

A QUANTUM LEAP IN SPEAKER TECHNOLOGY FOR HOME THEATRE AND HI-FI

Subsonic Polymorphic Technology Speaker Series

Reviewed by Richard Morgan

Every once in a while a product comes along that offers something different and makes home entertainment better. I feel like I am about to introduce you to a product from a great name like Meridian but when that product is Australian, it makes the experience all the more satisfying.

The latest product to stimulate my synapses comes from Subsonic, a local company with a respectable history in designing and making active subwoofers and a range of hybrid home theatre speakers (hybrid in the sense that it combines active bass and passive midrange/treble sections in the same enclosure).

Subsonic used our facilities in the process of fine-tuning the first HT range around 18 months ago and we had the pleasure of previewing the prototypes of a new Subsonic passive range of speakers in early January this year. The embargo is now removed and we can let the cat out of the bag about this new speaker technology.

It's a fact there are myriad speaker systems on the local market and one could be forgiven for thinking we need another range like a hole in the head. But the new range from Subsonic is not just another range of transducers it introduces technology that goes a long way towards optimising sound reproduction in all manner of listening environments.

Now that's a major feat considering the variety of rooms out there and their (usually deleterious) affects on the sound character and quality generated by most speaker systems. But it's made possible by Polymorphic Technology from which the new Subsonic range takes its name. It sounds like a snappy marketing phrase, and, sure, there may be an element to this claim, but the synergy of Polymorphic components not only recognises.

Before we get into aspects of Polymorphic technology a mention of the series on which it's based. There are three front speakers models, engineered for both home theatre and music reproduction - the \$2499 PM-1 \$1999 PM-2 and \$1699 PM-3; a centre speaker, the \$1299 PC-1; and a rear effects model, the \$1299 Model PR-1.

Polymorphic technology

Over and above thorough conventional speaker engineering principles, Polymorphic Technology is actually the combination of several technologies and strategies in speaker design – impedance switching, room size tailoring and room acoustics compensation, complex phase dispersion - and their thorough, thoughtful implementation. It is applied in varying capacities in all

five models in the Subsonic Polymorphic Series to provide outstanding control over operation.

Impedance switching is a deceptively simple 4 ohm / 8 ohm toggle switch. It's provided to more closely match speaker impedance characteristics to an amplifier's potential to drive those speaker impedance loads.

Some amplifiers – even respected models – can strike trouble driving five home theatre speakers or two sets of main speakers simultaneously, particularly at high volume levels. This can cause overload in the amplifier.

At best it's frustrating if overload engages the amplifier's protection circuitry, but at worse it can be expensive and time consuming if either amplifier or speakers (or both) are damaged. Polymorphic impedance switching varies the impedance of the speaker as seen by the amplifier to match the driving conditions.

The 8 ohm switch position is provided for amplifiers driving multi-speaker situations or when an easier speaker load that draws less current is preferred. There's a minor reduction in perceived volume level in this mode. The 4 ohm position can be used with stable amplifiers (particularly two-channel music applications) to generate slightly more sound level.

Next in the Polymorphic Technology package of solutions is a 'room size' switch. As Subsonic explains it, bass response from a speaker system is dependant on the size of a listening room and the proximity of speakers to room boundaries. Speakers that sound fabulous in a store's auditioning environment can have over emphasised bass with less control when they are installed in a smaller home listening environment. Even placing speakers too close to a rear or sidewalls can create a similar effect.

The room size switch facility has three positions - for large rooms and small-to-medium rooms. If the Subsonic speakers sound bass heavy, switching to medium or small room mode is designed to re-align the bass response shape, tighten up bass dynamics and restore control and tonal balance. In larger rooms the large room position is the obvious choice, except where the speakers are located close to room boundaries and a small room setting may be appropriate.

Room acoustics also play an important part in how speakers will sound. In fact the effect of room acoustics is the primary reason speakers sound different at home

compared to when they were auditioned in-store. This is the third strategy in Polymorphic Technology.

Few people have the luxury of a dedicated home entertainment room. Subsonic also understands that the potential to change home listening environments to suit a speaker system is often very limited and usually impractical. That's why the company created the potential to change its speakers to suit the acoustics of different listening environments – and made it as simple as the flick of a switch.

The room acoustic selector has positions for bright rooms and soft rooms; the former features an abundance of reflective material such as glass, timber or tiles while the latter feature absorbent items like curtains, heavy furniture and carpet.

Bright rooms can make give sound a bright, exaggerated and edgy quality, while soft rooms can make sound dull, bass heavy and uninteresting.

