THE B.A.S. SPEAKER

EDITOR-IN-CHIEF: Brad Meyer

COORDINATING EDITOR: Peter W. Mitchell

STAFF: Robert Borden, Alvin Foster, John Schlafer, Jack Stevens

PUBLISHER: Peter W. Mitchell, President, BAS

Subscriptions & Membership Information

THE BOSTON AUDIO SOCIETY
P.O. BOX 7
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In This Issue

This issue is part of our big catch-up effort: the second of three issues to go to press within about six weeks. Its contents include two BAS meeting reports, a double dose of IN THE LITERATURE, and a collection of three reports on interesting things seen and heard at the Consumer Electronics Show in June.

The regular June meeting featured Tony Federici of Scheiber Sonics and an old Boston boy, Daniel Queen, with an interesting exploration of acoustics and imaging. A special bonus June meeting featured some guests from Japan: Mr. Naotake Hayashi, President of Stax, with some sweet-sounding equipment designs, and Mr. Saburou Egawa, reviewer and consultant, with some startling ideas and provocative demonstrations. Perhaps the latter will provoke not only a lot of discussion but also some informative experiments.

In response to numerous requests this issue also includes comprehensive subscription information on most of the English-language audio publications which we abstract in the IN THE LIT column and recommend that you read.

This issue is also an experiment in typography. We have occasionally wondered whether setting the SPEAKER in double columns, rather than one long line of type running the full width of the page, would make it easier to read. Let us know what you think.

On the other hand, circumstances dictated that this issue be produced on an IBM Selectric, whose letters are aligned vertically as well as horizontally. This tends to make large blocks of type more difficult to read. So, whether single column or double, we definitely intend to revert to our previous typeface (with proportional spacing of letters) in the next issue.

The B.A.S. Speaker (ISSN 0195-0908) is published monthly by The Boston Audio Society, Trapelo Road, Lincoln, MA 01773. Subscriptions are available to members of the Society. Membership dues are $12 per year, October 1 through September 30 ($25 U.S. currency overseas, including air mail). $11.45 of the dues are a subscription to *The B.A.S. Speaker* including all issues of the applicable membership year. **For further information and application form, write to The Boston Audio Society, P.O. Box 7, Kenmore Square Station, Boston, MA 02215.** Second-class postage paid at Boston, MA. POSTMASTER: Send address changes to: The B.A.S. Speaker, P.O. Box 7, Boston, MA 02215.

Used Equipment Broker

Over the years my interest in audio has led to the purchase of used equipment from various sources. In the Boston area the Phoenix, Want ADvertiser, and Boston Globe, as well as the odd poster nailed on neighborhood trees, all offer used audio equipment for sale. As with any other aspiring local buyer I may respond to the ad, visit the seller, examine the item in question, and may use anything from a deft kick to a portable oscilloscope to complete my notion of analysis of the product's condition.

When the ad is in a national publication (Audio, Audiomart, B.A.S. Speaker) rather than a local one, the audiophile does not enjoy the same opportunity of inspection. Of course, a satisfactory transaction will instill confidence in the rare situation where one has future dealings with the same seller. The majority of the people with whom I have dealt over the past ten years have been reasonably honest in describing their equipment, and my reliance in their good faith has been well placed. However, some have been coy or misleading about a unit's history and condition and others alarmingly tardy in paying for equipment delivered to them. It is due to the latter elegy ment that a certain anxiety accompanies one's more typical dealing with a new and distant voice.

My effort to deal with the situation described above is called the New England Electronics Exchange. In effect, I will serve as broker between buyer and seller. A monthly newsletter will be distributed which will list equipment offered for sale by individuals Each listing will include a description of the unit offered, using grading scales developed for this purpose. For a 10% service fee (to be deducted from the sales price) I will receive payment from the buyer on the seller's behalf, instruct the seller where the unit is to be shipped, and release the payment to the seller once the buyer has had an opportunity to inspect the unit.

In this transaction the element of uncertainty is to be resolved for the benefit of both buyer and seller. The seller is guaranteed that he will receive full and prompt payment for the equipment shipped. The buyer is guaranteed that the equipment received will be as described; if not he is free to return the unit and his money will be refunded in full by the Exchange.

The newsletter is to be published monthly and distributed nationally via first-class mail.

The goal of the NEEE is to help develop a larger and more efficient market for used audio equipment. Additionally, readers of the newsletter will be advised of industry news -- technical developments and business successes (or setbacks) that may affect the market value of audio equipment. A subscription to the newletter will be priced at $12.00.

The advice and experience of B.A.S. members is urgently solicited, to make this a useful service to the interested audiophile. Members are invited to call or write for a free sample copy.

New England Electronics Exchange
Box 82, Harvard Square
Cambridge MA 02138

617/491-3000 (Sun-Thur, 6<10 pm EDT)

We anticipate publishing the first issue on or about October 1, 1980.

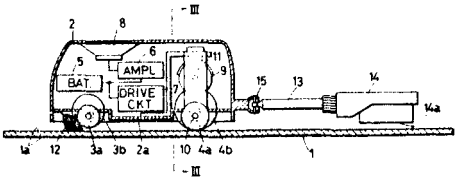
-- Jay Honeycutt (Massachusetts)

Patent News

In recent years audio magazine has established an annual tradition of including in each April issue an imaginative review of a product credited to a designer with the retrograde name "I.LIRPA." One of the best examples, in the April 1978 issue, was the I. Lirpa VDRS Vehicular Disc Reproduction System, a universally useful "direct drive" record playing system. Its operation was based upon the stationary disc/moving cartridge principle. The record was played while lying on a table. The record playing system was a cartridge body to which an axle, wheels, and a drive system had been added so that the cartridge would drive itself around the record in a spiral path (not to be confused with car stereo, of course!).

You may have thought the VDRS was purely a joke. The editors of Audio may have thought the VDRS was purely a joke. But Ira Leonard has found, in the Patent Review column of the March 1980 Journal of the Acoustical Society of America (Vol.67 No.3, p.1099) a description of U.S. Patent No. 4,166,624, granted to Y. Mori, S. Tamura, S. Hoshimi, and S. Yasuda, who have assigned their rights in the patent to Sony Corporation. The patent was applied for on May 23. 1978 and was granted by the U.S. Patent Office on Sept. 4, 1979.

What is the invention described in U.S. Patent 4,166,624? It is a record player, described in the JASA summary as follows --"a little bus which scoots about the record using the groove for its tracks. The outer rear wheel, 4b, is larger in diameter than the inner rear wheel, 4a, so that the little vehicle tends to move in a circular path." The tiny van body contains a battery, drive circuitry for the wheels, an amplifier, and a little speaker. Trailing the van, and connected to it via a universal joint, is a stubby tone arm, headshell, and cartridge. The illustration below is reproduced from Sony's patent.



Do you suppose Sony's engineers read Audio? The examiners at the U.S. Patent Office obviously don't, since I. Lirpa seems clearly to have established prior art sufficient to invalidate the Sony patent, at least in part.

-- PWM

Stax Headphones: A User's Report

The Stax components demonstrated at the special June BAS meeting were brought to Boston from Chicago, where they had been used as demonstrators in the Stax room at the Consumer Electronics Show. After the meeting most of the components were eventually forwarded to New England dealers to serve as store demonstrator samples. Two samples were not: Mr. Hayashi left the set of Stax SR Lambda Earspeakers and the associated SRM 1 headphone amplifier for me as a gift. It was an extraordinarily generous gift, far outweighing whatever assistance I gave to Messrs. Hayashi and Egawa in connection with their visit to Boston. So the User's Report which follows is not a coldly objective assessment; it is too much tinged with delight for that.

But as luck would have it, during the past year my work as consultant has involved a number of tests of prototype headphones for clients, so I have been exposed to a number of different headphone models of varying quality and type. And I have developed a procedure for measuring the frequency response of headphones which appears to correlate fairly well with the gross subjective differences I hear. ("Gross" is an appropriate word here, as the frequency response aberrations and colorations of many headphones from reputable manufacturers are indeed gross, far larger than the response errors among today's better loudspeakers. Response deviations of ± 10dB are common and ± 20 dB not unheard of.)

The key to the measurement is a "coupler" which, while unorthodox in construction, mimics fairly well the acoustic absorption properties of the human head and provides a surface on which the headphone is mounted, plus a hole in which the microphone of the Ivie IE-30A spectrum analyzer is installed to measure the headphone's output. (No attempt is made to reproduce in the coupler the convolutions and cavities of the outer ear; differences among headphones are so large that such refinements are unnecessary at this stage.)

The accompanying graph presents the one-third-octave response of the Stax SR-Lambda earspeakers as measured via this coupler. As rioted above, the credibility of this coupler rests mainly on the fact that I have found its measurements to correlate well with the subjective differences I have heard among tested phones, and that is true in this case as well. As the measurement suggests, the Stax SR-Lambda is a very smooth-sounding headphone -- easily the smoothest I have tested to date. It has a notably warm tonal balance which is much more "musical" than "hi-fi", and disc surface noise is not exaggerated in these phones the way it is in many others. In fact, given the reality that records nearly always have a brighter tonal balance than what one hears when sitting halfway back in a concert hall, the tonal balance of the SR-Lambda seems ideally chosen for listening to recordings. With many records these headphones impart a musically realistic texture (especially in woodwind and string tone) which I have previously heard

only in live music and in full-range electrostatic speakers such as the KLH Nine, Acoustat Three, and Stax ELS-8x.

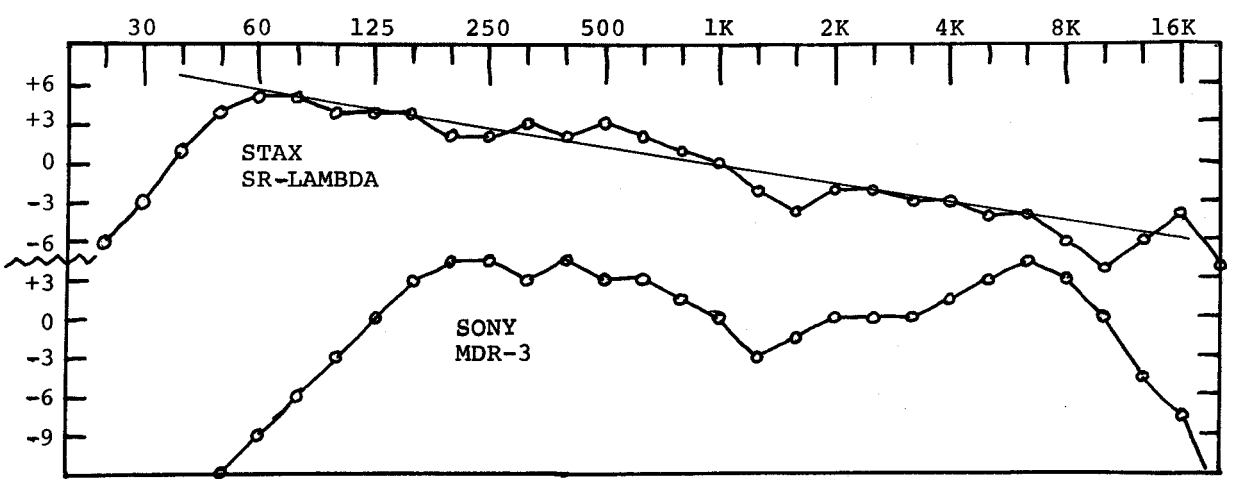
The SR-Lambda also shares the principal flaw of these loudspeakers: its tonal balance, while musically euphonic and extremely pleasing, is not dead-on accurate. Thus it is not as appropriate for analytical monitoring of on-location tape recordings as a brighter, more forward reproducer would be. (Of course for on-location monitoring one would want to have acoustically-isolated closed-back headphones anyway; the drivers in the SR-Lambda are mounted in an acoustically semi-open cage which doesn't isolate the listener from ambient sound.)

Incidentally, don't interpret the sloped high end in the graph as meaning that the sound is dull or lacking in highs? it is not. The highs are all there -- smooth, sweet, finely-etched, rather than sizzling. At the opposite end of the spectrum, the bass is full and rich, if you want a tight, crisp bottom end, look for something with leaner low-frequency response.

The essential virtue of these and other electrostatic phones, of course, isn't revealed by the response curve but only by listening: the delicacy and transparency of subtle details, the freedom from congestion in complex passages, the total lack of listening fatigue, the precise rendering of microphone perspectives,

It's not audio nirvana for $49.95; the price is $270, not including the headphone amplifier. Speaking of that, the SRM-1 driver unit does a splendid job of driving the SR-Lambdas, and is very convenient to use since it operates from line-level signals (i.e. from the output of a tape deck, tuner, or preamp). Thus one can have superb headphone sound without having to carry a power amplifier around. One final note: while the excellent sound quality produced by the combination of SRM-1 and SR-Lambda was not surprising, their ability to play loud was. In the past some electrostatic headphones have been noted for fine sound but have been severaly limited in attainable volume levels: not these. The combination plays louder, clean, than most dynamic headphones I have tested. The SRM drives all models of Stax electrostatic phones.

