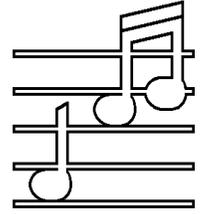


# AUDIO BASICS



A MONTHLY NEWSLETTER OF AUDIO INFORMATION

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## The 1991 Summer Consumer Electronics Show

Since we needed to attend the C.E.S. show in Chicago and because we were planning on being there on June first and second, *Audio Basics* was set back a week to allow us time to attend the show and report to you on what is new in the world of high fidelity and consumer electronics. And since giving you a thorough report is going to take twice the space we normally have available for each issue, we think the time is right for a double issue to give you all the information at once while our notes are still fresh.

Although the overall show was disappointing, both in absence of innovation and attendance, there were enough real gems displayed to keep us busy making notes so that we can give you a good report on things you really need to buy to enhance your life-styles (so they say - especially if they are pastel orange and pink).

As usual, actual high fidelity products are pretty much segregated from the normal life-style enhancing stuff. So that while Chicago's huge set of exhibition halls at McCormick Place were overflowing with video games, quadruple 15" woofer sets for your car, extended warranty policy merchandisers, smaller cam-corders and VCRs with more buttons yet, most purveyors of "high end" audio were located in hotel rooms in the Conrad Hilton downtown. It is ironic that although this industry started with high fidelity as its foundation, now real high fidelity (as opposed to mid-fi) is looked upon as some small step-child of the consumer electronics industry. More money is probably made selling hand held video games to 3rd graders than the whole high fidelity industry takes in so it is lucky they get a place to exhibit at all. Anyway, this year I am going to walk you completely through our visit to the C.E.S. Let's go.

### We Started at McCormick Place

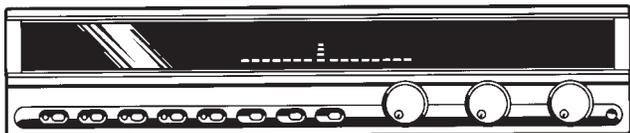
We got going Saturday morning a little before the exhibits opened so we stopped first at the outside plaza at McCormick place where they park the satellite dishes and loud car audio systems. A few years back **satellite receivers** filled the plaza. This year there were only two. Scrambling and grossly overpriced costs for legal viewing of pay TV channels has just about eliminated this innovative part of the home entertainment industry. Now that you can get sent to jail for watching Sesame Street on "public" TV (it is scrambled too) in the privacy of your own home if you try to decode it without proper authority, all the fun and adventure of searching the skies for new and interesting pro-

gramming has vanished. We don't think that the major cable companies ever intended to use scrambling and pay decoders as a method of getting fair prices for their services from satellite owners; we suspect their intent was just to eliminate the home satellite industry completely. Who is going to pay \$5.00 to watch a movie on their own satellite receiver when one can rent the same movie for 99 cents?

The active "**car radio**" exhibits are located outdoors for good reason. They are run with such ridiculously high sound pressure levels that one can hear them inside the exhibition hall anyway. The major thrust of this part of the consumer electronics business is to see how loudly they can

produce rude low frequency noises. When you fill a pickup bed with 15" woofers pointing up and run enough power amplifiers to drive a rock concert, you can make pretty amazing noises. Everybody powered their exhibits from the main AC power lines as these "mobile" systems draw so much power they would kill the battery and burn up the alternator in seconds. Sorry, the necessary very long AC power cords are not standard. As far as I could tell, the concept that audio might relate to preserving the fidelity of actual music is absent from this section of the industry. It is amazing what atrocities can be sold in the name of enhancing your life-style.

Fortunately, the exhibition hall doors opened before our ears shut down completely so we headed in for our first planned destination to see and hear the most technically interesting and musically refreshing conceptual new product of the show.



### The Hughes Sound Retrieval System

I have had the good fortune to be able to use a prototype free-standing Hughes SRS processor for the past couple of months complements of the folks at Hughes Aircraft. Although a version of their circuits has first been licensed and used in big Sony TV sets (where I discovered it) the people at Hughes are interested in its use in high end high fidelity applications and thus provided me with a sophisticated pre-production prototype of the free standing unit to get our reaction to their innovations.

Essentially, the Hughes SRS processor inexpensively generates a huge three dimensional sound field with amazing imaging and depth with no need for extra speakers or amplifiers. Only two loudspeakers and one stereo amplifier are necessary – the speakers and amplifier you already own. It even works with mono source material!

I will quote Arnold Klayman, a senior scientist with Hughes Aircraft and the inventor of the

system who explains, "Its operation is based on an understanding of some of the factors of our hearing system which, in the past, have not been sufficiently addressed. *Ears and microphones do not respond to sound in the same manner* and the Sound Retrieval System corrects some of these differences so that the end result is closer to reality." He also informs us that: 1. Our hearing varies with azimuth (the angle between the sound source and our ears) due to the complex shape of the outer ear (the Pinna), 2. The ear canal is resonant at approximately 2.5 kHz, 3. Our hearing response to in-phase sounds is very different from 180° out of phase sounds, 4. It is difficult to determine the direction of sounds having wave lengths close to the ear to ear distance (1.3 to 1.5 kHz).