As its name applies, the room acoustic switch helps match Subsonic speakers to the acoustic characteristics of particular rooms and maximise the performance potential of the speaker-room interaction. Tone controls simply apply generic equalisation to the response of the speaker with no consideration of the actual speaker response and, most importantly, the speaker's off-axis or power responses. However, the Polymorphic room acoustic switch lets users change the speaker design into one that has been specifically developed to overcome some very common room acoustic problems.

Operational guidelines around these techniques not withstanding, I reckon you should always let your own personal preference dictate the settings you chose ... and it's obviously a bonus to be able to do so.

Subsonic main speakers

The Subsonic Polymorphic Technology range of loudspeakers (PM 1, PM 2, PM 3) is engineered for high fidelity music and movie sound track reproduction. They share the same cosmetic design and vary in dimensions and mass. Likewise Subsonic technology (including Polymorphic elements) is shared throughout the range.

Each model features a sloping front baffle, which performs three functions: provides time aligned sonic capacity (better sound stage imaging); reduces the number of internal parallel surfaces (reduces sound colouration); and adds some visual interest.

Real wood veneer is used as the enclosure skin on each Subsonic model, while internally there's triple bracing to reduce cabinet flexing and strategically placed acoustic tiles (apparently preferable to conventional acoustic wadding). Heavy-duty gold plated high quality binding posts provide cable connection and also a bi-amping or bi-wiring option.

The Polymorphic adjustment facilities are located for easy and quick adjustment on the front panel. The switches are clearly labelled and laid out and feel positive to use.

It's clear that attention to build quality is outstanding - even the prototype samples were exceptionally well put together and construction of the production line units is as good as it gets. The PM series is also 100 percent magnetically shielded. This avoids screen discolouration and damage caused by magnetic interference when located close to a television.

The fact there are no unsightly screws on the front baffle of the Polymorphic series is a hint at the depth of engineering that has gone into its development. But while the absence of visible screws is visually pleasing it has a sonic benefit by eliminating reflection and refraction effects that degrade sound. In fact, Subsonic has looked closely at the role of the cabinet - and particularly the front baffle - in providing a rigid and acoustically inert environment from which the drivers can operate.

The drivers are not just screwed in place; they are clamped into machined receptacles and held with a tightly compressed pad and clamp. This technique suppresses degrading resonance in the frame of the driver while significantly damping the resonance factor. Attention has also been paid to the baffle shape to integrate the mechanical and acoustic components of the loudspeaker.

Subsonic uses dedicated drivers (engineered for the application) in the PM main series. The same drivers are used throughout the Polymorphic range (including the centre and rear speakers. It's a major step toward creating an ideal 'tonally matched' system and helps provide seamless transition between all five speakers in a surround application, particularly when it comes to realising Dolby Digital material.

Subsonic's 160mm diameter black fibre bass/mid driver is a third generation version of Subsonic's favoured propriety driver. Its ultra lightweight cone is capable of extraordinary detail and is married to other components that render them virtually bulletproof.

Subsonic main speakers tweeters employ aluminium voice coils instead of regular copper - more expensive than conventional tweeters, but the resulting (ultra light) assembly is also more responsive and linear. A wide dispersion dome and mild horn-shaped lens then kick in to create a lifelike sound with up scaled precision, maximal soundstage potential, and all important improved off axis performance.

The crossover networks use air-cored inductors and polypropylene capacitors because they provide a cleaner signal path for the sound signal.

Finished in Blackwood or Jarrah timber veneer and individually hand built and hand polished, the PM's can beautifully compliment your decor and equipment, as a product that is both visually and aurally captivating.

Subsonic centre speaker

Subsonic apparently designed its centre channel speaker, the model PC 1, from the ground up, concentrating on creating a product that produces an open sound stage with

extremely wide horizontal and vertical dispersion characteristics – and a sound big enough to match any size television screen.

There's a well-founded theory that conventional centre channels speakers only give their best results at listening positions that are directly on-axis, with response dropping off dramatically the further off axis listeners move. In any listening scenario, the number of people who can take advantage of this 'sweet spot' is very limited (often only one).

Subsonic imbued the PC 1 with a complex field dispersion design to give maximum sound coverage and the best sound possible to all listeners regardless of listening position. Integral to this design are three angled front panels and a three-tweeter array on the front.

The PC 1 uses the same magnetically shielded drivers as the Subsonic Polymorphic main speakers to maintain tonal matching (and performance attributes) with other subsonic speakers. However, it's versatile enough to be inserted into any home theatre speaker system with stunning effect.

The Polymorphic centre speaker is also cosmetically matched to the main models. Its enclosure is rigidly braced and damped, the finish is matching wood veneer and connection is gold plated connectors. Then there's the full complement of techniques and features that make up the Polymorphic Technology.

Subsonic has wisely engineered the centre channel to reproduce a full range and very open sound with exceptional bass response its class.

