Raycom – POC to US Army

Project Title: US Army Project- California

Project Manager: Howard Offit

Location: Irwin NTC (National Training Center) Combat Training

Completion Date: February 20th through March 10th

Ft: Irwin Coordinates: 35.2628° N, 116.6846° W

Radius of operation: 20 Kms

Emission Designators: LTE (all four emissions used) 10 MHz bandwidth

Frequency: 703- 755, 770 – 785, 800-805 ***(no band 14)***

Introduction:

The US Army's "grab-and-go" communications infrastructure The battalion is a military logistics system in which soldiers and equipment are pre-positioned at forward locations so that troops can access them quickly and easily as needed such as communication equipment. This approach can help ensure soldiers have the supplies they need to complete their mission, even in fast-paced or unexpected situations.

Between February and March 2023, a large exercise will be held that will include a demonstration of the ability of telecommunications companies to which Raycom has been selected to present its solutions. The purpose of POC is to enable communication between the US Army "grab and go" headquarters and forward battalions as well as a senior command in the SOC. Raycom offers an “All in one solution” that houses the radio, Core, and EMS system allowing the deployment of a private LTE network in minutes that is secure through three levels of encryption (and has the ability to add/embed additional encryption from the MEC to the LAN) and backhaul satellite communication creating a true end-to-end solution.

Background:

Captns Tan and Johnson of Fort Stewart have been tasked with researching how to create a grab-and-go/dispersed headquarters for army battalions in theater. The first focus is on communications utilizing secure encrypted technology that can be connected to a Drone(s) to increase the coverage versus a normal antenna which may be hampered by local topography. The idea is to use the LTE box 173 (2x10 Watts) on band 28, to achieve this goal. The initial POC is to demonstrate the capability using a "hub truck" to house the LTE unit and tethered drone to increase the cone range.

One test of success will be the time it takes to get the system up and running once the truck is deployed in theater.

Raycom’s Product:

4G LTE BOX = a complete virtual LTE network running on mobile or fixed hardware with instant and secure "plug and play" LTE network activation.

Scope:

Examining Raycom's LTE-BOX system as a **stand-alone** system and as a **backhaul** for communication to MBK/Cradlepoint units.

Dispersion of 5 km

Raycom's antennas will be connected to the meter-15 mast for satellite and LTE transmission.

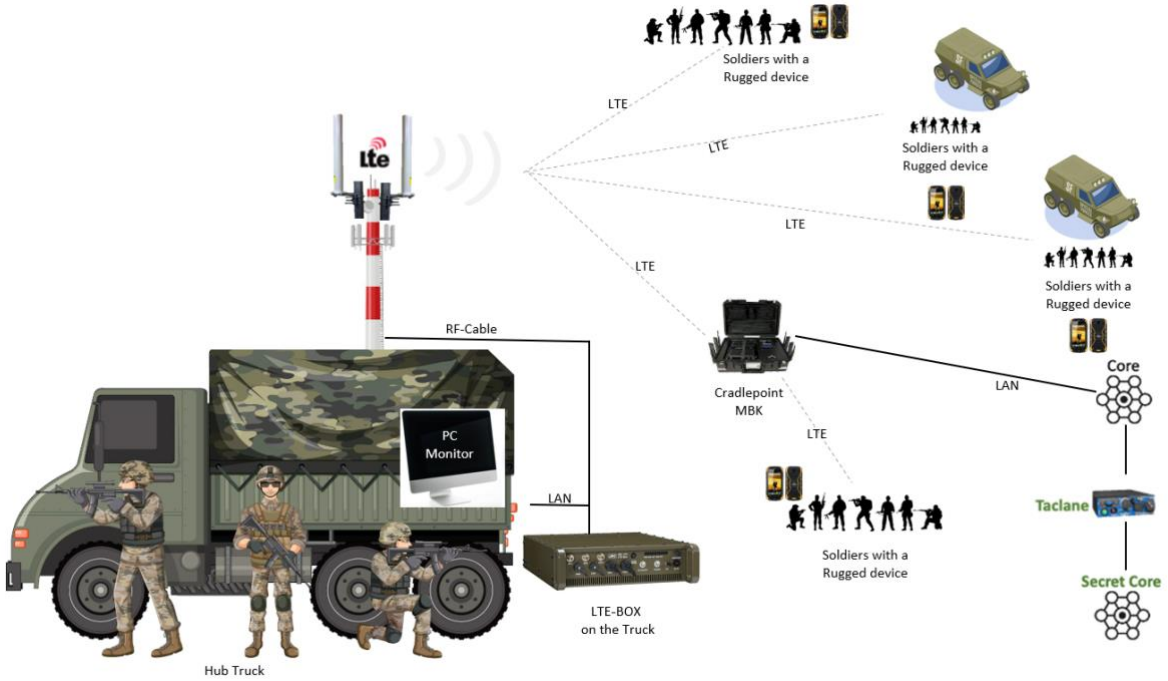
The use of Raycom's LTE-BOX will be divided into 2:

1. The LTE for the hub truck will be used as backhaul for communication to the MBK/Cradlepoint units.
   - About 3 nodes will be connected with each node connected to an MBK unit

2. Will serve as a system independent of other systems for communication with the forces

**** The system test will be LTE-BOX only without dependence on other systems/ third parties****

POC Architecture: – LTE-BOX on truck



Equipment list

1. LTE Box + protection and case for LTE Box.
2. Voltage (220V) for LTE Box.
3. 2X - Antennas - OMNI
4. Cables and connectors
6. 10X - Ruggedized phone
7. 10X – Sim-card
8. External antenna for phones
9. Management software of the system
10. MCX PTT SW
11. PC Monitor

Equipment list for presentation

1. Table
2. Roll Up
3. computer
4. TV screen for display

Conditions and distribution of responsibility for the model:

- **Us Army**
  1) Supplying vehicles, buildings, communication mast or any other system to which they want to connect Raycom's equipment.
  2) Supplying a US military technician to install the antennas and systems.
  3) Coordination of the Communications Ministry for the RF B28 (700Mhz) frequency.
  4) Entry permits to the US military base (if required) for Raycom personnel or anyone on their behalf who is required to be part of the experiment.

- **Raycom**
  1) Equipment needed to perform the experiment and check its integrity during the experiment.

Acceptance Criteria:

- Continuous connectivity transmission.
- voice calls - PTT

- Video calls in 540/480 resolution – PTT.
- Range - a minimum range of 5 KM for continuous voice and video communication.
- LTE box works and can be deployed quickly.

**** The system test will be LTE-BOX only without dependence on other systems/ third parties****

Contact info and stakeholders Plan:

- The POC will be for:
  1. General Donahue
  2. Lt. General Morrison
  3. Lt General Menis
  4. Major General Constanta Ft. Stewart

Appendices:

LTE-Box 173 specifications:

Highlights

Item	Description
Complete LTE Network in-a-Box	EPC, eNodeB, application servers are in a box
End users devices	Supports standard commercial mobile devices
Advanced LTE	Advanced LTE-MIMO Radio Technology
Simple Operation	Fully standalone operation and simplified operation
Fast bring up	Approximately three minutes from power up to full operation
Multi-power Source Supply	Support operation using AC power and/or dedicated battery
Multi-Bubble Communication*	Supports multiple LTE Box connection w/o backhaul (External Radio unit is required)
Communication tools*	Optional integrated PTT App server, Video server and Location based service (Check with JRC)
Interoperability with legacy voice system*	Optional interoperability with legacy system e.g. P25, Tetra (External Radio Gateway unit is required)
Backhaul	Backhaul interface with 3G/4G Cellular modem, Wi-Fi backhaul or VSAT link
Maintenance	Simple maintenance with GUI

*Optional

Specification

Item	Description
Model	JRL-173(FDD)
Form factor	Metal Chassis
Dimensions (L x W x D)	449mm x 420mm x 115mm (w/o mounting ear)
Weight	< 15kg
Input power	DC:+20～+33V (accessory AC/DC adapter) Internal module: MIL-STD-1275E
LTE Frequency	FDD: Band 28 (For other bands, check with JRC)
Bandwidth	5/10/15/20MHz
Transmit Power	2 x 10W
Number of Antenna	2 antennas (2 x 2 MIMO)
Max Connected / Active Users	256
Max Throughput	150Mbps Downlink, 50MbpsUplink (FDD 20MHz BW)
Interfaces	1 x 10/100/1000BASE-T for backhauling (RJ-45) 1 x 10/100/1000BASE-T for maintenance (RJ-45) 2x antenna RF connector (N type) 1x GPS antenna connector (N type) 2x USB port for management 1 x Wi-Fi antenna (for maintenance)
Synchronization	GPS
Network Functions	Internal routing capabilities NAT for connected UEs Service - Multi APN support, per UE or per UE groups - Advanced TFT support - Advanced QoS Control (Bandwidth, application, destination etc.) - Admission Control IP Allocation - Dynamic, Static, Internal, External, from dedicated pools Multi users - Support network behind UE
Management Functions	Remote connection and control (using backhaul interface) SNMP, TR-069 support System status indications
Security Functions	White list of roaming partners (PLMN-ID) AKA based authentication (key generation and distribution) Standard LTE AES-128 encryption SIM info encryption UE to device bundling Un-authorized users report
Applications	PTT, Video-PTT, Video Call Location based service
MTBF	≥ 100000 hours
Certification	CE, FCC, ANATEL

Environmental Condition

Item	Description
Operating temperature	-33°C to +50°C (MIL-STD-810H)
Preservation temperature	-33°C to +75°C (MIL-STD-810H)
Humidity	METHOD 507.6
Atmospheric Pressure	70 kPa to 106 kPa
mechanical shock proof / vibration proof	MIL-STD-810H METHOD 516.8
Waterproof / dust-proof	IP67

Option Items

Item	Description
Antenna	TBD
GPS antenna	Frequency Range: 1575.42MHz ± 1.023MHz