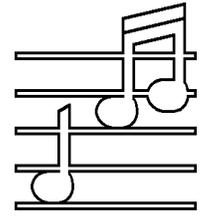


# AUDIO BASICS



A MONTHLY NEWSLETTER OF AUDIO INFORMATION

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## MiniDisc (MD), Digital Compact Cassette (DCC), and You (U)!

A few days ago I was invited to an informative and interesting seminar introducing the new recordable Sony MiniDisc (MD) audio format. It was presented by Sony, *Stereo Review* and *Audio* magazines, and Audio King, a local large scale quality audio-video retailer. The evening presentation was held in a large meeting room at a Bloomington, Minnesota, Marriott Airport Hotel and was attended by a couple hundred consumers, recording industry people, and salesmen.

The presentation was very well done. The projected "ecological niche" for the MD, its features and functions, and its suggested advantages over a tape based format were very ably explained by Marc Finer, Director of Communication Research, Inc., a marketing consultant to Sony. Then the podium was turned over to Ken Pohlman, well known technical expert and author of *The Compact Disc Handbook*, who explained the technical aspects of the MD – how it plays, how it records, and how it can store only 1/5th the information density of a CD and still preserve much of the music.

Inasmuch as both the MD recordable small disc format and the competing DCC digital tape format are both penetrating the market now with hardware in the \$750 or so range, it is time to look at them a bit closer and see how they relate to the needs of an *Audio Basics* reader.

It is also time to tell you that this is a special "double issue" of *Audio Basics*. We are still working double shifts to dig out from the avalanche of orders from our once in a lifetime special offer this winter. It will take about another couple of weeks for us to work our way back to our normal three week lead times and for us to see if the outdoors still exists – they say the snow is melting here now. Writing *Audio Basics* simply had to wait until Sundays when the shop was closed and that has put it late. With so much to write about (an excellent and witty report by Gregg McArthur on the Consumer Electronics Show follows, along with our report on the innovative engineering of the brand new B&W 803 Series Two loudspeaker), we thought it would be better to combine two issues and be early for



March to make up for being late for February. We will be back on schedule for April, and no – no more sales! Not only did you help pay for our tooling costs, you ran us completely out of a production run of preamplifier chassis! Don't despair – more are due in two weeks from our friendly aluminum anodizer.



## The Sony MiniDisc (MD) System Has Much to Offer:

- **Random access.** You record to it much like a computer floppy or hard disk. The built-in micro-processor puts the music wherever there is room on the disc, not necessarily in linear order. Thus it can record until it is full (keeping track of selections thru an indexing system) and can write new data into the "cracks" between removed files until it fills the disc again. You don't keep track of where the information is actually located on the disc; its built-in operating system does that for you. It can find selections very quickly.
- **A 10 second anti-skip playback memory buffer.** The system takes the information off the disc and first feeds it into a solid state memory. The internal processors pull the information out of memory at a slower rate than it is fed in – much like pouring buckets of water into a 55 gallon drum, while having a small faucet at the bottom drawing it out. If the memory gets full, the system simply waits until there is room before "pouring" more information in. If the laser is bounced into mistracking (as could happen in a portable unit in a car or while jogging) then the system can draw out the ten seconds already stored in the memory while the laser is finding its place again – just as you could quit pouring water into the drum for a while and there would still be a flow from the faucet. The memory also gives the laser time to find data scattered across the disc when a selection has been written in many segments. In fact, it is possible to take the disc out and put it back in again (within a few seconds) and the machine never quits playing!

*Note however that the buffer is for playback only, it is not available for recording. When recording, the unit must be kept still and*

*undisturbed or distortion and mistracking will occur! You cannot reliably record "on the fly."*

- **"No wear" playback.** The playback system is a non-contact laser read system, much like (but not compatible with) the 5" Compact Disc playback system you are all already familiar with. On playback, the 2.75" MD is not going to wear out. Because it is housed in a cartridge case (much like a 3.5" computer floppy but smaller) it is less exposed to accidental damage too. I still remember my first Macintosh computer purchase. The salesman pulled the operating system discs from his pants pocket (lint and all) to install on my new computer!

