

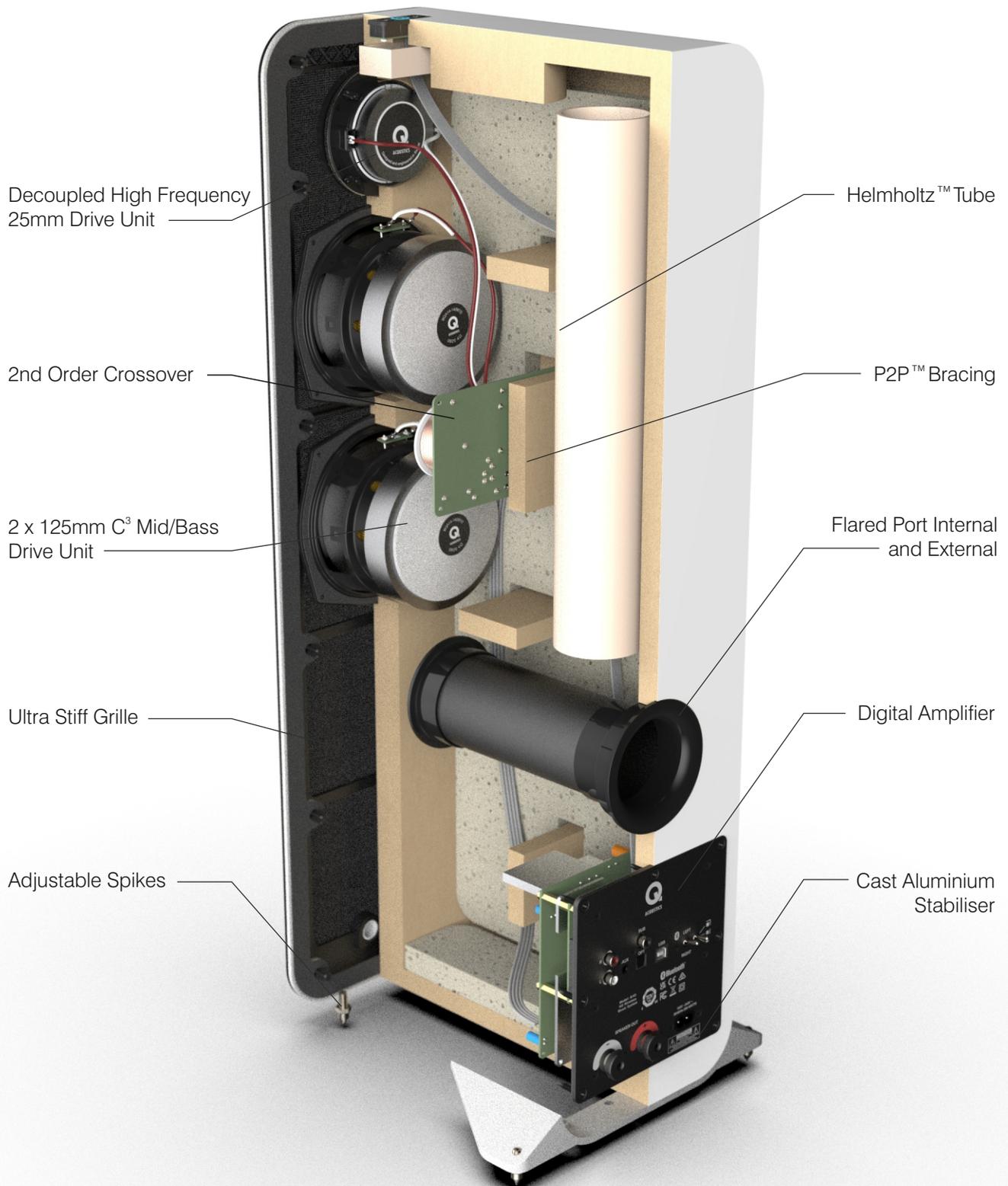


M40 HD Wireless Music System
Technical Information

M40 HD Wireless Music System

This is a new design, not an adaption of one of our many award-winning passive products.

Designing a dedicated music system allowed the engineers to optimise all the acoustic elements of the M40, creating a product that is much smaller than a conventional passive speaker and separate amplifier configuration, but without loss in performance.



