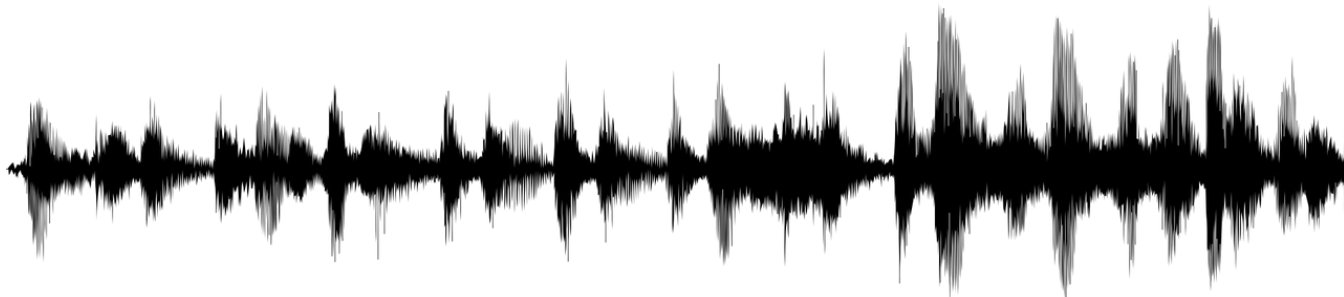


# EXOURAL HEARING DEVICE

Perfect hearing. Audio device that boosts the listener's audiometric response to achieve perfect hearing.



## Contact information

**Address:** ETSIS de Telecomunicación – UPM, Campus Sur, c/Nikola Tesla, s/n, 28031, Madrid

**Website:** [euitt.upm.es](http://euitt.upm.es)

**Email:** lino.garcia@upm.es

## Technological Offers type

Technological solutions

## Research and innovation areas

- Architecture, Baukultur and Creativity
- Digital Technologies, Artificial Intelligence, Cybersecurity, 5G, Robotics
- Health and Wellbeing

## ODS



## Where?

Home Automation Centre, CEDINT MERCATOR: Geoinformation and Smart Systems Technology

Keywords: | audiometry

### Brief description of the solution and the added value it delivers

The Audio Research Group at Universidad Politécnica de Madrid's (UPM) School of Telecommunications Systems and Engineering has developed a device that boosts the listener's auditory response, so that sound can be perceived with the highest possible quality.

This device can be used for any commercial audio application and can even function as a clinical hearing aid, with a cost saving of more than 80%. It is a low-cost piece of hardware (or software, in any device that can support it) that allows the listening experience to be enjoyed to the fullest.

### Description of the technological basis

The exoaural hearing device is placed between the ear and the audio player to boost both the user's audiometric response and the response of all the links in the audio chain itself.

It is a hardware device or software (depending on the programming capabilities of the audio player), which, in a single configuration phase, is capable of capturing the user's audiometric response, as well as uploading the responses of all the links in the audio chain (headphones, audio player, etc.), and subsequently boosting it in real time in order to achieve an ideal response when operational.

*'Simple and low-cost solution for the perfect listening experience'*

### Business needs / application

- Audiovisual entertainment
  - The development of audio signal technology has gone as far as it can. The industry has far exceeded the capabilities of the auditory perception system. A better listening experience does not require better technology.
  - Need for a qualitative leap in the world of audio, because of the potential losses suffered by record companies due to illegal downloads.

*'The entertainment industry needs a qualitative leap in order to keep growing'*

- Medicine
  - Reduction in the cost of clinical hearing aids while maintaining their quality.
  - Headphones acting as clinical hearing aids.
  - Making sound quality compatible with impaired hearing.

*'Hearing impairment needs to be included in the world of high-quality audio'*

### Competitive advantages

- The first audio device to integrate the listener's audiometric response into the audio playback.
- Increased quality in the world of audio.
- Compatible with other audio equipment (music players, headphones, TVs, smartphones, etc.).
- Low-cost system.
- Software version for smartphones.
- Also applicable to individuals with severe hearing impairment. This system performs the function of clinical hearing aids at a much lower cost (>80%).

### References

- The research team involved has more than 20 years' experience in audio, acoustics, active noise control and digital signal processing applications.
- It has various patents related to audiometry and active noise control.

### Industrial protection

Patent granted in Spain: ES2593076B2.

### Stage of development

- Concept
- Research
- **Lab prototype**
- Industrial prototype

- Production

## **Contact**

### **Exoaural hearing device contact**

Lino García, Antonio Mínguez

ETS Ingeniería y Sistemas de Telecomunicación - UPM

e: lino.garcia@upm.es

e: antonio.minguez@upm.es

### **UPM contact**

Innovation and Entrepreneurship Programmes

Technological Innovation Support Centre (CAIT) - UPM

e: innovacion.tecnologica@upm.es