Equipment Reviews

ATC SCM50 Passive/Active Loudspeaker

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I've been in this game long enough to know that something special is arriving when it comes in flight cases the size of telephone booths. I half expected to see "Pink Floyd, Wembley Stadium, London" stamped on the side. Ben Lilly, ATC's cheerful sales director, read my mind as he flung open the rear doors of the firm's smart blue van. He smiled and said, "Don't worry, it's not too bad, they're on casters." When I was younger I thought it would be great fun being a roadie, traveling the world, getting drunk with rock stars, getting laid by groupies, and sharing the camaraderie of the tour bus at 4 a.m. as the sun rose over the Nevada desert. Nowadays, my aspirations are more limited—managing to haul these ATC speakers into the house without my feeble spine crumbling into a mixture of dust and broken sinews would do. I reckon I could still manage the getting-drunk-with-rock-stars thing quite well, but I'm not sure I could keep up with the groupies anymore.

For the uninitiated, ATC is a purveyor of studio monitor systems to many of the world's elite artists, recording studios, mastering labs, and concert halls. Lilly casually mentioned that the company would be installing some massive ATC SCM300 monitors and two of its largest subwoofers into the walls of Abbey Road's Studio 3 the following week. ATC is part of a small group of speaker firms—along with PMC, B&W, Focal, Amphion, and Dynaudio—that sell both professional studio monitors and speakers for the home. I would suggest that such manufacturers have an edge because they understand how to build neutral-sounding and revealing studio monitors and tend to apply a similar approach when designing domestic loudspeakers.

There's a huge number of loudspeaker brands competing to be among the very best in the world, but only a handful have the knowledge, engineering capability, and expertise to build everything in-house, from the ground up. Many elite brands source custom-specified drivers from firms like Scan-Speak. By contrast, ATC designs and builds every drive unit in-house, and hand-builds its own crossover circuits and active amplification packs. The company knows that every loudspeaker design decision impacts the sound—ATC even manufactures the voice coils used in its drivers. In an ATC speaker, everything—the wire used for coil winding, the magnets, the gap employed, the number of turns on the wire—is within the company's control. Some of the factory machinery is actually custom-built by ATC for specific assembly processes. This extraordinarily deep engineering expertise is what makes the company's loudspeakers so very special. It's also why they are used by Air Studios, Abbey Road, Pink Floyd, Enya, Mark Knopfler, the Royal Festival Hall, and the Sydney Opera House. Make no mistake, a visit to ATC's UK headquarters in Aston Down, Gloucestershire, is to walk upon audio holy ground.

Sadly, this isn't Jonathan's listening room—it's the extraordinary ATC Dolby Atmos array at Blackbird Studios Nashville

The firm offers two ranges of loudspeakers: the professional range, geared to commercial users, which in true Spinal Tap style come in any color you like as long as it's black; and a domestic range with beautiful real-wood veneers. The domestic range is further subdivided into three categories: the Entry Series, which runs from the SCM7, a small bookshelf speaker, to the SCM40 floorstander I reviewed earlier this year; the Classic Series of standmounted monitors, which runs from the SCM20SL to the SCM150SL; and the Tower Series, ATC's floorstanding range, which runs from the SCM20ASLT to the SCM300ASLT. The tower models have the same acoustically loaded cabinet volumes as their standmount counterparts, because the lower part of the tower cabinet is partitioned off.

ATC's naming convention is very logical—the number refers to the acoustic volume of the cabinet, A means active, P means passive, SL refers to the high-specification Super Linear drive units fitted to certain models, and T signifies a tower/floorstander. The important thing to note is that the Tower and Classic series are derived from ATC's professional studio-monitor range, featuring the very same drive units. Like the studio monitors, their cabinets are built by ATC's own cabinet facility, while the cabinets for the Entry models are outsourced and feature more modestly priced veneers, and slightly lower-specification drive units. Most ATC speakers come in active and passive versions, although the company asserts that active designs are superior for a variety of technical reasons. I shall explain later.

The ATC SCM50s supplied for this review were a specially modified pair with detachable amplifier packs and crossovers to enable active and passive operation to be compared. Both of these modules fit into a cavity in the back of the cabinet and can be swapped out in minutes. Connections for the passive module are superbly machined triwire binding posts on the rear panel, which take standard banana plugs. The active amplification module is fitted with a single XLR socket input. For this test, ATC provided a narrow-gauge Van Damme cable (as used in many professional studios) to run from the HiCap power supply feeding my Naim NAC 82 preamplifier to the loudspeaker. For the passive configuration I used either Naim's recommended NAC A5 loudspeaker cables or some exotic Chord Company Sarum T cables, which cost in excess of $10,000 for a 20′ length. The SCM50PSL (passive) costs $25,999 per pair (all prices in USD), while the SCM50ASL (active) retails at $33,999 per pair.