Versatile Connectivity Options

M40 includes connectivity for most currently used sources including -

- Bluetooth® 5.0 with aptX™ HD for the highest resolution from mobile sources and many TVs.
- Asynchronous HD USB input for the best digital performance when streaming via a PC.
- Optical for compatibility with a wide range of TVs and HD digital sources.
- Analogue inputs to cover the outputs of fixed or mobile analogue sources.

Bluetooth audio specification

The M40 system includes full Bluetooth 5.0 specification for the best range and data transfer. AVRCP (AV Remote Control Protocol) is included for seamless control of volume, track and play/pause from either the mobile source or from the remote control. aptX HD and aptX Low Latency ensure the highest audio quality from Bluetooth sources.

USB Audio Specification

The asynchronous USB 2.0 input accepts a resolution up to 24bit/192kHz for compatibility with Hi-Res on-line streams available via computers. Volume up/down, previous/skip track, and play/pause commands are also supported via USB.

Optical Specification

The optical input with a resolution up to 24bit/192kHz ensures compatibility with optical sources such as optical equipped TVs and audio-visual streaming sources.

Analogue Specification

The analogue input provides both phono and 3.5mm jack connectivity for hi-fi analogue sources such as CD, mobile devices and TVs with an analogue output.

TV Specification

M40 provides options to connect your TV via Bluetooth, Optical and Analogue (Phono or 3.5mm jack). Position the M40 system either side of your TV for stunning TV, movie and gaming sound.