As an experiment, rub your fingers together in front of your forehead and continue rubbing while bringing your hand around to the side of your head. **Do it now!** Notice that your perception of the sound changes dramatically in both volume and frequency balance. Because of the special shape of your outer ear, *where the sound comes from affects the way you perceive it*. Part of the information about where a sound source is located (imaging and staging information) is provided by your ear's ability to discern sound locations by frequency differences. You hear the direct wave forms from the performance along with the indirect (reflected) wave forms from the space of the performance. You hear the reflected information differently than the direct information because its relationship to your ears is different. This helps you determine the space and acoustic quality of the performance location. A microphone does not have this ability. When microphones are used to record the performance, no matter how many microphones or channels are used, some of the spatial information will be recorded erroneously because the microphones cannot properly discriminate the different perceived frequency response and volume of direct and reflected information. In playback the information is further distorted because the recorded reflected informa-

tion is coming from the wrong locations (even if you use a four channel surround sound system).

Fortunately a composite stereophonic signal consisting of a left channel (L) and a right channel (R) may be electronically combined to produce a Sum signal (L+R) and a Difference signal (L-R) or (R-L). The Sum signal contains all the direct and centered sources. The Difference signal includes all the difference information between the left and right channels and all the ambiance information. It is the difference signal that provides the spatial information.

What the Hughes SRS system does electronically is to analyze the Difference signal dynamically, make a good estimate of where the information was coming from, and then dynamically adjust the frequency response and volume of that portion of the signal to make your ear think that the signal had originated from its correct spatial location instead of from the loudspeaker. Essentially, it extracts the dimension information from the signal on the fly, modifies the information to closely conform to what the ears (instead of microphones) would have heard, and stuffs the information back into the main signal before passing it to the amplifier.

The Hughes SRS Processor goes between the preamp and the power amp (or in a tape or EPL loop on your preamp or receiver). It works! It has no "sweet spot" – the spatial stability fills the listening room. It requires no pre-processing – it works on all your existing source material. It is completely compatible with your existing high fidelity system. It even can be switched to provide an outrageous three dimensional sound field from mono sources (doing wonders for broadcast TV and old mono video tape signals).

With the simple version of the SRS in my Sony TV (fortunately available at the audio outputs for use with a quality amplifier and speakers) I was amazed with the spatial effects but not so sure of the fidelity because I was stuck with Sony TV originating audio circuits and no controls. With the much more sophisticated free standing SRS pro-

cessor I have my best audio electronics as the driving source and amazing control of the sound field. The musical quality is just fine, and with the Space control (adjusts image size) and Center control (puts center channel soloists in the right place) the SRS is adjustable for just about any acoustical environment and system.

The Hughes exhibit allowed the listener to switch the system in and out of circuit and to play with the controls. It was most impressive. They also introduced some low priced small satellite loudspeakers and sub-woofer combinations at the show that I will have to evaluate here before reporting on further. Our newest amplifiers, preamps, and CD players are working so well that it made it difficult to fairly judge the lesser performance of almost all basic audio components I heard at the show. I should have put an  $\Omega$ mega Control Amp in my briefcase to use as a source. I did that a few years back with a Mos-Fet 150B prototype and almost got kicked out for embarrassing too many people.

The retail price of the Hughes SRS is \$449.00, the size is 17" wide x 4" high x 11.5" deep x 8.5 pounds. It is pretty, it is flexible, and it really might enhance your life-style. We have them on order for sale now. Call us for more information. It is surround sound done the correct way with no accessories or extra speakers needed. It is strongly recommended to make your high fidelity system more entertaining and is an absolute necessity in your video system.

### The Next Stop was Magnavox

No new high fidelity equipment was displayed – we continue to use the 16 bit x 4 oversampling CDB610 CD player for our products. The exhibit was devoted almost exclusively to CD-I (Compact Disc Interactive) equipment. This is essentially a derivation of a CD player that hooks up both to your stereo and to your TV set. It plays back normal audio CDs (but with in our opinion the undesirable 1-bit D to A method) and plays back specialized CD-I discs that combine audio with video text and graphics information for display and manipulation on your TV screen – similar to

using a CD-ROM drive with your computer but without the computer's ability to store and extensively further manipulate the data. It also displays Photo CDs, another aspect of using CD format for storage of high density digital information. I am not quite sure of how well these devices will go over in the market place. I suspect kids will still go for the less expensive and faster dedicated video game machines and technically inclined adults will want a complete computer for their CD-ROM use.

The Photo CD was quite interesting. It appears to be a joint venture with Kodak. Essentially, soon Kodak will offer to put 100 of your favorite color slides or prints on a CD. The source optical scanner works at 3000 x 2000 lines of resolution so the images will be very sharp (unlike the fuzzy transfers to video tape now available). The playback is through a specially modified CD player (or perhaps an extra electronics module for the CD player you own now) and the connection is to your TV set. The resolution is sharper than the TV and the pictures displayed on a standard big screen Magnavox projector were much better than broadcast quality – very much better than a Canon Zapshot or similar. It will keep right up with HDTV when it gets here (more on that later). Evidently you can start with one roll of film and then have the processor keep adding pictures to the CD until it is filled (don't need to do all 100 at one time). There is no time limit on viewing and you can zoom in on the digital pictures and send the information to your computer. I have about 10000 color slides and another 10000 color prints from trips made over the years I sure would like to save in this format. I hope this comes to market soon.

