**ATC SCM20SL:**

Since my first encounter with these monitor speakers back in the mid-90's, I have been looking out for an affordable pair... And, just recently, this pair turned up at The Emporium:

For the uninitiated, ATC make high quality monitoring loudspeakers primarily for professional users. Their products are seen in recording studios all over the world - there's a good chance that your favourite CD was mixed using a set. Have a look at their website - their user-list is rather impressive, including the likes of Pink Floyd, Kate Bush, Lenny Kravitz, Lou Reed, etc, etc...

Their product names are easily deconstructed. SCM stands for Studio Control Monitor and 20 signifies a nominal internal volume of 20 litres. SL refers to Super Linear, a magnet technology that contributes to the extremely good distortion performance of the bass drive unit. With most of the product range, you can choose between conventional passive or active versions, the latter having an 'A' suffix

Probably their most famous product is the 3" soft-dome midrange - Wilmslow Audio will sell them to you, but check out the price! As you'll see, the bass driver in the SCM20 has descended from this unit...

Their models are available in a hard-wearing utilitarian painted finish or in a wide range of real wood veneers that are suitable for the domestic environment. If you get the chance to examine a pair, you'll notice how well matched the veneer is and how it wraps the corners, exemplifying the superb craftsmanship of these handbuilt loudspeakers

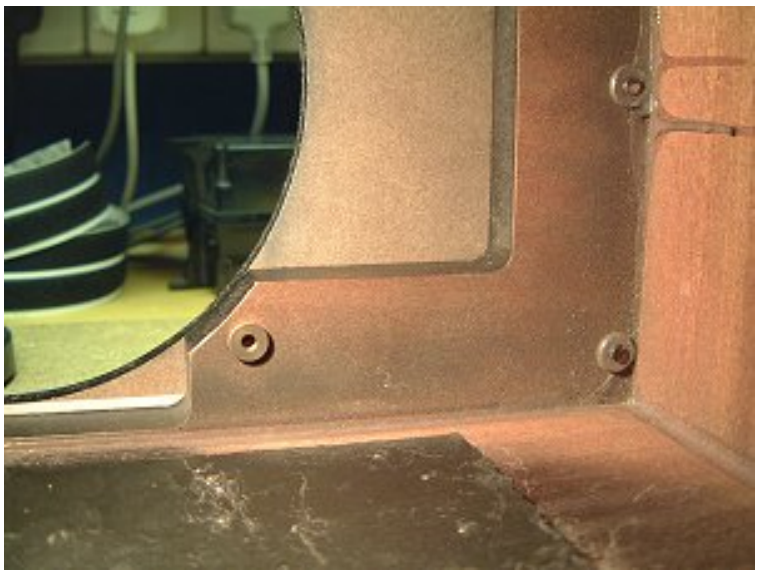
**Construction:**

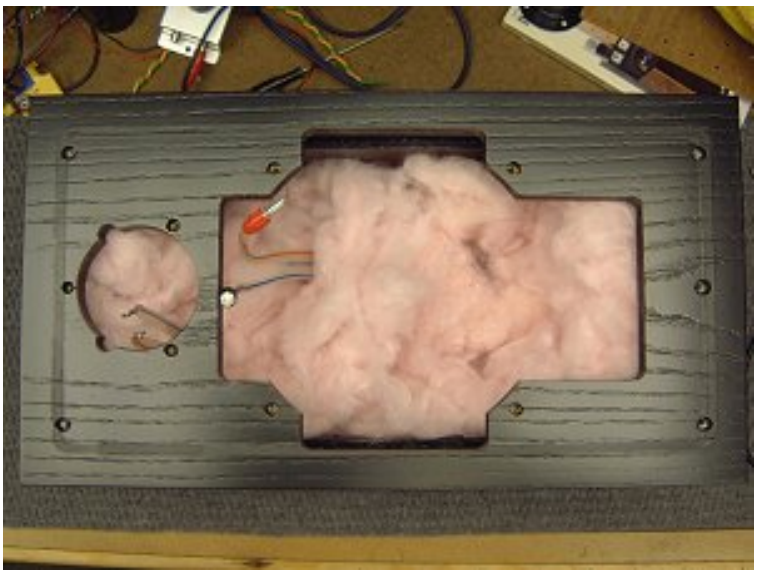
The SCM20SL is a relatively compact stand mounting model, employing two drive units in a sealed enclosure which uses a deep-and-narrow form factor to help make the model less visually imposing while appearing solid and purposeful. Your first impression of these speakers will be the weight - 23Kg each. While the enclosure is substantial, using 18mm MDF damped with self-adhesive bitumen pads, the bass driver is responsible for a large proportion of this mass.

