

BELTONE ALLY: BRINGING THE BENEFITS OF WIRELESS CONNECTIVITY TO THE BASIC HEARING INSTRUMENT MARKET

Tammara Stender, Au.D., GN ReSound Global Audiology



Beltone Ally is truly a landmark device in the hearing industry basic and budget segment. Its technology represents a significant step forward in basic-level hearing instrument signal processing, with more features available than ever. In addition, Beltone Direct Line wireless accessories augment the functionality and usability of Beltone Ally hearing aids with other audio sources. These advancements contribute to the continuous expansion of the Beltone 2.4 GHz Personal Wireless Network™ for a greater number of hearing instrument users

Wireless ear-to-ear communication hit the hearing instrument market in 2012 with the launch of the Beltone Promise hearing instruments. While still offering the connectivity to wireless accessories afforded by Beltone True, Promise raised the bar by introducing features that were optimized based on ear-to-ear wireless communication. These synchronized features made hearing aid use easier and more seamless for users purchasing top-tiered technology. Now with the launch of Beltone Ally, this technology is introduced into a new market: the basic hearing instrument segment.

Beltone Ally is available in two levels: 3 and 2. Beltone Ally 3 hearing instruments provide connectivity to all Beltone Direct Line wireless accessories. Beltone Ally 2 offers remote control accessibility.

Direct wireless connectivity between hearing instruments and accessories opens the door to many new opportunities for basic-level hearing instrument users. Beltone Direct Line wireless accessories – the Remote Control 2, TV Link 2, Phone Link 2 and the Personal Audio Link (myPAL) provide easy access to audio sources. As many of these accessories have been recently updated, these accessories boast true benefits in performance and compatibility with today's consumer electronics.



Figure 1. Beltone Ally hearing instruments

BELTONE DIRECTLINE WIRELESS ACCESSORIES

The Beltone Personal Wireless Network has been expanded in recent years with the introduction of up- dated accessories that promote the ultimate in us- ability with today's consumer electronics. Through the continued use of proprietary 2.4 GHz wireless trans- mission, connectivity reaches an entirely new level with these second-generation wireless accessories.

2.4 GHz wireless connectivity affords the real and meaningful user benefit of eliminating the need for a body-worn third device to connect the accessory to the hearing instruments. Eliminating this intermediary, typically neck loop component from the wireless sys- tem allows for better convenience and faster wireless connectivity. A more convenient wireless solution with- out a conspicuous body-worn streamer may promote greater acceptance and satisfaction among users. Faster wireless connectivity translates to better sound quality, as echo from sound sources such as the television will be significantly reduced or eliminated. For a more in-depth discussion on the second generation of accessories, see the Beltone white paper, "Beltone Direct Line 2nd Generation Accessories Bring Connectivity to a New Level."¹

Beltone Direct TV Link 2

The Direct TV Link enjoyed success upon its launch, performing stereo streaming from a TV, PC or other audio source directly to the user's hearing aids. The accessory was unique in the field, since no neck-worn device was necessary to transmit the signal to user. RCA cables were included in the packaging, along with a power cord and a removable stand. Users could control the streamed sound volume of the Direct TV Link through their hearing aids, the audio source volume control, or an integrated volume control on the accessory.

Since the introduction of Direct TV Link, changes have occurred in the design of new TVs and other entertainment equipment. One major change involves the output selection. Many modern TVs have removed their analog (RCA) outputs in favor of digital (coax) or optical (toslink) outputs. For that reason, the Direct TV Link 2 was designed to accommodate these new demands (Figure 2). Coax and toslink connectors are automatically included with the accessory. RCA connectivity is still provided through a standard 3.5 mm mini stereo jack instead of phono connectors, which allows for a smaller sized accessory with the additional connectivity options. Another improvement of the Direct TV Link 2 is the integration of the stand into the accessory, which also results in a smaller, sleeker design.



Figure 2. Direct TV Link 2

In addition to these design and connector updates, the Direct TV Link 2 includes Dolby Digital™ conversion. This integrated decoder allows a 5.1 type signal from the audio source to be downmixed to a stereo signal, which is often necessary for stereo streaming when the TV outputs are designed specifically for a surround-sound receiver. With the Direct TV Link 2, there is no need to purchase and install a Dolby Digital™ decoder if the entertainment system does not have an otherwise appropriate format selection. This is a distinct, unique advantage of the Direct TV Link 2, as compared to other audio streaming accessories available in the hearing aid market.

Depending on the setup of the TV and entertainment system, a video delay may occur with respect to the audio output. These complex systems may produce sound that precedes the picture on the screen. The Direct Link TV 2 is in a class of its own in the industry by providing an integrated solution to remedy this delay. Users can easily adjust the delay of the audio streamed signal to match the video, so that the picture and sound are completely synchronized.

Beltone Direct Remote Control 2

The Beltone Direct Remote Control 2 offers many new advantages over the first generation accessory. Although the Remote Control is an easy-to-use solution for controlling the volume, program and accessory activation, the Remote Control 2 provides many new attractive features, as well as a slimmer design.