Postscript: As a bonus a second curve has been added to the graph. Sony is marketing a line of extremely lightweight, very comfortable phones of which one model is supplied with the Walkman (formerly Soundabout) shirt-pocket stereo cassette player. Other manufacturers are also introducing similar headphones and small stereo cassette units, and I have had a chance to listen to and measure a few. The Sony MDR-3 is typical of the breed (notably in its bass response) and is smoother than some. Considering their very low weight and their comfort, they are pretty good. But there are conventional phones at the same price ($50 list) which sound better. -- PWM



In The Literature

ABSOLUTE SOUND, Issue No. 18

• Special Report -- The New Tubes (p. 129): Qualified rave reviews of the Audio Research SP-6B preamp and D-79 power amp, the Beveridge RM-1 preamp, and the Dennesen DM IV tube power amp.
• Three New Speaker Systems (p.144); Includes a lengthy essay on stereo imaging, containing some debatable assertions. Pyramid Metronome Three (truncated bottom end, world's best tweeter, imaging specific but not satisfying). Dayton-Wright XG-10 electrostatic (much better than the XG-8 , sounds superb from mid-bass up to mid-treble, needs a separate tweeter, imaging is flawed). Hybrid Impulse (dynamic woofer plus ribbon tweeter/midrange, sounds fabulously good from 100 Hz up, bass is overwhelmingly strong and flabby, imaging is flawed).
• Considerations (p.157): Phase Linear 8000 turntable (made by Pioneer, mostly superb, excellent isolation, smooth straight-line arm performance, but some flaws are identified). PS Audio PS--III preamp (phono module very good, line-level module not so). Yamaha PX-2 turntable (isolation not as good as the Phase/Pioneer, otherwise the Yamaha is an outstanding SLT system). NAD 3020 integrated amp (a knockout at its price, especially with difficult speaker loads; in some areas such as imaging it beats. certain very costly audiophile components). Satterberg MW-2 woofer (_splendid for use with mini-speakers, ideal with the Rogers LS3/5A).
• Further Thoughts (p.171): Linn Sondek vs Scardina-modified B & 0 40Q4 SLT turntable (closely competitive). Cybele loudspeaker (smooth, distant sounding, best with Audionics CC-2 amps). Stax CP-Y/ECP-1 cartridge system (seriously flawed in frequency response, separation, and channel balance).
• Technocracy (,p.176): Interview with Alan Hill of Plasmatronics.
• The Music (p.199): Record reviews, with raves about a couple of the locally produced Titanic discs.
• Special Report (p.218): David Shreve discusses the problems of achieving correct VTA and the audible effects of not doing so.

AUDIO, June 1980

* Video Scenes (p.20): Bert Whyte describes the Pioneer videodisc unit and the anatomy of the discs.
• Behind the Scenes (p.32): Whyte enthuses about Cerwin-Vega.
• Understanding Tonearms (p.52): B & O's chief whiz surveys basic issues in arm design.
• Reviews (p.76): NAD 7020 receiver (a rave review of both tuner and amplifier sections; phono preamp is exceptionally quiet). Optonica RT-6905 cassette deck with microprocessor timer-controller (.fine performance, good Dolby tracking, over 60 pushbuttons, price $1600). Fisher 6250 turntable (good). Sansui CA-F1 preamp (excellent performance, with one oddity: the phono S/N measures 2 dB better than the theoretical limit). Fried Model Q speaker (no deep bass, otherwise pretty good).

AUDIO, July 1980

• Behind the Scenes (p.20): Assorted activities at Dolby Labs.
• Letters (p.26): Curl, Otala, Jung, and Leach announce general agreement on TIM.
• Car Stereo Directory (p.28): Specs and features list.
• Keep Your Car Stereo Safe (p.60): On antitheft protection.
• Reviews (p.68): JVC A-X9 integrated amplifier (_"super-A dynamic-bias circuit, expensive, extremely clean). Dynavector Karat/Diamond m.c. cartridge and DV-6A transformer (ruler-flat response, perfect channel balance, excellent tracking, great sound). Connoisseur BD-2A turntable (_no--frills design, belt drive, good arm, excellent price/performance).

AUDIO AMATEUR, 1980 No.3

• Upgrading Your FM Tuner (p.7): How to bring an old dinosaur into the modern age.
• Installing FM and TV Antenna Sustems (p.14): John Allen's authoritative discussion makes its third appearance in print.
• Passively Equalized Phono Preamp (p. 18): An elaborate discrete circuit.
• The Grounded Ear (p.34): About a seminar on measurements vs audible distortions which took place at last May's AES convention.
• Audio Aids (p.36): Homebrew mods and hints.
• Test Report (p.42): Improving the Heathkit AP-1615 preamp; evaluating the

Logic Systems 318 dynamic noise filter (pretty good).

AUDIO ENGINEERING SOCIETY JOURNAL, May 1980

• Time Delay Spectrometry (p.302): Some of the uses of Heyser's technique for making time-gated measurements.
• Amplifier-Loudspeaker Interfacing (p.310): Prof. Greiner analyzes some effects of speaker cables and fuses. No, speaker cables don't behave as transmission lines.
• Phonograph Signal Rate of Change (p.316): Measurements of the slew rate of phono signals in assorted recordings: the worst-case value, transferred to the output of a 100W amplifier, is 2 volts/microsecond.
• Phonograph Preamplifier Design Criteria (p.325): Tom Holman updates his definitive study with emphasis on TIM, RFI, and the modified square-wave test signal

AUDIO ENGINEERING SOCIETY JOURNAL, June 1980

• Loudspeaker Testing (p.402): A description of the measurement system used at CBS Labs for High Fidelity's speaker reviews.
• Loudspeaker Driver Phase Response (p.410): Accounting for driver phase response in crossover design.
• Automatic Frequency Control in FM Tuners (p.422): Details on Kenwood's DDL Distortion Detector Loop which automatically tunes to the lowest-distortion point in the FM channel.

AUDIO HORIZONS, Vol. 1 No. 4

• Reviews: Cramolin contact cleaner (recommended for removing oxidation from metal-to-metal contact surfaces), Dynavector Karat/Ruby m.c. cartridge (terrific). Dynavector Karat/Diamond (the world's best, but VTA is critical). Hafler DH-200 power amplifier (good, alleged to be even better when its output bias is raised above the factory-set value of 200 mA). Linn Ittok tonearm (fussy but superb). Marcof glass platter mat (better than comparable felt and rubber mats). Michaelson-Austin TVA -1 tube power amp (very good). Micro Seiki BL-91 turntable (a very good belt drive), Musical Fidelity BB-1 head amplifier (battery powered, very good). Oracle turntable (good in its stock form, replacement of its platter mat makes it outstanding), Powerlight MC--4 head amp (.excellent but RFI prone). SAEC SS 300 aluminum platter mat (liked better than any soft mat). Spectra Disc Cushion elastomer platter mat (very good). Sumo "Power" power amp (very powerful and very good). Sumo "Gold" power amp (class A, potent, it's extremely good but its fans are noisy).
• Interconnecting Cables: Fully half of the issue is occupied by subjective reviews of two dozen sets of patch cords (speaker cables will be treated in the next issue). Dramatic differences in sound are attributed to the various connecting cables, but no attempt is made to rationalize these or correlate them with any measurements. Sample comments: "metallic top end, stridency, compression of stage size and dynamic range; heavily veiled, deficient in ambience and air, the cables add a rather grainy layer of distortion; their high end is a bit brash, and both extreme low bass and upper treble are missing; wide midband hump; the losses of this and every other cable are blatantly obvious; these cables ... turn a concert grand into a bar-room upright; timbre and harmonic structure are altered to a radical degree; these cables are very restricted in bandwidth, showing a sharp drop in amplitude in both upper treble and lower bass; as with the Mitch Cotter .. cables, dynamic range is also very highly compressed; thick blanket of haze engulfs everything; steel wire tends to sound brash and metallic, while silver-clad wire has the tendency to ring -- usually violently." These startling claims, while implausible, are intriguing and tantalizing, so at CES we asked editor/publisher Len Hupp whether he could specify any system of components costing under $10,000 in which these differences in cables would be audible. He couldn't; his tests employed mainly custom-made components. So independent verification of his claims will be difficult.

AUDIO TIMES, May 15, 1980

• News items: GAS, verging on bankruptcy, is looking for a buyer. Stax and Denon are setting up their own U.S. import offices. Tech HiFi and Tweeter are both getting into video retailing. Numerous VCR manufacturers are developing models with Dolby noise reduction for audio, and Dolby is also working on a video noise reduction circuit for VCRs to eliminate colored snow in pictures.

AUDIO TIMES, July 15, 1980

• News items: Audio-Technica has bought Design Acoustics and will expand the speaker line. Sony has demonstrated a prototype 4½ lb video camera/recorder combo, hoping to establish it as the standard successor to 8mm film before marketing it in 1985, And Sony has joined forces with Philips. to refine and promote the latter's 4/ inch Compact Digital Disc system, hoping to get it accepted as the worldwide standard digidisc format before marketing it in 1982-83 at $500. Philips will back it with lots of releases on the DG, Philips, London, and related labels, while Sony will release many CBS recordings.

DB, July 1980

Theory and Practice (p.10): On dynamic range and how the human hearing mechanism provides dynamic come pression.

• Digital Audio (p.22): First installment of a continuing series on basic concepts of digitized audio. Good reading.

• AES Los Angeles (p.42): Notes on last May's convention, including the hotly disputed demonstration of muscle fatigue induced by digital sound.

* If We Can Hear It, We Can Measure It (p.49): About testing facilities at KEF, plus reports on tests conducted at the London AES convention in February in which engineers listening to A/B comparisons could not hear 9th-order 20 kHz filters nor soft clipping but could easily hear hard clipping and/or a 10 kHz filter.

GRAMOPHONE (England), May 1980

• Reviews (p.1726): IMF ALS30 loudspeaker (low efficiency, good performance at the price). STD 305M turntable (an excellent belt drive, close to the Linn in performance). Sony MDR-3 headphones (very light, comfortable, sound pretty good). QED 26/2 cartridge equalizer (provides flexible switch selection of load capacitance and resistance, well made). Zerostat Z-track tonearm damper (similar to the Disctraker but different in detail, well made, works well, recommended).

GRAMOPHONE, June 1980

• Sounds in Retrospect (p.77): Sonics of recent discs reassessed.

* High Fidelity 80 (p.78): Goodies seen at a hifi show.

• Reviews (p.91): Monitor Audio MA84 speaker (well made, slightly bass-heavy tonal balance). Grundig CT-5500 cassette deck (flexible controls, bias trimmer, good performance).

HIGH FIDELITY, June 1980

• The Autophile (p.11): Surveying new car stereo stuff.

• Equipment Reports (p.28): JBL L-19 speaker (compact, efficiency is low, power handling high, pretty good sound). Boston Acoustics A100 speaker (wide dispersion, unsually uniform response, good imaging, impressively uncolored sound). Infinity RS speaker (forward, gutsy sound, low impedance, some 3 kHz ringing, otherwise good). EPI 120C loudspeaker (_smooth, good bass and crisp top, good depth imaging). Cerwin-Vega HED U10 loudspeaker (relatively efficient, smooth except for an obvious irregularity at the 2 kHz crossover, tweeter somewhat beamy, otherwise OK). Note that the magazine is including a metronome in speaker photos as a convenient index of relative size.

• Living with Loudspeakers (p.50): Mark Davis and five speaker designers exchange views about speaker/room interaction, radiation patterns, appropriate test and design parameters, stereo imaging. Moderated by Peter Mitchell.

• Seven Myths of Speaker Buying (p.55): Advice for novice shoppers.

• The Trouble with Orchestras (p.58): Gunther Schuller's trenchant and widely discussed diagnosis of our symphonic discontent, identifying ignorant trustees, jet-set conductors, and cynical players among the villains.

HIGH FIDELITY, July 1980

• Crosstalk (p.11): Q's and A's. This column formerly entitled "Too Hot to Handle",

• Equipment Reports (p.21): Marantz 2000 receiver (very good tuner,, good preamp, infrasonic filter, conservatively rated amp with lots of dynamic headroom and output current; an excellent budget receiver). Sony V25 receiver (very good tuner, very quiet, preamp good but has no infrasonic filtering at all, power amp is good at 8 ohms but current-limited at 4 ohms, front-panel design is superb). Akai R-30 receiver (good tuner, flexible taping connections, infrasonic filter with some deep bass rolloff, amp is good at 8 ohms). Teac 650R cassette deck (bidirectional record/play, works well,

alignment good, performance good, fast peak-reading meters). Modular Acoustics 3000 loudspeaker (plays loud, high power handling, strong bass, sweet treble, some roughness around the crossover). Adcom Crosscoil XC/LT m.c. cartridge (light weight, high output, no head amp needed, line-trace stylus, smooth response, internally damped).

• Cassette Tape Tests (p.32): Tests of 6 ferric 4 chrome-equivalent, and 7 metal-particle tapes. Test parameters are well chosen, yielding useful results; note the best-buy performance of RKO Ultrachrome (.DuPont's second-generation chrome oxide).

• Record Cleaners (p.43): A user's survey of disc-care products.

HI-FI NEWS & RECORD REVIEW (England), May 1980

• The 1980 Shows (p.72): New stuff seen at shows in three cities.

• Analogue vs Digital (p.83): An intriguing, detailed comparison between the Sony PCM 1600 digital recording system and the top-line Ampex ATR 100 analog deck. The Sony looks awfully good, its main flaws being distortion at ultra-low signal levels and a bit of mild ringing on high-frequency transients probably caused by the antialiasing filter.

• Subjective Sounds (p.89): Notes on the audibility of anti-aliasing filters and soft clipping (the AES experiment); the Technics SL10 clam-shell record player.

• The Trackability Factor (p.91): A study of the factors governing the tracking ability of cartridges.

• Las Vegas (p.97): Report on the Winter CES.

• Reviews (p.143): KLH 3 compact speaker (good imaging, amazing bass for its conveniently small size, some midrange coloration). Audio Pro AA14 speaker (biamplified with built-in amps, plays loud, relatively compact, good imaging, good sound).

• Five Tonearms (p.150): A comparative review paying special attention to structural resonances and flexure. All five exhibit poor tracking geometry when installed per instructions but are OK when aligned with an external protractor. Rankings: Audio Technica AT1100 best, Lustre GST 801 (medium-high mass, resonance-free), Ultracraft AC300 Mk II, ADC ALT-1, Infinity Black Widow (worst, severe resonances, the supplied arm damping is ineffectual). Ariston RD-11S turntable (belt drive, good performance, isolation superb in audible range but poor below 20 Hz).

HIFI NEWS & RECORD REVIEW, June 1980

• The Role of the Recording Engineer (p.57): The evolution of pop recording methods.

• Analog vs Digital (p.62): Comments on digital studio equipment and its implications for the future.

• Record Pressing Faults (p.77): It seems that British pressings are no longer paragons of quality.

• American Record Quality (p.87): In direct comparisons American pressings are still worse except for HNH and other small independents.

• Reviews (p.124): JR EX1 amplified subwoofer (generally good, but not a true "sub" woofer, rolls off below 40 Hz). Hafler DH-200 power amplifier (kit is easy to assemble, conservatively rated, very slight crossover distortion at high frequencies, plenty of output current, drives reactive loads well, excellent value). Four receivers (ranked as follows, Yamaha 840, Kenwood 850, Marantz 4000, JVC RS-7, but the differences were judged to be slight).

MODERN RECORDING, June 1980

• Audio From London (.p.60): Notes on the. AES convention tests of the audibility of clipping and anti-aliasing filters.

• Lab Reports (p.62): Sanyo N55 "Super D" noise reduction unit (a two-band 2:1 compander, works *very* well, is incompatible with other systems). Onkyo 2080 cassette deck (.automatic AccuBias feature works well, has Dolby rec cal, best response obtained with ferric and metal tapes). Ramko ARA-1612 electronic patchboard (costs $3000, a super-convenient way of routing signals). Lexicon Model 93 Prime Time digital delay (a high quality mono pro unit with flexible special effects as well as delay).

MODERN RECORDING & MUSIC, July 1980

• Ambient Sound (p.661: About the audio of videodiscs and the choice of format for digital discs.

• Lab Report (p.70): A comparative test of seven premium open-reel tapes, with no useful conclusion; the testers did not optimize the bias for each tape, making the tests nearly useless.

POPULAR ELECTRONICS, June 1980

• Audio (p.18): About fitting the dynamic range of digital recordings into the home environment.

• Reviews (p.22): AKG K340 headphones (dynamic woofer, electrostatic tweeter, plays loud, sounds very good). Sansui

G-5700 receiver (.very good in most respects). Onkyo 7090 integrated amplifier (conservatively rated, has lots of output current and dynamic headroom, dynamic power exceeds 300W per channel at 4 and 2 ohms; good infrasonic and ultrasonic filters but a bit of deep bass rolloff in the phono stage; flexible tone controls, impressive performance overall).
• Video Test (p.45): Henceforth PE publishes insightful reviews of video products. First test: RCA CTC108 color TV chassis used in various new XL100 models (makes much use of ICs and solid state filters including a SAW filter for clean IF response; has a sensitive tuner, full 4 MHz bandwidth circuits, 3.5 MHz at the picture tube; overall video performance is quite good at the price).
• Video Cassette Recorders (p.51): A good introductory article on how they work.

POPULAR ELECTRONICS, July 1980

• Pseudoacoustics (p.18): Favorable comments on the Carver and Omnisonix image enhancers.
• Audio Reviews (p.22): Hafler DH-200 power amp (potent, lots of dynamic headroom and output current, dynamic output exceeds 300 watts at 4 ohms and nearly 500 watts at 2 ohms, drives reactive loads easily, kit assembly easy, an outstanding bargain). Vector Research VCX-600 cassette deck (three heads, bias trimmer, excellent performance, inadequate headphone output). Avid 100 loudspeaker (neutral, crisp, transparent, relatively efficient, excellent transient response, spacious sound, excellent value for money).
• Video Test (p.47): Magnavox T809 color TV chassis used in various 19" models (mediocre tuner sensitivity, full 4 MHz bandwidth all the way to the picture tube, uses comb filter to maintain maximum color resolution, unusually fine video performance).
• Low Cost Analog Delay Line (p.53): Just what we've been waiting for, a good-quality stereo delay costing only $250 in kit form. Uses the Signetics compander IC for noise reduction and the Reticon SAD 4096 IC for clean delay. The kit is not excessively complex, and performance is likely to be very good.
• Car Stereo (p.63): Lab tests of car stereo units: FM, tape, and amp sections tested separately, with interesting results. No overall rankings, as models had varying weakness and strengths; for example the Pioneer KE 5000 exhibited the best tuner sensitivity but its tape player had the worst flutter).

RADIO ELECTRONICS, June 1980

• The History of Television (p.43): Lots of interesting facts.
• Digital Audio (p.63): An intro to PCM circuitry in general and the EIAJ-standard VCR converters in particular.

RADIO ELECTRONICS, July 1980

• Small Speaker Systems (p.59): Reviewing the tradeoffs among size, low-end response, efficiency, and enclosure type.
• Review (p.70): Audio Control C-101 equalizer/analyzer (poor control labeling, excellent performance, good value, pink noise generator and microphone included, analyzer accuracy is good).

STEREO REVIEW, June 1980

• Audio Q& A (.p.22): Common sense about car stereo.
• Audio Basics (p.28): Car hifi in the old, old, old days.
• Tape Talc. (p. 30) : Q &A.
• Technical Talk (p.36): On measuring amplifier distortion.
• Test Reports (p.40): Aiwa 7800U receiver (digital frequency synthesis, superb tuner performance, amplifier is clean and smooth, good dynamic headroom especially at low impedances, good preamp section). Audio Technica ATH-7 headphones (electret drivers, some distortion at very low frequencies, very smooth. overall response, bass is subjectively good, phones are unusually comfortable). Boston Acoustics A100 loudspeaker (impressively smooth response, outstanding dispersion, spacious imaging, clean bass, excellent price/performance value). Marantz SD-9000 cassette deck (extremely elaborate controls and microprocessor, three heads, bias trimmer, solenoid controls, excellent performance at standard speed and superb performance at 3.75 ips). ReVox B760 tuner (digital frequency synthesis, $1700 price tag, "supertuner" specs, sensitive, exceptional interference rejection, 15 station memory, but doesn't retain selected station when switched off).
• Car Stereo (p.61): A thorough survey of features and selection criteria.
• War of the Videodiscs (p.69): A close look at the sound quality which is potentially available from videodiscs (whose sound is encoded in FM).

STEREO REVIEW, July 1980

• Audio Q & A (p.20) : Stereo AM, the problem of amplifiers wearing out, etc
• Audio Basics (p.24): Tone controls are there to be used.
• Tape Talk (p.26) : More Q &A.
• Technical Talk (p.31): Making A/B comparisons with the fine comparator devised by the Southeast Michigan Woofer and Tweeter Marching Society.
• Test Reports (p.34): Adcom GFA-1 power amp (potent, plenty of dynamic output at all impedances, the included fan is quiet; very good price/per formance value). Dynaco A-150 speaker (smooth, brilliant, good value, but its low-frequency power handling is limited). Garrard GT 350ap turntable (smooth automatic operation, low-mass arm, good geometry, mediocre vibration isolation). Koss HV/X headphones (comfortable, can play loud, fairly smooth response). Sansui 7700 receiver (a powerhouse, lots of dynamic headroom at all impedances, preamp section is okay, tuner pretty good).
• Listening Tests (p.52): An introductory essay on reviewing philosophy by Larry Klein, plus a thorough survey of the methodology of valid listening comparisons by Shure engineer Lynn Claudy.
• Remote Control (p.60): Convenience is the coming trend.

Peter Mitchell
(Massachusetts)

Subscription Data

Herewith, by popular request, information on the publications which are abstracted in the IN THE LITERATURE column, and a couple which are not. First the "slicks," whose operating costs and profits come mainly from advertising income while the subscriptions and cover price pay mainly for getting the mag to you. Monthly except where specified.

STEREO REVIEW, the biggest (circulation approx. 550,000 per month), generally the clearest and most free of errors and ambiguities, as befits a mag addressed mainly to hi-fi learners rather than engineer/audiophiles. Subscription price officially $9.98/yr, discounts to $4.99 widely available. Subscription address; Box 2771, Boulder CO 80321.

HIGH FIDELITY (circ. approximately 350,000), pickier equipment reviews, good feature articles, lots of classical record reviews. Subscriptions officially $13.95, discounted regularly to $9.98 and occasionally to $6.98. Subscription address: 1 Sound Avenue, Marion OH 43302.

AUDIO (circ. 150,000), originally for engineers, now tries to straddle the range from engineers to novices. $11.94 in U.S., $17.94 overseas, to Box 8168, One Fawcett Place, Grennwich CT 06835.

HI-FI NEWS & RECORD REVIEW, England's biggest (150200 pages per issue, over half ads) and one of the world's best hifi mags, with informed reviews providing a nice mix of measurements and listening tests, interesting columns and features, and record reviews which rate both sound quality and performance. $35.00 U.S., £ 13.00 elsewhere. Link House Publications Ltd., Robert Rogers House, New Orchard, Poole, Dorset BH15 1LU, England.

GRAMOPHONE, the English-speaking world's leading record-review magazine, assessing more records (and cassettes) in each. issue than you ever imagined could exist. Air mailed to U.S., $27 per year, $51 for two years. General Gramophone Publications Ltd., 177-179 Kenton Rd., Harrow, Middlesex HA3 0HA, England.

HI-FI CHOICE, not a magazine but a continuing series of paperback books, each. volume containing 50 to 100 reviews of products in a single category, permitting detailed comparisons to be made. (The current volume on Cassette Decks and Tapes is excellent.) Each review includes lots of measurements and a listening test. Each volume costs £ 2.50 (about $5.75) including postage to the U.S. Sportscene Publishers Ltd., 14 Rathbone Place, London W1P 1DE, England.

STEREO, a quarterly magazine with thoughtful and informed reviews, available only on newstands, unfortunately not by subscription.

POPULAR ELECTRONICS (circ. 450,000), covers the whole field of electronics including short-wave, video, computers and hobby circuits as well as audio. Sub. officially $14, generally discounted to half of that. Box 2774, Boulder CO 80302.

RADIO ELECTRONICS, originally for radio-TV service technicians, broadened to include audio, short wave, electronic games, VCRs, satellite TV, etc. The audio reviews are the weakest part of

the mag; the feature articles, video coverage, and construction projects the best. $13 to Box 2520, Boulder CO 80321.

MODERN RECORDING & MUSIC, aimed mainly at musicians trying semipro recording in basement/garage studios using a mix of hi-fi and pro gear. Not error-free. Features descriptions of pop recording sessions. $14 to 14 Vanderventer Avenue, Port Washington NY 11060.

The next batch are "underground ers", i.e. supported mainly by subscription rather than mainly by advertising. Quarterly except where specified.

AUDIO AMATEUR and SPEAKER BUILDER, Ed Dell's two "do it yourself" quarterlies mixing construction projects, explanations of theory, and debates on the issue of measurements vs listening, plus reviews. Recommended, and not just for solder-gun users. $14 and $10 respectively to Box 576 and 494 respectively, Peterborough. NH 03458.

THE ABSOLUTE SOUND, the biggest subjective review mag in both word count and circulation, and with a staff of reviewers instead of a monolithic viewpoint. Lengthy reviews of equipment and recordings; understandably popular. $20 ($30 overseas) to Box L, Sea Cliff NY 11579.

INTERNATIONAL AUDIO REVIEW, in form more like a book than a magazine, in frequency more like an annual than a quarterly. Reviews, clear explanations of physical principles, and large doses of epistemology. As we go to press, IAR has just changed its form to a monthly "Hotline" bulletin supplemented by quasi-annual book length volumes. $29 ($49 overseas) for four large volumes or equivalent. 2449 Dwight Way, Berkely CA 94704.

THE AUDIO CRITIC, the haughtiest mag of the genre, uses lab tests as well as listening evaluations, but prints only the conclusions and recommendations, not the supporting data. Tantalizing, interesting, well written, and arrogant. $30 for six issues ($36 overseas) to Box 392, Bronxville NY 10708.

STEREOPHILE, the original (.and still the most commonsensical) non--commercial subjective review mag. Editor/publisher Gordon Holt waits for product designs to stabilize before reviewing them, which is either frustratingly slow or gratifyingly rational depending on your viewpoint. $12 U.S. ($18 overseas) to Box 1949, Sata Fe NM 87501.

AUDIO HORIZONS, appropriately named since its observations tend to be at the fringe of perception, though in truth it's not much farther out than some of the others. $16 ($24 overseas) to Box 10973, St. Louis MO 63135.

The next batch are "pro" journals intended for people making a living in the audio field.

AUDIO ENGINEERING SOCIETY JOURNAL, the forum in which audio engineers propound design theories and explore the fundamentals of acoustics. Sometimes heavily mathematical. 10 issues/year. Nonmembers $45, subscription included in $35 member dues. 60 East 42nd St., New York NY 10165.

WIRELESS WORLD, the other big English language engineering journal, full of circuit designs and theory, the Bible of the working design engineer. Monthly. $31 (includes postage to U.S.), payable to IPC Business Press Ltd., Oakfield House, Perrymount Road, Haywards Heath, Sussex RH16 3DH, England.

RECORDING ENGINEER/PRODUCER, the largest and most comprehensive of the mags focusing on professional recording, concert sound reinforcement, and film sound; with background features on acoustics as well as hardware-oriented stuff. Six issues/year. $10 ($19 overseas) to Box 2449, Hollywood CA 90028.

STUDIO SOUND, the main British mag for microphonists, consists mostly of practical hardware features and reviews. Free to recording and broadcasting professionals, otherwise $30/yr (including postage to U.S.). Same address as Hi-Fi News & Record Review.

DB magazine, the other American periodical about recording, broadcasting, and PA sound. Generally avoids heavy math, emphasizes introductory features. Monthly. $12 ($24 overseas) to Sagamore Publishing Co., 1120 Old Country Road, Plainview NY 11803.

PRO SOUND NEWS, a newsmagazine about the recording and concert sound fields. Free to recording/broadcasting pros. 220 Westbury Avenue, Carle Place NY 11514.

The last group is the "trade" magazines intended to be read by retailers and other people in the commercial audio business. These mags are totally adver

tiser supported and are distributed free to people in the trade. The list includes CONSUMER ELECTRONICS, HIGH FIDELITY TRADE NEWS, AUDIO-VIDEO INTERNATIONAL, SIGHT AND SOUND, AUDIO DIGEST, and several others, but the trade publication of greatest appeal to audiophiles probably is AUDIO TIMES, a twice-monthly newsmagazine whose contents include new-product announcements, sales trends, news of corporate mergers and bankruptcies, executive hirings and firings, interviews about product marketing plans, etc. Free to the trade, otherwise $40/year. Box 5117, Westport CT 06880.

P.S. For most of the magazines listed above, the rate for Canadian subscriptions is $1.00 more than the U.S. rate, payable in U.S. dollars.

-- PWM

Special June Meeting

On June 22 about 60 members gathered at the Marriott Hotel for a special meeting featuring several guests from Japan: Saburou Egawa, a noted free-lance audio consultant and columnist for a major Japanese stereo magazine; Naotake Hayashi, founder and President of Stax Industries; Osamu Fukagawa, assistant manager of Stax Kogyo (U.S.) in California; and (not from Japan) John Taylor, New England sales rep for Stax, Tandberg, and other manufacturers. This special meeting was arranged by Mr. Roland Small, a BAS member who plays the bassoon in the Boston Symphony; Mrs. Small, who is Japanese, assisted with. translations during a SHOP TALK interview the day before the meeting.

Mr. Egawa began by reporting his discovery that the sound of audio components can be significantly altered by using heavy-duty AC wiring and -- surprisingly -- by reversing the orientation of AC plugs in wall sockets Of course, back in the tube era it was commonplace to find that AC plug orientation affected the level of audible hum; but Egawa discovered that the reproduction of transients and stereo imaging in modern components (whose hum level is subaudible) is affected by AC plug reversal. Investigating, he found that plug reversal yielded altered levels of AC leakage voltages on equipment chassis, probably arising from stray capacitance between the primary winding and the core of the power transformer in each product. (These leakage voltages are generally not dangerous because the associated leakage-path impedances are high, limiting leakage currents to very small values. But some audio components do produce a noticeable tingle when the front panel is stroked lightly with a fingertip.)

Of course the presence of leakage voltage on the chassis of a single component is of no consequence. The problem identified by Mr. Egawa is that when two components having differing leakage potentials (e.g. a preamp and a power amp) are connected together, leakage currents flow through the shields of the audio signal cables together with audio-signal currents. Since the leakage currents are electrostatically induced in each chassis, the leakage is not a pure 60 Hz hum signal; it is a buzzy, highly distorted waveform with many harmonics of 60 Hz spanning the midrange spectrum.

The reality of these AC leakage signals was demonstrated at the meeting. An AC digital multimeter showed the leakage voltage on the chassis of a preamp and a power amp and large differences in leakage potential between the two, varying with the orientation of the AC power plugs. With the meter connected between the preamp and power amp a leakage current of 13 microamperes was measured. Then, with the two products connected via a patch cord, a battery-powered Ivie spectrum analyzer was used to show the spectrum of the voltage drop developed across the patch cord resistance by the leakage current; but in this case the displayed signal was diagnosed by member Charles Pike as being due at least partly to radiated hum picked up by the test leads.

To demonstrate the sonic effect of AC plug reversal Mr. Egawa used a pair of Sony C48 condenser microphones, a mike preamp, a Stax SRM-1 headphone amplifier, and Stax SR-Lambda electrostatic headphones. The demonstration was not a controlled double-blind test, but various BAS members were convinced that a subtle difference in apparent timbre was indeed perceived when the headphone amp's AC plug was reversed. Mr. Egawa suggested two implications for his discovery: that audiophiles should experiment with AC plug orientation, and that designers should explore the possibility of powering the entire stereo system (except for the high-current output stage of the power amp)

from a single large power supply. (.Does this mean that we should give up our elaborate component systems and go back to using all-in-one stereo receivers?) Another alternative, which might have more appeal in theory than in practice, is to use 1:1 isolating transformers in the signal path from the preamp to power amplifier.

Mr. Egawa provided another rather startling demonstration with the headphones, this one relating to Kenwood's recent claims about "magnetic distortion" of signals in audio components due to the proximity of wiring to metal parts. Egawa's C48 microphones, like other high-quality condenser mikes, have internal FET impedance converter/preamps which are powered by 9-volt alkaline batteries. But the usual metal jackets of these batteries were removable, leaving only a cardboard jacket around the battery electrolyte. Remarkably, removal of the metal sleeves from the batteries appeared to produce a clearly audible change in the tonal quality of the microphones. That is, the presence or absence of the metal battery jacket from the battery compartment within the microphone's case ostensibly altered the sound of the mike. Such startling behavior obviously invites further study.

The latter half of the meeting was occupied by discussions and demonstrations of Stax audio components. The history of Stax reflects the personal history of the company's founder and President, Mr. Naotake Hayashi. He studied radio engineering in the 1920s and was involved in the early spread of broadcasting in Japan. During the 1930s he went to China and assisted a Shanghai record manufacturer to convert from acoustical to electrical recording, which got Mr. Hayashi involved in the design and manufacture of audio products, particularly amplifiers, microphones, and light-tracking phono cartridges for use by recording engineers trying to evaluate the quality of wax and acetate master discs. In 1938 he founded Showa Koh-On Kogyo, the parent company of Stax in Tokyo.

The modern phase of Stax began with the development of a condenser microphone in 1952, an electrostatic speaker in 1954, a modulated-RF phono cartridge tracking at only 1 gram (at a time when anything under 6 grams was considered low), and the first electrostatic headphones in 1959. Stax today continues to be dedicated to the use of electrostatic transducers, and the company now manufactures a full product line except for turntables. Current models include the ELS-4x and ELS-8x full-range electrostatic loudspeakers ($2400 and $3600 respectively), a broad range of preamplifiers and pure class A amplifiers, several tone arms, the CP-Y condener phono cartridge.. the CS-2 tone arm stabilizer, and -- the most popular category of Stax products -- a half dozen electrostatic headphones called "earspeakers" with a variety of adapters and preamps to drive them. The headphone models range from the $120 SR-44 (which uses electret transducers and so does not require a high-voltage polarizing power supply) up to the $390 SR-Sigma (in which the drivers are mounted away from the ear at an angle, at the front of an open cage so that the outer ear performs its usual tonal and localization functions).

A principal focus of current interest at Stax is the "super shunt" power supply, developed for the $3500 CA-X preamp and also being applied in other products including the DA-100 power amp, a tuner, and a condenser microphone. For comparison, a conventional power supply consists of a transformer, rectifier, filter capacitors, and (except in power amplifiers) a voltage regulator. The active circuitry of an audio product (its transistors and ICs) comprise a "load" which draws varying amounts of current from the power supply in response to the audio signal; and to complete the circuit all of the load current finally flows back through the circuit's ground paths to the "neutral" side of the power supply, e.g. the negative terminal of the filter capacitors or the center tap of the power transformer. In theory this works fine, but in the real world the ground paths in the circuit always have some finite non-zero amount of impedance; consequently the varying ground currents produce varying signal voltages along the ground paths.

To eliminate varying ground currents Stax adds a "shunt" regulator to the output of the power supply, in parallel with the load, designed to keep the supply's output current constant as well as its voltage. When the load draws more current the shunt draws less so as to keep the total constant. Thus the total current flowing in the circuit -- and through the ground paths -- is constant, and the ground paths are no longer "live" with signal-related voltages. As a further benefit, thanks to the constant drain on the supply, the power supply voltage is no longer subject

to. modulation by varying signal demands; the power supply is perfectly stable and noise free, and crosstalk and distortion due to power supply modulation cannot occur.

To conclude the meeting, recordings were heard through a system including the Micro-Seiki RX-5000 turntable, Stax CA-X preamplifier, two DA-100 power amplifiers, and ELS-8x speakers. The sound was not spectacular, loud, or "hi-fi" in quality; it was just uncommonly musical, unstrained, and very smooth and transparent. The demonstration recordings included a pipe organ tape recorded by Brad Meyer and Peter Mitchell, and a remarkable record of "Early Hi-Fi and Stereo" loaned by member Elbert Drazy; it is a compilation of recordings of Stokowski and the Philadelphia Orchestra made by Bell Labs engineers in 1931-32, including two excerpts in genuine stereo!

-- PWM

Regular June Meeting

On June 29 about 70 members convened at GTE. During the "open forum" portion of the meeting the principal subject of dicussion was the abrupt cancellation of SHOP TALK, the weekly show about high fidelity and music on WBUR hosted by Peter Mitchell, Dick Goldwater, and Brad Meyer. Peter took some time to explain the apparent circumstances leading up to the. sudden disappearance of the program from the air. Evidently the current station manager, Jane Christo, is punishing the SHOP TALK crew for having the temerity to disagree. privately with. her about the conduct of a hi-fi equip ment auction at the station in May. Listeners who call WBUR to protest the show's cancellation are being told that it is on vacation and will return in the Fall.

On BAS business, a few volunteers are needed to write these meeting reports for the SPEAKER. With several people to share the task, each author need only write up two or three meetings per year. Assistance is available in the form of an audio tape of each lecture and final polishing of your syntax by the Editor. Finally, to add a little incentive, you will be paid $40 for each report. If you're ready to volunteer, or want more information, contact Brad Meyer.

Peter invited comments on the usefulness of the IN THE LITERATURE column in its present form. Are the detailed citations and summaries of reviews useful? Should the column be abbreviated? Should we seek to include more publications like underground quarterlies and foreign magazines? About 25 people indicated that they use the column and look up articles referenced in it, while many others felt that its detailed summaries are adequately informative, and they need not go to the original. The column will continue in its present format for the near future.

Publication and mailing of the SPEAKER is still behind schedule, but the practice of having two editors working on issues in parallel is expected to help bring the scheduling back up to date before the end of this year.

