

DHS Science and Technology Directorate

Multi-Band Radio

Single-band radios make communications a challenge during multi-agency response

Most hand-held emergency response radios typically operate on a single band and cannot directly access other frequency bands. This means that most agencies cannot communicate with those outside of their jurisdiction—or even within their jurisdictions, sometimes—if they operate on different radio bands.

In a multi-agency response, it is rare that everyone will be using the same band. Therefore, to communicate with their colleagues, responders often resort to swapping or sharing radios, using a patching system, relaying messages through dispatchers, or even using runners to hand-carry messages. None of these solutions is practical, and many can be time-consuming in a time-critical situation. To provide a successful coordinated response, first responders must be able to effectively communicate with all partners across jurisdictional lines, including local, regional, state, and federal entities.

S&T, responders, and industry partners develop the Multi-Band Radio

At the request of first responders, the U.S. Department of Homeland Security Science and Technology Directorate (S&T) launched the Multi-Band Radio (MBR) initiative. Partnering with responders, S&T determined requirements for a single mobile radio capable of operating across disparate radio bands. Based on these requirements, manufacturers developed the hand-held MBR. At a cost comparable to a high-end portable radio, the MBR provides responders with the cutting-edge communications capabilities necessary to respond to emergencies.

The primary users of MBR are responders in command and control or special operations roles that need to interoperate with multiple entities, including incident commanders, first responders, and federal officials. The MBR is capable of

operating in bands between 136 and 870 megahertz (MHz), including the primary public safety VHF and UHF bands and the 700 MHz and 800 MHz bands. When authorized, it can also operate in the U.S. Department of Defense (DoD) bands and two federal bands. By simply selecting one of the pre-programmed channels, or by programming other authorized channels directly into their radio, MBR users can communicate with other agencies on other radio bands.

The MBR hits the streets

S&T tested and evaluated the MBR with responders through test demonstrations and pilots nationwide. Evaluations were conducted by police officers, firefighters, emergency medical technicians, emergency managers, and others to test the radio's ability to communicate across different systems (analog, conventional, digital, and Project 25 trunked) and agencies (local, tribal, state, and federal). S&T collected feedback and revised the MBR to ensure responder requirements were addressed. In February 2013, after completion of final test and evaluation, S&T published a final report of the pilot findings and a procurement guide to assist agencies in equipment procurements. The report and procurement guide can be found on www.firstresponder.gov.

The MBR initiative sparked industry development of a much-needed tool for responders. Now able to seamlessly communicate regardless of the band on which they operate, responders will be able to rapidly and more effectively coordinate operations. MBR equipment is now commercially available from four manufacturers, with more likely on the horizon. As the production of equipment with similar or advanced features enters the market, agencies will have the option of selecting MBR equipment and accessories from multiple vendors.

Both mobile and portable radio equipment are listed on the Federal Emergency Management Agency Authorized Equipment List. As a result, response agencies across the country may use grant funding to purchase MBRs for their agency.

| Frequency Bands | 138-144 MHz | 150-174 MHz | 162-174 MHz | 380-400 MHz | 406-420 MHz | 450-470 MHz | 470-512 MHz | 700 MHz | 800 MHz |
|----------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Local and State Public Safety Agencies | |  | | | |  |  |  |  |
| U.S. Department of Defense (DoD) |  | | |  | | | | | |
| Other Federal Agencies (non-DoD) | | |  | |  | | | | |
| Multi-Band Radio |  |  |  |  |  |  |  |  |  |