The Remote Control 2 has been fully redesigned to optimize the user experience (Figure 3). A larger, high-contrast display screen and a longer backlit time promote better visibility. The display surface has also been improved to be more resistant to scratches, and a carrying pouch is included for further protection. The signal strength to the hearing aids has been improved as compared to the first generation accessory, by moving the antenna to the top of the device. An ON/OFF switch replaces the former lock switch. The buttons have been redesigned for better tactility. In noisy listening situations, or just when users feel the need to turn off their hearing aids, a dedicated mute button is provided. Users can still easily activate and deactivate streaming through a dedicated button, but they can also adjust the proportion of direct streamed sound to environmental (hearing aid microphone) sound while in a streaming program. Finally, and perhaps most significantly, the four-AAA batteries required to power the first generation version have been replaced by a rechargeable lithium ion battery, allowing for charging via the universal wall charger or a USB port connection to a laptop or personal computer.



Figure 3. Beltone Direct Remote Control 2

Beltone Direct Phone Link 2

The Direct Phone Link 2 (Figure 4), launched in late 2012, represented the forerunner in second generation wireless connectivity for Beltone, and was the first “Made for iPhone” accessory. Like its predecessor, the Phone Link, it transmits speech or audio from the phone directly to the hearing aids. This ability to hear the phone in both ears promotes better speech understanding on the phone through binaural listening advantages.² Furthermore, the Direct Phone Link 2 provides stereo streaming quality for audio from the mobile phone to the hearing aids.



Figure 4. Beltone Direct Phone Link 2

A small, new swivel clip allows for better vertical positioning to pick up the hearing aid user’s voice. This is especially important, since a major benefit of the Phone Link 2 is the potential for hands-free phone use. Users can answer and end calls with a push of the multifunction button. Additionally, a miniature remote control is integrated in the accessory, allowing for volume and program adjustments. Volume adjustments can be made regardless of whether the user is actively streaming a phone call, or just using the hearing aids normally. A mute button that turns off the hearing aid microphones provides for an easier listening experience in a noisy environment. It is truly a user-friendly device, as it is rechargeable through the universal wall outlet or a USB connector.

Improvements to the Phone Link 2 as compared to the first generation Phone Link abound. Among these advances is a new built-in reduction algorithm that is applied to the outgoing signal, to improve the sound quality for the far-end caller (the conversation partner). Sound quality for the far-end caller is also improved by the use of two microphones on the Phone Link 2, which provides directional benefits for the outgoing signal in a noisy background.

A benchmark study was conducted to assess the sound quality provided for the far-end caller with the Phone Link 2, as compared to the first generation accessory.³ In the study, normal hearing listeners compared recordings made with each accessory in terms of sound quality and listening effort. Results revealed a significant preference for the Phone Link 2 recordings, both in quiet and in noise. In fact, Phone Link 2 sound quality and ease of listening ratings were better than the first generation Phone Link 78% and 99% of the time, respectively.

Beltone Direct Personal Audio Link (myPAL)

Rounding out the list of user accessories in the Beltone 2.4 GHz Personal Wireless Network is the Direct Personal Audio Link, or myPAL (Figure 5). This accessory allows a user to stream a conversation partner’s voice directly to the hearing aids, improving the signal-to-noise ratio (SNR). This is especially beneficial in noisy listening situations, such as a restaurant. It also has line-in functionality for streaming audio sources (such as an iPod, PC or TV) directly to the hearing instruments.



Figure 5. Beltone Direct Personal Audio Link (myPAL)

BRINGING IT HOME: USER BENEFITS OF WIRELESS ACCESSORY CONNECTIVITY IN THE BELTONE BASIC PRODUCT LINE

What does wireless connectivity of audio sources to hearing aids really mean to the user? The products described in this paper have numerous features and advantages, but the most important points are the benefits they provide to the user’s lifestyle. Table 1 lists several user benefits of this upgraded technology.

Device	User Benefits
Direct Phone Link 2	<ul style="list-style-type: none"> Hands-free phone use, which is especially useful while driving Access and connectivity to SmartRemote and Tinnitus Calmer apps Improved audibility for phone calls, music and video played through the iPhone or Android smart phone
Direct TV Link 2	<ul style="list-style-type: none"> Easier connections to modern entertainment systems Synchronization of picture and sound
Direct Remote Control 2	<ul style="list-style-type: none"> Rechargeable, integrated battery Improved screen visibility, button tactility and overall durability More control over streaming programs
Direct Personal Audio Link (myPal)	<ul style="list-style-type: none"> Improved audibility for speaker’s voice in noisy situations Portable streaming from audio sources such as a TV, stereo, PC or mp3 player

Table 1. User benefits of the Beltone Personal Wireless Network

PROVIDING MORE BENEFITS TO A GREATER NUMBER OF USERS

With the introduction of select ear-to-ear wireless features and second-generation Beltone Direct Line wireless accessory connectivity with the Beltone Ally 3 level devices, hearing instrument use and applicability has been elevated to new heights in the basic product segment. The significant improvements in usability, convenience and functionality of the second-generation Beltone Direct Line accessories empower Beltone Ally users to enjoy their hearing aids to the fullest. Perhaps most importantly, users of basic hearing aids can now enjoy the SNR benefits that were previously available only in higher price points, through wireless streaming from a conversation partner and from audio sources. Introducing these wireless connectivity advancements in the Beltone Ally hearing instrument family provides more hearing benefits for a greater number of hearing instrument users.

REFERENCES

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Worldwide Headquarters

Beltone A/S

Lautrupbjerg 7

DK-2750 Ballerup

Denmark

Tel.: + 45 45 75 11 11

Fax: + 45 45 75 11 19

www.beltone-hearing.com

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