MEETING FEATURE -- DANIEL QUEEN AND TONY FEDERICI

The focus of the meeting was on aural imaging and on two products whose distribution is being handled by Anthony Federici: the Schieber Sonics 360-degree spatial decoder, and the Daniel Queen model CA2 loudspeaker whose uniform 360 degree radiation pattern is intended to yield improved acoustic image localization and clarity.

The head of Daniel Queen Associates, a Chicago R& D firm, Dan Queen is also a member of the Acoustical Society of America, SMPTE, IEEE, and has been elected a Fellow of the Audio Engineering Society. He has served on many committees in these professional organizations and has published a number of papers in the field of audio. In his talk he reviewed his investigations of factors which affect the ability of a listener in a room to localize the aural image of a sound source in the presence of wall reflections.

As a young boy growing up in Boston Daniel Queen had an avid interest in audio equipment and music. He recalls hanging around the original Radio Shack store, then on Washington Street near Scollay Square, where their demo room had a switch box for comparing speakers and amplifiers. Some of the popular speakers of the day were the Stevens Tru-Sonic, the Altec Voice of the Theatre, and the Jensen bass reflex box, which could be adjusted for the desired degree of boom. His hi-fi system (mono, of course) included a GE 1201D speaker installed in a Jensen reflex cabinet.

On the musical side Mr. Queen recalls standing in the 10:00 AM "rush line" at Symphony Hall to get budget tickets for

the weekly Friday afternoon Symphony concerts. In the evenings he would go to the Savoy Cafe or down the street to the old Hi Hat to catch a few sets in these now-defunct jazz clubs, and then he and some musician friends would gather in a high-peaked garret on Columbus Avenue to listen to records through another GE 1201 mounted up high, near the ceiling. In spite of its limited low end and 6 kHz top, he found that this speaker mounted in that room -- sounded quite realistic, remarkably similar (despite its mono perspective) to the live music he had been hearing. This listening experience has stayed with him and provided some of the motivation for his continuing investigation of the factors which influence the way loudspeakers sound in rooms.

A key point in his initial analysis of this speaker's success, and of other speakers which pleased his musically-conditioned ear, was that they were all simple systems which had relatively smooth and broad dispersion over much of their frequency range. He also recognized that the listening room is an integral component of the reproducing system and that it would be necessary to account for its effects. This was not simply a matter of grinding through the physics of room resonance modes, boundary reflections, and reverberation times, but also involved the psychoacoustics of listening. He noted that humans have been listening in rooms for thousands of years and their hearing mechanism has adapted to this environment. This adaptation aids listeners in making sense of the complex sound fields set up by room acoustics and tailors their perception of what the speaker is doing.

One such pyschoacoustic effect is involved when a person tries to locate the apparent source of sound in a room when part of the sound from a loudspeaker is being reflected from a nearby wall before reaching the ear. Typically the listener will perceive the source of sound as located somewhere between the loudspeaker and the wall, with its exact position depending upon the intensity and arrival time of the reflection. Mr. Queen described a series of experiments he conducted to determine how the localization of the apparent source depends on the relative amplitude and phase of the direct and reflected sounds at each frequency.

Two cylindrically omnidirectional speakers (described below) were set up in an anechoic chamber as shown in Fig. 1, one producing the "direct" radiated sound and the other, spaced 30 degrees away from it, producing the simulated "reflection" from the wall which would be present in a typical listening room. Numbered cards positioned between and beyond the two speakers allowed members of a listening panel to identify the direction from which the sound appeared to be coming. The test signal was a gated burst of 1/3 octave random noise, with a cosine-shaped envelope 300 mS in length. The same signal was fed to the "reflection" speaker after of a delay of 0, 0.1, 0.3, 1.0, or 3.0 milliseconds at an amplitude of +10,+5, 0, -5, and -10 dB relative to the "direct" speaker. The noise bursts were centered at three frequencies: 250 Hz, 1500 Hz, and 6000 Hz, selected because of psychoacoustic studies which have shown that localization is strongly dependent on phase (or arrival time) differences at low frequencies and upon intensity differences at high frequencies, with the crossover between the two detection modes occurring at about 1500 Hz.

All combinations of delay, relative amplitude, and frequency were presented to listening subjects who were asked to pick the direction from which the sound appeared to originate. Results for five subjects were averaged and plotted in Figs. 2-4 for the three frequencies. Each graph shows, for one frequency, the apparent image position as a function of the relative intensity of the "reflection" speaker; the various delays are plotted with different symbols.

The solid curve represents Bauer's "stereophonic law of sines" which, for small angles, says that the direction v of the virtual image depends in a simple way on the direction of the reflection (θ_r) and the intensities of the direct (I_d) and reflected (Id) sounds:

$$\theta_v = \theta_r \frac{I_d}{I_d + I_r}$$

The data for 250 Hz and 6000 Hz follow this intensity law fairly closely for all delays tested, indicating that at these frequencies time delays up to 3 mS are not a significant influence in determining the virtual image location. At 1500 Hz the data are much more scattered, but if the points for delays below 0.3 mS are removed (being too short for typical wall reflections),

then the data conform more closely to the Bauer curve.

From these and other considerations Mr. Queen concluded that in general the apparent location of a sound image in a real room with one speaker depends almost entirely on the relative intensities of direct and reflected sounds, as predicted by Bauer's equation. One might expect, then, that to achieve good imaging from a stereo pair, each loudspeaker should be directional, radiating primarily toward the listener so that sidewall reflections would be at least 10 dB below the direct sound. This, however, places strong restrictions on where the listener may sit or move. In addition, Mr. Queen noted, attempts to create a highly directional speaker usually result in a radiation pattern having strong side lobes whose intensity and direction vary with frequency. This leads to frequency-dependent shifts in image position, so that the fundamental and harmonics of a sound appear to come from different positions in the stereo image. In multidriver speaker systems changes in the radiation pattern also often occur in the crossover region, resulting in instability of the apparent image.

An alternative to highly directional speakers is the use of speakers having essentially the same radiation pattern at all frequencies, so that wall reflections would occur at the same relative intensity at all frequencies. Then, while the wall reflections would broaden the stereo stage, the precision and clarity of imaging would be virtually the same as if there were no reflections. Mr. Queen has designed such a speaker, one which is omnidirectional in the horizontal plane; it consists of a radial horn mounted above an inverted woofer in a cylindrical cabinet as shown in Fig. 5e. Its output is uniform throughout a 360--degree angle within 2 dB.

To evaluate the effectiveness of this design the new speaker was compared with four speakers of more conventional design in a listening test involving a total of 42 people (in groups) in a listening room with the five pairs of speakers arrayed along one wall as in Fig. 6. The other speakers ranged in price from about $200 to $850 per pair, and their output levels were matched using A-weighted noise. The listening panel participated in two tasks. In the first, a localization experiment, monophonic vocal music was played and panelists were asked to decide which of ten numbered back-wall positions *represented* the apparent location of the sound. In the second, a variety of mono and stereo recordings were played and panelists were asked which speakers they preferred, in a series of A/B and sequential comparisons.

The two experiments are cross-correlated in Fig. 7. The vertical axis represents the frequency of expressed preferences for a particular pair of speakers, and the horizontal axis represents the specificity of localization (the higher the. number, the lower the variance in localization judgements). The trend of the curve indicates that speakers with the least ambiguous imaging tend to be preferred, (However, in the direct A/B comparisons the speaker with the strongest apparent bass output was ranked first in preference, while Mr. Queen's speaker was ranked second.)

A detailed presentation of these experimental studies can be found in "The Effect of Loudspeaker Radiation Patterns on Stereo Imaging and Clarity", in the Journal of the Audio Engineering Society, Vol. 27 No. 5, p.368-379 (May 1979).

In response to questions, Queen spoke in more detail about the loudspeakers. Each has three drivers: the midrange and high-frequency units are both contained in the radial horn, with a crossover at 3000 Hz. The 12-inch woofer faces downward into the cylindrical enclosure, with radiation from its rear surface emerging immediately beneath the radial horn, and it is mounted with a slight spacing between the front of its basket and the enclosure; the gap functions as the slot-load vent for the enclosure, Thus all of the sound emerges over a vertical area only a few inches high without the large driver spacing and consequent air-path time delays that are common in full-range speakers. Crossover to the midrange occurs at 700 Hz, the stated efficiency is 1.5%, and the free-field response is down 3 dB at 32 Hz, flat throughout most of the range, and down 9 dB at 20 kHz. A frequency-dependent protection *circuit* responds to excessive woofer displacement or tweeter heating. The speaker will generate sound pressure levels of 105 dB in rooms of up to 400 cubic meters. The Queen CA2 is priced at $1245 per side and is on display at Goodwin's in Boston.

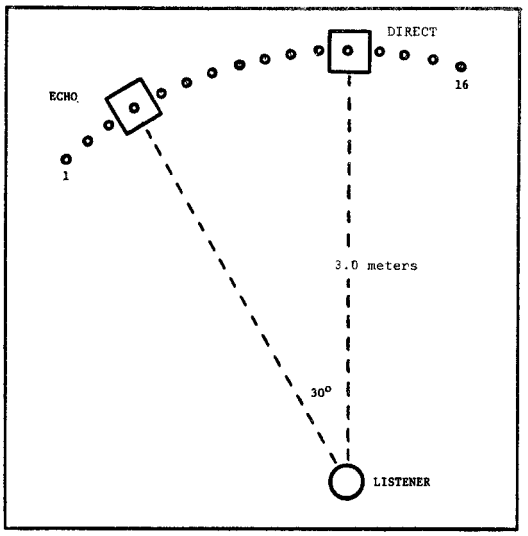
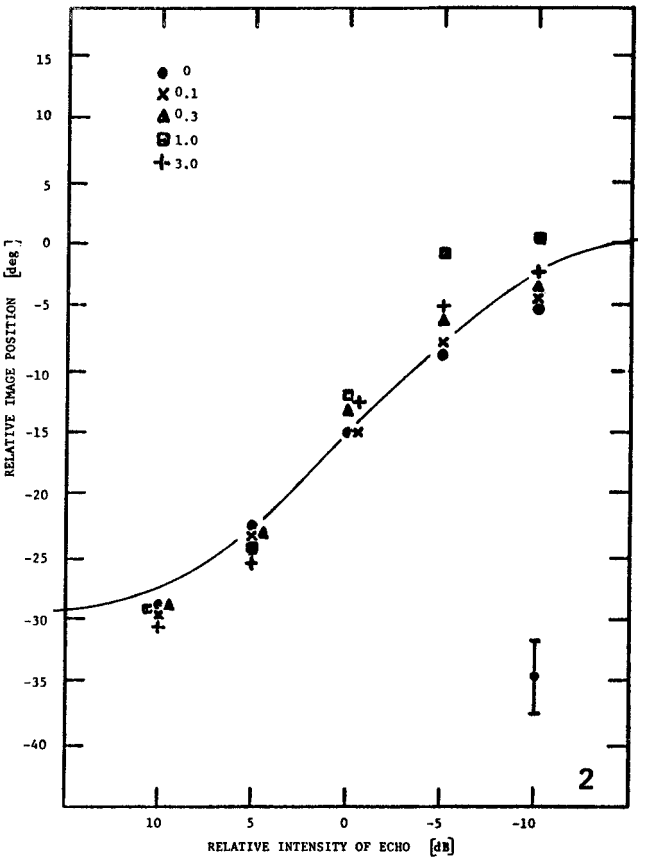
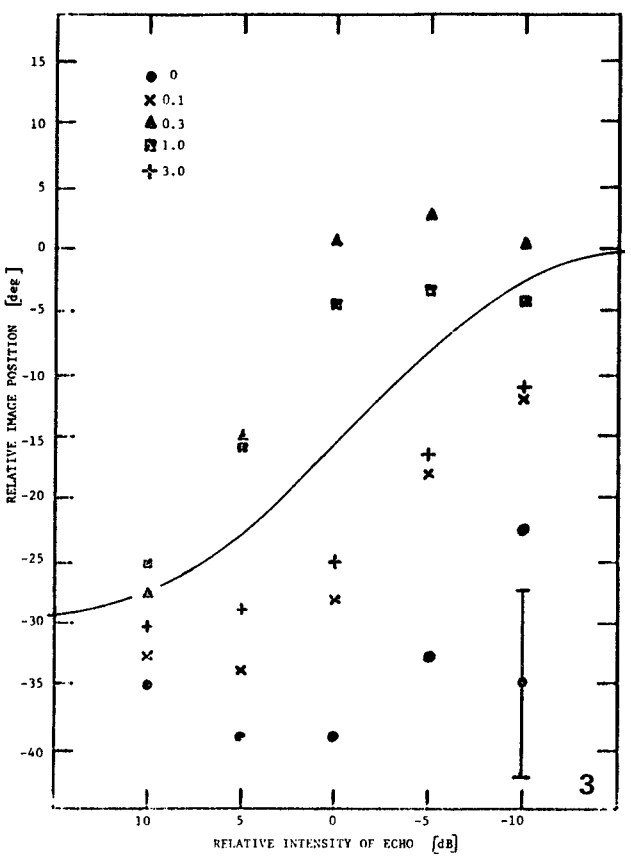
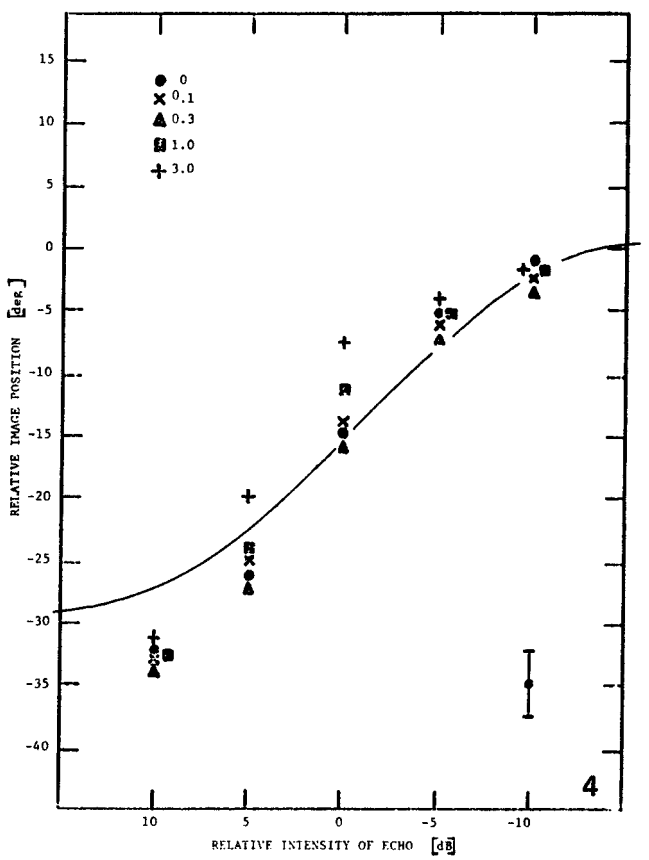


