Marine Corps Tactical Systems Support Activity

New Ground Radios for the United States Marine Corps

Overview

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MCTSSA Radio Frequency Communications (RF) Lab

Facility Description

- Self-contained, environmentally-controlled lab facility with ample floor space, power distribution and network connectivity for evaluation of tactical communications systems
- Controlled radio signal distribution
- RF test and measurement equipment
  - Collocated outdoor antenna site
  - DAMA/IW/ Dedicated tactical satellite simulator
  - Connectivity to other MCTSSA labs (GCE, 57 Lab, VSAT Lab, and NGEN Building.

Benefits

- Employ large numbers of radios in small space with minimum manpower while providing realistic signal effects caused by real distance and terrain
- Contain and control radio signal emanations to eliminate interference and preserve limited RF spectrum
- Reduce risk in fielding frequently changing radio software
- Replicate and resolve technical problems reported by Operating Forces
- Assist in tactical radio network planning

Capabilities

- Test, troubleshoot, experiment with fielded and developmental tactical communications systems in networks of up to 60 (VHF/UHF) radios
- Test ground-to-ground, ground-to-air and tactical satellite radios including Software Defined Radio.
  - Provide controlled, instrumented tactical radio channels for C2 systems under test, such as AFATDS, CAC2S
  - Provide instrumented base station for mobile radios or other mobile systems under test
  - Evaluation of antennas through software modeling and electromagnetic measurement

Accomplishments

- AN/PRC-117G Developmental Test
- MUOS Developmental Test
- Firmware Testing
- Recurring radio software tests as part of tactical radio configuration management plan
- SOT Testing and LFOC support .

United States Marine Corps Mobile User Objective System (MUOS) Tactical Radio

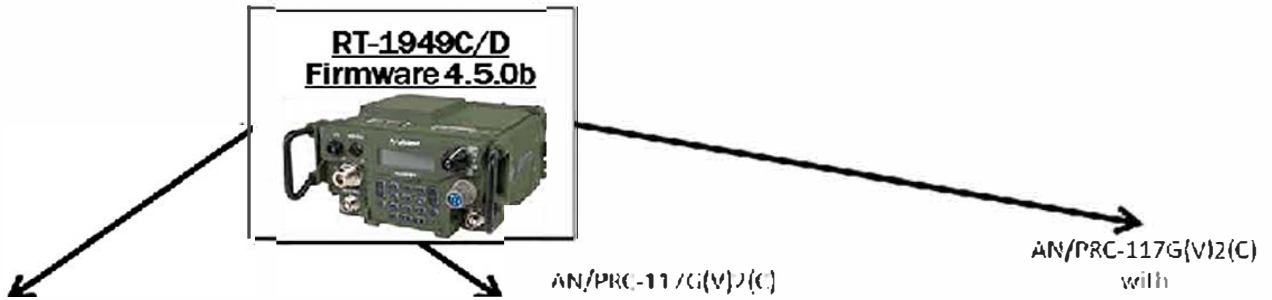
MUOS Introduction

- Mobile User Objective System (MUOS) is an ultra-high frequency (UHF) satellite communications (SATCOM) program
  - ❑ Four satellites in geosynchronous earth orbit with one on-orbit spare, and a fiber optic terrestrial network connecting four ground stations
  - ