

**PHILIPS**

Home cinema sound



# Immersive surround sound for any TV with wireless subwoofer

Philips Soundbar speaker HTL7140B  
Technology backgrounder



4K TVs, advanced game consoles, movie streaming and a revolution in TV programming have created huge demand for surround sound in the home. There are many configurations available, from traditional multi-speaker setups such as 7.1 and 5.1 systems, to stereo systems, to Soundbars equipped with a range of technologies. For the person looking for surround sound combined with an extremely slim form factor however the most common solution was a Soundbar with digital surround sound virtualization.

Not only do Soundbars such as these traditionally use a 2.1 speaker design, the virtualization technology they rely on is limited. The surround sound experience can be enjoyed in only a specific point in front of the speakers, so others in the room cannot get the same enjoyment.

Equipped with Ambisound technology the Philips Soundbar speaker HTL7140B combines the best aspects of a multi-speaker setup with the svelte clean lines of an ultra-slim Soundbar. It is able to offer those who prioritize slimness with a Soundbar that meets their needs without compromising on a realistic surround sound experience that everyone can enjoy. A wide range of connectivity options have been built in to the HTL7140B including 4K-2K pass through for video, *Bluetooth*<sup>®</sup> (aptX<sup>®</sup> and AAC) high quality wireless music streaming and even one touch NFC device pairing for effortless enjoyment of music from any device.

# Ambisound

Philips' updated Ambisound technology allows the Philips Soundbar speaker HTL7140B to produce a completely immersive sound environment throughout a room, regardless of room size and shape and even without a clutter of cables. Much like conventional 5.1 surround sound home theatre systems, Ambisound uses six sound drivers. The difference however lies in positioning. While in a traditional system speakers are placed around a room, in Ambisound they are all built into the HTL7140B. These speakers have been engineered according to an expert knowledge of psychoacoustic formula, array processing and precision angled drivers. By incorporating these technologies and design capabilities, Ambisound delivers surround sound no matter what shape the room or the location of the listener. Sound effects sound wider and more natural, and the small size of the system allows it to be easily placed with a TV.



In order to understand the impact and innovativeness of Ambisound technology, it is vital to understand the science and design behind it.

## Psychoacoustic Phenomena

Listening is far more complex than the action of sound waves hitting the eardrum. It is influenced by many other factors, so many that the science of human perception of sound has its own name – psychoacoustics.

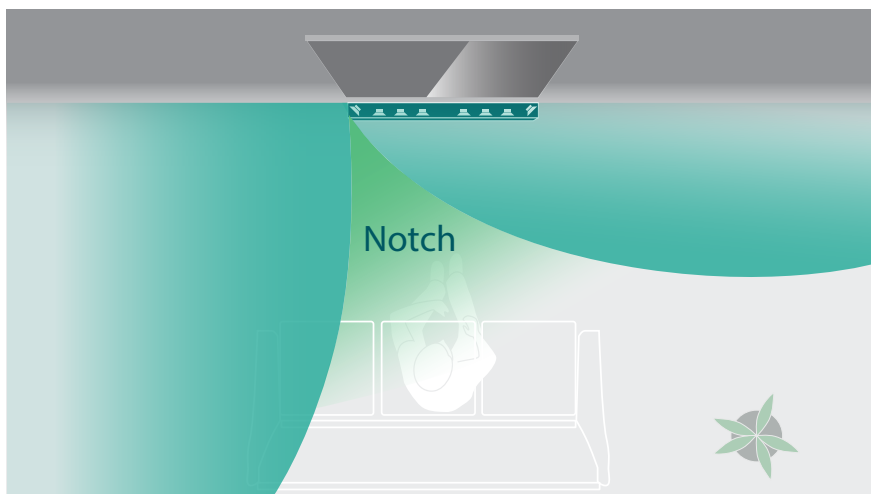
A simple example of psychoacoustic phenomena is the human ability to determine the direction of a sound. A sound from one direction, such as a guitar strum, will reach one ear before the other, allowing the listener to determine its direction of origin. The momentary difference in time between the sound being heard in one ear and the other is all the information the brain needs to determine where the sound came from to a very high degree of accuracy.

Ambisound is built on a deep understanding of psychoacoustics that feed a proprietary mix of processes designed to sculpt the listening experience to create a genuinely large, immersive soundscape from a Soundbar. Just one example of this is the use of digital signal processing to change the characteristics of surround channels, making speakers in front of a listener create sound that feels as if it is coming from behind them.