Subsonic rear effects speaker

Like the centre speaker, the Polymorphic Technology rear effects speaker system has been designed from the ground up. It has been sonically matched to all the other Polymorphic speakers but engineered to also complement surround systems from other manufacturers.

A three-baffle front panel design gives the model PR 1 a distinctive look and more than hints at the fact it's designed for positioning close walls to and underneath the grille there's some interesting technology (over and above the Polymorphic strategies).

Complex field dispersion design (CFD) is a technique comprising a precise three-tweeter array (matched to the tri-baffle function) and a room dispersion switching facility. These combine to work on optimising both horizontal and vertical sound dispersion while maintaining overall detail and the directional precision required from effects speakers. But it's much more than that.

Subsonic's Polymorphic technology involves a great deal of attention to the design of the effects speakers. Many research papers have been written outlining the incredibly complex interaction of "spacio-phasic" phenomena, timing, and spectral energy content and how these correlate to subjective psycho-acoustic criteria such as realism, depth, direction, width, openness and even

elevation. These speakers put these theories into practice and with outstanding results.

The Subsonic effects speaker is rather unusual in that they use multipoint sources even at the higher frequencies (multiple tweeters). Similar to a phase array type approach this design produces a field, which is perceived by the brain to be more a "sound window" than a "sound point".

To further enhance this design approach Subsonic has paid attention to the spatial projection pattern of the speaker by critically selecting crossover phase characteristics and the angular projection of drivers. This was then implemented by designing the cabinets to fire the drivers in specific directions into the room ... hence Subsonic's name 'complex field dispersion' for the design.

By combining the effect of this complex field behaviour with an acoustic power response (off-axis) that is far closer to what is considered ideal, Subsonic has created new levels of realism in the sound performance of any application. With the CFD technology you're not just getting the sense of realism that's usually associated with a conventional speaker design, you're getting far closer to the real thing. It's a quantum leap in sound technology that's essential for the ultimate entertainment experience.

The 'field dispersion' switch on the PR 1 can be switched to between direct or diffuse operation and is used relative to the position of the speakers in a room. Diffuse mode has been set up to suit positions that are away from reflective boundaries. It gives a wider directional effect and more open sound, optimal in the right environment.

However, the disperse mode can create over abundant reflections when the speakers are located near reflective boundaries and make the directional information in home theatre more confused and less realistic. This is where the direct mode comes in. It lets the PR-1 system make use of the natural reflections of its surroundings to create the same wide, open sound (and it works a treat).

In the PR 1 system, Subsonic has once again employed the same magnetically shielded drivers as the other Polymorphic speakers, thus ensuring good tonal matching. The cabinets are ultra solid and rigid and there's an excellent cosmetic match to the main and centre models.

Performance

The Subsonic system was placed in-situ for about a month, but the main auditioning panel comprised five people. We matched the Polymorphic PM 1 and PM 3 main speakers, PC 1 centre and PR 1 rear speakers with a Toshiba DVD player, Denon AVR-3300 and Onkyo TX-DS575 receivers, Panasonic video recorder and Denon professional CD player.

Our home theatre room measures 7 x 9 metres and is slightly more heavily damped than average (carpet, couches and a couple of tables, but clear gyprock walls). We used Taralabs interconnects and Audioquest Indigo speaker cables.

We used a plethora of discs and tapes across all movie and music genres that went beyond conventional auditioning parameters because the Subsonic system revitalised our interest in movies and music in general and we just plain old enjoyed ourselves most of the time the speakers were in situ.

First up, the Subsonic main speakers look a million bucks – absolutely gorgeous, even in their prototype form. The centre speaker is the same. It's large and impressive yet integrates well with the main system and looks great under a large screen television. The rear models maintain the cosmetic theme and look like they're worth every cent 4 (even before you can be excited by their performance).

Enclosure assembly and general construction quality on each model is simply outstanding. Binding posts and front panel switches are all high quality gear designed to last. It's obvious Subsonic has established high manufacturing standards here (watch out world). Remember the finish is real wood veneer, not a plastic facsimile of nature.

It didn't take long for us to discover that Subsonic has created something very special with the Polymorphic range. The PM 3 main speakers are simply outstanding transducers in every sense of the word, the PC 1 is easily and quite simply the best centre channel speaker I've heard regardless of price or producer and it's an opinion shared by all panel members.

It's not only a full-blooded performer (we all know that centre channel information is much more than dialogue), but also generates sensational imaging with believable spread and depth. Sofa cinema never sounded so good.

Naturally the Polymorphic Series is much more than a centre speaker, it's a range of products that integrate very smoothly indeed, with individual models also priced to be excellent value for money in a quality retail market. They look great in-situ and sit happily in medium to larger size rooms and smaller rooms with the PM 1 main model.