The drive units of the SCM50 are the very best that ATC makes and are individually selected and pair-matched to each loudspeaker cabinet. The tweeter is the ATC SH25-76S model, a higher-specification variant of the standard SH25-76 fitted to my own reference ATC SCM40 loudspeakers. This 25mm soft-dome tweeter benefits from ATC's unique dual suspension system, which adds a secondary suspension component to ensure greater linearity and suppress rocking modes. This system also negates the need for ferrofluid (which degrades with time) for cooling and damping, so the magnetic gap can be reduced, allowing increased power handling over competing designs. The S derivative differs from its conventional stablemate by using an even larger N48M neodymium ring magnet capable of generating even higher output. The normal drive unit pairs a smaller neo motor with a braced Kapton former and copper-coated aluminum voice coil. The S model fitted to the

SCM50 uses an alloy former with a copper-coated aluminum coil winding. The standard model thus has a slightly higher moving mass, while the S version has an exceptionally powerful motor assembly with an even stiffer coil former, which delivers lower levels of distortion, greater linearity, and higher power handling.

ATC uses state-of-the-art finite element analysis to design and optimize its driver motors, and in the case of the top-end SH25-76S tweeter, results in a very high flux density—in excess of 2.0 Tesla. This eliminates flux modulation from the surrounding metalwork. The tweeter top plate is magnetically annealed, resulting in slightly higher flux before saturation, while the precision-machined alloy waveguide is profiled to produce accurate stereo imaging.

At 3.5kHz, the tweeter crosses over to the legendary SM75-150S soft-dome midrange, regarded by many as the finest midrange driver ever built. This drive unit was first produced in 1976 and offers high power handling, low compression, low distortion, and exceptionally smooth response from 350Hz to 3.5kHz. The unit comprises a 75mm-diameter, 3.5mm short coil operating in a long magnetic gap, and is supported once again on the ATC dual suspension system to ensure greater linearity. The dome is constructed from a soft woven fabric impregnated with “a viscous damping medium” to reduce unwanted resonances. The diaphragm is mounted in a phase-correction flange to ensure exceptional fidelity. It’s a no-compromise design, hand-built in England without concern for cost—the only design objective was to ensure ultimate sonic quality.

Output below 350Hz is provided by the 9″ bass driver, which has a doped fiber-and-resin-composite cone and incorporates ATC's Super Linear magnet technology. According to ATC, the magnetic response of the steel used in the magnetic assembly of a loudspeaker is inherently nonlinear due to magnetic hysteresis (delay of the alignment of the atomic structure in a material compared to the instantaneous variations of the magnetic field). This nonlinearity gives rise to audible coloration. To combat this, ATC adds rings of SLMM (Super Linear Magnetic Material—a highly magnetically permeable material with low electrical conductivity) to the magnet assembly pole and front plate adjoining the voice coil to reduce hysteresis. While there has been much work published in audio engineering journals about the impact of hysteresis in loudspeakers, ATC claims this is the first time any production drive unit has incorporated technology to eliminate it.

This massively engineered bass driver offers frequency extension down to 40Hz at -6dB and accounts for a sizable part of the SCM50's 106-pound cabinet weight.

The extensively braced 0.75″ MDF cabinet measures 28″H × 12″W × 19″D and is available in black or white painted satin finishes, or cherry, oak, walnut, or black ash veneers. There's a surcharge for high-gloss finishes and an extensive range of premium wood veneers: rosewood, European crown-cut walnut, burr walnut, pippy oak, burr magnolia, or burr poplar. The entire cabinet is fitted with bitumastic damping pads on the interior faces and has a large, circular, front-mounted port near the base of the cabinet. The tweeter and midrange are offset inboard on the front baffle to mitigate edge diffraction, and the whole assembly is covered by a push-fit cloth grille. Visually, the effect is purposeful rather than graceful; loudspeakers like these in your living room convey serious intent!

