

# Boomerang Shooter Detection Technology

## Boomerang Shooter Detection System



Boomerang delivers the best performance at the lowest cost of any available shooter detection system. Boomerang uses passive acoustic detection, computer-based signal processing, and both aural and visual indications to help troops locate the shooter, reporting relative shooter azimuth, range, and elevation from incoming small arms fire.

### Features

- Operates on moving vehicles up to 60 mph, all terrains and environments (open field/urban)
- Detects shooter on first round fired under all environmental conditions (day/night/fog/rain/snow/sandstorm)
- User Outputs: Visual/Aural. Custom LED display of relative shooter azimuth, alphanumeric display, and integrated speaker
- Military 10-digit grid coordinates displayed in standby mode
- Simple Operation: On/Off switch, no calibration requirements
- Built-in system diagnostics and Ethernet interface

### Performance

- Shot Detection: >95% of supersonic projectiles
- Bearing Accuracy Error: < 2.5°
- Range Accuracy Error: +/- 10%
- Elevation Accuracy Error: < 2.5°
- Response Time: < 1.5 seconds
- Operation on moving vehicle: Up to 60 mph, all terrains

Both trained snipers and enemy shooters in Iraq and Afghanistan threaten the safety of our troops and the successful completion of their missions and are the second greatest cause of fatalities in combat. Troops in noisy military vehicles often don't even know they are being shot at until something—or someone—nearby is hit. In response, Raytheon BBN developed the Boomerang Shooter Detection System to give our troops the warning they need to get out of harm's way and respond to these assaults.

### Boomerang Is Saving Lives Today

Feedback from troops familiar with Boomerang system indicates they are universally thankful to have them. We shipped one system to a unit responsible for delivering wounded to a medical unit. A sniper was targeting our troops as they got out of the vehicles to open the entry gate. Soon after Boomerang arrived, his location was pinpointed and the sniper was captured. In another case, a HMMWV was equipped with Boomerang and the soldiers inside didn't even know what Boomerang was, but when they took fire, the system alerted, "Shot, one o'clock," and they were able to respond and capture that sniper as well.

The system operates when the vehicle is stationary or moving, using a single mast-mounted, compact array of microphones. Boomerang detects small arms fire traveling toward the vehicle for bullet trajectories passing within approximately 30 meters of the mast and shooters firing at maximum effective weapons ranges. Incoming round detection is determined in under a second. Significant efforts have been implemented to prevent system false alarms caused by non-ballistic events such as road bumps, door slams, wind noise, tactical radio transmissions, and extraneous noise events (vehicle traffic, firecrackers, and urban activity). The system does not alert when shots are fired from the vehicle.

### Mechanical

- Size – Display: 7.25" W x 4.75" H x 3.25" D
- Size - Mast/Array; 3' long (~7' high when installed) / 22" dia. array
- Weight-Total System: approximately 15 lbs

### Electrical/Data Interface

- Power: 25 Watts
- Supply Voltage: 9-30 Vdc
- Data Interface: Ethernet or USB

### Environmental

- Operating Temperature Range: 0° to 50°C
- Storage Temperature Range: -40° to 71°C
- RFI compatibility: MIL-STD-461E
- Shock/Vibration: MIL-STD-810F

### Additional Features

- System Calibration: None required, all microphones replaceable (un-matched)
- False Alarms: None due to wind noise, bumps, or door slams
- Return Fire Suppression: No alert from outgoing fire
- System Diagnostics: Built-in test at boot up. Microphone test using standard whistle
- 1/4" Stereo Headphone Jack for connecting directly to individual headsets or vehicle intercom systems
- Vehicle Installation: HMMWV, <1 man-hour

### Products/Options

- Boomerang Position and Heading Sensor
- Boomerang Static Installation Kit
- Boomerang Situation Awareness System
- Uninterruptable Power Source
- Integration/Installation Kits (Aero-stat, LAV, MRAP, M1151, Stryker, etc.)

Boomerang is easily integrated with other Boomerang product options, such as the Situation Awareness System, as well as other third-party systems. Through its intuitive System Integration Kit and simple Ethernet interface, Boomerang output can be used to slew camera devices, feed remote weapons station equipment, or report shooter position to an existing Tactical Operations Center. Whether stand alone or in combination with other systems, Boomerang increases target detection and survivability.



To learn more about Boomerang, please call or write:

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