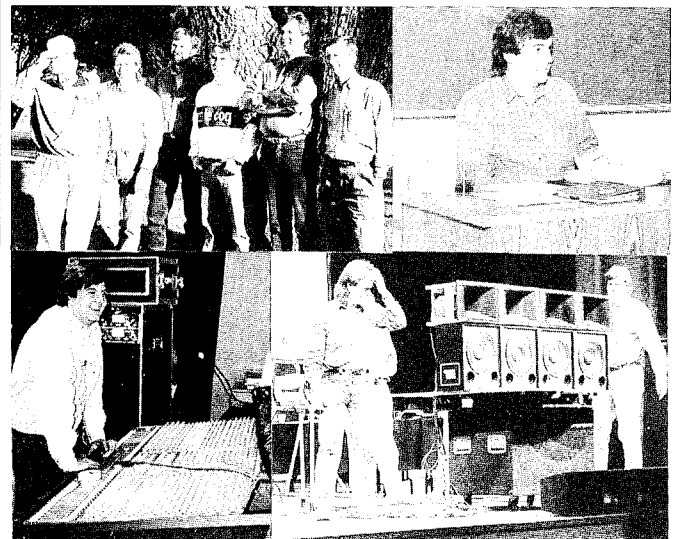
Roy told the members of the workshop that they were very lucky. When Clair Brothers started audio manufacturers did not make equipment that would take the abuse of touring sound and they had to design and build their own. Now manufacturers are putting a lot of money into research & development and we can buy good equipment off the shelf -- while the big 5 still have to design & build to maintain a competitive edge.



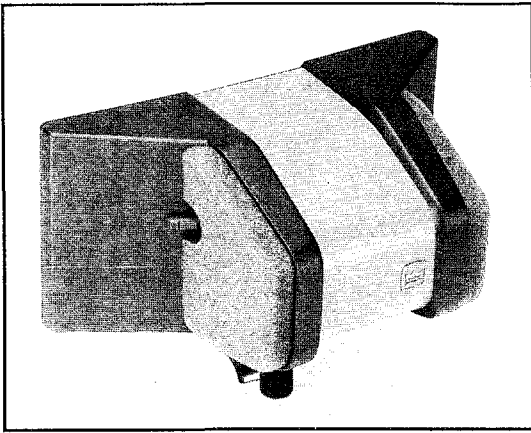
M. L. Procise is probably the most sought after mixing artist/engineer in concert sound. In both workshops M. L. worked his magic both technically and personally. M. L. is a litmus test for other personalities. If you can't relate to M. L., you may be in need of help. A totally likable, self effacing man who plays "Bubba" until it creeps in on you how much this guy knows and how skilled he is at applying it. M. L.— like Will Parry, Roy Clair, Albert Leccese, Mick Whelan, and David Scheirman is just further proof that concert sound work doesn't make great men. Great men made concert sound work.

Watching Albert Leccese handle the monitor mix with M. L. Procise as the performer was a mixture of "I Love Lucy" and Hamlet. M. L. played the part of the sadist performer to perfection while Albert soothed him with both patter and sonic performance. Just as race cars sort out the unfit into either hospitals or premature retirement, so concert sound work sorts out those not quick witted enough, humble enough, and good humored enough to retain their own sense of value while occasionally dealing with artists that may have lost theirs.

Al's expertise includes all aspects of the tour sound business, but he spent a lot of time discussing the importance of organization and planning every detail of the packaged system for the special needs of the client.



Photos by Joe Spiegel of Pro Sound News



The Crown SASS Microphone System

The press release here is, to my mind, the ideal way to promote a new microphone system. The talker is not mentioned, though I suspect that there is a narrator, hopefully on the same microphone system. Certainly we were delighted to send \$4.95 to cover postage and handling.

Our own initial impressions of SASS is that it's the easiest acceptable way to make TV stereo audio pickup. We are sufficiently impressed to continue exploring SASS's potential in far greater detail. □



PRESS RELEASE

Produced by Crown International and Michael Billingsley, a new CD featuring recordings made with Crown's SASS-P microphone is now available free of charge from Crown Corporate headquarters in Elkhart, IN. More than a mere demo of the popular stereo condenser microphone, the CD runs over an hour in length and contains a wide-ranging assortment of live music, studio music, stereo sound effects, samples, and A/B comparisons with other stereo microphones. An effective tool for demonstrating stereo equipment or making your own samples, it is just plain entertaining as well.

....To round out the package, each CD comes with an extensive amount of documentation revealing how each recording was made. Photos incorporated with the documentation also reveal microphone placement and what the actual recording sessions looked like while underway.

To obtain a copy of the SASS CD, please write to SASS CD, Crown International, PO Box 1000, Elkhart, IN 46515. While the disk itself is offered free of charge, please enclose a check or money order for \$4.95 to cover handling and postage charges, and allow 3-4 weeks for delivery.

The Four Horsemen

The four horsemen of the aquarian apocalypse are: Vulgarity, Stupidity, Ignorance, Cowardice. One has only to travel down the highway to witness the first three regularly, and face-to-face encounters with the same individuals usually reveal the fourth.

We much prefer the company of men and women with a strongly developed ethical sense based upon an un-

wavering morality. This is usually a matter of family background rather than schooling and we are pleased to observe these qualities in a majority of the individuals who attend our classes.

Our grads may not individually feel they are the top man or woman in the business, but we know that they can outperform 99% of the non Syn-Aud-Con grads out there. □

A View From the Cellar

This Spring in Indiana was, we hope, most unusual - first a very premature prolonged warming that caused everything to bud and then a freeze: no blackberries or peaches.



We then saw true flash flooding of our small branch below the house as the deluge arrived, stayed, stayed, stayed, stayed and stayed. About 30 minutes later after it rains that hard, what has been a small stream that one can literally step across begins to have surges, each a little higher than the last, until a stream 50 feet wide carrying full sized tree trunks takes its place.

When it was observed that we now have two dogs, two llamas, two horses, two goats and four cats, it was suggested that we might be building an ark. Fortunately, the farm is in the hills and all the water flows away rapidly with only the deep ravines experiencing the results.

It is an old saying that "corn should be knee high by the 4th of July." This year it barely made it. Two years ago, I couldn't touch the top of the corn on the 4th.



Now, I'm a student of lightning storms. I respect them and enjoy watching, from a safe viewing point, the truly spectacular displays they can generate. This year the sky literally turned green, lightning whirled in circles and a major tornado passed by 1 mile away - in the air. Three miles east of us it lowered and destroyed a series of homes as well as full sized high tension line steel towers.



Just west of us, Petersburg and Bedford made international news as this same tornado did major damage. Its winds were reported to have exceeded 300 mph.

We had calls from all over the world inquiring about our safety, and we want to thank those most thoughtful people for their



The photograph above shows the remains of the home of Eva Davidson of the Clearspring neighborhood. Mrs. Davidson's car (in the background) was flipped onto its top by the storm.

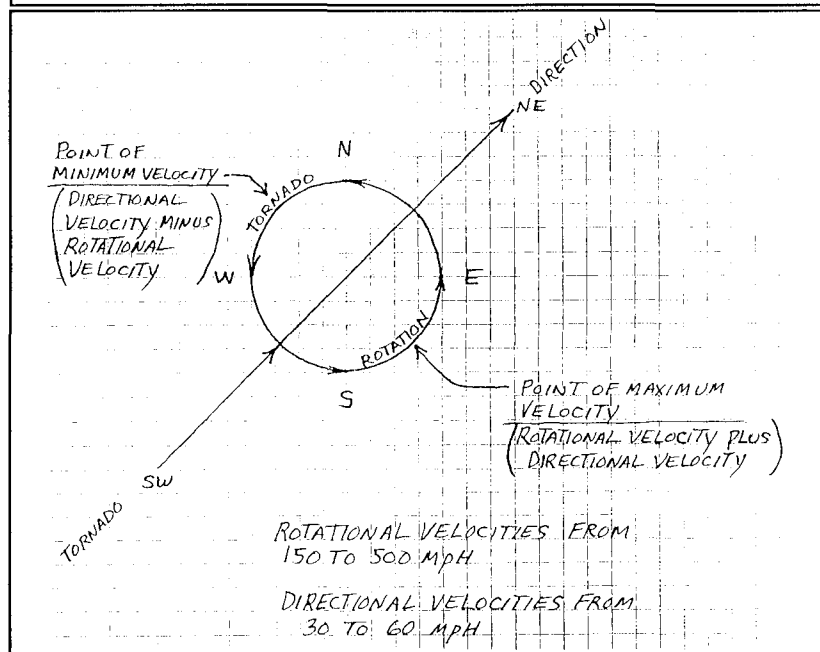
calls.