Theoretically, the SCM50 presents a benign load in its passive mode, with a nominal 8-ohm impedance and a low sensitivity of 85dB/W/1m. In reality, this is a loudspeaker that demands an amplifier with high current capability to provide enough grip for its powerful drive units. My Naim NAP 250 at 75Wpc was barely adequate. Fortunately, I was able to procure a Naim NAC 252 / SuperCap / NAP 300 DR / NAP 300 PS combination, which was only rated at 90Wpc but delivered far higher current. This combination provided a lot more juice and a whole lot more grip than my rather overtaxed NAP 250, and really got the ATCs singing.

However, the active amplification module option favored by ATC took my power amplifier out of the equation entirely. This puts the crossover before the power amplifiers, whereas the crossover comes after the power amplification stage in the passive version. The amplification pack supplied by ATC comprised three separate class-AB MOSFET amplifiers per cabinet, all of which are designed and built in-house, and added around 17.6 pounds to the weight of the passive loudspeaker. The onboard amplification in each speaker provides 50W to the tweeter, 100W to the midrange, and 200W to the woofer, and is air-cooled by means of a large, finned heatsink protruding from the rear of the cabinet.

Active loudspeakers are the norm in professional usage and are strongly preferred by ATC in all use cases. The company cites a number of technical reasons for this:

- In a passive crossover, any changes you make to the circuit affect level and phase. Active filters allow independent control of level and phase/time, so stereo imaging is better with active designs.
- Passive crossover performance will change as the voice-coil temperatures rise. This means that passive systems sound different at high and low volumes.
- Passive crossovers require bulky and expensive components to deal with the high voltages from a power amplifier. Active systems offer better performance at lower cost because their crossovers operate on low signal levels.
- Intermodulation distortion is reduced in an active system because the separate amplifiers are located after the crossover, and therefore each one only operates over a limited bandwidth.
- An active system can offer individual trim corrections for each amplifier module, to better match the characteristics of the specific drive unit it powers. A power amplifier has to be designed to be compatible with a range of passive speakers with a variety of different drivers.
- Active amplification is integrated in the cabinet and requires no casework, so is cheaper to manufacture than passive amplification of the same quality.

There are some negatives for active amplification, however:

- Amplifiers within loudspeaker cabinets are subject to vibration, which may adversely impact sound quality.
- The sound of a passive speaker can be tuned by powering with an external amplifier with a specific character. This is not possible with an active system.
- Active loudspeakers are heavier than their passive counterparts.
- If an inboard amplifier requires repair, the whole system is out of action; in a passive system, the external amplifier can be swapped out if it fails.

With their active amplifier packs installed, the speakers were mounted on the supplied ATC frame stands in my 33′ × 14′ listening room. Careful attention must be paid to positioning a pair of SCM50s. The full-bandwidth, ported design means that placing them too close to a boundary wall will result in bass bloom. They require an absolute minimum of 18″ from the rear wall (3′ would be even better), with around 20 degrees of toe-in toward the listening position to sharpen stereo focus. Once the optimal position had been determined, I fitted the supplied M8 spikes to the stands and commenced listening.

It’s only rock’n’roll but I like it

I began by pulling out one of my favorite demo tracks, the Rolling Stones’ “Miss You” from the *40 Licks* compilation of their greatest hits (16-bit/44kHz FLAC, Virgin 724381337820), and listening to the SCM50s in active mode. The sound of the drums had even greater scale and punch than I am used to through my ATC SCM40 passives. They benefit from a little extra volume, and similarly, the SCM50s didn’t fully open up until the vocals and piano approached live-in-room levels. The sound was utterly visceral; the bass driver is bigger and more powerful than the one in my own speakers, so there was certainly more air moving in the room. That wasn’t all, though. Perhaps the most impressive change was a feeling of greater openness across all the instruments. The tone of the guitars and Sonny Blue’s wonderful harmonica lines just seemed more tangible, while the subtleties of Jagger’s pouting delivery were revealed even more clearly. It was one step closer to live. Of all the loudspeakers I have heard in my system, the SCM50s were the most revealing, making it easier than ever before to deconstruct the elements of a song and understand it fully. Following an intricate bass line or hearing the fine detail of a tambourine was utterly effortless.