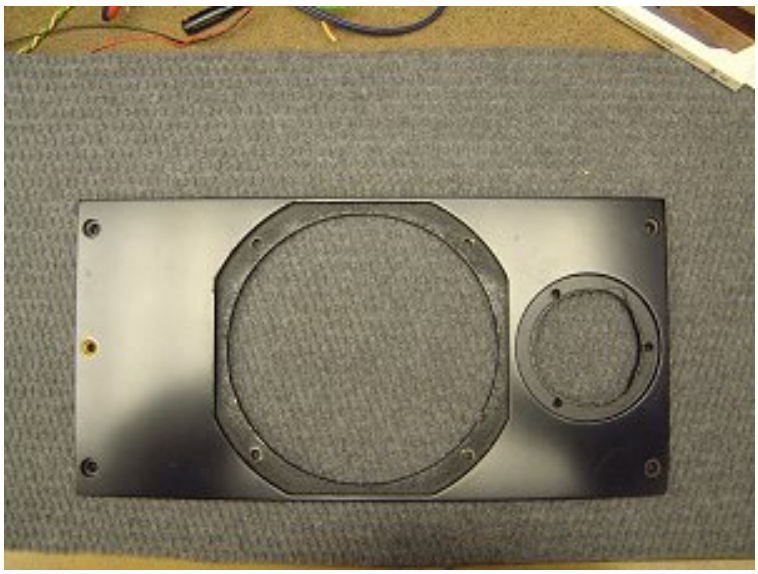
The baffle is double-thickness and fully-removable if required. I rather like the engineering here - the gloss-black baffle is smaller than the front of the enclosure and provides a neat recess for the gill frame, thus ensuring the sonic effects of this are relatively benign.

The baffle is neatly rebated so the drivers are flush with it. These views of behind the baffle demonstrate

the superb results of their CAD/CAM systems - you can also see the metal inserts that receive the serious M6 machine bolts that retain the drivers and baffle.

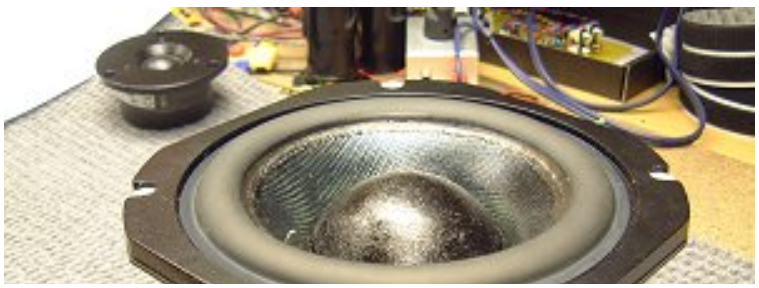






**Drive Units:**

No doubt about it - this is an impressive woofer. The high power voice coil is 75mm diameter, and adopts the "short coil, long gap" principle to maintain linearity at large cone excursions. This is connected