*Recording is a bit more complicated – actually a pretty amazing process – but does subject the disc to direct contact with the magnetic record head.*

- **Small size.** Effectively, three MiniDiscs fit in the space of one analog or Digital audio cassette and each MD can hold up to 74 minutes of information. We were told that some companies will soon offer MD, FM, AM radios for in-dash car installation that will have a 3-disc changer built in. A 100 disc changer is in the works too for home and car use. Fit your whole music collection in a bread box! Obviously "Walkman" sized portable players and recorder-players are available now and they will get smaller as the technology improves. Note that now 60 minute recordable MDs are available as they have a better production yield. 74 minute ones will be along soon.
- **Reliable pre-recorded discs.** Because pre-recorded discs are made with a "cookie cutter" process (essentially stamped out) just as a CD is, mass production is quick. In contrast, a pre-recorded tape has to be recorded one bit at a time in a slower linear fashion. This is an advantage for

the MD over the DCC in the production process of pre-recorded material. Whether it will allow pre-recorded MDs to be lower priced than pre-recorded DCCs is yet to be seen, but the pre-recorded MD process should be the most efficient. Of course the DCC production process is simpler – just record it from the master. But it will take more time to record it than to stamp out a MD.

The process of recording to a MD yourself is easy, but the technology supporting the process is very sophisticated. Actually, a completely different MD type is used for pre-recorded material (they are similar to standard 5" CDs in composition and technology and cannot be re-recorded). The recordable MD has an additional chemical layer inside it that changes its light polarization angle slightly (about 1°) when magnetized. To record, the more powerful record laser heats the disc's magneto-optical sensitive layer from the bottom to about 400°F while a magnetic signal is imposed from the top of the disc by a magnetic record head. The only area that is magnetized is the tiny spot (the size of a CD "pit") that has been heated. The process generates a string of magnetic "pits" along a pre-defined (in the MD manufacturing process) recording path. During playback, the magnetized "pits" polarize light from the low powered playback laser slightly differently than the rest of the surface. The system can reliably detect these differences and generate the necessary digital output.

The MD can be re-recorded many times (the internal magneto-optical layer can be re-heated and re-magnetized over and over). However the recorded disc will hold its data long term as it cannot easily be de-magnetized without heating to 400°. A stray magnetic field won't hurt it in normal use.

Note that in recording, the magnetic head does ride against the top surface of the MD but it is claimed that wear is very low as the

surface is much smoother than a tape and there is no oxide to shed. The laser never touches the bottom of the MD. You can tell a recordable from a non-recordable MD by the package. The non-recordable MD has a shutter only on the bottom for the playback laser. The top of the disc magnetic record head cannot access it. The recordable MD has a shutter on the top side too for the magnetic record head.

The MD is not compatible with the current CD format. The 5" CD holds 5 times as much information per unit time and thus has much higher fidelity potential. The 5" CD is not recordable – although Tandy is still working on a version that is.

### **The Philips Digital Compact Cassette (DCC) Has Virtues Too!**

- **It is simpler.** The playback and record process is just a more sophisticated (much more sophisticated) magnetic tape process. Pre-recorded and blank tapes are identical.
- **It is backward compatible with existing analog cassette collections.** In addition to making and playing higher quality digital records on DCC tapes, the Philips system will play back your old analog tape cassette collection with Dolby B or C noise reduction too as desired. A DCC machine does not obsolete the tapes you already own.
- **It is even more skip-proof.** As a tape medium with positive mechanical contact of the tape to the head with pressure pads, the DCC is more immune from skipping and mistracking in normal use. The extra memory buffer isn't needed (Ken Pohlman admitted that even with that the MD wouldn't keep up to his jogging - we suspect the DCC would).
- **90 minute record and playback times are available.** The most a MD can manage is 74 minutes.

- **It is a bit higher fidelity than MD.** Neither DCC nor MD can approach the data storage density of a CD. With a MD, about 80% of the information on a CD must be discarded. With a DCC, about 75% must be removed. A DCC tape requires somewhat less data compression and has somewhat better audio specifications than MD, but neither can retain all the musical information that a CD can hold.

The Philips DCC system is very different from the existing Digital Audio Tape (DAT) format. The DAT format is essentially a miniature video recorder mechanically with high speed rotary heads to get the high tape speed in relation to the head for the necessary bandwidth for good audio frequency response and dynamic range. The rotary head design of the DAT is complex and expensive. It simply has not been priced down to consumer product label, and with the advent of DCC and MD, probably never will, even though it has better fidelity potential.

Philips was faced with an interesting design contradiction with the DCC. To be compatible with conventional existing analog cassette tapes, the DCC had to operate at analog cassette tape speed (1 7/8" per second). This is far too slow to provide the bandwidth for high fidelity recording. The solution – a nine track head (eight data tracks and one control track). This effectively makes the tape speed eight times as great and does allow digital recording and playback – but with some compromises as we will discuss further herein.

The DCC format also allows clever digital directories with text displays showing tracks and titles and artists and so on (as does MD). Searching for tracks is very fast for a tape format, but not as instant as MD. Both MD and DCC offer lots of bells and whistles.

