HARRIS

USSOCOM Tactical Network Testbed Submission
TNT 13-1 (November 2012, Muscatatuck UTC, IN)
T.R.U.E. Communications in an asymmetric environment

Idea/Title: T.R.U.E. Communications in an asymmetric environment (Tactical Reconn/Maneuver in an Urban / asymmetric Environment).

Company: Harris Corporation

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Capability of Interest: Command, Control, Communications and Computers (C4)

Technology Readiness Level: TRL 6 System/Subsystem Model or Prototype Demo in a Relevant Environment

Capability:

This capability is a continued expansion and evaluation of the tactical cellular communications within relevant environments. For this event, we have three stations designed for different deployment and operational regimes.

1) KnightHawk™ is a 3G, higher capacity unit designed for use at fixed bases or large mobility operations (i.e. convoys, amphibious landings, etc).

2) Fusion LTE™ is a 4G unit designed for vehicle mobile operations, providing high-bandwidth digital communications in a frequency band that propagates well around vehicles and urban structures.

3) KnightLite™ is a 3G unit for use in vehicles and dismounted scenarios.

These units are linked via an IP network to provide cellular device voice and digital communications. These devices and their mission applications improve operations through better awareness, automation, and reduced weight. Three applications we will operate are Mobile Map, Active Tracker and Active AdvantEDGE. Mobile Map is an Android “moving map display”, but interconnected with other Mobile Maps for situational awareness and collaboration. Active Tracker is another Android app that provides position tracking and GPS-tagged intel feeds into Active AdvantEDGE. Active AdvantEDGE is a secure, distributed network Linux application that collects and shares field data, real-time position and status, maps, terrain, intel products, video feeds, etc.

Experiment Objectives:

1) Evaluate this multi-node configuration in a deployment scenario consistent with a SOF operation in an urban environment.

Plan:

a) Setup a "safe house" with a KnightHawk™ base station, tactical RF network (AN/PRC-117G) and if logistically feasible, a Seeker Tri-Band VSAT single case terminal for satcom backhaul to another CONUS location. This location may also host a Fusion 4G LTE node.
b) Outfit a truck with a mobile cellular configuration for vehicle and dismounted cellular operations.
c) Provide 6-8 cellular, Android handsets for use within a mission scenario.
d) Provide 1-2 RF-3590 ruggedized tablets, also for use within a mission scenario.
e) Monitor operations from a TOC (if available) in terms of position reporting, field intel collections, and voice communications.

Performance:

Measures include:

1. Subjective evaluation of the utility of the overall configuration in terms of
    a. Ease of making calls and conducting voice communications
    b. Use of Mobile Map for user situational awareness
    c. Utility of sharing field photos, video and so forth.
2. Signal strength and link characteristics between the base stations and handsets within the environment (i.e. safe house and surrounding area).

New Capability:

We believe portable and controlled cellular communications offer additional options for special operations in various environments. Within an urban context, controlled cellular networks are much less pronounced because they appear as frequencies in use by commercial carriers. However, with the advent of commercial handsets using controlled Android operating systems (from "bare metal") this permits more secure operations and a controlled "means" by which to communicate (specific details are sensitive).

The three stations developed by Harris cover the anticipated modes of operation, including high-coverage, fixed/mobile base stations; vehicular mounted stations that use the existing SINCGARS chassis; and low-observable, man-portable units. Each of these can operate completely stand-alone or interconnected through any IP network and channel protection (e.g. encryption, special means, etc).

The end effect is that teams and units can now realistically utilize unobtrusive comm channels in a variety of ways to suit their missions. Example scenarios include using 4G to exfiltrate high-definition surveillance video and other sensor data; plain-clothes, urban comms using what appear to be COTS handsets; providing a means to interact with indigenous contacts, reducing risk of exposure; and disposable devices controlled by your own cell network.

Capability Gap:

This capability addresses a gap in portable field communications within environments not permissive of mission-specific radios and networks. This approach reduces costs through the combination of commercial protocols and hardware, in conjunction with ruggedization and security for military operations. This approach also reduces weight and power resulting from the commoditization of chipsets, processors, and solid state storage. Finally, we believe this approach permits a higher degree of effectiveness in field operations by increasing situational awareness, communicating more efficiently and enabling new missions.

TOC: Yes (new)

Troops: Yes

Generators: No

HMMWVs: No

UAS: No

Responsibilities:

Mark Ingersoll (Integration Engineer); Brian Berlin (Comm Systems Engineer); Brad Truesdell (field support).

Safety: No issues whatsoever.

Experiment Duration: 3 days

Unavailable: No unavailable periods are foreseen at this time.

Frequencies:

Fusion 4G LTE uses Band 13, 746-756 MHz and 777-787 MHz

KnightLite 3G uses 1923 MHz (uplink) and 2113 MHz (downlink)

KnightHawk 3G uses 1946 MHz (uplink) and 2136 MHz (downlink)

Falcon III radios use 325-330 MHz

Seeker VSAT frequencies are TBD pending satellite transponder allocation

Band: UHF, LTE Band 13, UMTS and VSAT is TBD

Throughput: 3G 1-5 Mbps; 4G LTE 1-10 Mbps; ANW2 1-5 Mbps; VSAT TBD

Network Type: Digital

Discreet: DSS

Power: 3G: 1 watt; 4G LTE: 1 watt; ANW2: <5 watts; VSAT wattage TBD

Directionality: All omni-directional except for the VSAT

Addl Times: No additional transmit times are envisioned at this time.

Remote Site: Requesting a surrogate “safe house” location, preferably within a multi-story structure.

Remote Power: Yes

Access: No TNT or Internet network access is required.

IP Addresses: None

Network: No TNT-provisioned network access is envisioned at this time, but we may establish a network link via our VSAT to a remote location.

Types of Data: Data will be a combination of digital voice traffic, position reports, RF measurements and status, streaming imagery, handheld field photos, and possibly live and recorded video/audio.

Constraints: None we can identify at this time.

Publish: No