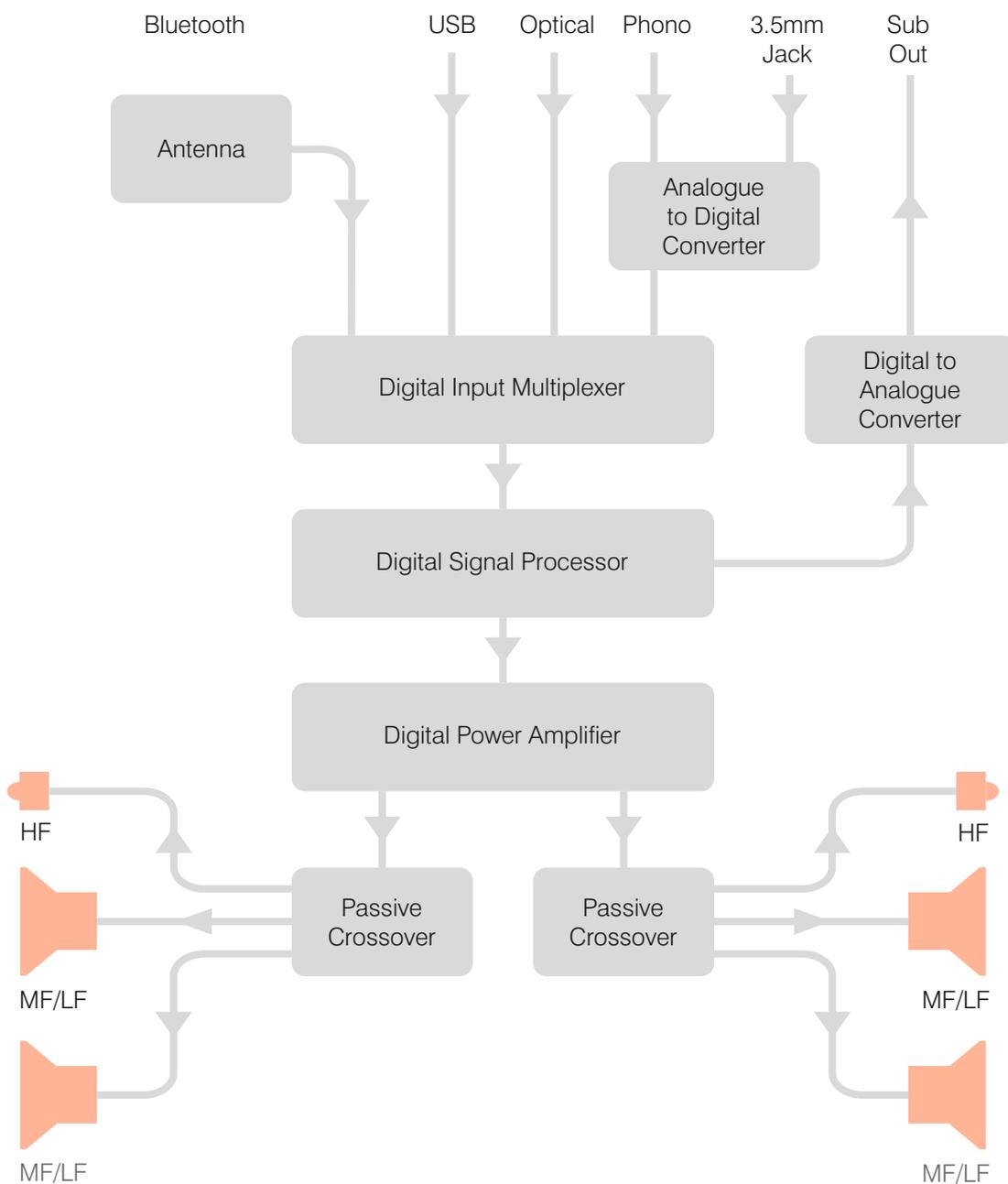


A Purely Digital Amplifier

The M40 system amplifier operates entirely in the digital domain. Digital input signals are acquired by a digital multiplexer then routed directly to a DSP (Digital Signal Processor) for equalisation. The DSP applies equalisation according to the chosen boundary condition and sets the listening volume. The resultant digital signals are then formatted by the DSP into bitstreams that are boosted by a separate low distortion Class-D amplifier to directly drive the speakers.

There is no requirement in this signal path for any down-conversion of digital signals into an analogue format. Analogue signals are digitally encoded at source, then follow the same path as digital signals through the digital domain to the speaker.

M40 System Block Diagram



Energy Efficiency

The M40 system conserves energy by careful attention to efficiency in both the power supply and power amplifier stages.

A side benefit of high circuit efficiency is reduced energy loss through heat radiation. This enables the amplifier module to be designed as a very compact unit that does not intrude significantly into the speaker volume and has been made possible by the adoption of a variable voltage topology.

Auto Sleep

A timer monitors audio through the amplifier and will automatically set the amplifier to standby 20 minutes after music has stopped playing to further reduce energy consumption.

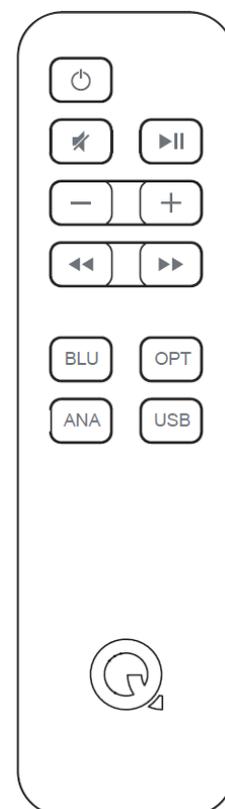
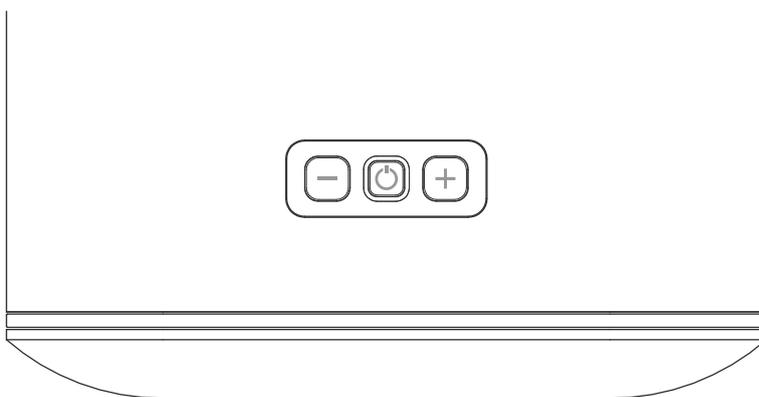
DSP in the M40 System

The DSP provides equalisation in the digital domain that is far beyond the scope of a traditional passive crossover. Part of the DSP equalisation characteristic controls the energy fed to the bass unit below port resonance where this can put the drive unit under unnecessary stress. Multiple bi-quad stages within the DSP have not only enabled the system to be optimally voiced for three boundary conditions, but have also been utilised to maximise low frequency extension and enlarge the soundstage, resulting in performance that belies the speakers' compact size.