## Now For The Big Questions!

### 1. Why the new formats?

They are both designed to be replacements for the analog cassette tape system – not replacements for the conventional 5" Compact Disc.

The analog cassette tape was invented by Philips over thirty years ago to be a Dictaphone! Its quality limits have been pushed beyond all rational expectations over the years.

Over the past few years, the sales of both pre-recorded and blank analog tape cassettes has been dropping. The format is slowly dying.

Why? That is obvious (as I have been telling you for years). Analog tape cassette simply is not a high fidelity medium. It won't come close to capturing the full dynamic range of a CD. As more people buy CD players and finally discover just how bad their analog cassette machines are, the sales curve of cassette has finally peaked.

But, cassette does have one obvious advantage over CD – it records. Thus, a new format was necessary – one to vastly improve the fidelity of a low cost and portable consumer audio recorder and playback unit.

DAT format was not going to do it. It is too complex, too expensive, and the copy guard issue scared everybody away. Oh, by the way, both MD and DCC are serial copy barred too. You can make one generation of direct digital recordings with either, but not subsequent direct digital recordings of the digital copy. Sorry, neither will do you much good in a recording-mixing studio – you can't even re-dub yourself (isn't the politics of consumer products interesting). Oh well.

The two competing new formats (MD and DCC) have evolved from different priorities at Sony and Philips. Philips wanted to protect the investment of current cassette

users. Sony wanted a recordable CD downsized to work better in Walkman sized products. So –

## 2. Which format is better?

Although the DCC has better technical specifications at this time, longer record and playback time, and better shock resistance and will play your old analog cassettes too, I suspect that MD will have the long term advantage.

I think that its wear-free playback capability and smaller size (you can fit more interesting versions of the machinery in more amazing places) will more suit the market.

At the seminar, I brought up my solution to the shorter record time with MD. Actually, it is simple. Inasmuch as you have a 10 second buffer, if you develop machines that use the buffer in the record process too, and then develop a MD changer that has a cycle time of less than 10 seconds, then you can cycle from one MD to another while recording with nary a glitch. The record process then would be as long as you desired. Just keep feeding it MDs every once in a while.

Essentially I suspect that the solutions to MD's current limitations in relation to DCC will be easier to overcome than DCC's final limitation that it is a tape medium. Unfortunately, tapes stick, bind, stretch, snarl, and wear out. Shopping center parking lots are full of them (and your don't find many discarded CDs out there). I'd put my money on MD.

## 3. Oh yes - how do they sound?

Not that great (but better than analog cassette).

Essentially the MD sounds the opposite of everything we have been trying to do to make high fidelity higher.

The seminar had an actual demonstration of this. It was possible to directly compare the digital output of a CD player with the digital output of a MD in a computer. A new signal being the difference between the original CD

and the MD recording was generated. This signal was essentially everything the MD threw away to compress the CD down 80%. We heard the playback of the CD, of the MD, and of the difference signal. Most people picked the original CD as being better at the demo (I didn't choose either - neither was "better" in the conditions of the playback of an alien system in a motel conference hall environment). However, the difference signal playback was telling. It contained all the "air" from the cymbals, all the "breath" from the voice, and all the sustained tones from the drums. Actually the demo played all of the error signal it was capable of under that set of test conditions - but not necessarily everything. I suspect that with our electronics and something other than little Sony speakers in a ballroom even more aspects of the difference would be audible. The demo made the assumption that the CD was being played back properly. My ears said that the conditions of the test got up to "mid-fi" at best. But even under the limitations of the demo the error signal playback told us that everything we are working so hard to preserve in the playback process is being thrown away by the MD format before it even gets to us.

Yes, it is quieter and clearer than analog cassette, but it has a long way to go before it is high fidelity and I doubt if the format will evolve into making that trip at all.

Ken Pohlman told me that while he could hear the difference between MD and CD (as could most everyone at the session, that to him at home DCC was indistinguishable from CD. That is a bit scary. The difference between the storage limits of MD and DCC only favors DCC by 5%. I bet Ken's CD player, power amp and preamp are doing the CD playback more harm than he suspects.

## 4. Why the sonic difficulties?

Because the designers are trying to stuff ten pounds in a one pound sack. Both DCC and MD are charged with providing over an hour of playback and recording time in a physical medium than can hold only a small fraction of a full CD data stream. The capability of CD was picked to store all frequencies up to 22KHz with 90 dB of dynamic range, providing audio

bandwidth and resolution that should be in excess of human perception capability and thus "good enough" *if executed properly*.