ATC has done something I thought was impossible here: engineered a ported loudspeaker that has the bass definition and clarity of a sealed design. When a tom drum was struck, a low-register piano note played, or a guitar strummed, the leading edge of the sound wasn’t blunted or the decay softened by muddy and ill-defined midrange or bass. Speed and attack were whipcrack fast with simply no blurring of the edges of the notes. This was clearly revealed on the track “Short Skirt / Long Jacket,” from Cake’s album *Comfort Eagle* (16/44.1 FLAC, Columbia Records). The astoundingly tight drum rhythms punched into the room via the ATCs with tremendous weight and speed, the sounds stopping and starting instantaneously, while the staccato brass backing was splendidly clear and articulate.

The reason that this ported speaker sounds like a sealed cabinet is down to ATC's unique design. All ported cabinets have a resonant frequency, which is related to relative dimensions of the port and cabinet. Most designers use this resonance to artificially enhance bass response, particularly in smaller enclosures, which is why they often sound boomy and slow. By contrast, ATC doesn't use the port to extend the bass, merely to reduce distortion by controlling the motion of the bass driver. ATC designs for a relatively low damping factor (Q) of around 0.5, which produces a gradual low-frequency rolloff similar to a sealed cabinet. By contrast, most ports are tuned to a Q of 0.7 or more, which reduces port damping and gives the impression of a more powerful bottom end—but often gives a "one note" bass response. A high-Q ported cabinet also has a much steeper rolloff than a sealed-cabinet design.

On the recommendation of SoundStage! founder, Doug Schneider, I have been reading the superb Ken Caillat books on the making of Fleetwood Mac's albums *Rumours* and *Tusk*, *Making Rumours* and *Get Tusked*. Caillat was the lead engineer on both albums; he was there while musical history was made and industrial quantities of booze and coke were consumed. Both books are a fascinating fly-on-the-wall insight into the way rock bands record and work, and his observations prompted me to listen to those albums again with renewed interest. On "Sara," Stevie Nicks's masterpiece from *Tusk* (16/44.1 FLAC, Warner Bros. Records), the SCM50s revealed the multilayered guitars, keys, vocals, and drums that were used to assemble the track more clearly than I have ever heard them before. Doug and I were both surprised to learn from the Caillat books just how many instruments were overdubbed on these classic Mac albums, which on first hearing on a lesser system sound like fairly simple recordings. Mick Fleetwood chose to use brushes for the snare on this track, and he locks into

a masterful groove that was beautifully rendered by the ATCs. John McVie's shuffling Hofner 500/1 violin bass came through the speakers with all of the famous acoustic timbre of the Hofner intact. Meanwhile, all the nuances of Nicks's sublime, slightly nasal vocals were reproduced with startling clarity.

While listening to the ATCs in active mode, I marveled at the SMC50's world-class ability to reveal each strand of a musical performance, and every instrument's contribution to a song; perhaps this is the overriding characteristic that makes this speaker so truly exceptional.

This pair of ATC SCM50s was quite simply one of the most breathtakingly revealing sets of loudspeakers I have ever heard. According to my definition of what constitutes high-end sound, these loudspeakers utterly excelled across all parameters, and I believe this is no coincidence. The SCM50 was designed from the outset as a recording engineer's scalpel; its task was to reveal every unwanted creak of a chair or surplus open microphone channel, and to permit forensic analysis of a singer's performance or technique. In *Making Rumours*, Caillat describes how they chose which microphone to use for Nicks's lead vocals on "Dreams." He set up around eight top-class vocal microphones on a long line of booms in the live room of the Record Plant studio in Sausalito, California, and asked her to sing into each one in turn. It was quickly apparent to both of them that the Sennheiser 441 best suited Nicks's voice, and it became her microphone of choice. It's the incredible transparency and openness of studio monitors that allows such differences to be discerned, and I believe it is the combination of ATC's studio heritage and superlative engineering that makes the SCM50 such an exceptional loudspeaker for the home.

Switching from active to passive operation revealed that much of this forensic excavation of fine detail was lost—at least when driven by my reference Naim NAC 82 / NAP 250 amplifier combination. Bass became less controlled and more inclined to boom, and the sound was more veiled. Put simply, the NAP 250 just wasn't powerful enough to get a grip on those huge ATC drive units and control them properly. This was an easy win for the active version of ATC's SCM50—time to pull out the big guns.

A clash of the titans

A quick call to Naim Audio, which is to hi-fi amplification what Aston Martin is to motor cars, saw Naim deliver the NAC 252 / SuperCap / NAP 300 DR / NAP 300 PS pre/power amplifier combination, which, complete with the associated flagship power supplies, costs $37,197. Upon revisiting the Rolling Stones' "Miss You," it was abundantly clear that this setup was in a different league to my own underpowered Naim combination, and a whole lot closer in transparency and sonic balance to the active configuration. All the usual virtues of speed, timing, and sonic impact that Naim equipment provides were present, along with smoothness, refinement, a deeper soundstage, and a sense of limitless headroom.