Controlling the M40 System

The M40 system is supplied with a compact, stylish remote control that controls the full functionality of the system including standby, volume, direct access of input source and play/pause/track navigation for a compatible Bluetooth or USB source.

One of the speakers also has Standby and Volume controls placed on the top surface for easy access .

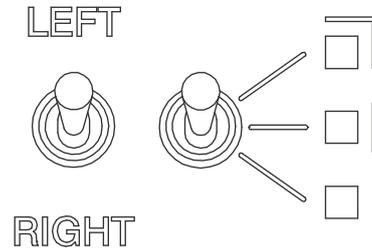


Configuration

The M40 system is a highly flexible system that can be optimised for both the room environment and the listener's system needs.

Channel setting

A channel setting switch on the back of the active speaker enables it to be set to the left or right channel. This feature allows the powered speaker to be positioned on the left or right of the system, whichever is more convenient for mains power.



Boundary setting

A three-position switch enables the DSP to optimise the speaker's low frequency voicing depending on the boundary condition within a room. These three locations are: close to a corner, close to a wall or in free space, but in practice the best setting is determined by listening to the three alternative equalisations once the M40 is set up in its listening position.

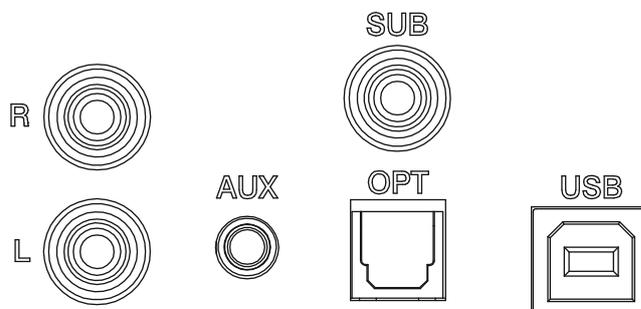
Port bungs

Foam port bungs are supplied as an optional fit. They are expected to be of most benefit when the speakers are placed very close to a wall, reducing the level of bass but improving the bass extension and definition.

Subwoofer Output

A subwoofer output is provided for connection of an optional active subwoofer to provide bass reinforcement for the lowest octave. The subwoofer out signal is derived from a dedicated Digital to Analogue Converter as a mix of left and right channels, then routed to the subwoofer output via an active low pass filter.

The subwoofer cut-off has a 2nd order (12dB/octave) filter alignment, with a cut-off frequency set at 330Hz.