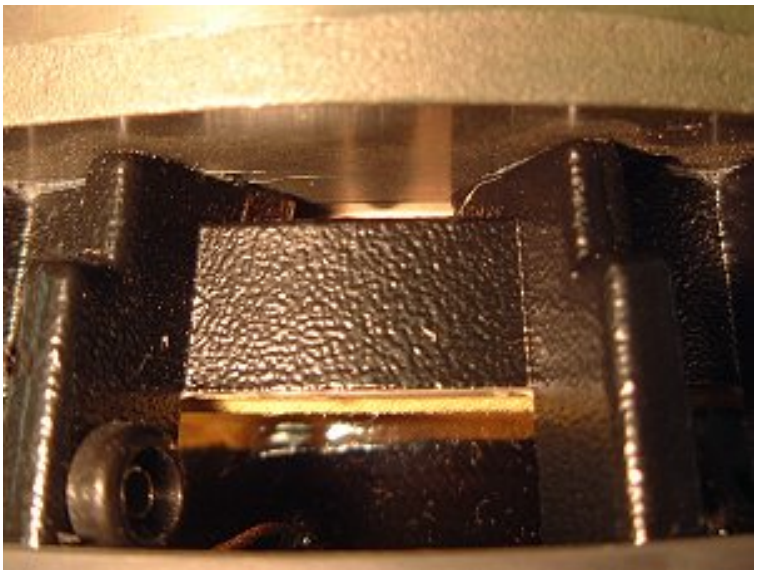
to a woven cone and 3 inch soft dome, both of which are hand-doped with a rather sticky damping material.

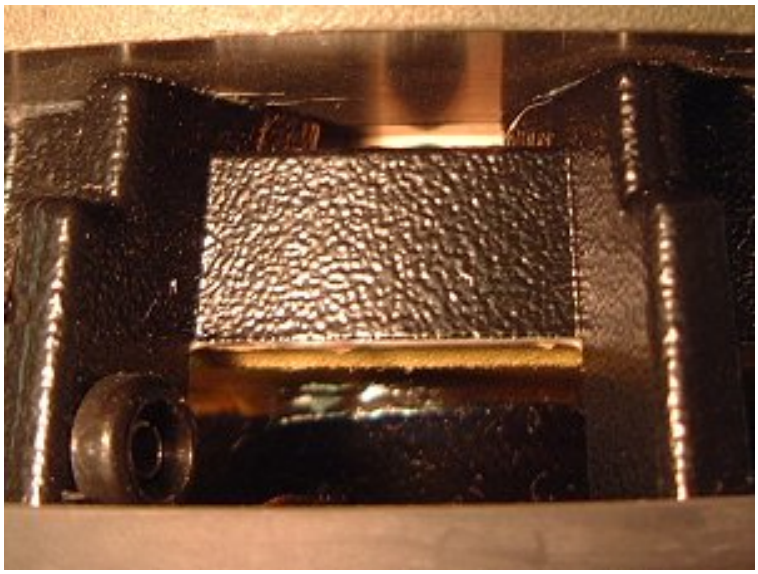
To assist with heat dissipation and control cavity resonances, the pole-piece is vented by a large (about 1/2 inch) hole drilled though the centre of the back of the driver. Also, the voice-coil former has holes in it - you can just about see this by looking carefully at the reflections of the coil former on the plate shown in the pictures below. Note the gap between magnet and the cast alloy frame that exposes the void between the rear of the spider and the magnet - normally this is enclosed to help keep debris from the magnet gap, but this forms another cavity that could be another source of colouration. I found the free-air resonance to be 45.8Hz - the system resonance is 59.3Hz.

It weighs a ton! Well, about 10Kg...

You can also see the rubber gasket and white plastic bushes that help locate the driver in the baffle, while providing a degree of mechanical decoupling.

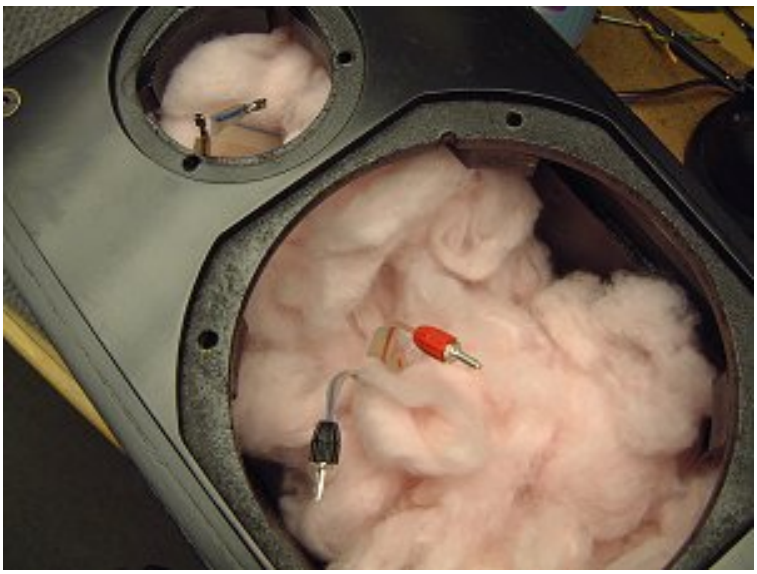
The magnet, which only just fits through the baffle cut-out, features SL (Super Linear) technology. Essentially, this is a layer of magnetically permeable insulating material to prevent eddy currents forming within the pole pieces. This shows itself as a thin groove, approximately 8mm from the voicecoil, as hopefully shown here. This was extremely difficult to photograph, hence the two, slightly different shots. Can anyone provide a diagram of this for clarification?



