If the history of loudspeaker manufacture is a topic about which you’re a wiz, you’ll already know that the rather strange ‘tweeter-on-top’ design that features on this new B&W CM10 has been a feature of this world-famous British manufacturer’s speakers since 1978, when it first appeared on the ground-breaking model DM7.

**EQUIPMENT**
The CM10 is a rare design… and not only because of that tweeter! First, it’s a five-driver, three-way bass reflex design. What this means is that it has not one, not two, but three drivers that are completely dedicated to delivering bass… or, more specifically, those frequencies below 350Hz. This is important because the delivery of good bass (that is, bass that’s powerful, extended, tonally rich and without distortion) requires a speaker to move lots of air. And, all other things being equal, the greater the cone area of a speaker, the better the bass. Thanks to using three separate 165mm-diameter bass drivers, B&W’s CM10 can boast that it offers 50 per cent greater cone area than almost any other speaker in its category.

As for that tweeter, why, exactly, is it up on top? It’s there for a couple of reasons. The first involves decoupling. The reason for decoupling the tweeter is that the movements the dome makes to create high frequency sounds are so small (amounting to only a few microns) that even tiny vibrations in whatever is supporting the tweeter (usually the front baffle) can affect the movements being made by the tweeter dome. Many companies do this by mounting their tweeters in a flexible coupling on the front baffle. B&W isn’t a huge fan of this method (it says it’s not particularly effective), so in the CM10, the tweeter is compliantly mounted in its tubular housing, and then that housing is, in turn, compliantly mounted to the top of the cabinet so, in effect, there are two completely different de-coupling processes in play.

The second reason for having the tweeter separate from the main body of the loudspeaker is that the dispersion of sound from any individual driver is dramatically affected by the surface on which it’s mounted. In acoustics terms, the ideal loudspeaker is one where all the sound issues from a single, dimensionless point in space. This is obviously impossible, but the larger a front baffle is, the more it will affect the performance of any tweeter mounted on it, as the tweeter’s dome area is tiny in relation to the area of the baffle. Putting the tweeter in its own tiny ‘cabinet’, as B&W has done in the CM10, means the tweeter comes very close to becoming that ‘dimensionless point in space’. Not only does this dramatically improve dispersion, but also the off-axis frequency response.

The tweeter itself is a new design for B&W and is unique because it has what B&W calls a ‘double dome’, but in fact it’s only the edge of the tweeter’s dome that is strengthened and stiffened by using a second layer of aluminium. The extra thickness stiffens the whole structure and pushes the first break-up frequency out to 38kHz, which increases linearity in the audio band. In a world where most hard-dome tweeters start breaking up at around 20kHz, that’s a huge achievement. At the rear of the dome B&W has recycled technology it developed for its famous Nautilus speaker ($95,000 per pair) because the output from the rear of the CM10’s tweeter’s dome is absorbed by a ‘Nautilus’ tube,
effectively reducing unwanted resonances and preventing reflections.

Look closely at the CM10’s midrange driver and you’ll see that it, too, is a unique design: completely different from a standard midrange driver. B&W calls this design a ‘fixed suspension’ transducer (FST). Instead of using a conventional roll surround suspension, the FST uses a narrow ring of foam at the outer edge of the cone as a suspension. Although the narrow ring flexes with movements of the cone, it doesn’t radiate sound like a conventional roll surround because its area is significantly less. Also, less energy is reflected back into the cone than would occur with a normal surround. However, the fixed suspension is fairly susceptible to external vibration, so in the CM10 B&W has decoupled the FST driver from the front baffle — although it appears to be part of the baffle, the FST is actually connected to the rear of the cabinet by means of a metal rod. The cone material of the FST midrange (Kevlar), was specifically chosen because it maintains a more constant dispersion pattern over its operating range than any other cone material, as well as the fact that it’s a perfect impedance match with the fixed suspension. Unlike many other companies, B&W impregnates its Kevlar cones with a stiffening resin after which it seals both

the resin and fibre by applying a top coat of polymer, thereby improving performance. (These are tricks that most other companies have yet to master, but since B&W has been using Kevlar since 1974, it is a master of the art!)

It’s important not to underestimate the importance of having a single driver dedicated to delivering midrange, as in this CM10. In every single loudspeaker system that does not have a dedicated midrange driver, the sound will be affected by Doppler distortion caused by the cone moving long distances to produce low frequencies at the same time that it’s also moving short distances to produce midrange frequencies. This means that it’s impossible to get accurate, low-distortion sound from a driver that has to produce both bass and midrange frequencies.

**PERFORMANCE**

Ever fallen in love at first sight? Even if you haven’t, you’ll certainly fall in love after your first listen to B&W’s CM10s, because they just, well, sound so ‘right’! And it really doesn’t matter what the first track you play is, because no matter what you choose — classical, rock, funk, jazz, Latin, hip-hop, scar, opera, you name it — you’ll immediately recognise that you’re listening to a superb pair of loudspeakers… that you’re in the presence of greatness. The overwhelming impression is of the music sounding ‘whole’ so that there’s no longer bass, midrange and treble, but instead just a seamless ribbon of sound, transitioning ever-upwards without limitation. And when we say ‘ever-upwards’, the high-frequency extension of B&W’s new tweeter is almost as astonishing as its dispersion… it goes so high it should come with a bat warning! More seriously though, if you’re paying good money for high-res audio tracks that push response beyond CD’s meagre 20kHz limitation, the CM10’s tweeter is just made for you. While you’re auditioning, do check the dispersion by moving around — don’t stay anchored in the ‘sweet spot’ even though it’s so alluring. Off-axis you’ll find the treble just as sweet, just as pure and just as extended. Impressive!

The sound of the FST midrange is something else again. It’s a well-known fact (in speaker design circles) that when B&W built its first FST, many speaker designers were ordering them so they could use them to build designs using it for use in their own homes. Because B&W wouldn’t sell them for commercial use, the designers were ordering them clandestinely, one at a time, as a ‘spare part’ from B&W’s service department. If that doesn’t give you an idea of how good the FST midrange sounds, even the briefest audition of a track featuring your favourite female vocalist will prove the point — and most especially if she’s accompanied by solo acoustic guitar or a grand piano. The sound has a pellucidity that has to be experienced to be believed.

B&W has, thankfully, resisted the temptation to use the enormous spare capacity of its three bass drivers to deliver excessive bass, or even to push it forward in the mix. Instead, it’s tuned them so there’s absolutely no distortion audible, even when you’ve got the volume control wound way up and also so there’s as much deep bass extension as most people will ever need… and it’s beautifully linear across the upper bass. Another advantage is that the speakers sound ‘deep’ even when you’re playing at very low volume levels… a welcome trait that is, unfortunately, very rare to find. Luckily (or, rather more likely, by design!) the CM10 has got it.

**CONCLUSION**

Where B&W leads, others follow… but when it comes to the CM10, we figure others are unlikely to follow, because there’s just so much high-tech built in that it would be hard to copy this design and impossible to do so for what B&W is asking on the retail floor. Which means that if you want a speaker that sounds this good, the B&W CM10 is the only game in town.