The result of the water is that the farm is particularly beautiful this year with grasses and forests abounding.

May and June classes are now past with wonderful grads adding to a long and distinguished list. I will slip in a sentence here: If you have always wanted the Syn-Aud-Con experience, do it now.

Incidentally, "the view from the cellar" is the safe viewpoint alluded to above.

Maximum & Minimum Tornado Velocities



Two Handy Synchronization Equations

$$d \text{ (in inches)} = \left(\frac{t c}{10^6} \right)$$

$$t \text{ (in microseconds)} = 10^6 \left(\frac{d}{c} \right)$$

Where: c is the velocity of the media in inches per second (i.e., (1130"/sec) (12) = 13560"/sec.
 t is the delay in microseconds (usec)
 d is the distance in inches

Example

For a distance of one inch

$$t = 10^6 \left(\frac{1''}{13560} \right) = 73.75 \text{ usecs.}$$

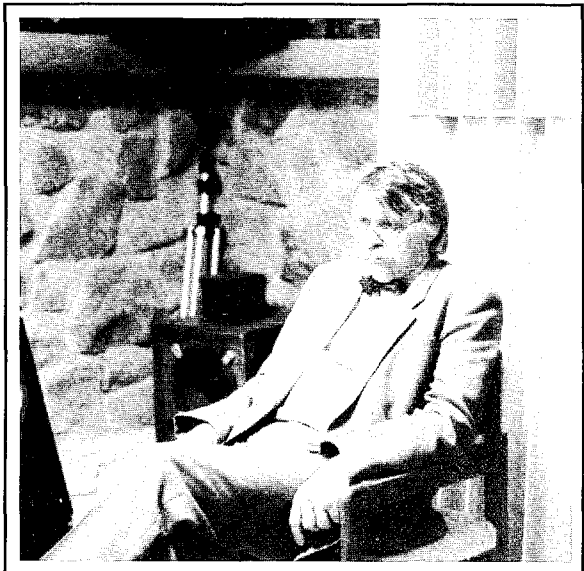
For 73.75 usecs

$$d = \frac{(73.75) (13560)}{10^6} = 1''$$

The Real Joy of our Sponsorship Program

One of the real joys of our sponsorship program is the sharing and interaction that we have with our family of sponsors. Many have been with us since the very early days of Syn-Aud-Con: Shure Brothers, JBL/UREI, Industrial Research, Crown, HME, and Community.

IRP paid us a visit in June that was a perfect example of everything we love about sponsors.



Dr. Ahnert listening to our In-the-Ear recordings.



Don, Dr. Ahnert, Roger Carroll, Brian Benn and Matthias Mueller.

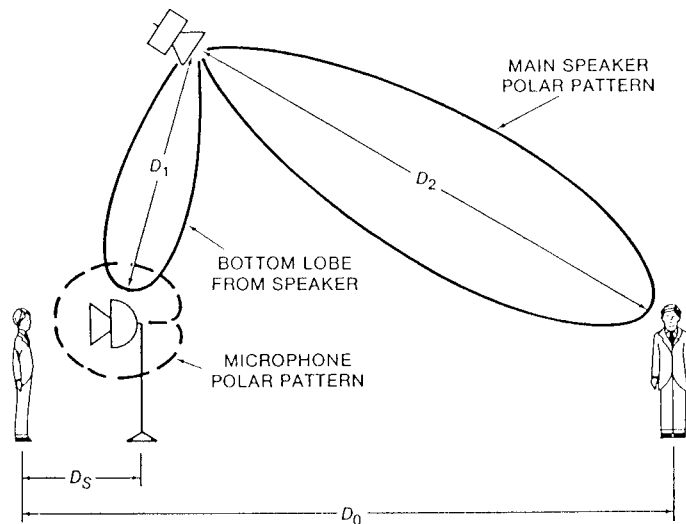
IRP had brought Dr. Wolfgang Ahnert to the United States to go over the plans for the new sound system at the Congress Hall in Moscow for which Dr. Ahnert is the consultant (tons of IRP equipment). Knowing how much we enjoy and appreciate Dr. Ahnert, Brian Benn, Vice President and General Manager of IRP, and Roger Carroll, Marketing Manager of Audio Products at IRP, flew down to our farm with Dr. Ahnert and Matthias Mueller of Koln, the IRP distributor in Germany, to spend the day with us.

It was a wonderful day — a day we will long remember!

