

Calibrating AV receivers

MULTICHANNEL MAGIC

Compared to stereo, setting up a multi-channel home theatre system can seem daunting, not least because of the fact that several factors need to be considered.

These include the size of the loudspeakers, the crossover frequency (the point at which the loudspeakers take over from the subwoofer), as well as the individual channel levels, and the time delay between the various channels.

Fortunately, most current AV receivers offer an auto-calibration option, which uses a supplied microphone, and a sequence of test signals, to determine the size and capabilities of the speakers in use, as well as how far they are located from the listening position.

The system then uses that information to determine channel levels, crossover points and delays in order to create a cohesive, believable surround sound field. In addition, many AV receivers will then include the option of active equalisation and signal processing to address acoustic anomalies, and to create a more dynamic, lifelike sonic delivery.

Some of these auto calibration systems are more accurate than others, and most should be considered as providing a guideline only. The best ones, such as Anthem's ARC system, are quite complex, requiring network connectivity, a laptop computer and at least a rudimentary knowledge of acoustics — but the results are worth that extra complexity.

However, basic calibration isn't rocket science and requires little more than a keen ear and a bit of time. And besides, the more affordable AV receiver models often don't offer auto-calibration. I've often found that manual, by-ear calibration is more effective than auto calibration.

Accessing the set-up menu of the receiver, choose the loudspeaker set-up system, then define whether the loudspeakers linked to the AV receiver are large

or small. Remember, large speakers have a better bass response than small speakers.

Crossover points can often be determined in the same menu. Remembering that the subwoofer will be looking after the bass delivery, it's a good rule of thumb to opt for 100 Hz for small speakers, and 60 or 80 Hz for larger speakers.

This presupposes that the subwoofer will be fed a LFE (low frequency effects) signal from the AV receiver, which means the receiver manages the bass, and sends the post-crossover signal to the subwoofer.

Finally, choose speaker distance, and enter the distance between the listening position and each loudspeaker. This can be easily measured with a tape measure.



Now comes the time-consuming part: using the built-in test signal generator, listen to the test signal (which is a form of white noise) through each channel individually, and compare it to the other channels, until the sound level from each channel sounds the same from a fixed listening position.

I usually start with the front channels, comparing left to centre, then right to centre, and then right to left to centre, until all three sound the same.

I then compare left surround to left front, then right surround to left surround, then right surround to right front, until all five channels sound the same.

In a 7.1 system, the back surrounds would be included in the comparison, until they too should sound the same as the other channels. Take your time with this procedure, and once complete, check all the channels again, until absolute uniformity has been achieved.

The test signal generator will also output a signal for the subwoofer, but I've found that this is best set with real sound — an effects-rich action sequence, or a surround sound-encoded music concert — and to then tweak the subwoofer level until it smoothly integrates with the rest of the sound.

In most cases, I find that I prefer unprocessed to processed sound, but where room acoustics are severely compromised, experimenting with EQ settings can help iron out some anomalies. Ask your dealer to assist if required — a sound spectrum analyser might be needed for accurate set-up in such instances.

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