### Onward to Dynaco

We headed across the main C.E.S. McCormick Place show floor in search of Dynaco. It seems as if the company that now owns the trademark is putting the Dyna St-70 back into production again.

Little did I know that I had helped design it! The actual amplifier is being built for Dynaco by Sound Values of Dublin, Ohio. A year ago when I

evaluated the resurrected St-70 Sound Values was offering at that time direct to their customers I built them a sample of our Super Seventy and made a series of suggestions as to how they could improve their own product. I was hoping to work with them to put the Super Seventy into larger scale production than my resources would allow.

My letter to them in June, 1990 said in part,

“Dear John, Here is the finished Super Seventy amplifier I promised you. You will need to supply tubes. Simply bias it as you would a stock St-70. Because the chassis cutouts won't support four 5-way binding posts without metal hacking, the 16 ohm taps are tied off internally. If you need them, you can bring them out to one of the binding posts and tie off that tap instead. The binding posts as supplied access ground, 4 ohm, and the 8 ohm taps. We don't use Dyna's bridge mono switch because it did not work well. It simply paralleled the two channels and it only made higher power into high impedance loads - along with poorer musical performance.

Now think about simplifying the St-70 a whole bunch to make it more rational to produce, build and sell. Get rid of the chrome plated chassis – painted steel or anodized aluminum will do just fine

Get rid of the redundant and obsolete parts layout. We can do the power supply and all on one PC card (rectangular-putting the diodes where the notch is now) to get a lower cost card and a simple chassis fit. Get rid of the front panel tube sockets (although that might be a good place for the bias pots). Punch the front and rear of the chassis for chassis mounted input jacks (two) and chassis mounted 5-way binding post output jacks (4 per channel).

It looks like there is no good substitute for the 7199 tube (except possibly the 6AN8A from the MK III) without doing a very complex and expensive drive circuit. *(1991 Note – I was wrong about that – Sound Values' discovery that the 6GH8A works fine with minor board alterations has saved the amplifier from the junk pile).*

But with a simpler and lower cost chassis layout (do you really need to furnish a cover cage?) eliminating the 5AR4 and many of the chassis holes and hardware parts perhaps the unit could be supplied at a price tube fanatics would like.”

Later, I also gave Sound Values permission to duplicate my redesign of the St-70 power transformer because their supplier could produce them more economically than I could in small quantities.

What I did not know was that these ideas (including some of our board layout ideas) had gone directly into the new Dynaco product. I understand we are mentioned in the instruction manual – credited there with the power transformer design. I guess I should be pleased. They (Dynaco) are now trying to design an upgraded circuit for the Pas-3 preamplifier. I wonder why they have not talked to me about that? I can hardly wait to see what their upgraded preamp circuit looks like.

I wish we knew how to go about getting paid for good ideas instead of just seeing them go into production elsewhere. The flattery simply does not help make the house payment.

Anyway the new Dyna St-70 will soon be available from authorized Dyna dealers for \$995.00 assembled only. We will continue to offer our superior Super Seventy assembled for \$695 (built on recycled original St-70 chassis as available) or the rebuild kit for \$200.00. It got a nice review in the most recent issue of *Sensible Sound* together with favorable write-ups of the Super Pas Three  $\Omega$ mega preamp, the Mos-Fet 240E (now  $\Delta$ elta 240) amplifier, and the  $\Omega$ mega solid state preamp. I have requested reprint permission.

Our current Super Seventy board will not fit in the new St-70 MKII chassis but I will do one if there is enough interest. We will let you know if it happens.

### **HDTV Will Happen Soon!**

Since Dyna was at the far back corner of the main show floor, we could not avoid tramping past some of the main commercial displays of “the zoo” and luckily stumbled across both the Hitachi and Toshiba prototype High Definition TV sets. Both offered outstanding 1200 line definition and 40” wide screen (16 to 9 ratio) performance putting home TV quality right up there with mini-mall movies. The Hitachi was downward compatible with regular broadcast TV because there is no HDTV broadcast standard in the USA yet (and if we keep dithering, the Japanese standard will take over by default). They show a normal 4 to 3 ratio picture by either “letterboxing” the sides instead

of the top, or by zooming in to fill the whole screen width while cutting off a bit of the top and bottom. They work best now for those with Laser Disc players and much letterboxed movies (those kept in the original wide screen format and shown on normal TV sets with a blank strip at the top and bottom). With the HDTV sets, the original wide screen Laser Disc version of the movie fills the whole screen - instant theater! Unfortunately instant poorhouse too – the entry level price tag right now in Japan is about \$14,000. But some day sooner than you think you will have high resolution wide screen video movies in your home at a reasonable price. It is about 5 years from being affordable and widespread. Sometimes technology does march on.

We did not see audio innovations on the main show floor. The major oriental companies were all too busy displaying camcorders, video, and accessories. This used to be a hi-fi show. Now it is a Far East made appliance and gadget show with more space devoted to answer phones than to headphones. Grado was not there and I saw no other really good phones at all. We headed for the McCormick Center Hotel where there were a few hi-fi holdouts.

### **B&W Liked My Ideas Too**

B&W’s main display celebrated their 25th year in business and honored the memory of John Bowers, their founder and long term guiding light. They displayed samples of all their benchmark products – innovation after innovation that set standards for the industry over these 25 years.