Speaker Technology

Mid/Bass Drive Unit

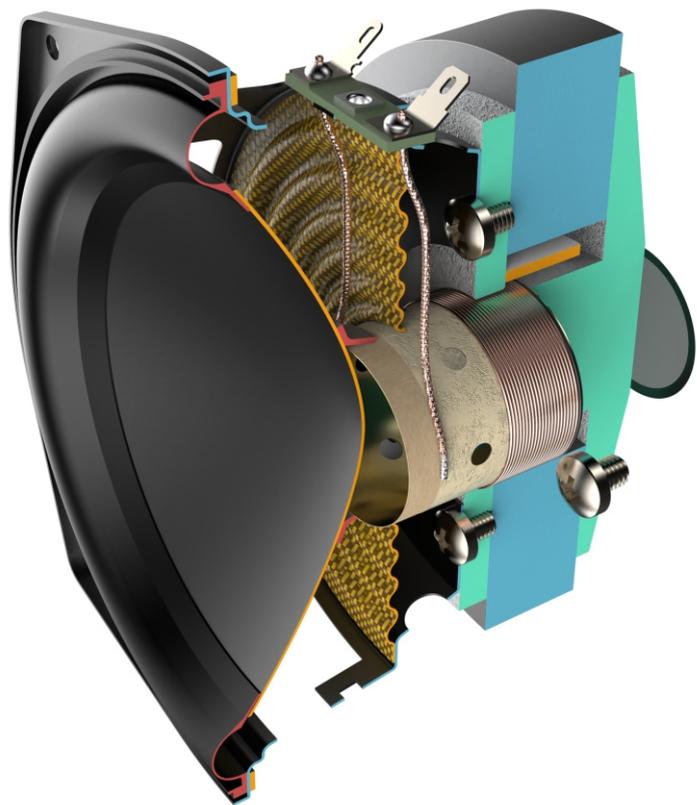
C³ Continuous Curved Cone™

The profile of a bass/mid driver cone has always been a compromise. Whilst a straight conic profile has benefits at bass frequencies, it exhibits undesirable break-up modes that will restrict its higher frequency range. A flared cone is a better option to control the cone break-up towards higher frequencies, however the flare shape will not hold its rigidity at low frequencies so well as a straight conic shape, particularly at the outer diameter. Q Acoustics multi-disciplinary research team developed C³ (pronounced 'C-cubed'), a multi-radius complex curve contour cone profile that exhibits 'best of both' benefits with the bass characteristics of a straight conic profile, and with the mid frequency control of a flared profile.

The M40's 125mm drive units have good motor strength, high BI and the voice coil is wound from Copper-Clad Aluminium Wire (CCAW) over a glass fibre former to keep the moving mass low and eliminate the eddy currents associated with aluminium formers. As well as having excellent dispersion the drivers also exhibit well controlled frequency response which enables smooth integration with the tweeter using gentle slope, low order crossovers. Frequency and amplitude linearity is also exceptional for a drive unit in this class, with harmonic artefacts below 0.2% in the critical mid

The benefits of these drive units are not subtle, and can particularly be heard as excellent bass dynamics, significantly better than single radius flared cones. The C³ profiles really do exhibit the best characteristics of a simple, straight conic profile, but without its undesirable break-up modes. The tight, damped bass sound of M40 enables more flexibility in placement of speakers near the boundaries of the listening space.

It is rare that a genuine advance is made to one of the fundamental design elements of a loudspeaker drive unit. Most progress in loudspeaker design is incremental, based on the use of more advanced materials etc, but the C³ profile has successfully addressed shortcomings in one of the basic geometrical elements of drive unit design.



High Frequency Drive Unit

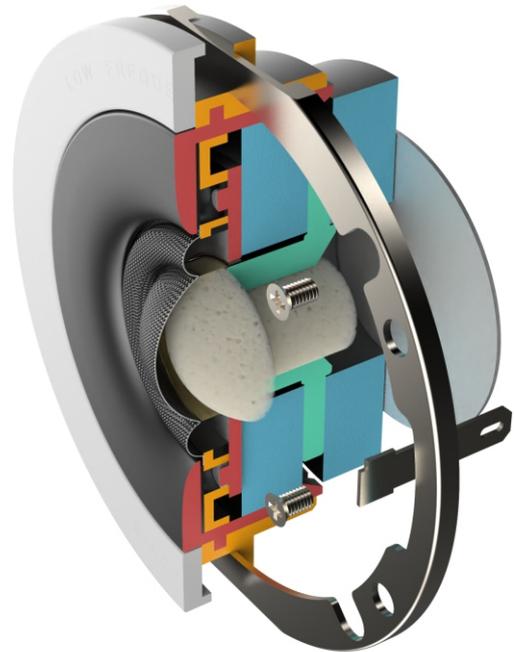
Fabric domes and inverted roll surrounds are design features inherited from the Q Acoustics Concept series, which widen the dispersion characteristics and give the M40 excellent off-axis performance. These elements are driven by powerful motor units and decoupled from the baffle via a compliant suspension system. Vibrations from the mid/bass units, which can impair the performance of the high frequency drive unit are isolated, allowing the drive unit to perform with dramatically reduced interference. In practice this means it can accelerate without flexing and stop very accurately without unwanted resonance.

Crossover

The crossovers are modified 2nd order designs with high-grade metallized polyester film capacitors and low saturation air core inductors in the signal path. The resistors are high power wire-wound types, bifilar wound for ultra-low parasitic inductance.

