

# POWER TO THE PEOPLE!

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Power to the people has often been used as part of a political slogan or rallying cry. In the case of the new 900 MHz wireless 3 Series™ Power Plus behind-the-ear (BTE) hearing aid, this became our development mantra. We set forth to use innovative mechanical design combined with unique electronic packaging to create a hearing aid that would indeed give power back to the people — in a wireless platform. The journey to market combined the efforts of a cross-functional team, which was composed of 12 different departments. The design engineering hours alone totaled more than 13,000.



Marching forward with elements of a proven design, Starkey Hearing Technologies introduces the 900 MHz wireless 3 Series Power Plus BTE. The Power Plus BTE uses a design similar to other 3 Series standard products and features a 138/80 (ANSI 2cc) matrix. The use of finite element modeling provided greater precision in the design process, improving telecoil placement. Telecoil placement can be challenging, especially in wireless devices, due to the electromagnetic fields associated with telecoils.

A telecoil often requires shielding to reduce artifacts; however, that shielding can sometimes reduce the sensitivity of the telecoil. Because of the patients with severe-to-profound hearing loss who will be using this device, we held ourselves to a high standard for telecoil sensitivity in order to provide the greatest benefit to the patient. Finite element modeling allowed us to zero in on placement and a unique configuration that did not require shielding.

Careful consideration was also taken in selecting the transducers for this device. For this product, we carefully selected thinner, matched-pair microphones. These microphones not only have a size advantage, but also do not drift over time like traditional microphones. Strategically positioned thinner microphones allowed us to design this product to be much shorter than any power BTE on the market today (Figure 1).

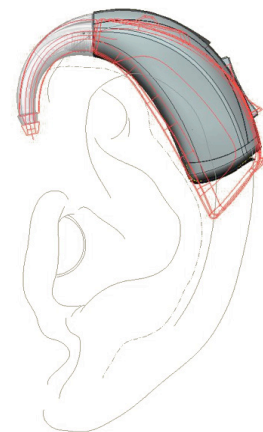


Figure 1: Power Plus BTE 13 in grey shown with closest competitive hearing aid in red wireframe.



## Power Plus BTE 13 Components

- |                     |                                  |                  |
|---------------------|----------------------------------|------------------|
| 1. Microphone cover | 6. Switch cover                  | 11. Receiver     |
| 2. Microphone boots | 7. Electromechanical switch flex | 12. Antenna      |
| 3. Earhook          | 8. Spine                         | 13. Battery door |
| 4. Case             | 9. Electromechanical switch      |                  |
| 5. Rocker switch    | 10. Flexible circuit             |                  |

Thoughtful design elements are also important in providing a patient-focused hearing aid design. The finger pick used to open the battery door was developed and tested to ensure that the patient will be able to open the battery door using the edge of his or her finger instead of a full fingernail. The right/left indicator size has been adjusted to improve visibility, allowing for easy identification of the device. Professionals will find the new style of indicator easy to place using a “snap in” design. Another design element, the user control, is the much requested configurable rocker switch. Quality is at the top of our list of requirements as we work on a hearing aid design. Electroacoustic and quality design verification testing (DVT) are completed on all Starkey Hearing Technologies hearing aids prior to release to the market. Electroacoustic DVT ensures that results (output, gain, equivalent input noise, etc.) meet customer, internal and external standard requirements (e.g., Nordic requirements). Quality DVT verifies and validates Starkey Hearing Technologies system requirements including items such as IP ratings, battery contact spacing, wireless programming and audio, among a myriad of other tests.

This BTE is fully coated with HydraShield®2 to improve moisture resistance. For an additional measure of protection, we designed a microphone cover that is fully replaceable in the field. There is no need to send the device in to replace the mic cover; the user simply rotates the earhook 90 degrees and lifts from the indentation just above the rocker switch (Figure 2). Instructional videos are available on StarkeyPro.com.




Figure 2: Microphone cover finger pick used to remove microphone cover.

The 900 MHz wireless 3 Series Power Plus BTE also offers a wide array of features, including full wireless capabilities, which are proven to enhance the patient’s listening experience. The 3 Series Power Plus BTE features:

- Bluewave® 3.0 Processing
- Voice iQ™2
- InVision Directionality<sup>3</sup>
- Spectral iQ
- Purewave Feedback Eliminator<sup>3</sup>
- Acoustic Scene Analyzer
- Binaural Spatial Mapping<sup>3</sup>
- Synchronized User Adjustments
- iQ Boost
- ISO Compression
- Self Learning

We realize that most patients want the option of wireless accessories. So in addition to a full array of features, the Power Plus BTE also offers full compatibility with the following wireless accessories:

- SurfLink® Mobile
- SurfLink Media
- SurfLink Remote Control
- SurfLink Programmer

The 900 MHz wireless 3 Series Power Plus BTE is an elegant combination of sophisticated hardware and thoughtful design elements. The 138/80 matrix provides professionals with an opportunity to fit significant hearing loss with a small, wireless hearing aid. Additionally, full wireless capabilities mean compatibility with popular wireless accessories. The Power Plus really does bring power to the people! 



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