Fig. 1. Two loudspeakers were set up in an anechoic chamber for localization experiments, one representing the direct sound and the other the sound which would be reflected from the wall of a listening room.







Figs. 2 - 4. Data from the localization experiment is plotted as apparent image position in degrees from the direct speaker versus the relative intensity of the echo speaker for 250 Hz, 1,500 Hz, and 6,000 Hz, respectively. Different shaped points correspond to different delays in milliseconds, as indicated by the legend.

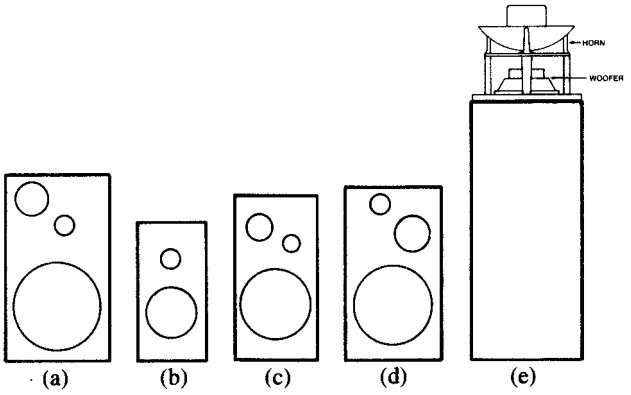


Fig. 5. The configurations of the five loudspeakers which were used in the panel test. Speaker (e), the quasi-omnidirectional design, was also used in the localization experiment.

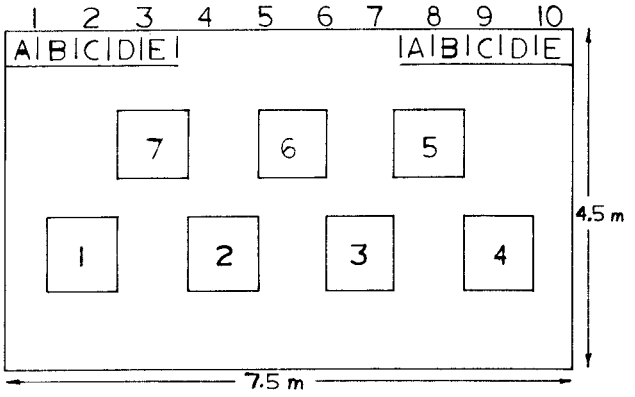
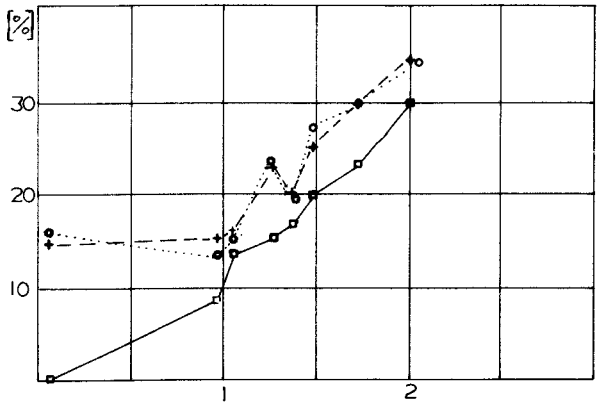


Fig. 6. Listening room plan in which panelists were seated around seven tables. Loudspeaker pairs, as shown in Fig. 5, were located at A - E.



□—direct (A–B) comparison
+—total sequential choices
o—stereo

Fig. 7. Degree of speaker preference in percent is plotted against ability to localize sound image with that speaker for the panel tests.

Tony Federici, President of Scheiber Sonics, discussed some of the problems which have been common in four-channel decoders and ambience extraction systems, which operate by detecting the out-of-phase or random-phase component of the composite stereo signal. All but the simplest of these spatial decoders contain logic circuits which continually adjust the gain and phase of each channel in order to enhance the front-back and side-to-side separation; the Tate and Scheiber are generally regarded as the most sophisticated of such products. But most spatial decoders, whether simple or complex, have tended to suffer from wandering images, diffuse localization, and unwanted instruments appearing at the side or rear of the listener where only the hall ambience should be.

Ideally, Federici suggested, one should be able to crank up the level of surrounding ambience to any desired degree (or at least to a subjectively realistic level) without creating a false sound stage at the rear. In many of the older spatial decoders false localization effects and audible gain pumping occurred because the circuits were too slow in their response. The newer Tate decoder is very fast in its logic action, yielding better imaging of transients; but with sustained notes it exhibits unstable behavior which sounds something like tape flutter as the decoder tries to decide where to place the image. What is needed is decoder logic whose speed is signal dependent, adapting itself to the needs of the music. While time-delay circuits have been the most popular approach to ambience reproduction in recent years, Federici disapproves of the high-frequency rolloff which most delay units exhibit in the rear channels. He believes that, since the authentic ambience of the recording site is contained in the grooves of the record, the best method of spatial reproduction is that which best extracts that ambience and presents it around the listener. This is the Scheiber Spatial Decoder, in which all of the problems referred to earlier have been effectively solved. The unit has controls for optimum decoding of SQ recordings (some of which are still being made, notably by EMI), as well as ambience extraction from un-encoded records. It costs $3000.

A playback system was set up by Goodwin's to demonstrate the Scheiber Sonics spatial decoder and the Queen CA2 loudspeakers. The electronics included the Mark Levinson ML-1 preamplifier and ML-3 power amplifier. Unfortunately one of the rear speakers was inoperative, so the full effect of the spatial decoder could not be experienced. Initial impressions of the Queen loudspeakers were generally favorable, eliciting comments on their good vertical as well as horizontal dispersion, their solid bass, and their clean, airy top end.

In the final portion of the meeting some of the many BAS members who had traveled to the Chicago Consumer Electronics Show reported on some of the more interesting new products seen there. Detailed commentaries on the CES are to be found elsewhere in this issue.

-- John Schlafer

CES REPORTS

by Brad Meyer, David Weinberg, and Peter Mitchell

Editor's Note: Stores have been going bankrupt and everyone agrees that the hi-fi business is in a slump, but manufacturers continue to introduce new products at their biannual extravaganzas, the Consumer Electronics Shows in Chicago (June) and Las Vegas (January). An unusually large contingent of BAS members made it to Chicago for the Summer CES this year, walking the miles of corridors and returning with the obligatory 100-pound suitcase full of literature. In these pages three members report on some of the things they saw. To set the stage Brad Meyer presents a first-timer's impression of the Show, and in the following reports David Weinberg and Peter Mitchell comment on some of the products which caught their eye or ear.

A BEMUSED AND ANECDOTAL ACCOUNT OF THE 1980 SUMMER CES by Brad Meyer

This was my first Show, and I was suitably overwhelmed by the size and complexity of it all. As you may know, there are three separate buildings in which things happen: McCormick Place, a huge convention hall in the classic tradition, with three levels of immense open spaces temporarily subdivided into exhibit booths plus some very large exhibit rooms; the adjacent McCormick Inn, which has medium-large open exhibit spaces on the lower floors and hotel rooms on the upper floors; and, about two miles uptown, the Pick Congress Hotel , which has regular hotel rooms of the sort used for the AES convention at the Waldorf in New York.

I. McCORMICK PLACE

McCormick Place is the zoo. There you will find the widest variety of exhibitors and the most outrageous and amusing promotions. Having been to AES conventions before I felt more at home in the smaller exhibit areas, so McCormick Place is the area I covered least well. Among my omissions was the Pioneer audio/video demonstration room, which was very popular and apprently spectacularly well produced. Still, I did catch a few things:

There was a "robot" wandering around the main lobby, representing Omni magazine, which (who?) was accosting sightseers and engaging them in conversation. It (he?) was equipped with a TV camera and a microphone, and was being remotely operated by a very clever man who spoke (in an absolute monotone) through a small speaker in the robot's front. The optics of the CCTV system were good enough so that the operator could read people's name tags, which allowed him to startle the unwary in a very satisfying way. He (it) always collected quite a crowd; he was an extremely impudent robot. His promotion of his sponsor was direct and to the point: "Do you read Omni magazine?" "No." "You should. Or else."

(Attendees at the CES generally are acquainted with technological toys, so the sight of the Omni robot wheeling around the exhibit corridors elicits mainly amusement rather than awe. But last year I encountered him in the street-level corridor of the Palmer House Hotel in midtown Chicago, where he (it) was blowing the minds of innocent civilians unconnected with the CES. To the technically unsophisticated it's not obvious that he is operated by wireless remote control. At first glance he seems completely convincing as a genuine, self-motivated (and frighteningly intelligent) robot or, at the very least, a metal uniform with a little man inside! -- PWM)

Video-related components are going to be big next year. Small forays into the field are being made by companies marketing things like a tuner that picks up the sound off of

the television channels and sends it to your preamp. A young lady at one booth told me that the device she was promoting provided the TV sound in "stimulated stereo." Must be for the X-rated movies they're sending over the cable late at night.

Speaking of X-rated movies, the porn videotape merchants were back this year, apparently having toned down their displays considerably. (Yes, they were less blatant, but they occupied twice as much floor space, which testifies to the prosperity of the business. -- PWM) Last year they were simply showing uncut versions of their wares; the one booth I visited in June was showing what might literally be called "teasers," meaning previews that would themselves been rated R at most. VCX, one of the largest video distributors, had Marilyn Chambers at their booth signing autographs. I didn't see her; someone who did told me that the overriding impression was that she looked tired.

On the last day of the Show I stopped by an automotive accessories booth, and while there I suddenly heard loud disco music coming from the other side of a cloth partition. Surprised that such a manufacturer should be exhibiting in this building, let alone in this section, I wandered over, only to discover that the sound I heard was coming from the open windows of a Pontiac Firebird. There were two men sitting inside the car, apparently talking to each other. I don't know how they were doing it, because the level was just about right for disco where I was, fifteen feet away from the vehicle. I had my peak-reading sound level meter with me but discovered that it had been left on, its batteries were dead, and there was no AC within 20 feet of the car. Anyhow, it was <u>LOUD.</u>

II. McCORMICK INN

Across a sunken expressway from the Place is the McCormick Inn. Exhibits at the Inn were devoted to audio, and it was here that I heard the KEF 105s (they sounded good), the Sony APM monitor speakers (4-way, with square flat drivers, good-sounding, very analytical, $14,000/pair), and several satellite/subwoofer combinations (ADS, good; ADC, especially nice; Visonik, not good). Of course these evaluations should be regarded as tentative, maybe even highly suspect, because of the extreme variations in room acoustics, source material, and associated equipment. After a while one listens for flaws so severe that they show through all the other variables in the situation. I have not had a chance yet to confirm or deny any of these judgements since I got back.

