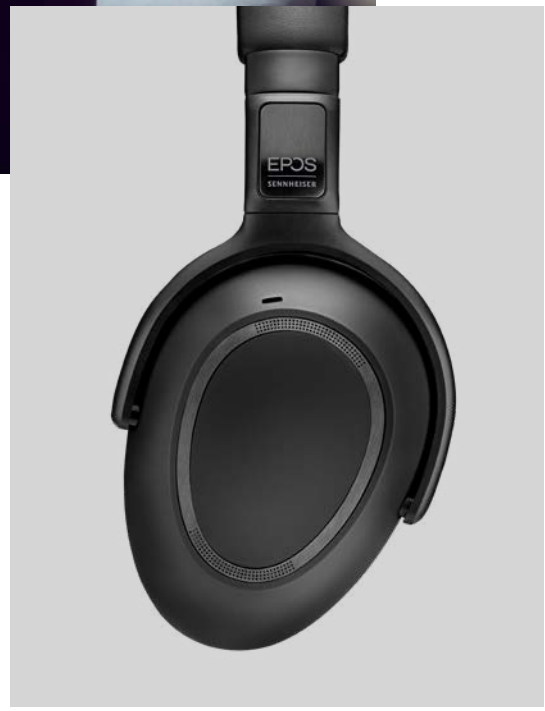
Take Control of Your Sound Environment

Why Active Noise Cancellation?

Thanks to roaring aircraft engines, rumbling trains and snarling traffic – what could be a restful holiday or smooth business travel experience can be rendered noisy and stressful. Flying can be particularly draining, with passengers often subjected to a continuous noise level of 60-65 dB(A) prior to takeoff, and 80-85 dB(A) during flight and 75-80 dB(A) during landing*.

Trains can be similarly noisy and distracting, with station announcements and inescapable "loud talkers." Background noise is a serious issue which permeates many environments and affects us all to varying degrees. Unfortunately, today's open office environments reflect these same circumstances – constant background noise and distraction make it nearly impossible for employees to effectively focus on the tasks at hand. As a result, productivity plunges, employee satisfaction deteriorates, and ultimately the bottom line bottoms out.

* Study: "In-cabin noise levels during commercial aircraft flights"
H Kurtulus Ozcan, Semih Nemlioglu, 2006



Passive or Active?

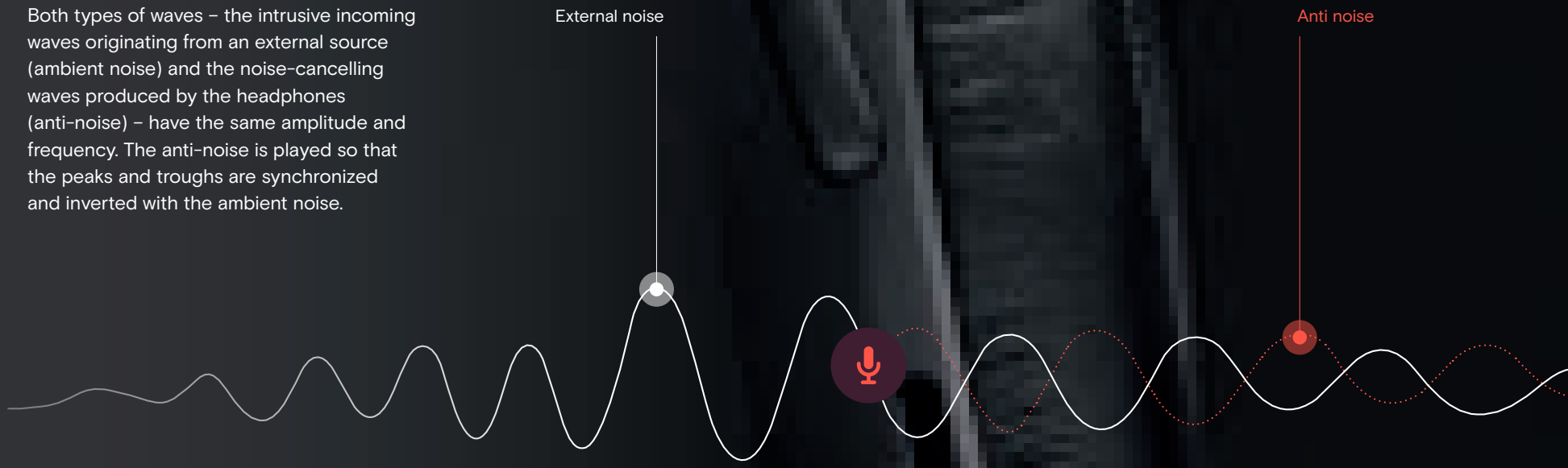
Passive noise cancellation, or noise isolation, is the most fundamental way of protecting ears from ambient noise. Any set of headphones offers some component of passive noise reduction because the headphones themselves physically block sound waves – especially higher frequencies. High-quality passive noise-cancelling headphones use layers of absorbing material but still reduce noise by only 15 to 30 dB. In a plane scenario, with passengers exposed to up 85 dB(A) of continuous noise and even more on takeoff, passive noise-cancelling headphones are not particularly effective. In addition, passive noise cancellation fails to reduce noise in the low frequency range (20 Hz - 800 Hz). Here is where active noise-cancelling headphones offer a distinct advantage.

