

## Phonak ComPilot

The smart 3-in-1 accessory

### Introduction

People with hearing loss want to be able to participate freely in all the activities of daily life. This includes having trouble-free access to standard communications and entertainment systems, such as land-line and mobile telephones, televisions, MP3 players, radios and other audio equipment, all in excellent sound quality. Wireless transmission systems can make this possible. Phonak is the longstanding market leader in the field of wireless signal transmission for hearing instruments. For several years, the wireless communication interface iCom has offered easy Bluetooth connection between Phonak hearing instruments and a variety of audio sources and telephones. With stereo quality sound, wideband Bluetooth audio and data transmission and optional FM connection, the device offers multiple wireless connectivity options for a wide variety of entertainment and communications devices. When making a call on a mobile phone, for example, the Bluetooth signal is received from the phone and wirelessly transferred to both hearing instruments. Even hands-free calls are possible with the built-in directional microphone.

Remote controls continue to be an important part of a hearing system for many users. In addition to offering a convenient control alternative, they can sometimes be a necessity, given the miniaturization of hearing instruments which sometimes makes on-board manual control difficult or entirely unavailable -- thus making manual handling more difficult.

Phonak introduces an all-in-one remote control/audio interface, Phonak ComPilot, which can be controlled by the user with only a few buttons, and offers unique new features as well.



### Why are wireless transmission technologies needed?

For people with sensorineural hearing loss, communication in situations involving background noise and/or larger distances can often be difficult. In such situations, an FM system, a longstanding wireless option, can enhance speech understanding. Previous studies have shown that FM systems can improve speech understanding by 10-20 dB when no hearing instrument is being used, and around 12-18 dB beyond the use of a hearing instrument alone [1] [2] [3].

Well-known problems related to telephone use, such as the exact placement of the handset close to the hearing instrument microphone, frequent feedback, poor sound quality, and monaural-only transmission, can be overcome with the use of the latest wireless transmission technologies. The latest generation of digital hearing instruments enable true binaural signal processing using wideband audio. Furthermore, FM and Bluetooth signals can be transferred (streamed) directly to the hearing instruments via an interface such as iCom [4].

With iCom, Phonak offered, for the first time, a modern communication interface, not just for mobile phones, but also for Bluetooth-enabled audio devices such as telephones, laptop computers, MP3 players, televisions, GPS and home entertainment systems. The communication link between the audio device and iCom is wireless and uses standard Bluetooth technology. iCom converts the received signal into a signal based on Phonak transmission technology, which can be received by compatible hearing instruments. This allows wearers of hearing instruments, for example, to receive calls on mobile phone calls directly in both ears, with a higher level clarity. As acoustic transmission from the phone receiver to the hearing instrument microphone is not necessary, there is a significant and measurable improvement in sound quality in the ear [4].

With the new ComPilot, Phonak now presents an interface with many additional and unique options, facilitating more than 8 hours of audio streaming before needing to recharge the battery.

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## Phonak ComPilot and Phonak TVLink S basestation

The new Phonak ComPilot together with the TVLink S basestation, a new television interface, represents the latest technology in the stereo transmission of audio signals. Signal quality has been optimized in regards to transmission delay, so there is now neither a perceptible loss in sound quality, nor a noticeable transmission delay. This ensures that hearing instrument wearers experience no echo effects and that what they hear matches what they see on the screen (e.g. lip sync issues). During transmission, the analog audio signal is coded for Bluetooth and transmitted from the TVLink S basestation to the ComPilot. This signal is converted to the Phonak HiBAN Technology (Hearing instrument Body Area Network) used by the hearing instruments. When the signal is received, it is processed by the hearing instruments, amplified as appropriate for the hearing loss and delivered to the ear of the wearer.



Figure 1: Phonak ComPilot and Phonak TVLink S basestation

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## Phonak ComPilot uses a dual-microphone system

When making hands-free calls, it is important for both the caller and the recipient of the call to understand what is being said. Unlike most other audio interfaces available on the market, Phonak ComPilot has an optimized, true dual-microphone system, not just an omnidirectional or single directional microphone. The Phonak ComPilot is thus the first audio interface to use the multi-microphone technology developed originally for hearing instruments. Since there is a reasonable distance between both dual microphones, the Phonak ComPilot can generate a narrow directional pattern upward to the mouth of the wearer. This makes it much easier for the call partner to understand the ComPilot user, even in difficult acoustic situations.

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## Phonak ComPilot is also a remote control

Wearers of Phonak Spice and Spice+ hearing instruments can also use the Phonak ComPilot as a convenient remote control. To ensure ease of use, Phonak ComPilot has only a few easy controls. The most striking feature is the large main control button in the center, which lets the user switch between the individual hearing programs. When audio-streaming or telephoning, the same large push button can also be used to control phone calls or audio sources.



Figure 2: Phonak ComPilot manual controls

Two other large, ergonomic buttons are available for volume control. When the "Home" button is pressed, the hearing instruments activate the start-up program. A fifth function button is available for making outgoing phone calls with a wireless land-line telephone (e.g. DECT Gigaset). This button can also be assigned to other Bluetooth functions. The Phonak ComPilot can easily be switched on and off using the on/off slider. Two indicator lights inform the user of the most important operating states. The Phonak ComPilot allows fast, secure and very discreet control of the wireless interface as well as remote control of the hearing instruments.

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## Phonak ComPilot speaks and understands

As the first audio interface of its kind in the hearing instrument industry worldwide, Phonak ComPilot has a built-in text to speech generator, which can translate written text into speech. This allows for the transmission of clear informational messages, such as low battery status or other important information. The user, for example, is informed that the Phonak ComPilot is connected to an FM receiver. If the phone supports the function, the name of the caller is read out as it has been entered in the mobile phone's phonebook (caller ID). This takes mobile telephony to a new level – in the car too – as, for the first time, the caller ID is available without needing to be able to see the phone's display. The new speech generator is a very useful tool, which allows for a whole new level of convenience.

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## Summary

With the ComPilot and TVLink S, Phonak has once again demonstrated its commitment to the ongoing improvement of its products and the development of innovative solutions that are unique in the market and benefit both users and Hearing Care Professionals. Users can connect the Phonak ComPilot to almost any available audio or TV signal source. They can make truly hands-free phone calls, and when the phone supports this function, the built-in speech generator identifies and announces the caller.

Phonak ComPilot can easily be operated using just a few large buttons, with the direct transfer to the hearing instruments, the system adjusts the signals automatically to the individual hearing loss. The wide Bluetooth transmission distance of up to 30 meters, together with excellent audio quality and the long battery life of more than 8 hours round out a uniquely versatile, multi-function accessory.

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## References

- [1] Phonak Focus 34
- [2] Crandell, Smaldino & Flexer, 1995
- [3] Thibodeau L, American Journal of Audiology, Vol 19, 36 – 45, 2010
- [4] Phonak Field Study News, iCom, July 2009