## Array Processing

The control of sound radiating from a speaker array is known as array processing, which is most commonly used to create beams of sound aimed at the listener. In a traditional conventional 5.1 surround sound system the listener is surrounded by speakers to give them a sense of immersion. However this method requires multiple speakers, wires and excessive clutter. None of which is ideal for clean and modern home design. Today people look for simple and clean designs resulting in an explosion in Soundbars, but for surround sound these too are not ideal. With speakers all located in front of the listener and sound waves aimed directly at them the sense of immersion is lost.

What is unique about Ambisound technology is its ability to create immersive sound from the form factor of a Soundbar. This is achieved through a specially designed form of array processing that creates gaps, or areas of silence, in the surround and front channels. Inside these gaps some sound waves are suppressed yet outside the gap they reappear. This creates sounds that appear as if they are coming from the rear of the room even when they have been created in the front. Using carefully calibrated gaps, Ambisound is able to provide a full multi-channel surround sound experience with speakers only in front of the listeners.





## Precision Angled Drivers

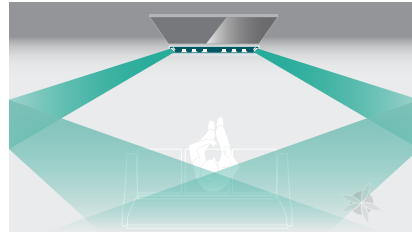
Aliasing, or the irregular sound field response pattern that is radiated by any multi-speaker arrangement, is reduced through the use of a band pass filter on surround and front channels. This removes the higher, aliasing causing, frequencies but also leaves the naturally more easily directed remaining high frequencies. Ambisound takes advantage of this by feeding center and front channels direct to the listener in order to ground the sound to the screen. Surround channels are then sent to outer drivers that feature both flat and angled varieties. The flat midrange inner drivers are complimented with an angled tweeter and both sets of speakers have their own drivers to further widen the soundstage.

Finally, the notch effect works well for the medium frequencies, but not for the high frequencies. Therefore, two tweeters are placed on each side of the bar. The tweeters are angled at 45 degrees and send the high frequencies sideways, enlarging the soundstage also for the high frequencies.

## Ambisound then and now

At the time Ambisound was launched, it was revolutionary. Over the years Philips audio engineering experts have further refined it. Ambisound today is far more advanced than it once was, but the aim is the same. To always give the listener the best possible surround sound experience with minimum effort.

The main improvement between Ambisound found in the Philips Soundbar speaker HTL7140B is in its speaker arrays. Where once all outer speakers were angled outwards, they are now split into two groups. One set of mid-range outer speakers with two drivers faces directly forward, while one angled tweeter faces diagonally outwards. By introducing forward firing speakers without impacting Ambisound's surround sound capabilities, the system can now be much thinner.



As the two mid-range drivers on each side each have their own amplifier, every one of the four mid-range speakers on the Soundbar can receive a customized sound signal. This allows them to create a wider soundstage than if they received the same sound. Working in tandem with two soft dome side-firing soft-dome tweeters and two mono-center speakers, the sound stage is further widened while dialog remains sharp and clear.

In essence, this all-new evolution of Ambisound as found on the Philips Soundbar speaker HTL7140B is a big advance on the experience offered by the previous design of Ambisound. This is what earns its status as the Ambisound G2.



## Specifications

CTN	HTL7140B	
Product dimensions	Main unit (W x H x D)	1060 x 38 x 54.5 mm
	Subwoofer (W x H x D)	195 x 304 X 400 mm
Sound	Feature	Philips patent Ambisound technology
	Sound enhancement	Treble and bass control
		Audio sync
		Auto volume
		Movie
Sound system	Music	
	Voice	
	Smart Sound	
Output power	Sound system	Dolby Pro-Logic 2, DTS Digital Surround
	Subwoofer output power: 220 W	Speaker output power: 100 W
		Total power RMS @ 10% THD: 320 W
Loudspeakers	Driver per main bar	2 speakers for center channel, 2 x 1" mylar tweeters, 4 speakers for front/surround
	Subwoofer driver	1 x 8" woofer
Connectivity	Rear connections	Digital optical-in, HDMI 1.4 output (ARC), HDMI x1 input, Audio-in 3.5 mm jack, USB
	Wireless connections	Bluetooth® APT-X, AAC and NFC
Convenience	EasyLink (HDMI-CEC)	Audio return channel
	HDMI	Supports 4K2K





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