

# Bluetooth® in Professional AV

The idea of Bluetooth being used in the world of professional AV has always been considered crazy at best. As a wireless consumer audio standard with a limited broadcast range and nominal audio quality, it always seemed best suited for personal headsets and Bluetooth speakers in a residential application.

However, as Bluetooth has grown to become the most adopted wireless audio standard in the world, and one that is now integrated into all of our personal computers and mobile devices, it's becoming more and more difficult to ignore. So, when we looked to solve the challenges of integrating this wireless standard into a professional AV solution, we knew there were several technical challenges we would need to solve before bringing Bluetooth into the professional AV world.

The first challenge we faced was the very limited, 6-12 foot broadcast range consumer Bluetooth transceivers currently possess. We needed to extend the range of the Bluetooth transceiver, so pairing a device could happen anywhere in a typical meeting room space.

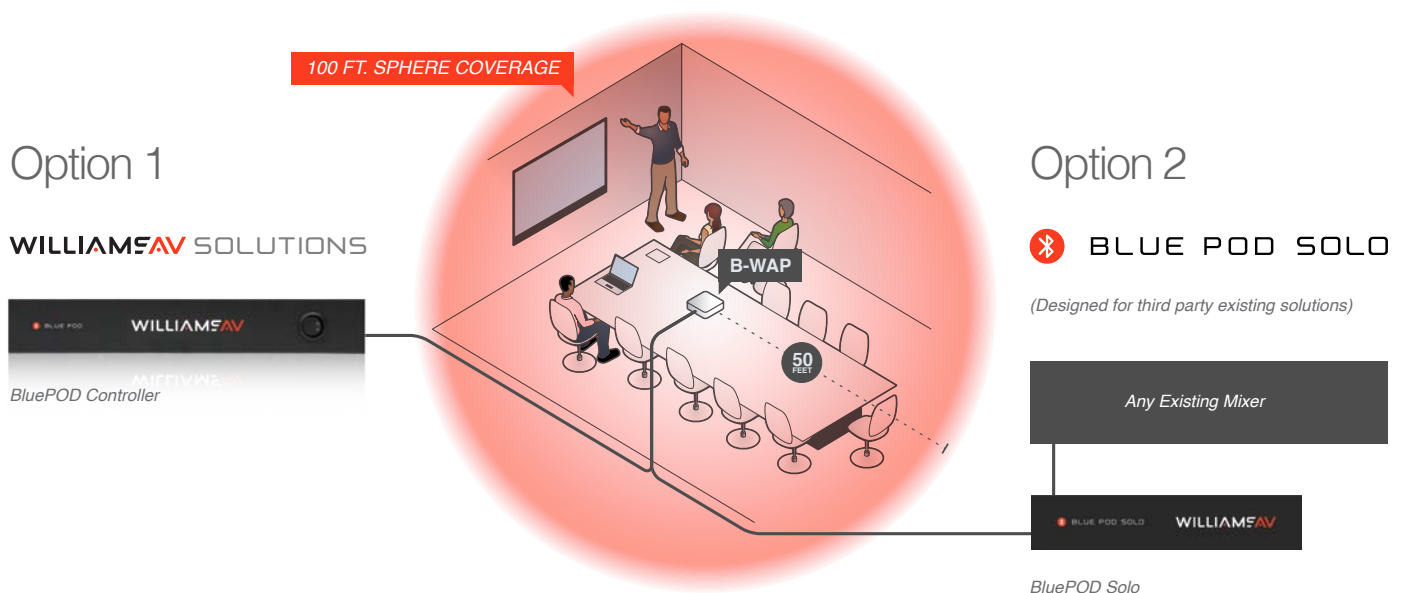
The second challenge was moving away from the auto-pairing that occurs when connecting consumer Bluetooth devices.

This feature is very helpful in a residential setting where you are pairing personal devices and want them to auto connect every time you re-enter a room. Auto-pairing is not helpful in a business setting, however, where connecting a device to the Bluetooth audio network and sharing your device with a group needs to be a conscious choice.

The third challenge was creating a Bluetooth audio stream with high enough audio quality to be used in a professional audio application. To do this, we would need to go to a better codec to support higher bandwidth and, as a result, less compression. Doing so would result in reduced latency and a higher signal-to-noise ratio to reduce the amount of background noise. Consumer-grade Bluetooth audio, unfortunately, doesn't always sound very good. To improve the audio quality, we needed to use a better codec.

Lastly, we needed to provide integrators the ability to control the Bluetooth access point from the room control system. If Bluetooth is to be successful in the AV industry, we needed to give integrators the ability to control it with the AV room control system that is also controlling other AV devices in the room.

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Williams Sound has a 45-year legacy of designing professional wireless audio products. So, we already had in place a talented engineering team to develop a professional solution for broadcasting and receiving enterprise-quality Bluetooth. We just needed to develop a new, wireless Bluetooth broadcasting platform ready for integration into professional room applications. After a year of engineering development and filing of multiple patents on the new platform, we are pleased to introduce the new BluePOD.

In order to make Bluetooth a professional AV product, we moved away from typical product architecture where Bluetooth is embedded directly into a product. We created a standalone Bluetooth wireless access point (B-WAP) ready for direct installation in a room and easily centralized to provide optimum range and coverage. This gateway design allows integrators to design Bluetooth connectivity directly into their system designs, just as they would any other networked Dante device, or by using an analog input/output from their audio mixer.

The BluePOD system is equipped with either an analog balanced line input/output audio interface or with a Dante network port. The audio sources are then fed into the audio system for processing. So, just like our assisted listening systems, we are system agnostic and will work with most audio systems equipped with either an analog audio I/O or a Dante network port. If audio conferencing is required, the audio system needs to be equipped with the appropriate AEC/ acoustic echo cancellation to handle the near-end and far-end echo that occurs on a cell phone call.

The B-WAP is based on the aptX HD codec. The aptX HD is the high-definition version of the original aptX codec that Qualcomm developed years ago. The goal of aptX HD codec was to significantly improve the audio quality by increasing bandwidth of the Bluetooth stream. The end result is excellent audio quality, low latency and minimal background noise.

BluePOD gets its name from the small, pod-shaped enclosure housing the B-WAP. This BluePOD wireless access point transceiver provides up to a 100-foot sphere of Bluetooth broadcast coverage in a typical office or educational environment. Like any access-point system, the goal is to

centralize the location of the B-WAP to maximize coverage.

All Bluetooth access and call-management functions for connecting devices to the access point happen in the B-WAP. Additional functions include call-connection management, audio streaming and Bluetooth profile selection. A simple Cat5 cable system is incorporated to provide power, control and audio back to the BluePOD controller for connecting to the room's audio system.

For device pairing to the BluePOD, we will never allow the Bluetooth signal to auto-pair to a device for a number of good reasons. We instead offer two methods of manual pairing, which can include a security code, if required. Once a call or audio signal stream is disconnected, the system will detect the completed call and will then disconnect the user. Should a user connect to the BluePOD and not use it, the BluePOD will automatically disconnect the caller from the unit.

The goal of BluePOD is to finally provide the AV industry with a technology platform for deploying Bluetooth solutions. We offer this broadcast-quality Bluetooth solution to support the needs of the professional AV integrator. Like our assistive listening products, our goal is to produce a high-quality Bluetooth solution compatible with any existing audio system or new system in the process of being designed. Either way, we are here to help support your Bluetooth projects.