Simplifying the Electroacoustic Modifier (M_e)

The electroacoustic modifier M_e is normally set to 1.0 for a majority of designs. It is examined on page 271 of SSE in some detail. The illustration shown here is perhaps the simplest way to envision how M_e operates. It should always be kept in mind that M_e is only useful outdoors in and indoors where microphone and loudspeaker are in very close proximity to each other such as a monitor loudspeaker and an entertainer's microphone. Whenever the loudspeaker and microphone are separated by a distance equal to or greater than critical distance D_c , then $M_e = 1.0$.

Defining The Electroacoustic Modifier M_e



$$M_e = 10^{\left(\frac{L_{MIC} + L_{SPK}}{10}\right)}$$

Where: M_e is the electroacoustic modifier

L_{MIC} is the difference in dB between the microphones on axis sensitivity toward the talker and its off axis sensitivity toward the loudspeaker.

L_{SPK} is the difference in dB between the loudspeakers on axis sensitivity toward the listener and its off axis sensitivity toward the microphone.

$$PAG_{DIR} = PAG_{OMNI} + (L_{MIC} + L_{SPK})$$

Competence Is Freedom From Hype

If good men and women don't do the best they can do all the time, then the creeps of the world rule the roost. This is true for audio as well as all the other areas of life. Talking about what's wrong accomplishes almost nothing of value and can often mesmerize the naive. There is no standard written that can stop faulty reasoning from doing the wrong thing just as there is no law written that the lawless will obey. Just as the truly free private citizen must be his own policeman (though not his own judge and jury) so a truly competent audio man or woman must have actually earned that competence not just have been appointed or anointed.

We believe that acquiring confidence in one's competence is what Syn-Aud-Con is all about. When you actually **know** what the facts about a given subject are that is a bullet proof vest against the professional audio bullshooter. Having measurement competence is being armed against rape by specification, innuendo and hype advertising.

What we are discussing here is not honest ignorance. We've all suffered that if we're honest about it. What I'm talking about are those concepts being pushed in our industry by people who we know have been exposed to the truth and turned their backs on it.

The Family Called "Rauland"



There are not very many audio companies in which the dealer/contractors are a "family". Rauland is one.

We were invited to conduct a Sound Engineering seminar in Chicago for Rauland DMs (District Managers). The picture shows the camaraderie among the DMs. We were totally surprised at the morning coffee break on the second day to have the DMs arrive wrapped in bed sheets. It seems that factory engineer, Jim Dahlquist - who also attended the seminar - got confused one night at the hotel where they were holding a sales meeting. He

opened the door to the hall instead of the bathroom, the door shut and locked behind him, at 3:00 a.m. There he stood - immodestly exposed - in an open atrium-type hallway. Somehow he managed to find a sheet to wrap himself in and made his way to the lobby to get another key.

The DMs aren't about to let him forget it!

The best part about an in-house seminar is that we learn. Tom O'Brien, our host from Rauland, took us on an early morning tour of the Rauland plant. IT'S IMPRESSIVE! We had toured the old Rauland plant years ago

and it was a delight to see the planning and growth. This all had special meaning to us because Rauland is the salvation of the Biamp company for whom we have so much respect. (We had followed for some years the struggles that Ralph Lockhart endured to save the company from extinction, first as sales manager and then president/co-owner of Biamp — and it was a company worth saving — so it was with genuine pleasure that we heard of the Rauland/Biamp marriage.)

We look forward to the cross-breeding of new products that communication between two such innovative companies is bound to produce. □

Learning the Art of Intercommunication

Bill Thrasher was on the program for the 1988 Carpenter's Home Church Audio & Music Seminar. *SoundCheck* transcribed the article to reproduce in their November/December 1989 issue.

It is very informative. Even if you know all about intercoms and private communication systems, the article is excellent to share with your customer that doesn't understand the problems.

I called Jeanne and Curt Taiple to

ask if they would be willing to copy the article for interested parties. They agreed. \$2.50 will get you a copy of this excellent 6-page article. Write or call Jeanne Taiple, 1471 Colgate Dr., St. Charles, MO 63303. 314-946-4360.

I can't resist adding what Curt and Jeannie say *About the Author*: "Bill Thrasher is an extraordinary gift to the church audio world. His credits read like a who's who in audio -- sound division for the Billy Graham crusades, member of the technical crew for the annual Southern Baptist Convention, years of work at Disney World, et. al."