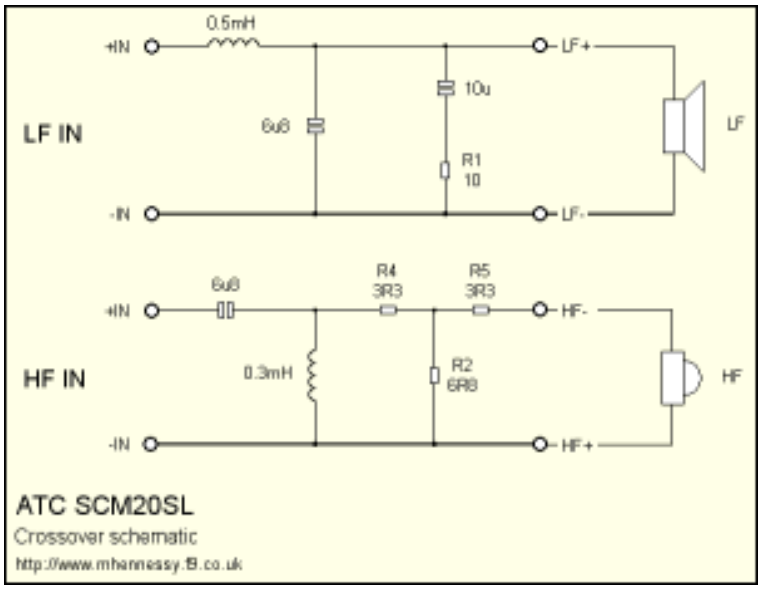


The tweeters are supplied by Vifa, and use a conventional 1 inch soft-dome. The thick aluminium faceplate is an ATC modification, and has a short flared section which provides dispersion control. The rear of the magnet is covered by a plastic enclosure, the air contained within playing a part in the acoustic performance, thanks to a vented centre pole-piece. While somewhat overshadowed by the bass driver, it certainly feels like a high quality device...


My examples have been rewired with some DNM solid-core cable. While this is expensive cable, and well-regarded by some, I don't feel that it is appropriate for these speakers. It is rather thin for my liking, and I anticipate replacing it soon.