They displayed the DM-1, their first loudspeaker and an immediate commercial success, a big floor standing unit using the KEF rectangular woofer (or similar). They showed the legendary DM-70, the stunning electrostatic hybrid of the early 1970s. The “pregnant kangaroo” – the DM-6 – was there, the first practical execution of a complete time aligned speaker (and the first high end B&W we sold). More modern speakers followed, ending with a cutaway of the unique, huge, and complex

Matrix 800 (\$15000 to \$18000 per pair depending upon finish).

A new video tape was playing that has recently been put together by a B&W dealer. It has excellent coverage of the B&W factories and their engineering methods. I was told this short tape will be available to dealers soon. I will let you know when we get it. You will be interested in viewing it too.

The static display room had a large section devoted to a new B&W designed product that is to be marketed through a separate company. The product is the **Rock Solid Monitor**. It is a "life-style monitor" – a tiny little plastic cased two way system featuring an ingenious swivel mounted base that can let the speaker mount anywhere. It sets on shelves upright or sideways. It can set directly on a TV set because it is magnetically shielded. It mounts directly to walls, ceilings, and protected areas outdoors (it is water resistant). There is an optional mounting bracket that lets the speaker mount in clusters of two to four units. It comes in a variety of colors (black, gray, and purple) and it is kind of cute – looks a bit like the head from one of Orson Wells' Martians. Musically it does not compete with the mainstream B&W products. It is priced a bit higher than the V201 and isn't as natural sounding on high fidelity applications (brighter, with less bass and limited dispersion). I have been told that its purpose is to compete with (and beat) things such as Bose minis, etc. I was also informed that only three B&W dealers (including us) did not choose to handle them. (Many dealers – including us – got a preview sample about a month ago to listen to in their shops.) We decided that if the purpose we serve is to advance the state of affordable high fidelity then it would be a contradiction for us to recommend products that do not in our opinion serve that goal. Call us old fuddy-duddies. We think that the high fidelity product first must offer high fidelity and then all the convenience and life-style enhancement possible in its price range. If the ease of use comes ahead of enhanced musical performance then what is its true purpose? The Rock Solid

Monitor is nicer than Bose and similar. But we hope you demand much better than this entire class of product. We suspect its design was based upon the assumption that people buying mass-market type audio equipment don't listen to what they buy and don't care if it faithfully plays music or not – that the package, not the contents are more important. We wonder about the virtues of this policy (selling audio to people who are not interested in audio) and if it will work long term. Is this the reason the C.E.S. show is an answer phone show now instead of a stereo phone show? We suspect that those not interested in reproducing music will do their "hi-fi" shopping at K-Mart or similar and won't have ever heard of high fidelity, B&W or Audio by Van Alstine. I wish they had put the swivel wall mountable base on the CM-1 instead.

However B&W did have impressive musical demonstrations at the show too. In a separate sound room **the 800s and the 25th Anniversary version of the 801** were playing. The improvements to the 801 you all already know about – simply do what we told you to do with the crossover – all our good ideas were put into production so the speaker now behaves just like the ones we have been selling for the past year and a half. There were also some "improvements" made we are not so sure of. The protect circuits have been eliminated and there is no internal provision for using just one set of speaker wires - you have to use external jumpers between the dual sets of binding posts if you choose to not participate in the "bi-wiring" madness now going through the hi-end industry (in our opinion simply a ploy to cause the neurotic audiophile to be forced to buy twice as much overpriced speaker wire as he would normally "need" – all to the immense satisfaction and profit of his friendly purveyor of expensive speaker wire). Anyway the price has not gone up (still \$5900/pair list) and the warranty remains at 5 years so losing the electronic protect circuits likely won't cost you anything but some inconvenient down time in the event of a "oops." The huge 800s were played after the 801 demonstration and they do seem to be a bit better yet – even better depth and imaging – and it is really hard to beat an 801 in this respect. But I have

real doubts about how many of you can afford or want \$15000 per pair loudspeakers, especially ones that look this – to be polite – “unusual.” We are not authorized to sell them – the closest “local” dealer for this product in the Upper Midwest is in Chicago. Although the B&W display was as musically non-annoying as anything we heard at the show, it did not offer the degree of definition, transparency, transient detail, or dynamic range and bass fidelity that we can get out of a  $\Omega$ mega or Fet-Valve amplifier at home driving even a pair of our upgraded DM640s. The basic audio electronics at the show (everybody’s) were disappointing in relation to what we are used to listening to at home and made our evaluation process difficult. We heard B&W 801s used in several “high end” displays downtown at the Conrad Hilton. In each case the sound was very underwhelming. Nothing makes up for terrible room acoustics or gritty sounding electronics.