Les Tyler of dbx was demonstrating their new microprocessor-controlled equalizer/analyzer, the Model 20/20. By the time I heard thd demo he had done it quite a few times, and he was really slick. The 20/20 will feed pink noise into your system and automatically set its octave-band controls to achieve flat response at a given microphone position within about ten seconds. It can store several different correction curves and switch between them at the push of a button, and can add a pre-set amount of top-end slope to any stored curve at the flip of a switch, a handy feature as those of you will know who have heard records played over a system with flat response. Initially they used a pair of AR-9s to demonstrate the device, but the 9s were sufficiently close to flat to begin with that the difference made by the equalization was rather subtle. This made the demonstration ineffective; when your audience has been hit over the head by everything they've heard that day, you've got to do the same or they won't get the message. So Les substituted a pair of the M & K satellites (without subwoofers) and the 20/20 tried, with a fair degree of success, to restore the missing low bass and smooth out the upper midrange.

The most elaborately staged demo I heard was also at the Inn: the Infinity Reference Standard, or IRS (they weren't able to resist the obvious pun; the final words on the opening announcement tape were "... ladies and gentlemen, you are about to audit the IRS"). The demonstrations were staged for about forty people at a time and were given in two parts: a series of excerpts of analog tapes, then a playback of digital tapes from a Soundstream recorder. The digital tapes (mainly Telarc masters) sounded much the better of the two, apparently because of differences in mikes and miking. As far as I could tell from having heard the disc versions of the Soundstream tapes, the IRS has an overall character similar to, but smoother

than, Infinity's smaller Reference Standard 4.5, that is to say, with huge deep bass, recessed lower mid-range, and a forward and slightly peaky top end. I have never really liked the sound of Infinity's tweeter the EMIT, and having 72 of them playing at once doesn't make them sound much better. The system did very nicely on the cannon fire in the 1812 Overture, though; the difference in the sonic character of the various cannon shots was quite obvious.

III. THE PICK CONGRESS

The hotel that housed all the high-end manufacturers is a couple of miles from the other two facilities, which gives the smaller exhibitors space for themselves but separates them to a degree that demands careful planning about what to see and when. There are shuttle buses that run from one place to the other, but they also go to many other hotels on the same route, so it's not the quick trip the organizers would have you believe. The only way to get rapid access to the different parts of the Show is to blow huge amounts of money on taxis, which are scarce at most times of the day. It's really a very clumsy arrangement, but there seems to be no other choice because the main convention facilities are just too far from everything else. (The only consolation is that it used to be worse, with the small audio manufacturers scattered among a dozen hotels all over town. - PWM)

The exhibits at the Pick, as well as most at the McCormick. Inn, were fairly easy to move around in. This apparently is a sign that attendance at the Show was down this year. If that is the case, I am not looking forward to coping with. a busy show. The hotel has two towers which aren't connected above the fourth floor, so the usual scheme for seeing everything is to take an elevator to the top of one tower and walk quickly down, noting the rooms you want to visit more thoroughly later, and then do the same for the-other side. As is usual with such well-conceived plans, mine went down the tubes almost immediately as I wandered aimlessly about, being captured first by one exhibit, then another.

There is a quality of sanctity about many of the proprietors of exhibits at the Pick which I have not found at AES conventions. People seem to feel a little freer about running their priestly number on their visitors here than at AES, where the visitor is more likely to have an engineering background. At the CES one hears technically outrageous claims made with great confidence and verve. As a small example there is a high-priced interconnecting cable being sold for use with wide-band preamps and power amps, which some electronic designers (Bedini, for instance) swear by. This cable has an RF filter built into one end, and its manufacturer logically suggests that the end with the filter should be connected to the input of the amp so that it will filter out any RFI picked up by the cable itself as well as the RFI being passed on from further up the signal path. In the minds of many, however, this suggestion becomes a pronouncement that the cable sounds right only when the signal goes through it in the proper direction, as though the wire were somehow sensitive to the direction of electron flow through it or something. If you point out to a true believer that the signal in the wire is AC and so flows in both directions, you may be branded a techno-freak, which in this case is defined as someone who thinks in abstractions all the time and doesn't know how to listen.

This is not to say that Mr. Bedini holds this irrational view of the way these magical cables work, but he made it very clear that any power amplifier had to have a bandwidth of at least a half MegaHertz to sound good, and that these special cables definitely sound better than ordinary ones. As Peter Mitchell, who overheard Mr. Bedini's lecture from the entrance foyer of the suite, pointed out afterward, a wideband amplifier would certainly be more likely to benefit from an input cable that suppresses RFI than would an amp whose response is rolled off above 50 kHz or so. In all fairness it must be stated that the sound in the Bedini room was unusually transparent and clear, althoug I am inclined to ascribe this more to a good phono cartridge (Fidelity Research Mk III) and to the smooth and sweet-sounding Sequerra Pyramid ribbon tweeters than to anything in the electronics.

There was a surprisingly high incidence of good sound at the Show, despite what I had been led to expect

about bad listening rooms and noisy environments. I heard a borrowed Beveridge System 3 in one suite sounding very good indeed, although Peter Mitchell mentioned that the ones in the Beveridge suite didn't sound as good. Peter wanted to measure the good-sounding ones with the Ivie analyzer, but the person in charge of the suite wouldn't permit it, having noticed that Peter was wearing a Stereo. Review badge, which meant that he was inescapably allied with the forces of evil. It was a truly remarkable display of prejudice. (When this individual, working for an amplifier manufacturer, heard about the theory that power amps being operated within their voltage and current limitations tend to sound the same if their frequency responses are identical, he practically had an apoplectic fit.) There is a strong progability that in a scene like this, if you remain too level-headed and rational you will be seen as a troublemaker, someone who is out to spoil the game. In a very real sense, it's true. Much of what is being sold at the high end has an appeal largely based on magic, and the prestige of technical oddity and high price. Without those factors, high-end audio would be neither as lucrative nor as interesting as it is. And as you probably have noticed, some of the best sound at the Show was accompanied by the most offensive explanations and arguments.

One remarkable demonstration was accompanied by no explanations of any sort. Peter Moncrieff, the editor/publisher of International Audio Review, has put together a very unusual speaker system which has imaging properties that *are* nothing less than startling. The system, called the IAR Lab Monitor, consists of two small subwoofer cabinets and two flattish midrange/tweeter units that look like scaled-down Quad electrostatics, only with funny protrusions bulging out the grillecloth in several places. These panels are placed almost facing each other, and although Moncrieff says they work best in many rooms with only a couple of feet of separation, they were set up about eight feet apart in his small, very live room at the Pick. I heard no material with which I was familiar, and Moncrieff played only a few individual cuts of popular discs or short passages from classical records, so once again firm conclusions can't be made. But on several of the selections, and especially on a cut from an old Manhattan Transfer record, the sound had a vividness and solidity which was, in my experience, unique. The sound was not totally uncolored, having what sounded like slight roughness in the upper presence range, but on the whole it was so natural, unforced, and unspectacular (in the best sense of the word) that it was a blessed relief from much of what I had been hearing all day. I was extremely attractive and easy to listen to, while also giving a great sense of immediacy -- a rare combination. The imaging was, I think, largely responsible for this; individual voices or instruments (or organ pipes) each seemed to possess only one location in the sound field instead of being spread out as they are in most systems, including ones with minimal cabinet diffraction, dipole radiation patterns, or other features designed to improve imaging. And unlike the electronic image-enhancers I have heard, the highs seem to come from the same location as the rest of the spectrum. As a result the brain has one less kind of unreality to compensate for, and the experience of listening becomes more relaxed and effortless. Placement of both the listener and the speakers are alleged to be extremely critical with this system, although I got much of the effect from a position a couple of feet off-axis on some of the selections.

There were several French speaker manufacturers at the Show, from which it was possible to assemble a general view of French speaker design which is narrow-minded almost to the point of vanishing altogether. This is it: French speakers are smooth and uncolored, but they lack the low bass that Americans have come to expect; the region from 35 to 50 Hz is about as rolled off in the French designs as it is exaggerated in the speakers we tend to like.

I heard the Hill Plasmatronics speakers for the first. time, and talked for a while with Alan Hill. He was demonstrating the units to dealers, so I didn't have time to make any frequency response measurements. I wanted to do this, because Hill showed me a curve stored in his Ivie (which he said had been made at the far end of his rather long listening room) that was unusually flat. The speakers didn't sound as bright as other systems that I have heard when they have

been equalized to have flat response under similar measurement conditions. It may be, as Hill claims, that ordinary drivers sound bright and harsh when EQ'd to be flat because they have such peak response curves and high distortion due to nonlinearities at the edge of the diaphragm. Further measurements and listening tests with the Plasmatronics speakers may have to wait for Hill to come to this area. He says he will do this (and give a presentation to the BAS) if the trip can be made to coincide with the establishment of a dealership in the Boston area; who wants to be a Plasmatronics dealer? From what I could hear (again, on unfamiliar and slightly unpleasant source material) the Plasmatronics speakers are promisingly unspectacular, with good overall tonal balance and perhaps some minor frequency-response problems around 2 to 3 kHz from the cabinetry surrounding the plasma arc. They may well be extraordinarily transparent, but as I was hearing a slightly worn-sounding record there was no way for me to tell.

There are more stories about equipment, but I'll close with a bit of overview. The CES is sponsored by the Electronic Industries Association and is therefore basically a massive promotion and pep talk for the industry. As a piece of PR it is immense, and it gives an idea of the size of the whole enterprise which you can't get any other way. There are two daily publications covering events and promotions at the Show, one a tabloid on newsprint about the thickness of the new Real Paper, and the other a slick 82 x 11 magazine whose Sunday issue hit 274 pages. The newspaper even has a section of international news from Reuters for those who are too busy at the Show to buy a Chicago daily. The Sunday edition of the tabloid carried a front-page story on the Yamaha B-6 power amp, a black truncated pyramid that is said to be a direct rip-off of the Carver M-400. There was outrange in certain quarters over the publication of the story, which added spice to the incident; the dispute was then under negotiation and has since been settled (Yamaha is paying licensing fees to Carver 1.

The EIA honchos at the Show were downplaying the drop in attendance and telling everyone how healthy the industry is. Meanwhile Bernie Mitchell, formerly of Pioneer, now of Advent, explained to the press how the postwar baby boom had created the phenomenal surge in hi-fi business in the late '60s and early '70s, and how the age group (average 222 years) that buys stereo systems is growing up and out of this market, so that dealers who want to prosper in the '80s had better get into -- you guessed it -- video, specifically projection TV with video discs and with stereo audio around it. Bernie also pointed out that companies that had done well because of this bump in the population curve (Johnson & Johnson in the '50s, Levis in the '70s) are now pitching to the same people as they get older (J&J shows football players using baby shampoo, while Levi Strauss has ads for jeans that begin, "Let's face it, my body isn't the same shape as it used to be.. ."). It seems pretty clear that audio, which was once the province of a few of us nutball enthusiasts, and which has been invaded and transformed in scale by the Japanese behemoths, is going to be ,a relatively minor part of some new microprocessor-controlled electronic phenomenon in the next decade or so. That may produce a commonplace digital-based system which has performance that falls between good and excellent by present standards, and which costs only a few hundred 1990 dollars. Almost everyone will have one of these, and then us nutball enthusiasts may be left alone again to explore the outer reaches of the technology the way we were in 19`58, minus our youth and our innocence.

BRIEF NOTES AND COMMENTS ON THE 1980 SUMMER CES by David J. Wienberg

This summer's CES was the first I'd attended in some 15 years. Being used to the Washington D.C. Hi-Fi Show, and noting the list of almost 1000 exhibitors with expectations of over 60,000 attendees, I was surprised at the lack of crowding. According to one person, over 66,000 pre-registered and somewhere around 55,000 attended. The lack of crowding was attributed to fewer persons from each dealership attending, and those who came concluded their business and left, spending less time at the Show than was anticipated -- testimony to the state of the economy.

I was overwhelmed by the amount of money some of the exhibitors spent

such as Hitachi, with a free-standing exhibit hall of its own within the McCormick Place, two floors high and 30 or 40 feet on a side. Acutex had driven a tour bus onto the floor of the exhibit hall in which they exhibited some of their wares.

As for new products, DBX had a surprise: a microprocessor-controlled semi-automatic room equalizer for $1295, including a matched microphone. This item has some compromises to keep the price down, such as a single pink noise source (thus the two channels are correlated), and an inability to average its measured curves from several room locations to create an averaged room equalization. (Many people have commented on the latter point, so it now appears that by the time the product reaches the stores it will have the ability to store and average curves measured with several mike positions in the room --- PWM).

Apt stole the show in terms of civilized sound and an apt product: a 1031 pound 2/--inch high integrated amplifier rated at 80 watts continuous power per channel but with a dynamic headroom of 6 dB (320 watts/ch short-term output). It's an engineering tour-de-force but is not expected to reach the market until early 1981. Apt also had the good sense to use master tape demo material, played on a Studer B67 with Dolby A. The general use of discs at most exhibits, at the volume levels at which most were playing their systems, virtually guaranteed a large amount of acoustic feedback.

I also found civilized sound in the Allison Acoustics and Boston Acoustics rooms. Allison's Model Six cube generated the impression that the laws of physics were being rewritten; this little $125 box sounded so good I thought for a while I was hearing the Allison One, and at moderate loudness levels the little Six can even work with the Electronic Subwoofer. At a similar price C$130) Andy Petite introduced his new A70, smaller than the A100 but similar in sound.

