

Is Active The Answer?

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Late last year, Steel, Pearce and myself went over to TAG NZ's West Auckland HQ to take a look at the new ATC SCM20SL AT Active floorstanders that had arrived a few weeks before.



Active speakers have fascinated me for a while, the idea of dispensing with the system matching required between amplifier and speaker and having a self contained, perfectly optimized setup is more than a little attractive.

I'm ultra happy with my amplifiers and my speakers. I've been lucky and ended up with a match made in heaven but I'm always wondering what my next upgrade will be. Maybe the latest generation Theophany M5 speakers because mine have been superseded twice already while my amplifier designer has moved his products along as well. Then there are the cable issues – good speaker cable is expensive. With a set of actives and a good preamp (check) I'd be sorted for life, more or less.

There are compelling technical reasons for going active i.e. having the speakers driven by their own amplifiers with crossovers ahead of the amplifiers. Gary Steel's Martin Logan Purity speakers are powered but not active (as I once said), because one amplifier drives both the electrostatic panel and the cone driver based bass section, with the crossovers after the amplification, just like passive speakers.

For the technically minded, ATC goes into some detail in its marketing materials, the following is extracted from a PDF outlining the company's philosophy ([the full document is available here](#)):

The performance benefits of active over passive loudspeakers is substantial. Even a system, which incorporates the best available stand-alone power amplifier, will never achieve the performance of a similar active system. There are very good engineering reasons why this is true and the following brief will introduce some of the issues.

- 1. The magnitude of the frequency response of both active and passive loudspeakers can be controlled, with good design, to be within 1dB of one another. However, the phase component of the frequency response will always be better in an active system. The active filters produce better filter roll-off characteristics at crossover. Combine this with the inclusion of a variable all-pass filter at each crossover point to correct the phase response of the drive units through the crossover regions and the result is a loudspeaker with much better group delay characteristics. The benefit to the listener will be improved polar response and therefore radiated power response. Such an active loudspeaker will, therefore, have a large stable sound field with stable imaging and source location not possible with a passive loudspeaker.*
- 2. A passive crossover will only operate correctly into the load impedance of a particular loudspeaker drive unit. However, the impedance of a loudspeaker drive unit will change with the amount of power input. This is because loudspeakers are very inefficient and most of the input power is dissipated as heat in the voice coil. As a result the temperature of the voice coil will rise and, because copper has a positive temperature coefficient of resistance, the impedance of the loudspeaker drive unit will rise. The result will be frequency response errors as the filters move from their designed response with increased input power. This effect does not occur in active loudspeakers where the filter response is maintained independent of input power to the loudspeaker.*
- 3. Because the amplifiers in an active loudspeaker system are only required to operate over reduced frequency bands the intermodulation distortion products present in a passive system will be dramatically reduced, by typically 20dB, in an active system.*
- 4. In an active system the absence of a passive crossover and long cable runs together with a known amplifier damping factor prevents the modification of the loudspeaker drive unit "Q" ensuring better controlled low frequency performance.*
- 5. For a given amount of amplifier power an active loud- speaker can be expected to produce approximately 6dB more level than the equivalent passive system. Furthermore, powers may be more optimally specified in an active system. A tweeter, for example, requires much less power than a woofer to produce a balanced system performance.*



TAG's Rob Judd has had a fair amount of experience with active speakers in both the professional and consumer sides of the AV industry. He's in little doubt that the active systems have major benefits in terms of speed, bass tightness, transparency and endless headroom. On the other hand, he's of the opinion that passive speakers seem to convey more of the emotion inherent to the musical performance. Perhaps the actives are simply too clean and controlled for our old mental computers and we prefer a bit of imperfection? Listening to the \$14,999 ATC SCM20SL AT actives driven by an ATC CA-2 preamplifier and the humble little Zero DAC with one of ATC's big SL subwoofers showed exactly what Rob was talking about. With 250 watts per channel, biased to two thirds Class A according to ATC plus the sub, we had 1,150 watts continuous on hand (1,500 watts peak) and the sonics were filled with a sense of absolute control and glass clear transparency, with bass on the super tight side of taut and excellent imaging, along with the aforementioned headroom.

The sound was right up my street but based on a short listening session, I was left wondering if I would want a little more of something in the system before long. What this something was, I wasn't quite sure. It wasn't warmth because my current system isn't exactly a paragon of warmth. Maybe the system was just too clean and crisp even for me (never thought that I'd say that).

What it did was quite remarkable though (i.e, I loved most of what I was hearing) and is well worth exploring further. I'll have to set up another visit soon to try and get to the bottom of this. A trip to Hamilton to hear the [SGR actives](#) at Audio Reference is also on the cards.