B&W also displayed (but did not play) a new limited production “Silver” speaker. It was a DM310 sized bookshelf unit with a free standing top mounted tweeter with all the wiring (voice coils, inductors, internal wiring, and binding posts) done in solid silver. The price is \$7000 per pair. I was told that a solid silver version of the 800 is coming too. I did not ask what the price of that would be. I did have a long talk with one of B&W’s chief engineers about the product (pointing out that they should put us on the payroll – he was very interested when I told him how we had “fixed” the DM640s). Anyway, he claimed that without the silver wire he could get either the dynamic range and transient response he wanted, or the ultimate smoothness he wanted, but not both at the same time (I simply think the factory’s reference amplifiers and preamplifiers are not good enough). With silver wiring, he claims he can get a better combination of both smoothness and dynamics. I said I would have to have that proven to me in double blind tests with the only variable being the silver wire. I pointed out that because the wire is of different mass, resistance, and ductility than copper, that changing to silver wire yields coils with different external magnetic fields and voice coils

of different mass and with different internal damping, and thus the different sonic signature can easily be caused by uncontrolled variables. I also pointed out that changing the mass, damping, and magnetic field of the coils and crossovers can be accomplished a lot more economically than winding everything of solid silver. I suggested that they not get carried away assigning virtues to inanimate objects (“silver sounds better”) and instead concentrate on finding out why the physical changes they made produced sonic quality they like better. Better and inexpensive is more useful engineering than better and much more expensive.

### The Remainder of McCormick Center Hotel

After leaving B&W we visited most of the other sound room displays at the McCormick Center Hotel. In our judgment the best sound was coming from the **Dahlquist** and the **Tannoy** rooms. Both were pleasant but were not playing dynamic or wide range material so we could not be sure what would happen when things got more complex. We liked the looks of the new Tannoy Sixes line of speakers (seven models prices from \$279 to \$1399 per pair). They reminded us of slimmer versions of the old B&W 2000 and 3000 although with six sided rather than five sided cabinets (to break up internal reflections). They are built with modern material and innovative engineering techniques. I would not mind auditioning a set here but I would be surprised if they outperformed our improved DM640s that have more cabinet volume (nothing beats more cubic inches for clean and efficient deep bass response). But both the new generation Dahlquist and Tannoy Six series speakers belong on your audition list if you are shopping for speakers.

### The Basement of the Zoo

Next we visited the lower level of McCormick Place to get a taste of grot. We were amazed to see booths for at least twenty different **extended warranty** sales companies. As I pointed out in an earlier issue of *Audio Basics* it is very good business to sell you an extended warranty policy on

your home entertainment product. I wonder if any consumer has actually used one of these policies to get something fixed for free after their normal manufacturer's warranty has expired and before the item became functionally obsolete. If you have used an extra cost extended warranty and gotten your money's worth, write and tell me about it, *Audio Basics* readers want to know! We saw many booths displaying a whole new product category of **home medical electronics** (pulse takers, vibrating chairs and beds, etc.). There were no digital do-it-yourself appendectomy kits yet. In other aisles we saw slip covers for video tapes designed to make them look like leather bound books. We saw a holder for your remote control units. It clipped them all together to make one giant remote the size of a cookie pan. We saw (and unfortunately also heard) gobs of "sing along" **Karaoke** cassette players - you buy tapes of popular songs with the main vocal line missing - you get to sing into the microphone yourself and mix your very own voice with the cassette - a real direct to boombox presentation. Yetch!

We did find the always interesting magazine section and got free samples of many audio, video, CD, TV and general magazines. The vendors are hoping to get show goers to advertise or subscribe to their publications. Usually these booths are manned by salesmen, not the editorial or technical people so you don't get the opportunity to learn much at the booths. Thus, much to my very pleasant surprise, I discovered Wayne Green himself stationed in the **CD Review booth**. As any of you who read *CD Review* (recommended) know, Wayne Green, the publisher, is a much more successful iconoclast than I am. Thus when I informed him of the nasty little known fact regarding 1-bit CDD to A conversion (11 million divided by 20 thousand equals about 500 which sets an upper limit of the number of samples per cycle at high frequencies to 8-bit, not 16-bit dynamic range and resolution - thus insuring that "bitstream" CD players are bad news) he suggested that I write up the details for him for possible use by *CD Review*. He also was concerned about the likely loss of data with the new DCC (Digital Compact Cassette)

format. We will get to that in another page or so. I offered to lend him an amplifier to play with and will send him a little  $\Omega$ mega amp soon. It will be interesting to see where we get with that. I bought some absolutely great CDs from Wayne Green - on his own Greener Pastures label. If you don't have his Scott Kirby playing Scott Joplin piano rags and Banjo Dan bluegrass CDs your collection is not complete. They are musical in all respects!

As we left the show floor we noticed an unfortunate and interesting sign of the times. The only thing on the whole floor drawing a crowd (biggest single draw I saw at the whole show) was the line of men (several hundred) waiting for free autographed copies of *Penthouse*. Guess what still sells best of all?

### Innovations 91

To save time, we decided to visit the special **Innovations 91** display. This is a separate trade show sponsored hall room filled with the "cream of the crop" - the products judged to be the most innovative of the year. What a waste of time. If the evaluation had been made on real engineering innovations instead of ones done by copywriters, the display could have been held in a broom closet. Sorry, I don't consider dual control clock radios and remote control range extenders (for example) to be very innovative. The display was features and packaging oriented all the way. I am sure this is an unfair observation. Very likely hidden away somewhere in amongst those 169 products displayed were a few with new and more useful functions and purpose. It is just that they are so buried between the "even more buttons yet" VCRs and the transparent telephones that it makes finding them difficult. Let me know if I missed something important.