The systems that operate the Polymorphic Technology operate very effectively. When flicking the switches I expected to hear large alterations in the sound and the acoustic set up, but the changes were actually quite subtle. Where some manufacturers apply technology only to make it highly evident or noticeable, Subsonic implements it for maximum effectiveness, not sensationalism.

In the case of Polymorphic Technology, the requirements of the systems involved for the best effect are actually quite subtle. We set the operating parameters to large room, where except for some general fiddling they remained. This applied to relaying most movie soundtracks and for stereo hi-fi (and 5-channel music), although I found that changing the dispersion pattern to the 'diffuse mode' (dull, bright or normal) setting on the rear Polymorphics could provide opportunity to fine tune movie sound in our large room for specific applications.

The capacity to manipulate and mould sound and acoustic settings is in my opinion a real boon in tailoring the

Polymorphic speakers to different rooms. I accept that it's impossible to do this 100 percent in all instances, but with this new Subsonic range you at least have the option of going a long way toward room matching (and it's done without affecting the stunning audio performance of the speakers themselves).

The basic Polymorphic home theatre system (based on the PM 3 main speaker) creates natural, expansive movie sound and really excels with digital processing systems such as Dolby Digital. It's an honest sound quality with an exciting character, tempered with the type of refinement that only thoughtfully implemented technology provides.

Moving to the top-line system - based around the PM 1 main speakers - retains all the important attributes of Polymorphic performance and creates a larger, fuller sound that is naturally afforded by the bigger PM 1 cabinet and enhanced driver set-up.

In many home theatre surround speaker configurations the speakers are often easily identifiable as sound sources. But with the Polymorphic systems, members of the auditioning panel found that they were fully cognisant of the sound (direct, ambient and effects) but delightfully unaware of the speakers themselves. The result is that their full attention was directed to the performance rather than the products used to create that performance.

All elements of movie sound – the aforementioned direct, ambient and effects sound – are smoothly integrated. Dialogue was incredibly clear and articulate, even in action movies where the sound level, complexity and intensity really escalate. We clearly heard parts of the Matrix that were previously muffled and indistinct and even suffered from shell casing ('tink', 'tink', 'tink') overload when gunfire reached its peak. Directional and steering logic information were relayed with precision.

The sword fight in Rob Roy conveyed a sensational sense of action, aggression and desperation that's better than I've ever heard. There's a great sense of subtle directionality with these speakers in this scene and if you want nuance the mutterings of the assembled crowd became dialogue for the first time.

Since the majority of viewing for most people isn't action, a speaker needs to be able to relay all sound information on a soundtrack, not just the loud segments, and the Subsonic fills the bill perfectly. In fact, it does it so well one forgets about reviewing and just gets on with viewing.

For action sound and steering assessment we went to the chase scene in Clear and Present Danger. The rocket launcher sequences were outstanding and the entire sound field totally palpable (and damned exciting, even for the 30th time).

The consistency and accuracy of the directional information, outlandish and subtle alike, is a testament to the effectiveness of the combination of 'complex field dispersion' and room acoustics' techniques. A technological implementation for the new century.

The outstanding aspect of both Polymorphic systems was that all the information was presented to us without being blasted out of our seats, so in many ways it's better and much more enjoyable than conventional cinema (and definitely less fatiguing).

While dialogue was rooted to the on-screen action, it and the attendant sonic information was presented across an incredibly wide listening area so there's no need to fight for the listening 'sweet spot'.

Even under the hardest sonic conditions the Subsonic Polymorphic system remains remarkably composed and it can also relay subtlety and atmosphere with equal effectiveness and control. And when it comes to music the Subsonic series is also outstanding - full range, detailed, exciting, refined and totally involving.

To these ears, eyes and bank account the Subsonic Polymorphic Series is an outstanding example of home grown speaker engineering. Even on the world stage it's a winner. This opinion was sealed when we changed to two-channel operation and (a little bit of 5-channel stuff) - hi-fi sound was simple breathtaking!

The beauty of the Polymorphic design is that if you like what see and hear in-store, there's an excellent chance that you'll like it as much and probably more when you get it home. I don't believe there is another speaker design with the room matching capacity to equal this.

The performance, looks and quality of this speaker series are worth the price of entry, but the Polymorphic Technology makes this new Subsonic range one of the most exciting and important product releases in recent memory.

Make no mistake about it; the Polymorphic range introduces cutting edge technology that's going to force a whole bunch of speaker designers and manufacturers to play a fast game of catch-up ... if they can catch-up, that is. For only the fourth time in over 20 years as a reviewer I find myself with a new reference speaker system in the top-line Polymorphic system.

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