Disney World is where we met Bill, and it is true, Bill is "an extraordinary gift to the audio world".

He and his family reside in the Atlanta area and Bill now has an acoustical consulting firm. □

"Contact" – An Excellent Publication from University Sound

The March/April issue of "Contact" from University Sound has a very useful tutorial on their TLA-25 and TM-2 RSP and DLT with leased Telephone Company lines in conjunction with 25 volt amplifier outputs. These components establish the correct sending and terminating impedances, levels and isolation required. It is recommended reading for Syn-Aud-Con grads.

If you are not a subscriber, you can be on their mailing list: Write University Sound, 13278 Ralston Ave, Sylmar, CA 91342-7607. Ph: 818-362-9516. □

S. N. Shure — 65 Years in Audio

In 1925 S. N. Shure founded a radio parts company -- a company that very rapidly became an innovator in microphone development.

Shure Brothers' role in truly basic scientific advancements came out of S. N. Shure's ability to identify and encourage talented engineers. The very first paper published on directivity factor, Q, was by Ben Bauer while he was a Shure employee. That paper was written as part of the exploration of the world's first single element unidirectional microphone.

We use Shure mixers in every Syn-Aud-Con class as an example of

a professional device with a properly installed VI. Some Shure equipment used in our demos has operated for 18 years.



While manufacturers tend to look back over 65 years in terms of the products from which they have made their living, Syn-Aud-Con looks at Mr. Shure and his company with deep respect for the choice and handling of people, the company's

dedication to excellence in the market places they have chosen to grace, and in the uniqueness of a man who has led a successful company in a straight line for longer than any other audio pioneer. □

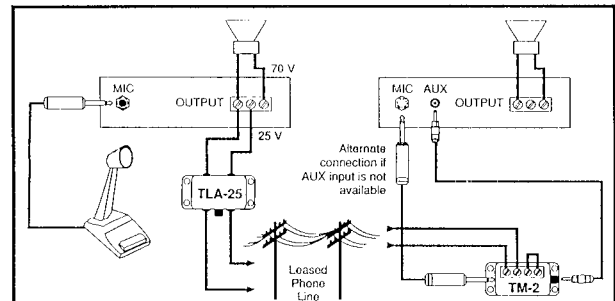


Figure 1. Point-to-point remote page/music transmission via leased lines.

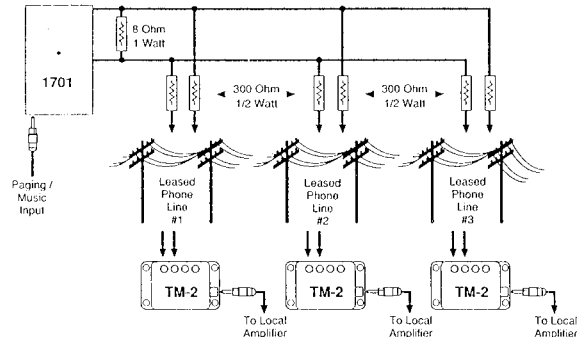


Figure 2. Multi-point remote page/music transmission with a booster amp.

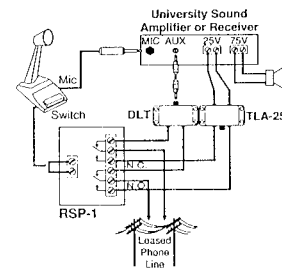


Figure 3. Distributed paging with relay-energized switching

Auditory Hallucinations

We recently were sent the following jewel by Rob Manual from Memphis as an example of a Hi-Fi dealer's newsletter.

Speakers and Watts

"Speakers do not put out watts—the output (sound pressure level) of a speaker is measured in decibels." This guy didn't even get "sound pressure squared level" correct. If he had it might have occurred to him that the level in decibels was directly related to the sound power in watts (acoustic).

This writer later states, "The efficiency of most speakers falls between 80 and 90 dB."

This same pundit goes on about watts of power: some common misconceptions.

We only wish he'd stick to the common ones! His misinterpretation of every audio and acoustic parameter he pontificates about is appalling.

The most frightening part of all this is that the largest single group of people being befuddled by this nonsense are medical doctors.

Do you suppose they handle their medical technical literature with the same blind faith?

Rob writes in his letter accompanying the "fun" material:

The proliferation of self-proclaimed engineers is staggering! Here in Memphis, we have several Hi-Fi cult leaders, making it extremely difficult to establish truths and reasonable listening habits and beliefs among audiophiles! I hope you are as entertained as I was when I read the following article. The article was written by Mr. David O'Brien, chief field engineer with McIntosh Laboratories.