### Onward to the Hilton

At this point we decided to take the shuttle bus back downtown to the Hilton and try our luck at the hopefully better sounding rooms set up there by the high-end manufacturers. There were approximately 139 display rooms in the Hilton spread

over 10 floors. According to my count there were 43 loudspeaker manufacturers, 28 solid state electronics suppliers, 14 vacuum tube electronics builders, 13 cable purveyors, 5 digital processor makers, 4 magazines, 5 accessory suppliers, only 4 holdout turntable importers, and 23 rooms of miscellaneous stuff such as Floaters and Room Tunes.

We shouldn't have even tried. By the time (late afternoon) that we got to the Hilton and found the magazine that is supposed to be publishing a highly favorable review of the Mos-Fet 120D (now  $\Delta$ elta 120) in their next issue – hoping that the issue would be available at the show but alas not for another three weeks – we were so tired we got into the dither mode. We would step to a room entrance, try to listen, not be impressed, and not go in. That is silly. We were there to see and hear stuff. We called it a day and resolved to do better the next morning when we were fresh.

The next morning we started at the top – the 14th floor of the Hilton and tried to listen carefully everywhere. It was an impossible task. I'll try to give you our overall observations first. We were surprised at the number of very large (100 + pound) vacuum tube amplifiers. Some were quite good. There were too many very expensive external D to A converters - why we don't know. A good D to A is the size of a thumbnail, costs about \$25.00, and fits conveniently right inside your CD player. It appears that many esoteric designers are trying to apply analog design assumptions to digital circuits – about as appropriate as sending a cat to obedience school. There were many strangely shaped and very expensive loudspeakers (bookshelf size for \$6000 and up) that appeared to have no redeeming virtues. One even included a digital processor-equalizer that could only be placed between your CD transport and your external CD D to A converter. How clever, a multi-thousand dollar speaker that can only be used on CD, and only if you have already been suckered into buying an external processor. I don't see a very big market niche for that product. Interconnect cables and speaker wires keep getting bigger, more bizarre looking, and more expensive – how about \$590 for

a foot and a half? There were liquid filled and cryogenically treated speaker cables the size of your wrist with end lugs an inch across. I wonder if the designers or users understand that inside their amplifier the internal connections inside the power transistors or tubes are half the size of a hair. Why previously frozen cables or CD players “sound better” escapes me. The only thing I like frozen is ice cubes.

The overall sound at the show was very disappointing. The best cases were simply not annoying. Most rooms were harsh, dry, and grainy with the grain varying from grit to powder from room to room. Most that sounded not annoying were playing polite material at low levels and many that sounded nice superficially fell apart if any crescendos came along, the strings becoming strident and the bass going boomy. We never heard any really solid deep bass at all at any display. Only one amp, an Italian made **Vulcan 280** vacuum tube giant, had really good transient detail and it didn't play the detail as harmonically as I would have liked.

We kept making a mental note in listening at any sound room – would an  $\Omega$ mega Control amp and a pair of B&W DM620s win if we swapped for them on the spot? Almost always we suspected that answer would be yes. By end of day we were oversaturated again could only judge tolerable and not. There were too many sounds in too little time with inadequate references. I will try to recall a few specific impressions anyway.

**Audio Research** had very pleasant sound and they too displayed a new external (20 bit) D to A converter.

**Laser Illusionists** were sticking an “optical to optical” filter (that is what I think they said) in and out of circuit in the **Wadia** suite claiming it improved optical signal to noise ratio (or something like that). The people from Wadia seemed to like it - we couldn't tell because the sound was too nondescript to allow us to make a good judgment in either case. Actually, if the original data read is

not good, you cannot improve it after the fact. If your laser is out of focus, mistracking, or the disc is vibrating enough to make the data read ambiguous you need to fix the originating problems, not to attempt to fix the data stream later.

**Apogee** displayed a very attractive and relatively inexpensive model (the Centaur Minor at \$995/pair) that had obviously good musical structure and excellent imaging. The only drawback is that it is a rather inefficient 3 ohm load over much of its range according to test reports. We would like to see an  $\Omega$ mega 240 or bigger driving it.

**Conrad Johnson** displayed their usual well crafted vacuum tube electronics, a "zero feedback" hybrid amplifier, and a 1-bit CD player. I don't understand going to extremes to preserve definition and detail in the amp and preamp but not noticing that you have given it all away in the source.

**Essence** had a nice sounding 5 way speaker system with each driver built into its own separate cabinet. The system looked a bit like an oversized set of children's building blocks stacked one on top of one another. However they had enough drivers to cover the audio range using only 6 dB per octave crossovers (no electronic transient ringing as is often the case with steeper filters unless the designer has engineered in adequate damping and few do) and the musical results were impressive. This is another speaker I would like to hear in my own listening room on our own electronics.

**Vision Acoustics** seemed to display loudspeaker systems with no tweeter at all. Actually the tweeter was hidden, it was a low mass crystal tweeter bonded directly to the center of the woofer cone! This new twist on a coax design seemed to work quite well.