Grille

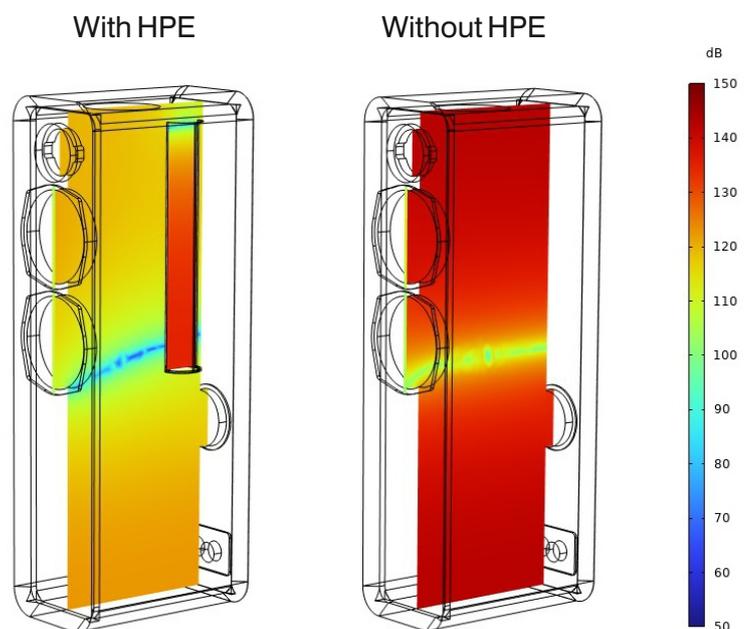
Particular attention has been given to the M40 grille. By fixing the grille to the cabinet the engineers have been able to utilise the cabinet inherent stiffness and therefore significantly reduce the grille's structure particularly around the drivers. Thus, the M40's open grille design results in an un-impeded acoustic with negligible sonic interference.



Cabinet Construction

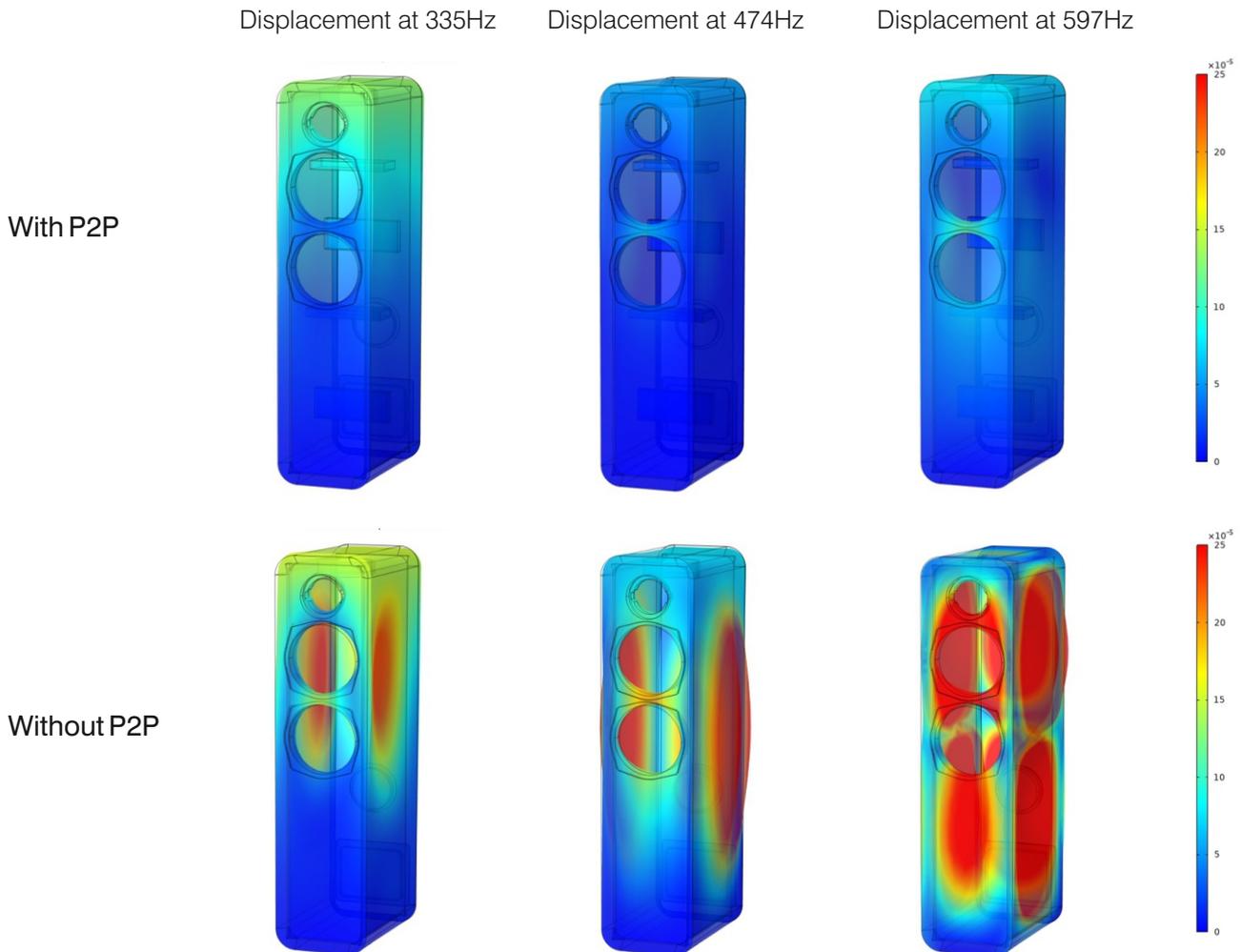
Helmholtz Pressure Equalizer (HPE™) Technology

