Force Protection

At a Glance

Objectives

- Detection of kinetic and non-kinetic threats from sufficient standoff that enables a maneuver unit to maintain operational tempo
  - Pre-shot detection and classification
  - Wide area, clutter discriminating
  - On-the-move, multimodality detection and tracking capability
  - High-probability detection with low false alarm rate of buried/obscured/moving objects
- Neutralization of kinetic and non-kinetic threats with precision from a sufficient standoff distance that enables a maneuver unit to take action, maintain operational tempo and increases warfighter survivability
  - Fuse-independent kill of buried/obscured objects
  - On-the-move, multimodality neutralization family of systems
  - Lightweight, expeditionary, organic to maneuvering unit
  - Real-time detection/neutralization integrated system of systems
- Mitigation of the effects of a range of possible insults/threats to the individual warfighter and the small unit through signature reduction and enhanced personal protection while lightening the equipment load
  - Lightweight equipment that still increases the protected area and the individual's ability to maneuver
  - Modular/tailorable protection
  - Tools that enable system-level tradeoff studies

Points of Contact

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The Force Protection Thrust was established to examine science and technologies in the wide-ranging arena of force protection. The thrust's purpose is to discover, mature, demonstrate and transition advanced technologies for protection of the future warfighter when faced with counter-mobility obstacles and weapons. The thrust will enhance the ability to stop the most common threats and counter and readily adapt to emerging threats, ranging from armies in conventional warfare to an individual terrorist in asymmetric and irregular warfare, while minimizing impact on mission accomplishment. To do so, the thrust will concentrate on developing technologies that support four operational capabilities sets:

- Explosive hazard/obstacle defeat
- Air defense/counter-rocket, artillery and mortars
- Counter-tactical surveillance and targeting
- Personnel survivability

Force Protection's vision is to enable the force to maintain operational tempo at the small unit (battalion and below) and individual warfighter levels when facing counter-mobility obstacles and weapons. The thrust will provide technology that increases force survivability from multiple modes of enemy attack throughout the spectrum of warfare through a distributed protection concept. Each capability will be expeditionary in nature, lightweight and able to provide a far greater degree of protection than any comparable system currently available. The technologies will lead to the capabilities to detect, neutralize and mitigate the effects of both kinetic and non-kinetic threats, including improvised explosive devices and landmines, rockets, artillery, mortars, snipers and directed energy threats.

Research Challenges and Opportunities:

- Orthogonal-mode signature stimulation
- System-level analysis tool to investigate system-agnostic variables, including crowd dynamics and flow, sensor placement, geometry and generic sensor performance models
- Smart mine countermeasure for defeat of multimodal explosive hazard
- Application of high-powered lasers to Marine Corps air defense mission profile, requiring an in-depth analysis to understand system parameter tradeoffs between laser power, beam quality, beam director design, beam combining methodologies, jitter, recycle rate, prime power and cooling
- Optical augmentation—detection of optical systems via active means
- Determining appropriate tradeoff matrices for protective equipment on area of coverage, survivability, weight and comfort so that armor system designs can be optimized