The people building the Sims damping rings are doing things better now. Their previous device, a damping ring that was affixed by adhesive to the top side of your CD was too massive and could not be removed without damaging the CD. Now they

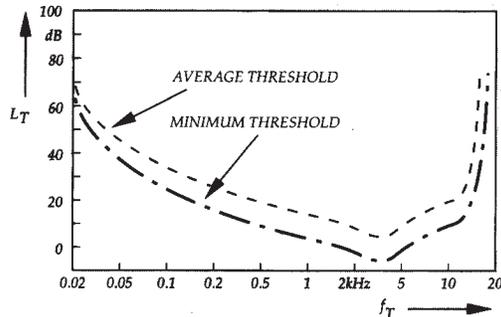
have a much more interesting device – the **Sims CD Rings**. This damping ring goes around the edge of the CD and is removable - no sticky stuff. It is low mass and physically unobtrusive. We have some samples to try. We want to see if it will help the trackability of any of our "problem" CDs in good or marginal transports. We will count the glitches with and without and let you know the results.

We got to meet the gentleman who donated the cables I like, Ray Kimber. At **Kimber Kable** you can actually buy heavy and durable speaker cables for \$2.00 per foot terminated with hardware that does not break amplifier fittings. Ray showed me some newly designed spade lug speaker wire connections he is just starting to produce that make a lot of sense. They also have some new heavy duty panel mount RCA jacks that fit cables as solidly as a bank vault door shutting. I have asked them to price the jacks for me in quantity to see if it is possible to offer them to you as an extra cost option. Remember the cost of 18 to 24 super premium jacks on the back of a preamp adds up frighteningly fast. What you would like and what you would want to pay for might be quite different.

I should not overlook **Genesis** loudspeakers. This company combines the talents of Arnie Nudell (founder of Infinity) and Paul McGowan (formerly of PS Audio). Their new speakers (three compact to small sized pedestal mounted full range units and two active servo-feedback powered subwoofers) are attractive and different. They have semi-cylindrical cabinets with significant attention to materials and design. The overall musical quality of their display said they are on the right track. Check them out.

The last major interest I can cover is the **Marantz** display and **DCC - the Digital Compact Cassette**. Marantz (owned by Philips for some time now) is remembered in the U.S.A. for the classic styling, performance, workmanship, and simply overall product excellence of the Saul Marantz designed vacuum tube equipment of the 1950s. Interestingly, a company called **Classic Audio**

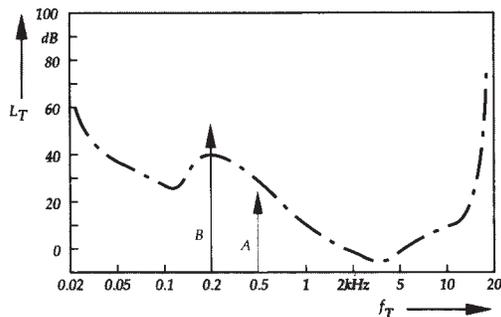
still produces original replacement faceplates for the significant old Marantz and McIntosh products, and even builds the huge old Hartsfield corner horn speaker too, all impressive 200 pounds of it. Anyway, Philips is bringing the Marantz brand back to the US market with very attractively styled components featuring the original gold fin-



ish, but with curved lines and even color LCD displays. What really caught my eye was the only DCC that I heard playing at the show and the opportunity to pick up a little literature about it.

### The Digital Compact Cassette (DCC)

Digital Compact Cassette is another digital tape format developed by Philips. One of its main claims to fame is that it is downward compatible with existing audio cassette tapes (a tape made on any old ordinary cassette recorder will play back on the DCC machine so if you buy a new Digital



Compact Cassette machine, you can still play back your old tapes - they won't be digital and they won't be as good, but you can still play them). With a DAT machine your old cassettes won't work at all. To design a new digital format that still plays old analog cassettes too is quite an engineering feat - but it involves significant design tradeoffs. Obviously a rotary head design was not possible (as used in VCRs and DATs) because that would

not be compatible with analog cassettes. The rotary head is used to get a high speed difference between the tape and the head, necessary for the wide bandwidth needed for the digital data stream. Actually the tape speed in the DCC has to be very slow - 1 7/8" per second to accommodate analog tape playback. This speed is far too slow for the bandwidth necessary to contain the digital data stream in a single uncompressed track. Philips' solution is a nine track digital record-playback head built into the same space as a conventional stereo analog cassette head (covering half the width of the tape) with two conventional analog playback head elements built into the assembly covering the other half of the tape width. You don't turn the tape over to record or play the second side - the head rotates 180° to accomplish this.

By using 9 simultaneous tracks 0.0072" wide (8 data tracks and 1 control track) and by using very fine gaps (0.0000389") on the digital record-playback head you multiply the effective tape speed times eight and that times the bandwidth increase of the microgap head, providing enough bandwidth for a compressed digital data stream. Using chrome video tape further enhances the bandwidth potential. The head technology uses thin film wafer construction with dimensions as tiny as in integrated circuit fabrication.

Each of the 8 digital tracks can store or retrieve 1-bit of data during one sample period (32K, 44.1K or 48K Hz sampling rates are possible). This provides 8-bits of data per sample for both audio channels or 4-bits per channel assuming conventional linear decoding. To store one second of music a DCC uses 352,000 bits of data at the CD 44.1K sampling rate while a compact disc uses 1,411,200 bits of data. The DCC must store the same music using only 25% of the capacity that a CD has available. Obviously, something has to give.

