

The Hybrid Public Safety Microphone (Turtle Command™) - Land Mobile Radio Converging with Broadband

Broadband augmenting traditional Land Mobile Radio (LMR) networks

As they have for decades, first responders rely on LMR for the bulk of their critical communications needs. While many first responders frequently augment LMR communications with their smartphones, these commercial broadband devices lack the mission-critical voice capabilities (i.e., radio-to-radio or one-to-many communications) to serve as a viable alternative to LMR networks. Existing commercial broadband networks provide first responders with enhanced capabilities. Further, with the advent of a nationwide public safety broadband network, it is imperative that application and device development be fostered to enable broadband to more aptly augment LMR networks.

The Department of Homeland Security (DHS) Science and Technology Directorate (S&T) and U.S. Customs and Border Protection (CBP) have partnered to conduct research addressing first responder needs for mission-critical voice over broadband, remote management (e.g., over-the-air programming [OTAP]), video and data transfer to tactical users, and network integration (i.e., ability to roam across LMR and fourth generation (4G) Long-Term Evolution LTE). Addressing these needs, in part, was the impetus for the Turtle Command™ Hybrid Public Safety Microphone project.

Initial pilot tests were conducted in 2013 with public safety officials in Kearney, Nebraska, followed by real-world prototype testing. The product was tested at the Department of Commerce's Public Safety Communications Research Boulder labs in 2014 and field tested by CBP and other federal partners in 2015.

Low cost, add-on solution

Turtle Command is a bridging solution that enhances legacy radio system capabilities by using commercial broadband networks to improve communication interoperability. The Turtle Command hardware and software components function independently, providing first responders with the ability to communicate on either LMR or commercial broadband networks. It can be added to any existing LMR system to provide access to cellular networks. The Turtle Command software integrates multiple communication devices on cellular voice networks and can be downloaded onto any type of smart device (e.g., tablet, smartphone). The software

allows first responders to access LMR channels via broadband, providing them communications on their mission critical voice network. They can also set up separate broadband conferences on cellular networks from their smart device. These supplemental broadband conferences allow first responders to create unlimited separate conferences that can be tailored for each incident, facilitating off-loading of traffic from the limited number of LMR channels. The software enhances coordination with responders who may not have access to LMR radios. Notably, Turtle Command does not require costly replacement of existing equipment and infrastructure, allowing first responders to use their communications systems to the end of their lifecycle.

Turtle Command Benefits

- Enables unlimited broadband conference function for voice communication (e.g., one-to-many, many-to-many), with full-duplex (multiple users at a time can speak);
- Connects legacy radio channels to Internet voice broadband conferences via cellular or Wi-Fi;
- Increases coverage, redundancy, and resiliency by providing the ability to leverage both LMR and commercial broadband networks on the same device;
- Provides public safety recording and instant playback/replay;
- Displays current location of user and all other conference members via the mapping feature;
- Offers a video view and broadcast feature;
- Provides OTAP of field devices; and
- Includes Advanced Encryption Standard (AES)-256 encryption/virtual private networks.



Turtle Command™ Field User Hardware: The Turtle Command™ shoulder microphone and Turtle Alert™ smart device application allow the end user to leverage existing LMR and commercial broadband networks