To store the same recording time in 1/4th or 1/5th the capability, obviously most of the information has to be thrown away. Both DCC and MD use their own versions of non-linear digital signal compression to scrunch that data down to make it fit. Sony calls their scheme "ATRAC" (Adaptive Transform Acoustic Coding). Philips names theirs "PASC" (Precision Adaptive Sub-Coding).

In essence, their algorithms throw away that portion of the signal that they think you couldn't hear even if it was there. The compression routines throw away the low level high and low frequencies, the soft tones under loud tones, and so on.

The routines don't always make good assumptions. I pointed out one obvious problem at the seminar as follows:

One way the non-linear compression routines get rid of "unnecessary" data is to throw away sounds that are of too low a level to hear.

For example, after measuring the hearing curves of many people, it becomes obvious that low and high frequency tones fade out much sooner than mid-range tones. Thus if you have three tones recorded at the same low level, then you will be able to hear the middle tone long after the high and low tones are gone. Thus, the compression mechanism throws away the high and low tones under that condition (because you couldn't hear it anyway) and saves the scarce recording room on the medium for more important information.

I pointed out that the assumption that the high and low tones could be discarded could only be true *if the playback was never done at a higher level than the recording*. For example, if you played the three tones in that ballroom at a level at which only the middle tone was audible, then to make the low and high tones audible too, all you would have to do is turn up the volume! But, if you had first recorded the playback on a MD and it had decided that the low and high tones

were at too low a level to hear, it would have eliminated them. Then turning up the volume of the MD recording would not make the tones audible – because they would have been eliminated from the recording completely.

At home, if you want to hear a bit more, you crank up the volume. With MD or DCC playback, turning it up won't let you hear more. What you couldn't hear at low levels is gone! The compression schemes throw away too much. The result is much like prime beef in the microwave. It still measures the same but the flavor is annihilated.

We wish the designers and marketers had first chosen to preserve the fidelity of the music in bringing these new formats to market. Are MD and DCC better than analog cassette?

Yes they are.

Will MD or DCC make your high fidelity system more faithful to the source material and bring you the pleasure of a listening experience closer to live?

No, these formats will not do this.

Perhaps if the random access and magneto-optical recording capability of MD is applied to 5" full storage capability CD useful high fidelity consumer recording capabilities can be achieved. Perhaps if the concept of non-linear encoding is applied to the CD format, using all the bits for best effect rather than less efficient linear encoding, the real fidelity of CD can actually be enhanced.

For car use, for Walkman type portables, for any application where mid-fi is good enough, these new formats will be just fine. We can get you a Philips brand home DCC deck right now for about \$750. But for high fidelity, you need to save your money and wait for something better.

Of course the basic CD is still here and doing its job just fine. The cost of our Omega II CD Player remains just \$395 and many tell it it is the best sounding CD player they have ever heard. As a playback medium, there is nothing better on the horizon. Remember, it is the music, all the music, that we want for U.

*Frank Van Alstine*

## Memories of an Audio Show junkie. by Gregg McArthur

The International Winter Consumer Electronics Show held January 7 - 10, 1993 in Las Vegas was for most business people attending it a bad trip. The exhibitors tried to be excited about the new products but for most of them business has been slow and many of them did not have excellent prospects for sales in 1993. Many of their big customers were missing this show or were sending a smaller staff of buyers to the show and the buyers were not staying as long. All the normal business had to be compressed into a shorter time. This notwithstanding, the show was as big and garish as ever.

We did not attend the show as journalists so we did not take notes or take pictures. This report is from memory. There was much that was worth remembering.

The show, as in prior years, filled the greater part of four buildings with displays, demonstrations or business meetings: the Las Vegas Convention Center, the Las Vegas Hilton, the Sahara Hotel and the Mirage Hotel.

The largest and most elaborate displays were at the Convention Center. With its multiple floors and annex buildings, it provides the area of about eight football fields for displays. The single largest display was by Panasonic/Matsushita Electric/Technics and included almost everything they produce but featured the video end of their business with an accent on Projection TV and home theater systems. Other huge displays featuring home theater systems included Pioneer Electronics who had a great line of new video disc players with impressive features for video but unimpressive "one bit" digital sound. Home theater was perhaps the single biggest feature this year at the Convention Center. Video quality was much improved over previous years with Pioneer Elite and Mitsubishi demonstrating outstanding large screen and rear projection television. In the order of exhibit size, Sharp, Casio, Sanyo, Fisher, Emerson, Gold Star, Thompson Consumer Electronics who bought RCA, Canon, Samsung, Sony and Eastman

Kodak were the other really impressive displays at the Convention Center. The Video 8 camcorders will soon dominate that market. It looks like the VHS-C manufacturers are just showing up but without any new features to talk about. Sony and Canon have new small, lightweight camcorders with simplicity of operation or outstanding technical features or a combination of both depending on what the consumer wants.