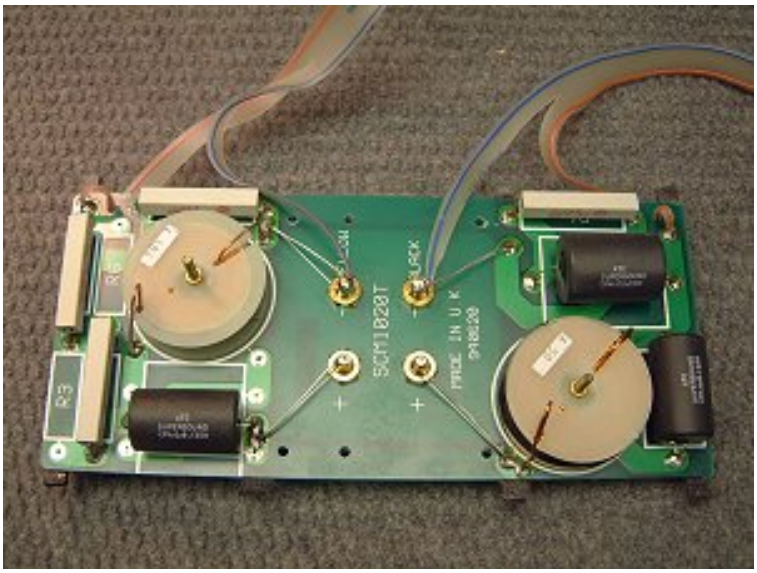


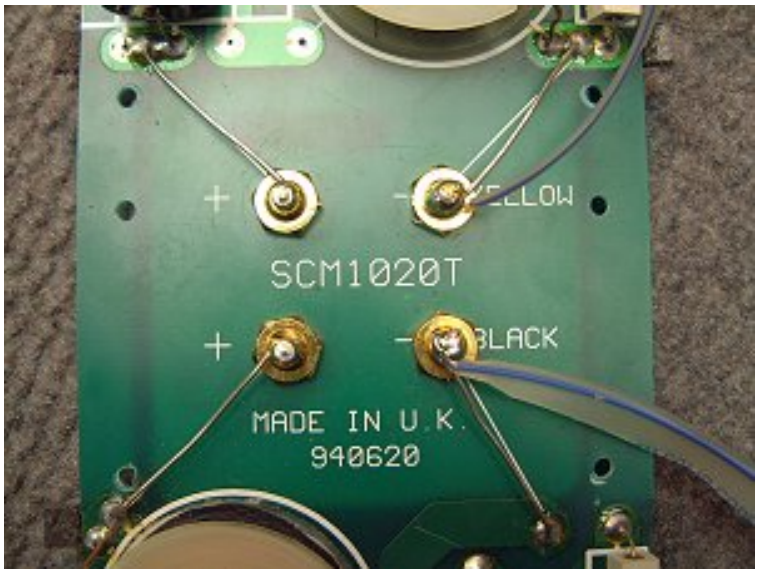
The crossovers are assembled a high quality double-sided PCB mounted on the rear panel. Compared to the Rogers and BBC designs I have studied, the crossovers are refreshingly simple. This is a sure sign of good quality drive units that behave well within and beyond their normal operational range.




Since originally writing this page, I've acquired a Marconi LCR bridge and had planned to measure the inductors at some point in the future. But thanks to Robert Hoyle for supplying me with the values, saving me the effort of dismantling them again!

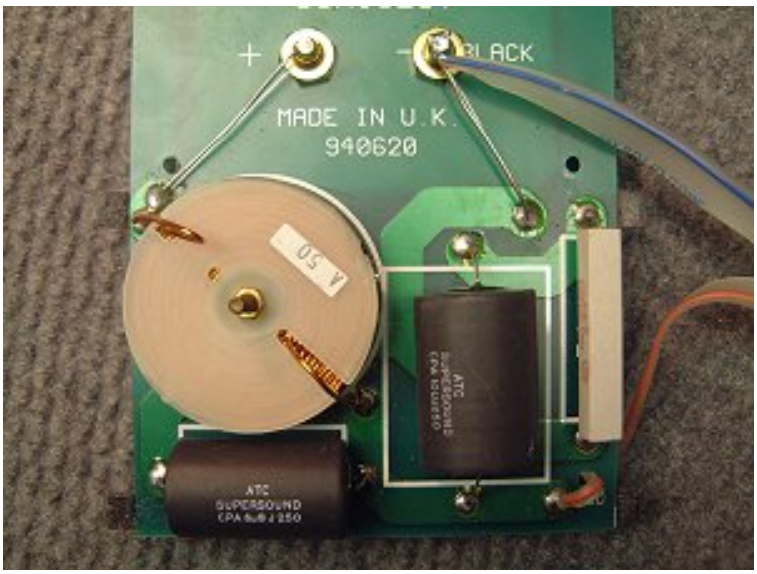
You'll notice the buy-wiring terminals. The misspelling is intentional, as it's hard to believe that a pro-audio oriented company like ATC really believe in it. Do a search on Google Groups and you'll find some posts on the subject - it seems that this might have been a 'marketing' decision.