Stereo Fantasies, Fact and Fiction

The stereo music reproducing industry has been in existence long enough for a small but vocal cult to have arisen. This cult considers themselves to be the abso-

lute authority on subjective evaluation of the good or bad characteristics of all types of stereo equipment and accessories. A number of publications have appeared that appeal to the believers of the cult. These are usually called the "Underground Press". The publishers and contributors of these magazines usually have good intentions. However, due to the limited technical background shown by most, the results can many times be a disaster to the unsuspecting reader.

"All the water faucets in your home must be turned in a north-south direction or your music won't sound right."

Many of the printed articles and comments on performance characteristics of products are written by people who obviously have little or no technical background. Decisions and judgements are made by those who are ignorant of basic physics. Descriptions and explanations are often so far from scientific logic that they border on magic or even hallucination.

Many new subjective terms have been invented to describe these various listening experiences. Most of these terms have no logical or scientific origin and cannot be challenged, since the meanings have been invented by those who are using them.

It is amusing to read comments on the performance of a particular product by two different authors. Many times their conclusions are totally different, and seldom is either able to back up a conclusion with scientific proof.

Examples of some of the comments found in several of these non-scientific publications are listed below:

1. "The first time I listened to this amplifier it sounded terrible. After I left the

amplifier turned on all night, it sounded fine the next day. Therefore, one must always turn on an amplifier at least 12 hours before listening." Good solid state amplifiers and preamplifiers do not change over a few hours. If a unit does change in performance over a short time, it is either in desperate need of service, or is a very poor design. It is a fact, however, that human perception does change depending on how we feel. If there actually is a perceived difference in sonic accuracy, it is usually we who change, not the equipment. The misconception just described also can lead to the following misconception.

2. "It is necessary to leave all amplifiers, preamplifiers and similar components on all the time for maximum operating life." There is no more logic behind this idea than leaving your automobile parked in the garage with the motor running continuously. Neither are all electric lights turned on in a house 24 hours a day.

Quality modern day stereo components are designed to safely turn on and off as needed. Any given stereo component has a definite operating life span. Leaving the unit on continuously, means that the available listening time will actually be reduced since many operating hours occurred when the unit was not actually being used.

3. "You must shield your speaker wires with 2" by 4" wood planks coated with special varnish. If you don't do this, your music won't sound right." Attributing magnetic shielding properties to wood requires no further comment.

4. "All the water faucets in your home must be turned in a north-south direction or your music won't sound right." No comment.

5. "Cover all your telephone headsets with pillows so they won't resonate with the speakers." Wall, floor and ceiling reflections will affect speaker response, but something as small as a telephone headset is about as significant as a single needle in a large haystack.

6. "You will get improved performance from your preamplifier if you place a special brick on top of it." The reason given, and this is a virtual quote, "The brick blocks the cosmic rays from entering the preamplifier circuits which would otherwise interfere with the intertransitional silence periods in the music".

Cosmic rays are light years away from anything resembling audio frequencies.

7. "Special silver interconnecting cables are absolutely necessary to faithfully reproduce audio signals."

How does IBM get away with using

ordinary copper wire to connect a keyboard to a mainframe computer? This is a perfect example of a cure without a disease.

8. "There are many characteristics affecting the sound of stereo components that cannot be measured."

Improvements in measuring techniques are constantly being made. With currently available technology, the ability to measure a product and accurately predict its performance is a known fact. If there were really so many unmeasurable characteristics, a good sounding piece of equipment would be a complete accident. There would also be no known way to repeat the design if we could not measure what made it that way.

9. "Skin Effect has to be considered when designing speaker cables."

Any library has technical books which discuss skin effect in great detail. This phenomenon has been understood for decades, and is completely documented. A few minutes of calculation quickly proves that Skin Effect on audio frequencies is so tiny that it can be completely ignored. The main characteristic of speaker cables that does matter is resistance. The lowest possible resistance in a speaker cable will produce the best results.

Many of the comments and articles read in these cult magazines are actually

Unfortunately, one of the side effects of excessive audiophilia is a tendency to develop auditory hallucinations.

amusing and entertaining. Everyone is of course entitled to an opinion.

If an unsuspecting reader who may not be technically informed is misled into spending large sums of money for the wrong products, it is truly unfortunate.