The audio end of home theater has deteriorated. Not one demonstration we heard had audio sound to compare to the demonstrations at the Summer Chicago Show or last year's Las Vegas show. Those prior demonstrations featured Hi-End audio gear that was worked into the system. New demonstrations feature HI-Tech looking "made for video" audio gear that looks great or is easy to incorporate into the decor but it is of inferior sonic quality. The move to THX certified equipment now looks like a move away from quality in home theater. THX seems to stand for very loud distorted bass that shakes the floor but does not sound like naturally occurring sounds. Every surround sound decoding system demonstrated seemed to degrade the audio. The old Dynaquad system which provides a front (center), left, right and rear speaker driven by one good stereo amplifier seems to sonically better any ambient sound recovery system with the exception of the Hughes SRS system which still uses just one good stereo amplifier. Of the home TV projection systems shown at the show, the Sharp Vision impressed me most but the sound drove us away from the area.

Perhaps the most impressive decision at the show this year was the decision to have all of the mobile electronics exhibits in the outdoor area. Sad to note, some exhibitors insisted on having an indoor car audio demonstration. Perhaps it was to drive us outdoors. No, I did not allow anyone to trap me inside the car as a demonstration was about to begin. And yes, you are too late to come up with your own car audio equipment line under the Earthquake Sound name. The name is already taken and they had a big demonstration at the show. Sorry! In fact, you can't believe how sorry. Was

their system able to reproduce the sound of the Bob Wasserman bass violin from the Duets CD? There are some very fine CD player systems, amplifiers and speakers available for car audio systems these days but it seems like none of them work toward accurate sound reproduction. The demo systems at the show were not to be listened to. The Earthquake Sound display was near the center of the display area and we turned back before reaching it. Just as well if we would have persisted, we would have had nothing left to listen with when we got there. Which probably explains why many of the car audio systems sound like they do.

Frank, do you recall our favorite game at prior shows? Who would be the first one to spot the 1000 watt boom-box that could be easily carried on the shoulder while the power drained from the six or eight D-cell batteries that provided voltage enough for those impressive 1000 watt amps and 4" bass drivers. (Yes, the boom-boxes that featured SUPER BASS and were "digital ready".) We didn't see one this year. Frank, you never did explain to us how those audio engineers were able to make a 1000 watt amplifier powered by six D-cells. We did see a big variety of indoor TV antennas that were shaped like miniature satellite dishes with lightning bolts coming out of them. They must sell like hot cakes because we see them at garage sales all the time now.

The Hilton Hotel was the venue for most of the workshops and lectures. Getting started in retail Karaoke was not on my list but Digital Wireless Communications was great. Within a very few years, we will be able to carry a vest pocket PC that is more powerful than today's laptop PCs. It will include a modem and cellular phone system that will access other computers and data banks from where we are. It will access a nearby printer via infra red and will have a built in hi definition color monitor screen.

There was a workshop on the New Digital Audio Recording Formats. It was informative and geared to build excitement for marketing the new DCC and mini disc recorders that Philips and Sony are now marketing as well as

the recordable CD format which Radio Shack will be marketing soon. These products will soon be heavily advertised and marketed via favorable reviews and news stories in the Hi Fi Press. They are an expensive sonic improvement over present compact cassette recorders and they provide quick convenient random access to the recorded material like current DAT recorders or compact disc players do, but the sound is a big step backward from CD. Those of us who didn't buy DAT recorders would do well to restrain ourselves again.

There was just one marketing meeting on digital recording formats. There were five marketing workshops on TV or home theater systems. Marketing will try to create a demand that is not there yet. Soon we will be told that we have to own a home theater system. The message I got was that for the wise consumer, now is the heyday of hi end audio. We are going to see the general quality of audio go down from here. The "one bit" CD decoding format was a first step in this direction. It was a step backward but it was marketed as a step forward. There were discussions of improvements in the commercial recording process and in the sound quality of Compact Discs. There will be improvements in the process of restoring old analog tapes and digitally remastering them for reissue on CD. The consensus at the show was that the quality of recorded compact discs will improve and the quality and the cost of some of the playback equipment will improve but the trends will become more toward features rather than toward sound quality. So much for the workshops and the discussions in the halls afterward.