So vast was the improvement that I found myself switching back and forth between active and passive to determine just how the two differed. The short answer is that the actives won on solidity of soundstage, neutrality, and ultimate detail retrieval—that ability to hear the lowest-level subtleties of a mix. The Naim combination offered more bass slam, fractionally quicker transient response, and slightly more drama. With the Naim rig, I got the sense that the sound was slightly larger than life, whereas the ATC active configuration was more neutral. I will be honest here—in over 20 years of reviewing, I have never been so unsure of which presentation I preferred. This was a duel between two of the finest firms in British audio engineering and I adore what both companies do. I swapped back and forth, trying every genre of music under the sun: hard rock, female vocals, live performances, classical. As the Naim amplification traded blows with the ATC's onboard modules, my preference would waver between the two; it was like an epic Wimbledon final, with one player breaking a service game only for their opponent to break back.

Best of all, though—the sound of the SCM50s was just incredible in either configuration, and I was in the presence of one of the best loudspeaker systems I have ever heard. Both configurations utterly rocked the house, offering world-class dynamics, a feeling of totally uncompressed music-making, and astonishing levels of transparency and detail. I turned to an old friend: Deacon Blue's *Live at The Glasgow Barrowlands* on Blu-ray (EAR Music 0211866EMU), encoded in DTS-HD Master Audio at 24/96 in 5.1 surround. If you haven't got this superb Blu-ray, just buy it! On the track "When Will You (Make My Telephone Ring)?" I listened to the beautifully improvised interplay between James Prime's Hammond organ and Ricky Ross on Roland electric piano. The stereo sound reproduced by the ATCs was so convincing, so lifelike, and so emotionally stirring that it was life-enhancing. I was astonished how close the experience was to seeing the band live. Dynamics were off the scale; mere audiophile considerations of tonal sweetness or frequency response became irrelevant as I savored the entire live performance via my Optoma HD33 projector.

Listening to the sublime "I'll Find My Way Home," from the album *The Best of Jon and Vangelis* (Polydor 821 929-2), the ATCs demonstrated the recording's incredible keyboard programming to impressive effect. Both actively and passively, the SCM50s threw a colossal wall of sound, way beyond the actual locations of the speakers, and those keyboards repeatedly panned to the left and right of the soundstage. Jon Anderson's remarkable alto-tenor vocals shimmered above the proceedings, driving the song on to its emotional conclusion, thanks to the exceptional midrange driver in each speaker. Perhaps most impressive of all was the way that the ATCs reproduced the lower registers of the bass keyboards, lending the song more impact than I am accustomed to. In truth, this is a very bright mid-1980s production that verges on shrill through many loudspeakers. The SCM50's tweeter design is so sweet-sounding, refined, and neutral that the sound remained highly enjoyable. The bass isn't particularly extended on this recording, but the SCM50s reproduced what bass is there with a tremendous sense of power and control. I was keen to hear what the speakers could do with this track; Vangelis had recently died, and I was playing it in tribute to the great man.

Conclusion

In summary, the ATC SCM50 is a benchmark design and a world-class loudspeaker, whether driven actively or passively. In the active configuration, it represents an incredible bargain in the high-end audio field—and that would be my choice if I were laying my money down. In my experience, there's no other loudspeaker that comes even close to its immense power, neutrality, bandwidth, speed, and sheer visceral impact at anywhere near the price. If you choose to go the passive route, expect to budget significantly more than the $8000

difference in cost between the active and passive SCM50 variants for your amplification. The big Naim combination powering the passive SCM50s offered stunning sound—at significant cost—and the transparency of the ATC loudspeakers allowed all the virtues cherished by Naim enthusiasts to really shine.

Visually, the ATC's purposeful looks aren't as pretty as something like a B&W Nautilus 801 D4, but the minute you hear a pair of SCM50s you simply won't care. This is a loudspeaker for music lovers who want to hear their music sounding as close to the master tape as possible. If you want to experience what it was like to stand in the Record Plant's Sausalito studio in 1976 as Mac laid down "Go Your Own Way," this is as near as you're going to get without dating Stevie Nicks and shooting a line of coke off the back of the studio's API mixing desk.

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