

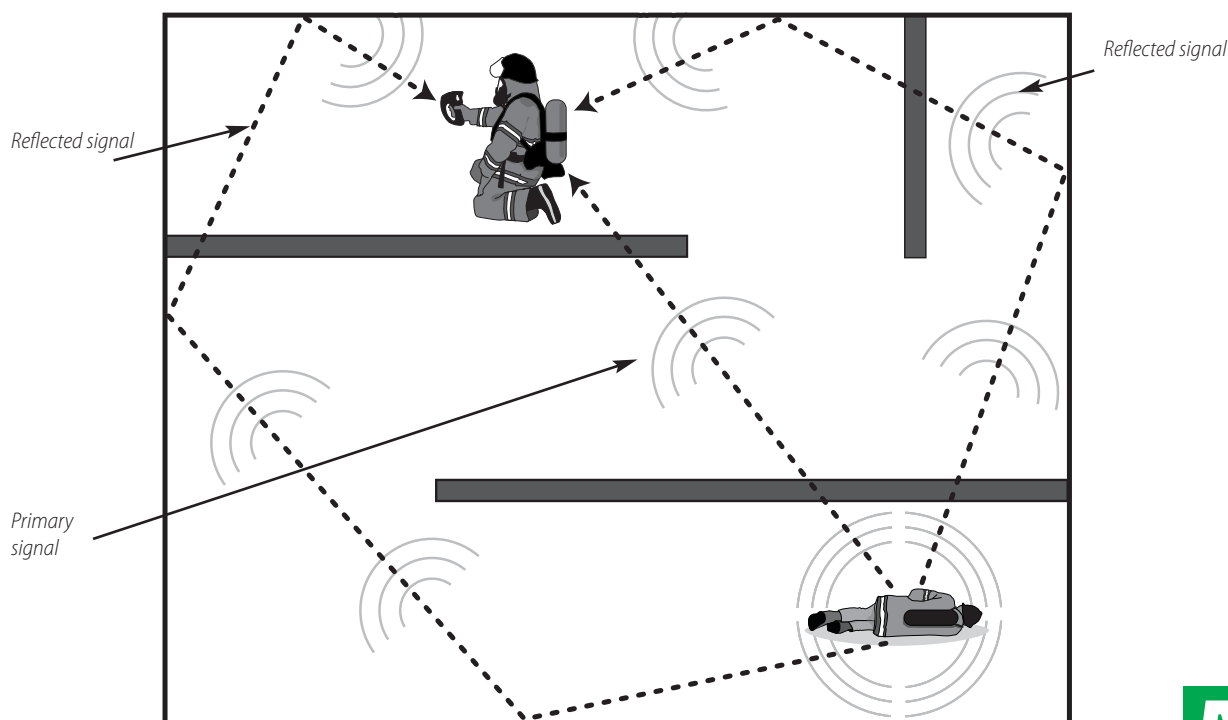
White Paper on Firefighter Location Systems

Due to the emergence of products with claims regarding firefighter location systems, MSA would like to provide you with an overview of operational principles and safety considerations for these systems. We hope that you'll find this information to be useful when making important decisions about selecting safety equipment.

Principles of Operation:

Location systems currently offered integrate with SCBA, and function as homing beacons to assist rescue personnel with victim locations. One system type, based upon an ultrasonic signal, claims a 120-foot-range line of site. Ultrasound travels well through small spaces, such as the gap under a closed door. However, ultrasound has virtually no capability to transmit through solid surfaces such as common drywall and other building materials. Furthermore, the 120-foot range can be reduced significantly indoors, depending upon open pathway structures between rescuers and victims. Ultrasound signals also reflect from indoor surfaces (such as walls, floors, and ceilings) and create multiple signals (or multi-paths). Multiple signals may potentially confuse search tools used by rescue personnel, resulting in trial-and-error processes to determine the correct signal that leads to the victim. In fact, reflected signals also may potentially lead the search tool away from the victim.

Another current SCBA-integrated system transmits a 2.4 GHz radio frequency (RF) signal and claims a 900-foot-range line of site, a technology used in early avalanche-style outdoor beacon systems to locate sportsmen, hikers, and skiers. The 2.4 GHz signal range is reduced when used indoors and does not travel well through gaps smaller than its 5-inch wavelength. This signal is considered to be poor at dissemination through building materials, and also creates reflected signals that require trial-and-error methods to determine the primary signal to follow. This technology cannot determine the building floor level where a victim may be located, as the signal reflects from all surfaces, including ceilings and floors. The diagram below shows an example of the presence and effect of reflected signals within a structure.



Safety Considerations

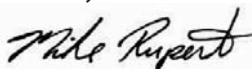
An important consideration with both technologies is the trial-and-error time required to differentiate between a primary signal and a reflected signal. Reflected signals can greatly mislead rescue teams and consume valuable minutes available to find a victim. MSA has evaluated these technologies and has elected not to pursue them. We believe that these types of products do not yet incorporate enabling technology, necessary for reliable and effective indoor performance that is critical to the safety of both victims and rescue personnel.

In response to fire service industry needs, MSA engineers continue to explore solutions for indoor firefighter location through modified inertial navigation. This technology is self-contained and does not rely on directional radio signals as do homing beacons; therefore, this system would not be subject to misleading directional information associated with reflected signals. In terms of user interface, we believe that an effective location system should provide a three-dimensional display of the location, and as an option, the pathway that firefighters travel within a structure. The diagram on the right represents an example of a potential firefighter location solution, showing real-time location and firefighter movement, which could be viewed on an incident command screen or on a handheld device by rescue personnel.

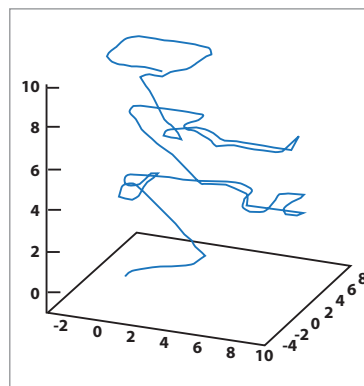
Summary

Decisions concerning new products and technology are challenging. Our intent is to provide facts to allow for informed decisions and product choices that provide the greatest value and safety for your fire department. We believe that homing beacon technology is not appropriate for firefighter location. MSA strongly supports the need for solutions to locate firefighters indoors, and continues to develop technology that is expected to provide fast, accurate, and user-friendly location information. Until this technology is ready, MSA recommends that fire departments apply their resources toward proven accountability methods, enhanced incident command tools, and compliant self-rescue products.

Sincerely,



Mike Rupert
Product Group Manager
MSA First Responder Products



Note: This Bulletin contains only a general description of the products shown. While uses and performance capabilities are described, under no circumstances shall the products be used by untrained or unqualified individuals and not until the product instructions including any warnings or cautions provided have been thoroughly read and understood. Only they contain the complete and detailed information concerning proper use and care of these products.



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