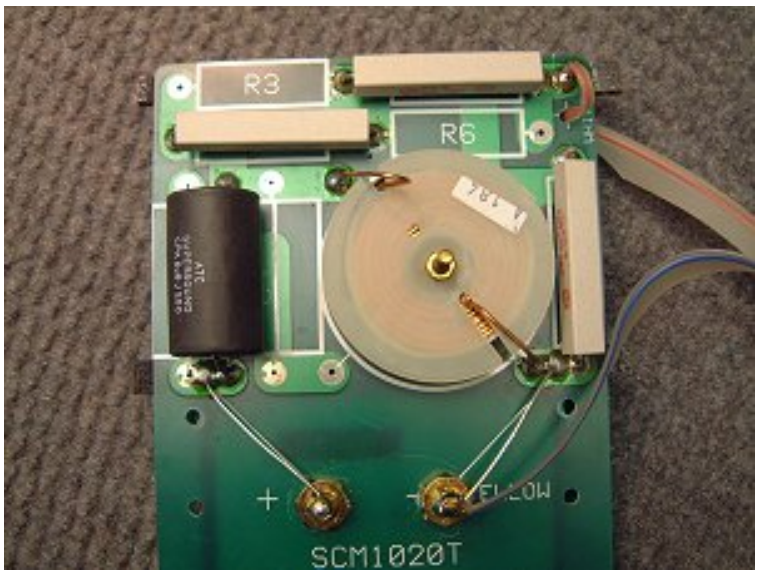




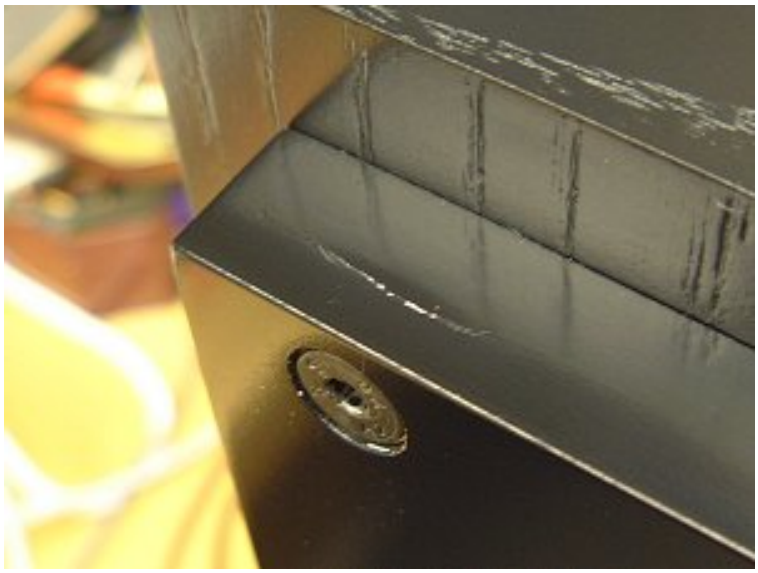

The bass and treble sections of the crossover are shown here. The bass path is a simple 12dB/octave LC filter, with an RC impedance-correcting network in parallel with the drive unit. For the treble, a similar LC filter is followed by a resistive T-section attenuator to bring the tweeter level down to match the woofer.

The capacitors are interesting, being labelled "ATC Supersound" - they're from the Ansar CPA range. The coils are air-cored and use very thick wire - note that they are held to the PCB using brass bolts. The resistors are standard 5% high-powered ceramic wirewounds. The double-thickness (2.5mm) glass-fibre PCB is double-sided - the layout is identical on both sides, which effectively halves the resistance of the tracks. You can see a CAD date-code of June 20th, 1994



One of the loudspeakers suffers from hairline cracking at the tops of the baffles - it looks like the machine bolts were overtightened when the internal wiring was "upgraded". It's the same story at the bottom of the baffle where there are three bolts securing it. The other loudspeaker shows the early signs of this, but the paint hasn't cracked yet. I've slackened the bolts slightly (while checking for air leaks) to hopefully prevent this problem getting worse. I think it is probably nothing to worry about, other than being a cosmetic defect... Wonder how much ATC charge for new baffles???



**Sound Quality:**

I was delighted to hear that these sounded as good as I remembered them, despite my amplification. I should explain that these speakers are seriously inefficient, at around 83-84dB for 2.83V at 1m. The impedance dips close to 4 ohms at several frequencies(*), so these speakers require serious amplification - ATC recommend between 100-300 watts!