The Sahara Hotel was the venue for most of the hi end audio displays and demonstrations. With the proliferation of thermionic valve amplification in high end audio, the Sahara was well named. Even in January, the demo rooms were hot! The halls were hot and stuffy and crowded. It felt like the Sahara. Tube equipment has benefited from good reviews in the American and Foreign audio press. Everywhere there were new brands of tube amplifiers and pre-amplifiers. Perhaps the most impressive sound at the show was from the

Tube Research amps (\$27,000 per pair) with the Tube Research pre-amp (about \$8,000). The combination was used with a Wadia transport and converter and small British BBC monitor speakers. The sound was exactly what the golden ear reviewers have extolled to us lately – impressive mid range quality with artificial depth and a milky smooth high end that lacked detail at least in the demo room where we heard them. The high end and the bass did not offend but while the sound was lovely, it was not real. It lacked the live character is now available from better and much less expensive equipment. That equipment was not to be heard at the show.

Displays at the Sahara seemed to be as effective as the demonstrations. The purpose for exhibiting at the show is to attract the attention of retailers. The feeling at the show was one of contempt for demonstrations of the sound. For many retailers, the sound quality is not that important. If the equipment has been well reviewed, looks good and has a prestige price, the retailers feel like they can market it profitably. The favorable review has become paramount. Most of the demonstrations at the show seemed to be directed not at the buyers for retail outlets but at the reporters from the audio press who were at the show and would perhaps be impressed enough by the demonstration to give the product a favorable comment. This year it seemed like the product did not need to be demonstrated unless there had been no prior favorable review. A good static display in a cool room with good product literature and a good sales presentation could get the orders as well as a demonstration. Or so it appeared.

This is in part due to the poor conditions there for demonstration. When there was a demonstration, usually the room was hot. The power consumption from the equipment being demonstrated was such that circuit breakers for the hotel were often failing, shutting down the lights and air conditioning as well as all of the demonstrations. The voltage was probably running low. Most of the demonstrations utilized some kind of power conditioning equipment. Much of this equipment had some capability

to boost voltage as well as to suppress transients and spikes on the line or to filter RFI. The voltage boost was probably needed. So was the power line conditioning. It was too little to make enough difference. The general sound quality could not be great under those conditions.

Some exhibitors make a great attempt. Richard Shahinian did his best to have a great demonstration at the Sahara and he did very well without expensive power conditioning equipment or audio cables. This year he has used the Bedini solid state power amps and the Theta digital front end. I did not see Bedini amps anywhere else at the show. Richard seems to have very good ears. He attends live concerts and knows what real music sounds like. For 25 years he has been developing his loudspeakers and his ability to demonstrate them. He does very well. His Diapason speakers sounded like good music on the wide variety of program material he brought to play.

Another very good demonstration at the Sahara was by Sound-Lab Inc. teamed with Klyne Audio Arts, Ltd. The Soundlabs A-1 Ultimate speakers are huge electrostatics. They were driven by Stan Klyne's latest solid state pre-amp and amp. They used CD source material. I don't remember the CD player they used. Very clean midrange with lush detail and sound stage. Lots of depth of image. Stan Klyne likes to talk about the process of designing high end audio equipment. He starts with good but somewhat conventional circuit design. He then listens to the equipment and makes changes to improve the sound. He describes the design process as art as much as science. The final careful changes to promote the sound that he seeks in the equipment are his art.

The most impressive venue at the show is the beautiful new Mirage Hotel. The hotel is just beautiful. Out front is a South Pacific island where every hour there is the most authentic volcanic eruption this side of Mount St. Helen's. Inside the hotel there are displays in the ballroom and banquet areas. The air conditioning works great and the high ceilings help damp the noise. Upstairs in the expensive suites and

large rooms there are some excellent, by invitation only, displays. The audio press is welcome there.

Analog is still alive in high end audio. People were talking in the halls about the Thorens Prestige turntable, a new Swiss air bearing turntable and arm combination designed by Dr. Foresell – the combination sells for between \$12,000 and \$19,000 depending on options. A new turntable/arm combination from Rockport which sells for about \$20,000 and the new Oracle turntable which looks great and was used effectively in three demonstrations. New cartridges were demonstrated and raved about. A. J. VanDenHul demonstrated his new Grasshopper III and a few less expensive cartridges but also had his loudspeaker, amplifier, plugs and cables there. The Lyra cartridges were popular and a few demonstrators were using the Well Tempered Turntable and Well Tempered Tonearm. L A Audio, a Denmark company was demonstrating their tube type model R-2 RIAA phono amplifier. Part of the popularity of analog at the show is related to the markup for dealers on these products that retailers can create a demand for and part is related to the appearance of some outstanding new phonograph records that can be purchased at premium prices from high end audio dealers. The fact is that R T I, the records stamper who manufactured most of the Sheffield and Realtime vinyl pressings is still in business and is stamping records again on 180 gram vinyl that we have not seen since the mid 50s. Many different Audiophile records were available at the show. I purchased a few that had originally been issued on the Klavier label and I was as impressed with them at home on my AVA modified Harman/Kardon-Longhorn Grado setup as I was on the \$20,000 playback systems at the show. Why get excited about a very limited supply of new phonograph records? They give dealers something to point to when demonstrating turntables and related analog gear and there are many high end audiophiles who are not that concerned with the supply of software. They have a \$30,000 hi fi system and have 17 phonograph albums that are great demo records, “doctored

for stereo,” and they can hardly wait for someone to come to their home so they can demonstrate all 17 albums to them.