The best procedure for a stereo listener is to select a reliable stereo component dealer in the local market area. The dealer should have been in business for a number of years and have a good reputation in the community. The selected dealer should also have a properly staffed service department.

Consult this dealer for the best com-

ponents to satisfy your stereo system needs.

Spend the money that would go for a subscription to an underground publication for a new compact disc.

Rob sent us a Letter to the Editor of High Fidelity Magazine, and the answer from Larry Kline, printed in the March 1989 issue.

Audio Illusions (Reader's Questions)

Some of my audiophile friends have told me that it helps the sound of audio components to weight them down with bricks or other heavy objects. Others suggest that I mount my amplifier on sharp pointed feet. Does either suggestion make sense?

Name Withheld

(Answer)

Unfortunately, one of the side effects of excessive audiophilia is a tendency to develop auditory hallucinations. Various subjective acoustic effects are sometimes imagined and reported as having an objective existence despite obvious conflicts with the laws of electronics, physics in general, psychoacoustics, and even logic and common sense. But although intense audio involvement may lead to irrational behavior often suggestive of a mental aberration, such behavior resembles more a primitive, magic-based religion. Through the ritual application of totem objects—weights, specially insulated or wound oxygen free speaker cables, mysterious liquids, special feet and stands, and so forth—to their sound systems, true believers are able to experience wonderful audible improvements not always perceptible (since they are nonexistent) to those without equivalent dedication or faith.

Viewing all this with incredulity and amusement are those who, if not atheists in this hobby, are at least agnostics on the question of the audible improvements wrought by wondrous whatevers. Unfortunately, it's in the nature of the game that reviewers claiming to hear positive effects resulting from the application of the totem objects have far more credibility in the eyes of true believers than do the skeptics. The reverse is also true: Skeptical reviewers are valued more highly by the nonbelievers.

In short, the question of audible improvements achieved by expensive accessories is very much subject to what I call

the ambiguous ENC effect: Depending on which way you prefer to look at it, the abbreviation can stand for Enhanced New Component or Emperor's New Clothes.

Tom Danley from Intersonics (makers of the outstanding servo-drive sub woofers) wrote us to vent his frustration:

Have you ever wondered what happens to politicians and other professional truthstretchers when they are unable to find "work" in their own profession? I never once stayed up late wondering about it; I guess I had assumed they would just sink back down to the bottom of the pond to form coal or oil deposits eventually.

The other day it hit me like a .600 nitro express that some of these guys are marketing "special" audiophile cable. I couldn't believe my eyes—page after page of voodoo wire. Sure I have seen ads for this stuff before, but never in such concentration. It made me feel a little sick and a little angry; B.S. or pseudo science is gaining so much popularity in our society that I am starting to get worried. For the past eleven years, I have been working with and designing ultrasonic and low frequency RF signal and power circuitry. I have come to appreciate (usually the hard way) some of the effects that can occur when you are dealing with these frequencies at high powers in the real world. I have never seen anything that would suggest that most of the effects attributed to these cables would happen at all or would occur at audio frequencies (unless you were using hopelessly inappropriate wire in the first place).

Perhaps the wild performance improvement claims have more to do with the subconscious warding off the buyers' remorse for spending hundreds of dollars on insignificance. Or perhaps it is just beyond my "faith" that a 350 dollar AC cord will improve the performance of whatever it's connected to "by delivering smoother, cleaner and higher current than standard cables." This requires a big leap of imagination that I just can't make.

I thought you might get a laugh from the "monstrous voodoo cable".

We are not frightened by this kind of nonsense as it rarely harms other than the pocketbook. What is frightening is those politicians that haven't left the government, but are practicing voodoo with our Bill of Rights. □

Professional Services

Acoustical Consultants may list their cards on this page. There is no charge. The only requirements are that you are a full-time consultant, that you have attended a Syn-Aud-Con seminar, and have an active subscription to the Syn-Aud-Con Newsletter. If you would like to be on our Consultants page, send in four (4) business cards for our file.

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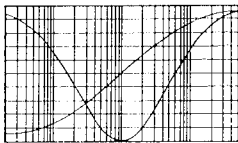
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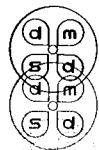


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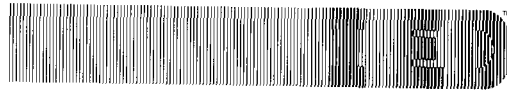
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