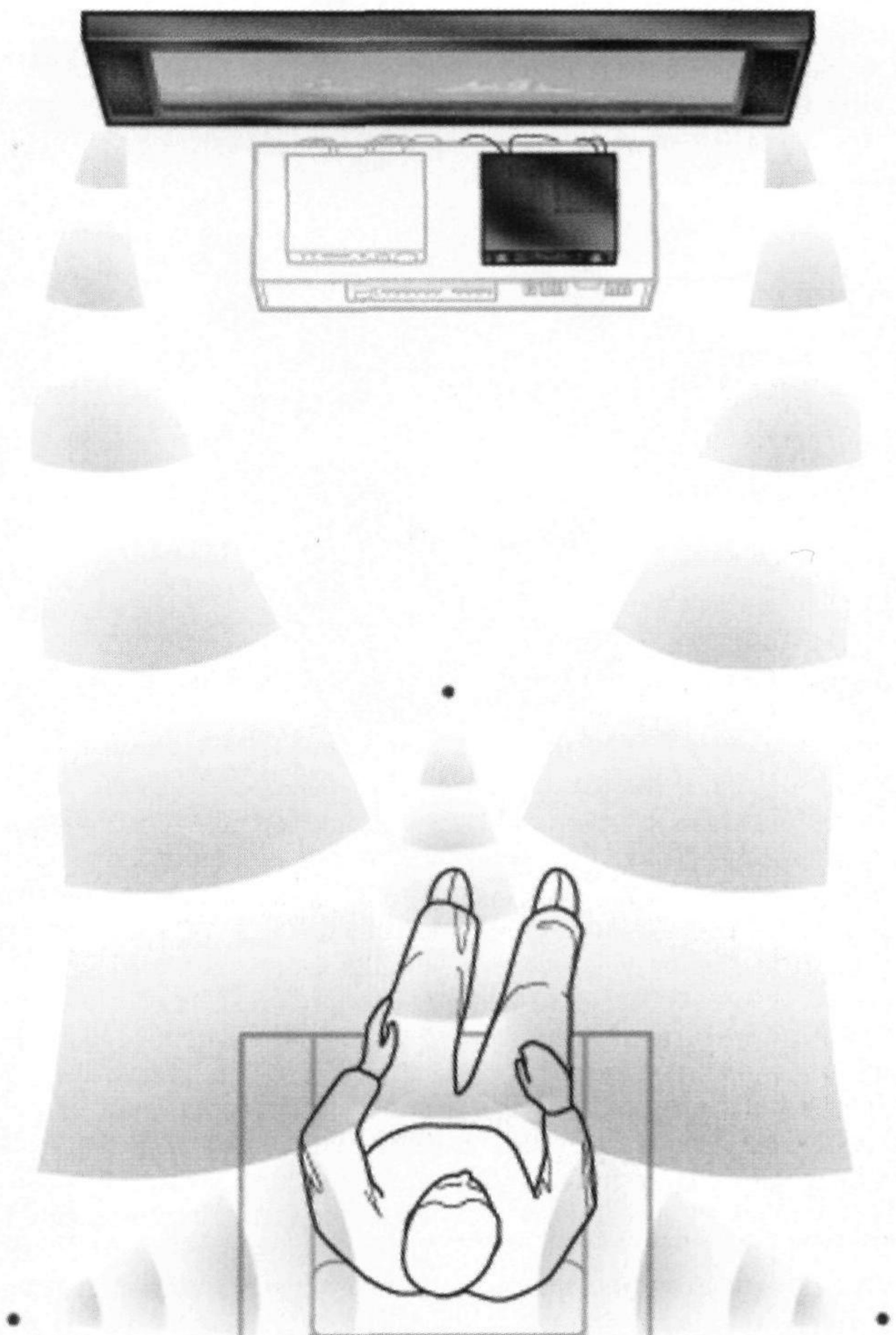
'You can place the unit and speakers wherever you want, it's easy to set up and less space is required' Shusuke Sena, Sony UK



Dolby's Virtual Speaker relies on understanding how the human head affects hearing

about the concept of 'cleaner living'. This will enable us to reach the other 88 per cent of consumers who haven't ventured into this market yet."

SPEAKERS BE GONE!

How does the technology work? Virtual surround sound systems create the perception that there are more sound sources than are actually present by tricking the human auditory system into thinking that a sound is coming from somewhere that it is not.

There are various ways of doing this. One is to use knowledge of the head-related transfer function (HRTF), which describes how a sound (parameterised by frequency and source location) is filtered by the diffraction and reflection properties of the head, outer ear (pinna) and torso, before it reaches the transduction machinery of the eardrum and inner ear.

With an appropriate HRTF, it's possible to calculate the signals required at the eardrums for the listener to perceive sound from any direction. These signals are then recreated at the eardrum using a crosstalk calculation technique, which tries to reproduce a desired signal at a single target position while cancelling out the sound perfectly at all remaining target positions, using only two speakers and two target positions. This is a popular method used by many manufacturers, but it works best for a single listener. The effect won't be the same for multiple listeners in a room.

Dolby's Virtual Speaker technology uses HRTF, explains Craig Eggers, senior manager, consumer electronics partner marketing: "We built on the HRTF foundation technology by designing Dolby Virtual Speaker from the ground up, capturing and analysing the performance of a perfectly calibrated 5.1 speaker system, and translating that information into a highly sophisticated algorithm. The process involved more than 16 months of engineering work to initially develop."

Sony based its own S-force front surround technology, the name it gave to its virtual surround sound system, on an HRTF foundation. It replicates the effect of a bank of rear speakers to give surround sound from just two speakers and a subwoofer.

Another method is to use reflections. Some surround systems work by directing and reflecting steerable beams of sound off the walls, windows and furniture of a room, so that the listener hears the reflected sounds. This technology is used in 1 Ltd's Digital Sound ▶