# A5 Technical Paper

# Acoustics

A5 offers versatility without compromising performance. This is down to attention to detail in the science of acoustics, as well smart implementation of audiophile-grade electronics. This manifests itself in a combination of sensible implementation of core Bowers & Wilkins technologies, many of which were originally designed for our custom install and high-end loudspeaker ranges and bespoke A5 development.

**Nautilus™ Tapering Tubes**
Not all sound generated by speaker drive units is good sound. The kind that emerges from the back of a working driver, into a conventional box cabinet, can bounce around and make a mess of the good sound coming out of the front. By using the tube loaded tweeters first designed for our flagship Nautilus™ loudspeaker, rear reflections are fully absorbed to ensure pure high frequencies.

**4inch drive units**
A5's drive units use the same driver as our M-1 home theatre speakers. The glass fibre cone material controls diaphragm resonances to improve off-axis mid to high frequency beaming, creating a spatial and natural sound anywhere in the room.

**Anti-Resonance Plug**
Additionally, in order to control the resonances emitted from the voice coil and the associated high frequency distortion Anti-Resonance Plug technology (as found on the high-end PM1) has also been implemented.

**Speaker basket**
Sound radiates from the rear of a drive unit as well as the front. For most applications this is undesirable as the rear sound adds colouration when it reflects off the speaker basket. By using a speaker basket with increased open area, rear sound reflections are minimized. Additionally, the air pressure behind the diaphragm is distributed more evenly, which prevents rocking of the diagram and voice coil components. The result of this reduction in rear sound reflections and the more uniform speaker movement is the dramatic reduction of associated coloration.

**Flowport™**
A5 also incorporates Bowers & Wilkins Flowport™ technology. The dimpled holes around the port reduce air turbulence in the same way as a golf ball. The ports are ultra silent so the bass is clean at all listening levels.

# Audiophile electronics

**Amplifiers**
Each tweeter and driver is powered and controlled individually. The latest class D amplifiers with minimal output filters address intermodulation distortion in the electronics domain. Audio artifacts normally associated with the use of output filters are pushed higher in frequency, way out of the hearing band. To the listener the result is smooth and clean high frequencies.

**Digital Signal Processing**
For many compact speakers, when played at high volume levels, the sound becomes unlistenable and incoherent. A5 takes a clever approach by applying propriety Digital Signal Processing. A5 monitors and analyses the audio signal at every sample and intelligently optimises the system to ensure controlled bass output and room filling sound at all listening levels. The direct digital signal from the source passes through our audiophile digital to analogue convertors ensuring that the sound is kept intact and as accurate as possible.

**Power supply**
Great sounding audio electronics, especially amplifiers, rely on a great power source; this has not been over-looked for A5. The power supply has been designed to deliver maximum stability. Clean, low-noise power ensures that all electronic components including the amplifiers can unleash their full potential.

# Design

**Build quality**
A5's audio electronics and acoustic components are capable of generating a lot of sound output. To ensure that the enclosure does not rattle or buzz, great attention and thought has been applied to the design. Not only has the enclosure been made from glass re-enforced ABS, extra strengthening ribs have been included to limit and control undesirable resonances. The end result is a wireless music speaker capable of producing room-filling, high-quality audio.

Bowers & Wilkins

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