Purpose: To discuss the capability gaps in the mission sets of homeland defenders that would lend themselves to the introduction/enhancement of ground robotics applications

Panelists:

Jim Russell – Air Combat Command (Chair)
Larry Burns – Las Vegas Metropolitan Police Department
John Gnagey – National Tactical Officers Association
Kim Keisling – Joint Task Force North
Darron Lee – Drug Enforcement Administration
Tom Lynch – National Tactical Officers Association
Shan Smith – Immigration and Customs Enforcement
Greg Torres – U.S. Customs and Border Protection
Robotics in Homeland Defense

• Identified 3 major user communities
  • EOD/bomb squad
  • Tactical Operations (CT/LE)
  • Tunnel Task Force (DEA/ICE/USBP)
• All users have different missions and different robotic requirements
  • EOD/Bomb squads
    • Need robotic capabilities for dealing with suicide bombers and VBIEDs
    • Require the ability to transport a heavy load down range
  • Tunnel Task Force
    • Need capability to operate below ground
    • Must operate in various geological conditions
  • Tactical Operations
    • Must be untethered, agile, stable, and have ability to deploy various tactical payloads
    • Need tactical operations robot vice EOD robot
Robotics in Homeland Defense

Requirement Documentation Challenges:

- No formal documentation has been developed
- US NORTHCOM is COCOM
- Counter Tunnel is number 4 for US NORTHCOM
- All aspects has not been articulated
- JTFN has drafted a prelim needs doc
- DOD and TSWG are tackling the programming
- Urgent Compelling document from JTF 134 for Counter Tunnel Operations could be basic document
- Threat documentation is being produced by DIA
Robotics in Homeland Defense (Technology Thrust Areas)

Platform

- Stability and Size – multiple sizes required/must be mission adaptable
- Power – batteries and or external power source
- Mobility – able to transverse water, mud, clay, steep slopes, dry dusty areas, snow, etc
- Advanced Materials – maintenance costs must be low
- Terrain and Environments – arid, wet, snow etc
- Survivability – capable of withstanding 7.62mm direct fire
Robotics in Homeland Defense
(Technology Thrust Areas)

Communication

• Frequency Allocation – needs to be determined
• Security – needs to be able to operate in a cluttered EMI environment
• Range and Bandwidth – needs to be determined
• Satellite Systems – needs to be able to data up and down link
• Wireless Communications – needs to be able to accept other wireless systems as demanded by mission profile
• Tethered vs Radio Frequency Systems – should be able to do both
Robotics in Homeland Defense (Technology Thrust Areas)

Control

• Human Factors – systems operated in extreme stress situations, needs to be intuitive

• Feedback Systems – platform needs to be semi-aware

• Multiple Vehicles – capable of co-operating with other similar and dis-similar systems

• Operator Control Stations – prefer stand alone due to keyboard complexity and the KISS principle

• Voice Command Recognition – ??

• Level of Onboard Intelligence
Robotics in Homeland Defense
(Technology Thrust Areas)

Navigation

• Tele-operation – to be determined

• Semi-Autonomous/Autonomous – some tasks should be semi-autonomous

• Path Planning – mission dependent

• Object Recognition – yes

• Obstacle Detection/Avoidance – yes

• Positioning Systems/mapping – yes
Robotics in Homeland Defense
(Technology Thrust Areas)

Payloads

• Chem/Bio/Rad Sensors
• Anti-terrorism Tools
• Defeat Systems
• Sensors
• Intelligence Gathering Systems
• Construction Tools
Robotics in Homeland Defense
(Technology Thrust Areas)

Manipulation

• Degrees of Freedom
• Force Feedback
• Operator Control
• Automation/Intelligence
• Precision/Accuracy
• Dexterity/Lift Capacity
Robotics in Homeland Defense
(Conclusion / Recommendation)

• Tactical Ops and Tunnel Task Force robotic requirements not clearly identified
  • Need methodology to define needs...may seek to leverage EOD/Bomb squad process for requirements identification and advocacy

• Recommend working with JTFN, TSWG, and JGRE for support to help in requirements development
Robotics in Homeland Defense

My sincere thanks to the members of the Panel....

Questions???