Refer to the graph above (copied from the Philips brochure, "DCC: The Fundamentals"). The curve marked Average Threshold is a graph of the min-

imum sound pressure that the average person can hear at various frequencies. The lower curve marked Minimum Threshold is a graph of the people with the most sensitive hearing. Essentially if these graphs are correct for music signals, then one can reduce storage demands for the DCC signal by having the system ignore signals that fall below the minimum curve on the graph.

Now refer to the second graph (also from the Philips brochure). Philips claims that a louder sound (B) increases the hearing threshold to an extent that it completely masks a nearby softer sound (A). Thus sound A need not be encoded if it falls below the dynamically varying new threshold of perception, caused by the occurrences of louder sounds. To simplify, what they are saying is that according to their evaluation of hearing tests, much small signal detail need not be recorded because you cannot hear it anyway.

The compression system also assumes that not all the sound spectrum is used at the same time (except with white noise) and thus storage is saved by allocating unused frequency bands to the sounds then being received.

This all sounds good, until one observes some of the limitations of the system.

First, these hearing threshold curves, below which it is claimed that data can be safely discarded *can only be true if the recording is played back at sound pressure levels no greater than that of the original music*. If the playback level is louder than the original, then sounds that would have now been audible because of their increased level will now be completely missing! You will now know that portions of the original performance have been eliminated.

Second, if you make a recording with a DCC tape from any source (live or recorded) at too low a record level some musical information will drop below the pre-determined cut-off threshold and will be lost. For example when recording from a CD or radio program with a lower signal level than

normal, you will lose audible information because the DCC coding assumes a standard record level.

Third, sound pressure levels above 100 dB cannot effectively be recorded because to capture them you will have to set the average record level lower and again start losing the low level information. This does not bode well for using the system for live music or with dynamic CDs as your source.

Actually, without the coding and compression the DCC is a 4-bit system (capable of just 16 amplitude levels per cycle at 20,000 Hz). For it to better this, the data manipulation schemes must work perfectly and the hearing curves they are developed from must really apply to the limitations in the perception of live music the curves describe. Also, the music must not be too loud or dynamic, and the recording must not be played back louder than the level of the original performance (or source).

The format does not save the producer of pre-recorded tapes from having to issue tapes in yet another format because they will still need to issue the tapes in normal analog cassette format and in DCC format too for those wanting a digital pre-recorded tape to play back on their new digital tape machine.

Finally, we wonder about the value of the compatibility with analog cassette tapes as an engineering restriction in the design process of another digital tape medium. When you buy a digital tape recorder there is no rule that you have to throw away the analog cassette recorder you already own. The only place we can see where compatibility might be useful is in a car deck, and who ever worried about high fidelity in a car anyway?

DAT is already too limited because of multiple copy restrictions and DCC will have that same problem (you cannot record yourself live and then make a digital dub or mix of your own performance). Given track widths the size of a hair and head gaps even smaller, we wonder how well DCC machines will hold alignment and stand up to

normal environmental vibrations and dirt in real world use. The world's parking lots are already full of shredded analog cassette tapes. We would advise using caution before being the first to buy into this new format. I want to hear just how well it can record and playback dynamic source material before I will be comfortable with it. For now we will assume that DAT maintains a useful edge.

Well! After all that we are back at the lower floors of the Conrad Hilton and are exhausted and back in the dither mode. It is time for a few final thoughts.

For the most part high fidelity equipment designed to be reasonably priced and inexpensive was missing from the show. Hafler was not there, Polk was not there. All the high fidelity manufacturers seemed to be aiming upscale with fancier and more expensive products. Everybody (except us) was complaining about how bad business is this year. We are doing better than last year - thank you! I wonder about the direction the "high end" industry is going. We turned out a better solid state amplifier (the  $\Omega$ mega) this year and lowered our prices too because it is a more elegant design that is actually easier and less expensive for us to build. I didn't see anyone else in the industry admit that better might cost the end user less. Of course B&W has improved value ratios over the years as their mid-priced speakers keep surpassing the older high end ones in absolute performance at a lower cost, but their top end models seem to keep getting more expensive anyway. I am worried however that if good introductory level equipment becomes too expensive and if the potential high fidelity enthusiast is confused by too much marketing hype over solid unobtainium cables and cryogenic vacuum tubes instead of being placed into simple, solid, musical, and inexpensive high fidelity equipment, that the potential customer will simply turn to another interest and leave us all staring at our dusty unsold solid gold cable spikes. It is time to go home.

## Used Equipment

No equipment to list this month - things tend to sell as soon as they come in. But we are always getting new items in for resale here and there are several components supposedly on the way to us as I write this. **Call us to inquire about what is available now.** You probably will be pleasantly surprised to find that a bargain is available if you act promptly.

Remember, if you would like to move up to better AVA equipment you can partially pay for the new equipment by having us broker your older AVA equipment right here. Remember too that this is not a dumping ground for old stuff. Our service applies only for those purchasing new AVA equipment of greater value than the old. We are not in competition with ourselves.

## Write for Our New Catalog!

If you missed the notice last month we will tell you again. We just published a complete new catalog dated May 1, 1991. It has 32 pages printed on glossy paper with many all new pictures (all very sharp photographically screened in). It costs us over \$1.50 to mail so we are sending it out only upon request. But we will be happy to send one to you if you let us know.

*Frank and Darlene Van Alstine*