Peter Snell had a new speaker of most unusual construction; I'll have to leave it to others to explain it. (Perhaps he'll bring it to a BAS meeting.) Its sound left me unimpressed, but he was having serious hum and reliability problems with the Audio Research equipment he was using. In the DB Systems room Dave Hadaway was using his Revox to provide feedback-free source material, and it was one of the rare rooms to use ROBAC sound absorbing panels on the walls. These have the form of anechoic-chamber absorbing panels, are covered with semi-attractive fabric, come in either 1 x 1 foot or 3 x 5 foot sizes, and cost under $5 per square foot when bought in quantity. Their absorption at low frequencies is limited by thier modest depth, but at midrange and high frequencies their absorption seems to be high. Dave said they went a long way to alleviate some of the room-caused sonic aberrations.

The Oracle turntable from Inception Audio Ltd (Canada) was in use in several rooms. Its platter mat is convex in cross-section, with a peak at the spindle, so a record placed on the platter actually wobbles on the raised center. Screwing down a large spindle clamp presses the record into intimate contact with the soft rubber vibration-damping mat. The main suspension resonance seems to be around 3 Hz, where many BAS members feel it should be. It appears to be worth further investigation.

Dolby Labs was doing a lecture/demonstration about the benefits of Dolby FM and HX, and Harman-Kardon showed a full line of cassette decks with HX, but surprisingly few other manufacturers were showing Dolby HX cassette decks.

I was amused by the fact that Kloss Video was inadvertently located next to Advent's big exhibit area! Both projection TV systems looked nice, but while Advent had the lights turned down low, Henry Kloss had all the room lights turned ON. Advent was receiving a video feed from a satellite receiver set up by Channel One (of Newton MA) outside McCormick Place. Advent also had their sound room, whose walls consist of stacks of Advent loudspeakers; I guess it is becoming a tradition.

Instead of merely listening to car stereo gear in a wall display or in simulated *car* environments, how would you like to sit in a Peugeot, or a BMW, or an Audi 5000? At CES

it certainly felt good, and the sound was interesting.

NAD used their 7020 receiver to drive six loudspeaker pairs simultaneously, including AR-9s, AR-94s, Polk 10s, Boston A200s, the new Dahlquist bookshelf speakers, and ADS 730s. It was certainly impressive to hear a "20 watt" amplifier drive this one-ohm load to quite respectible levels.

For those of us who listen to SHOP TALK ex post facto there is a marvelous device from Variable Speech Control Co.; a variable-speed cassette recorder with speech correction electronics operating over a range of 0.8 to 2.0 times normal playing speed. You could play a complete SHOP TALK program in only 45 minutes and still understand it! The speed-compensation electronics can also be used with other recorders; connect an open-reel deck with a 3-3/4 ips tape of SHOP TALK to the input, play it at 7½ ips, set the cassette deck's control to 2.0, punch PLAY and PAUSE, and it really works. The price is $295.

Audio aside, the CES covers a multitude of electronics including microwave ovens, antennas, telephone devices, and all forms of video. For those who travel as much as I, Fuzzbuster was there (and competitors); I didn't ask them about the Road and Track expose of their apprently fraudulent submission to Road and Track's radar detector evaluation of a "Super Fuzzbuster" which turned out to be a Cincinatti Microwave "Escort" packaged in a Fuzzbuster case! The Escort still tests out head and shoulders above everything else, and mine has more than paid for itself: in Connecticutt recently it detected a speed trap, while a mass. driver got caught for speeding, and in another recent 3-hour trip identified two speed traps.

Progress is marked in electronic chess. TRYOM showed a small computerized "Chess Traveler" which handles en passant and automatic pawn promotion, is claimed to be able to beat Chess Challenger 7, and boasts a re-tail price of $75.

Finally, my uninhibited plaudits to the Consumer Electronics Group (CEG) of the EIA, who run the CES. The shuttle buses among hotels and McCormick Place made traveling painless, the directories on each floor of the Pick made finding exhibits easy, CEG personnel were eminently helpful, and the guidebook is an excellent reference manual. The audio exhibits in the Pick were spread out throughout the hotel, minimizing the problem of music in one room interfering with the next room's demo. Overall, there was a lot to see and learn, and the people were marvelous. I'm glad I took the opportunity to attend, and I plan to go next year.

SELECTED CES HIGHLIGHTS FROM CHICAGO
by Peter Mitchell

I have written a detailed survey of part of the Show for the September issue of STEREO REVIEW and a broader survey of the entire Show for the audio supplement in the Sept. 9 issue of the BOSTON PHOENIX. So in these paragraphs I will concentrate on some of the highlights which especially attracted my interest.

It is obligatory, of course, to say something about the $20,000 Infinity Reference System. From the first day of the Show, the question most often asked when encountering someone in the hallways was Have You Heard the IRS Yet? To add to its allure the demo was a 20-minute closed-door affair and one had to stand in line nearly a half-hour to get in. While the sound of the system was impressive, it still was more like hi-fi than like live music; in fact it is recognizably "Infinity" as heard in their RS 4.5, scaled up in sheer peak output capacity - clean and detailed at low and high frequencies, with a noticeable lack of warmth in the midrange. In fact the sound nicely complements the slightly fat, warm sound of the Telarc digital recordings which were being played. Of course what sent people away breathtaken was the way the system reproduced the cannons in the 1812 Overture: with not the slightest sense of strain, and with precise stereo imaging of¢ the various blasts. I asked Jack Renner of Telarc about this; he said that he had planned specific stereo placements for the various cannon shots, but even he had never heard them reproduced the way he envisioned them, until now, (Of course the fact that the playback was from a copy of the digital tape, rather than from a disc, helped a lot. Those cannon shots drive most phono cartridges and tonearms

into such frenzied excitation that they do well if they just stay with the groove, without worrying about subtleties such as imaging.)

The Beveridge. System 3, in the Beveridge display room, sounded very smooth through the midrange, but rolled off rather rapidly at low and high frequencies. Upstairs in the JVC "super-A" room another pair of System 3s sounded remarkably transparent, open, and detailed with an airy top and firm, well-defined bottom. Take your pick. There were a few other rooms where one could hear sound that was truly musical in character rather than just good hi-fi. Acoustat, for example, was making some very natural sound with the Monitor 3 and 4, the first Acoustat electrostatics which don't have built-in hybrid amplifiers; without the amps the speakers cost only $825 and $1000 each, respectively. The key is an "interface module" with transformers overlapping in range, said to make an easy load for conventional amplifiers to drive.

In the Pyramid room Richard Sequerra was using an FR Mk 3F cartridge to demonstrate his speakers, including a new $300 HF-1 ribbon tweeter module (half the price of his revered T-1 tweeter) which sounded very sweet and clean. In the ACR room the R-T $100 ribbon tweeter also sounded remarkably sweet and musical; it appears to be the JVC ribbon tweeter. They're also using it in a line of "Apature" (deliberately mis-spelled) speakers with dynamic woofers, but the tweeter is clearly the best part. And the most startling demonstration of stereo imagery was provided by the IAR Lab Monitor speakers developed by Peter Moncrieff. The precision, stability, resolution, and three-dimensionality of their images provided an ear-opening listening experience.

The new Dahlquist box speakers play very loud, are remarkably free of cabinet resonances, sound very clear and detailed, but my admiration for them is entirely intellectual; I didn't enjoy them. ADC was demonstrating their B300 woofer modules ($600 each) with B410 satellites ($185 each) playing the Telarc "Firebird" at truly wall-shaking levels and sounding pretty good. Peter Snell's well-known Type A 3-way speaker made use of Roy Allison's design principles to avoid response errors arising from boundary reflections; in his new Type 1 2-way he has applied the Allison principle full-range. Its midrange/tweeter dome is nestled in (indeed, bisected by) the intersection of the front panel and a shallow ramp that rises up from the floor to meet the front panel, so no out-of-phase quarter-wavelength reflections of the dome's radiation can occur to interfere with its direct radiation,. This results in a startlingly unusual appearance for the speaker, but its sound was quite open and transparent.

While everyone else was playing the latest digitally-mastered recordings Robert Grodinski was playing a twenty-year old recording of Stokowski conducting music of Virgil Thomson, using his RG Dynamics preamp, power amp, and B &W 801 speakers. While this Vanguard recording was reputed to be one of the best in its day, it sounded wonderful on this system.

A number of new turntables made their first appearance at this show and drew attention as much for their unusual appearance and construction as for their performance claims. In addition to the Oracle these included the Janorhurst JBE Series 3 ($795) with a base hand-sculpted from a solid block of Welsh slate, plus a black acrylic platter topped with an array of circular aluminum discs instead of a platter mat; the $3000 Lux PD-555 which contains a vacuum pump to suck discs (warped or not) into intimate contact with its platter (evidently this is to be done for a minute or so before play, and the vacuum pump is switched off during play so as not to add any unwanted vibration); the Mitsubishi LT-5V ($450), a belt drive with straight-line tracking arm, designed to stand on edge vertically on shallow shelves together with mini-components; the Aiwa AP-D50U ($350), designed to be stacked in the middle of a pile of mini-components, and a startling sight to behold - it's a front-loading turntable which sticks out its platter like a tongue to receive a record, then it retracts back into its slot for play; and Micro-Seiki's $3500 120-pound RX-5000 whose platter alone weighs 35 lbs. It's a belt-drive, imported by SAE; just to gild the lily SAE set up a sample with a second 84-pound platter/base assembly next to the first, driven by a second belt, so that the first platter functioned as the world's most expensive flutter-filtering flywheel. And Marantz is finally bringing over here the exotic "Esotec" cost-no-object

series of components which they introduced at the Tokyo Audio Fair two years ago, including a two-armed turntable constructed entirely in alternating layers of brass and glass. Meanwhile, with all of the exotic and costly turntables being developed, and with the really useful innovations which are appearing in some designs, the turntable which I am looking for is still nowhere to be found: a $200 unit with a good arm and with a suspension as good as the AR turntable was twenty years ago. Correct design need not cost more than thoughtless design. Meanwhile, I saw one product which looks as if it really will help with the acoustic feedback problem in most existing turntables: the VPI base, which combines very high mass with isolating springs. It's worth a closer look.

I finally heard the Omnisonix image enhancer at the Show, and to say that it sounded awful would be an understatement. It was injecting far too much L--minus-R into the composite stereo signal, cancelling the bass and emphasizing the noise and distortion in the recording as well as yielding a vague, diffuse image. I told that to the person running the demo in the Omnisonix booth and he nodded, admitting that they may later introduce a step-up version whose L-R injection will be user-adjustable. Meanwhile I wonder whether the device varies from sample to sample, since Hal Rodgers (at Popular Electronics) and David Ranada have said mildly favorable things about the samples they have heard. Continuing on the topic of image enhancement, Bob Carver has finally taken our initial advice and split his preamp into three separate products, with the Sonic Holography circuit in one unit, the Peak Unlimiter and Auto-Correlator in a second, and the basic preamp in a third unit. So you can now get the Holography or the Correlator without having to invest in the entire $870 C-4000 package. Finally, Joel Cohen"s Sound Concepts IR-2100 image restoration control was on display; its remote-control paddle will make it really convenient to use, but I didn't get a chance to hear it.

One more signal processor of sorts deserves special mention; the DB-7 from DB Systems, which provides inversion of the relative phase of the two channels, or the absolute phase of the stereo system, as well as switchable audio-bandpass filtering. A nice tool to assist audiophiles who want to decide for themselves about the audible importance of absolute phase and of wideband response. The signal inverting stage can also be of use when bridging power amplifiers which lack the appropriate internal connections and phase inversion.

I enjoyed wandering around and observing a lot of projection TV systems but I was rather startled (and, as the owner of an Advent VideoBeam, dismayed) to observe how much crisper and more detailed the Kloss NovaBeam appeared to be in comparison with all the others. As for the cheap projection systems which are simply a lens and mirror used to project the picture off a conventional 12-inch Sony screen, I was surprised to observe that the $500 Fried unit was not as dreadful as I expected it to be. Of course it can't compete with a properly designed three-lens projection system, but considering its price it really wasn't bad at all.

In video I found two developments particularly exciting. (1) Panasonic demonstrated their VHD videodisc system and made it clear that they intend to enter the U.S. with it as a full competitor. Since the VHD system appears at first glance to combine the picture quality and control flexibility of the Magnavision/Pioneer optical system with the economical price of the RCA system, it looks as if we can plan for a prolonged three-way battle for market dominance. (2) A new company, American Value Systems, held a press conference to describe and demonstrate their backyard.. satellite receiver system which will retail for around $5000. It includes an antenna in semi-kit form and a fully-assembled set of ostensibly high-quality electronics. The presentation was incompetently managed, but Robert Cooper (the satellite TV guru) lent his prestige, and by implication his endorsement, to the proceedings. And the system works.