The Active Advantage

Active noise-cancelling (ANC) headphones provide all the benefits of passive noise-cancelling headphones but add an extra level of noise reduction by effectively removing lower frequency sound waves.

How ANC technology works

Both types of waves – the intrusive incoming waves originating from an external source (ambient noise) and the noise-cancelling waves produced by the headphones (anti-noise) – have the same amplitude and frequency. The anti-noise is played so that the peaks and troughs are synchronized and inverted with the ambient noise.



This alignment causes the waves to cancel each other out. The result – virtual silence for the relieved headphone user.

The technology involved

Microphone
One or more microphones placed inside or outside the headphone‘s ear cup picks up the ambient noise.

Battery
A rechargeable battery provides the required power to generate the anti-noise signals.

Speaker
The anti-noise is transmitted into the head-phones‘ speakers in addition to the normal audio. In many cases this would impact the normal (desired) audio sound waves; however, high-end active noise cancellation technology eliminates this factor so that the normal audio is not compromised.

Circuitry
The ear cup contains electronics which receive the microphone’s input and create the antinoise based on the microphone signal.

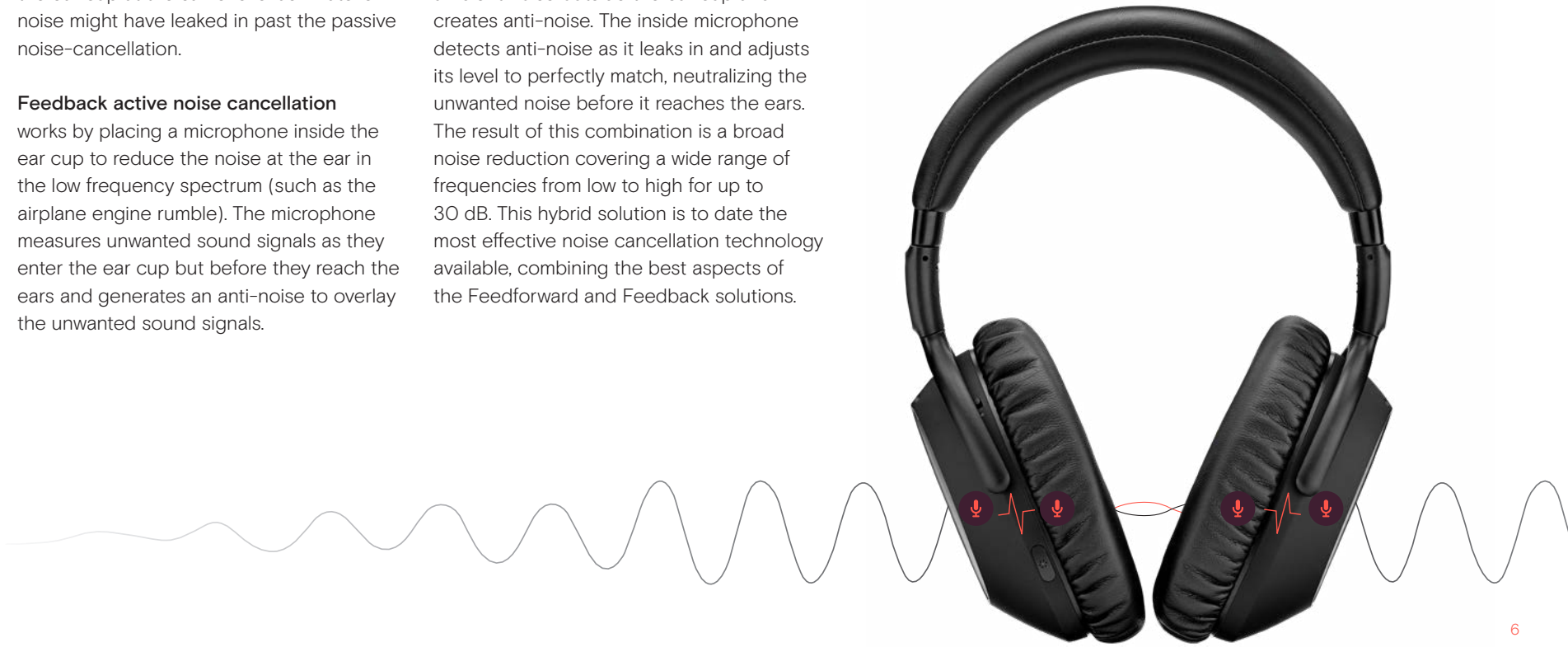
Together, these components provide noise reduction up to 30 dB (at low frequencies) in addition to the 15-30 dB reduction passive provide (at high frequencies), making them a good choice for plane and train travel, open office environments or any other location with a high level of distracting background noise.

The evolution of ANC technology

Feedforward active noise cancellation works by placing a microphone outside of the ear cup to reduce noise at the ear in the high frequency spectrum (such as colleagues chatting). The microphone detects surrounding noise early and plays anti-noise into the ear cup at the same level as whatever noise might have leaked in past the passive noise-cancellation.