In closing, the real news in high end audio is the new class of components – the interconnects, speaker cables, plugs and jacks, replacement power cords and audio add on devices. I was amazed to see the Shun Mook Resonating Record Clamp demonstrated with the Oracle turntable. Everyone at the demonstration was amazed at the sonic difference the record clamp made. I could hear a difference but I was not convinced that there was an improvement. I was not able to be present when the Shun Mook CD Clamp was demonstrated but in closing, let me quote from the beautiful sales brochure. *“This is a truly innovative product defying the basic principal of the digital-audio technology. How can a heavy wooden weight on top of a spinning CD totally change the performance of the digital signal and music? Again, this 3 inch round ebony clamp is made from the root of ebony tree which we feel has some magical power of its own. This clamp is dynamically balanced individually so that the high speed rotation of the player will not effect the spinning. This unit will bring out all the realistic vinyl properties of any recording and reproduce the utmost inner details, yet at the same time increase the width and depth of the sound stage. This device will also work with some drawer type units if one is willing to remove the cover and flip back the spring loaded plastic clamp.”*

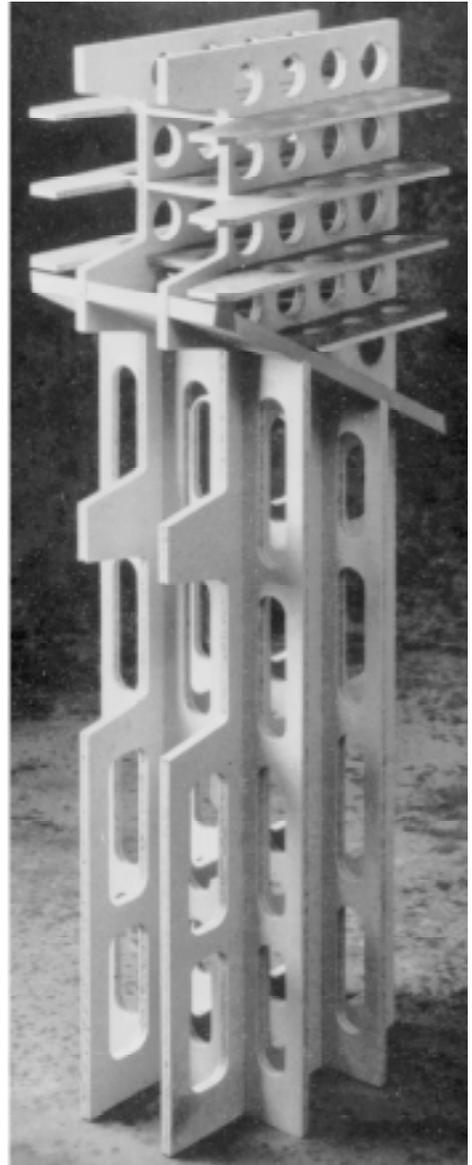
Hey, after listening to those cable guys, I can almost believe anything. Now did he say I was to get the CD rotating at high speeds or that I have to get the whole player rotating at high speeds? But I still don't believe all that stuff about the 1000 watt boom-boxes.

*Gregg McArthur*

## The All New B&W Matrix 803 Series Two - Major Sonic and Technical Improvements with No Increase in Price!

**B&W Has Done It Again!** Out of the blue a new MATRIX 803 SERIES 2 speaker has appeared and its technical capability and musicality is pretty wonderful. The price is the same (\$3000/pair list) but the performance is dramatically better. If you don't have the space and/or finances for the 801 Series 3, don't worry. The Matrix 803 Series 2 is effectively just as good. It only gives away a bit of high energy very low frequency impact and its overall sonic signature is slightly warmer – but it is a great speaker in its own right (no fixes necessary). We love it and you will too. I am going to let B&W tell you what they did themselves so you will have a better understanding of what it takes to make a good loudspeaker system.