The proportions of all tower speakers can introduce undesirable standing waves within their cabinets. The M40 towers therefore include a Helmholtz Pressure Equalizer (HPE) which converts pressure to velocity and reduces the overall pressure gradient within the enclosure, flattening the frequency response.



P2P™ Cabinet Bracing

In common with other Q Acoustics' products the M40 system speakers boast Point to Point (P2P) bracing which supports the parts of the enclosure that need to be stiffened making the new enclosures exceptionally rigid, improving the focus of the stereo image and giving the soundstage more accuracy than ever before.



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Conclusion

At just over 70cm high, the Q Acoustics development team have created this music system to be truly compact and discreet. Available in three finishes - Black, White and Walnut - they will fit seamlessly into many interior spaces. All this has been done without compromising the established Q Acoustics strengths of powerful, precise and engrossing sonic performance. Q Acoustics M40 is truly a discreet music system with a towering sound.

Specification

Power

Supply Voltage 100-240 VAC, 50/60 Hz

Power Consumption

Standby <0.5 W

Typical ~10 W

Amplifier Performance

Peak Power Output 2 x 100 W

Continuous Power Output 2 x 50 W RMS

THD @ Continuous Power <0.7 %

Acoustics

Enclosure type Reflex (ported)

Mid/Bass drive unit 2 x 125 mm (5.0")

High Frequency drive unit 1 x 22 mm (0.9")

Crossover frequency 2.5 kHz

Frequency Response (-6dB) 38 Hz – 22 kHz

Inputs

Analogue – Phono

Sensitivity 700 mV RMS

Max. input level 2.20 V RMS

Analogue – 3.5mm Jack

Sensitivity 400 mV RMS

Max. input level 1.25 V RMS

Optical (S/PDIF) – TOSLINK

Max. resolution 24bit/192kHz

USB – Type B connector

Max. resolution 24bit/192kHz

Bluetooth®

Bluetooth version 5.0

Supported codecs aptX™, aptX HD, aptX Low Latency, SBC, AAC

Outputs

Sub out – Phono

Max. Output 1 V RMS

Dimensions (W x H x D)

Inc. Stabilisers & Spikes 250 mm x 710 mm x 296 mm (10.0" x 28.0" x 11.7")

W/O Stabilisers & Spikes 170 mm x 700 mm x 296 mm (6.7" x 25.6" x 11.7")

Packaged (L x W x H)

Each 840 mm x 310 mm x 425 mm (33.1" x 12.2" x 16.7")

Pair 850 mm x 645 mm x 460 mm (33.5" x 25.4" x 18.1")

Weight

Amplified speaker 12.4 kg (27 lb 5 oz)

Passive speaker 11.8 kg (26 lb)

Packaged (Pair) 34.6 kg (76 lb 4 oz)