* I measured a 6.5 ohm dip at 180Hz, 4.4 ohms at 2.36KHz and 4.6 ohms at 4.46KHz

Despite this, my humble A1 manages to drive them to moderate levels surprisingly well. And the sound that results is incredibly detailed - these speakers simply let you hear everything on the recording. Of course, this can be a mixed blessing, as it renders another proportion of my CD collection unplayable (the LS5/9's already had done a pretty good job of this!)

The bass response is superb. As these use sealed-box loading, there's no port noise - it's surprising how prevalent this can be, even on otherwise excellent designs. Sealed-box loading can result in much better transient response, and the roll-off below resonance is slower at 12dB/octave, so you can hear some

surprisingly low bass notes. The overall result is superbly clean and detailed bass.

Naturally, my first tests were to compare the ATC's to the BBC-designed LS5/9's, as these had become my 'reference' speakers during the last year. The obvious points are that the ATC's are slightly forward, with a brighter top end. Bass is better balanced through the 60-150Hz region, and there is more extension. Also, room-node effects are much less pronounced with the ATC's (you can choose your desired bass level in my lounge by moving about - unfortunately sitting between the speakers on the sofa results in least bass). At the moment, I don't know enough about room acoustics to explain why this is...

Like the 5/9's, they are very programme-sensitive. If anything sounds wrong, then you can be confident that the problem is with the recording or the preceding equipment. The ATC's are so much more detailed that I am hearing limitations of the A1 that the LS5/9's only hinted at...

It's hard to describe the character of the sound because it is so transparent and neutral. But, upon identifying the main differences between the two models, the question was which speaker was more "right". After lengthy and careful comparisons, the LS5/9's show themselves to have a somewhat "wooden" character to the lower midrange, especially with piano music. With some types of rock music, the bass can seem hollow or distant, perhaps a consequence of the slightly unusual bass alignment(*).

> * A little while ago, I made some measurements of the bass driver and the reflex tuning employed. These, and my conclusions might make it onto the LS5/9 page at some point in the future...

The limited treble extension is a known weakness of the Audax driver employed by the BBC in the LS5/8 and 5/9 designs. The Vifa driver chosen by ATC has no such problems, being smooth and well-extended. It shares the best point of the Audax unit, however - the lack of 'dirty-treble' (as discussed on the LS5/9 page). Basically, if you can hear a rough, splashy cymbal, it's time to choose another CD. With lesser tweeters, you're probably hearing diaphragm break-up resonance's that seem to be on every recording - time to choose another speaker! Thankfully, this affect is becoming less prevalent as cheap metal-domed tweeters are out of vogue...

Due to the exceptionally low harmonic distortion, you can find yourself listening at much louder levels than normal - indeed, ATC issue this warning in the supplied instructions:

*The human ear tends to interpret distortions as volume and thus not realise how loud undistorted sound is. The SCM20SL, like all ATC monitors has very much lower distortion than conventional systems. It is therefore a good plan to start listening at an artifically low level and carefully increase the volume. It is possible for the SCM20SL to produce sufficient SPLs for your ears to intermodulate and this will make the*

*speaker appear harsh.*

**Update - August 2004:**

These were my initial impressions of the speakers after just a few weeks. More than two years have passed, and I'm still in love with them. Since then, I've replaced the Musical Fidelity A1 with a prototype Gainclone amplifier, which does a much better job of driving them. Having such revealing speakers was really useful during the development of this amplifier, and I'm sure that my listening skills have improved greatly in recent times.

But despite being very detailed and analytical, I find that these speakers can also "disappear" given good quality source material - they are very good at simply playing music without imposing their signature on the sound. I plan to build a much more powerful amplifier for them one day, and I might supplement the bass response with a decent sub-woofer, but otherwise I can't see myself changing them in the near future.

Finally, it's worth mentioning Richard, the friend who introduced these speakers to me back in 1996. I've known him for a long time, and he is much worse than me when it comes to collecting hi-fi! He seems to be very good at buying and selling on the second-hand market without making too much of a loss, and as a result he seems to change hi-fi almost every month. But, despite trying more speakers than I can remember, he still has his SCM20's after 8 years. That's all you need to know ;-)