**OVERVIEW.** The Matrix 803 Series 2 is a 2 1/2 way floor standing system with 4 drivers where both midrange and the two bass units work in unison to provide the total bass output. The system response is 32-20,000 Hz (20-22,000 Hz with the optional HPA filter). The sensitivity is a high 90 dB and the nominal impedance is 6 Ohm. A newly developed matrix grid - The Matrix (2)- is utilized to take advantage of different matrix requirements for the midrange and bass frequency range. There is no interaction between the midrange unit and the two bass drivers as the midrange unit is positioned in its own dedicated cabinet. This loading technique allows a higher total bass output than if the three units were mounted in the same cabinet. It also provides a cleaner system response as there



is no rear radiation interface between the midrange and bass unit sections and thus no smear effects. The effective power handling of the system has been increased by some 50% over the original 803 as the bass output is generated by 3 rather than 2 drive units. The system distortion has been further reduced as the radiating area of the midrange and bass units has increased. The increased cone area generates less distortion for the same power input.

**HIGH FREQUENCY UNIT.** The 803 S2 utilizes the now classic aluminum alloy tweeter designed for the 801 Series 2. The unit provides a true piston action response beyond 20 kHz.

**MIDRANGE.** The Kevlar coned midrange unit's response is extended down to the same cut-off frequency (-10 dB at 32 Hz) as the bass units. The overdamped driver gives a gentle roll-off from 140 Hz and down to the cut-off frequency, ensuring perfect control, and reducing distortion at higher levels. This is possible through the use of a dedicated port, mounted in the rear of the midrange cabinet, tuned to the same frequency as the bass port to avoid relative phase changes and subsequent loss of output. The midrange unit cone profile has been designed to match that of the Silver Signature bass/midrange unit. This profile is straighter than past cones and ensures maximum stiffness. The response is therefore very flat without any steps in the critical 2-6 kHz region. The response at the cross-over frequency is subsequently determined solely by the cross-over components rather than the units and thus providing an unusually smooth transition between midrange and bass units.

**BASS UNITS.** The two bass units are tuned with cabinet and port to perform as a 4th order system. With the optional HPA filter the tuning is a 6th order alignment.

**CROSS-OVER.** The cross-over features high saturation chokes on the bass units minimizing distortion on high transient music material. The saturation point of the new chokes, featuring pure iron dust core, has been increased from 7 to 14 amps which is the equivalent of doubled amplifier output (from 300 to 600 watts). This means that the 3rd harmonic distortion (audible distortion) has been reduced dramatically inside the effective peak power handling band of the 803 S2. The smaller tweeter choke is now air cored removing the danger of saturation and subsequent distortion. The capacitor specification has been increased from 160 to 250 volt and the tolerance levels have been reduced to 1% giving greater precision and consistency in the filters. The cross-over harness utilizes the latest Oxygen Free Copper (OFC) cable from Van den Hul. The cable is silver plated to maintain maxi-

mum conductivity, and energy transfer between input terminals, cross-over board and drive units.

**CABINET.** The new 803 S2 cabinet is slimmer than the previous 803 cabinet which allows for better dispersion and improved imaging. It features an 18 liter midrange enclosure and a 44 liter bass unit enclosure. The revolutionary new Matrix (2) grid (shown in photo) has been developed specifically for the 803. It features two different matrix structures mounted transversely with a dividing wall to separate the two cabinet cavities. The matrix in the midrange cabinet features a more closely spaced cell structure mounted end-on to the driver for maximum absorption. B&W research indicates that a small complex cell structure is best suited for the critical midrange band (600-3,000 Hz). The lower matrix features a larger cell structure to allow maximum airflow inside the bass cabinet. The open cell structure ensures a well controlled system Q with maximum output from the front mounted port while still giving the required cabinet stiffness within its pass band. The system Q is optimized.

Matrix 803 Series Two Speakers are available right now. We like them best in walnut, but they are fine in black ash too. Match them with an  $\Omega$ mega II 260 or a Fet-Valve 300hc and enjoy a new listening experience.

### Used Equipment Listing

In spite of all the recent new equipment sales, the used list is really short because the buyers have kept the old equipment for second systems or for their kids. It simply was not traded in.

There is one **Fet-Valve 300 amplifier** due here soon (1989 vintage) that will sell for about \$650.00. Call us in a week if you want it.

We can offer some **free chassis specials** on several Dyna and Hafler units. We have a good St-400 chassis and fair DH-200, St-120, and Pat-4 chassis available. Pay only for the  $\Omega$ mega II rebuild (plus shipping) (see our catalog for prices) and we will throw in the chassis free! Remember to call anytime about used equipment. Much comes and goes between issues without ever being written up herein. See you again in six weeks!

*Frank and Darlene Van Alstine*