Feedback active noise cancellation works by placing a microphone inside the ear cup to reduce the noise at the ear in the low frequency spectrum (such as the airplane engine rumble). The microphone measures unwanted sound signals as they enter the ear cup but before they reach the ears and generates an anti-noise to overlay the unwanted sound signals.

Hybrid active noise cancellation blends Feedforward and Feedback ANC into one system. It works by using two microphones on each cup (a total of four) – one outside the ear cup and a second one inside the ear cup. This coupling recognizes ambient noise outside the ear cup and creates anti-noise. The inside microphone detects anti-noise as it leaks in and adjusts its level to perfectly match, neutralizing the unwanted noise before it reaches the ears. The result of this combination is a broad noise reduction covering a wide range of frequencies from low to high for up to 30 dB. This hybrid solution is to date the most effective noise cancellation technology available, combining the best aspects of the Feedforward and Feedback solutions.



EPOS hybrid active noise cancellation technology

Adaptive active noise cancellation
EPOS has raised the bar on ANC technology with the introduction of ADAPT 600 – the industry's first UC certified adaptive ANC headset. ADAPT 600 leverages the latest, most advanced ANC technology to provide today's knowledge workers with an elegant, effective business tool specifically designed to adjust to the challenges of open office environments. EPOS hybrid active noise-cancellation technology offers an "adaptive" dimension which constantly monitors your background environment and seamlessly adjusts to ambient noise around you, providing the correct level of suppression where and when it's needed. This solution is unique from other ANC headsets in that it empowers you to take control of your sound environment, bringing a new dimension of peace and quiet lacking in other noise-cancellation solutions.

EPOS Adaptive ANC monitors your working environments and adjusts noise reduction in open offices, while reducing wind noise outdoors. EPOS superior headset solutions eliminate the incessant disruptions of today's open workspace and empower employees to reclaim control over their offices, for maximum focus and productivity.

For more information on ADAPT 600, please visit: eposaudio.com/adapt-660

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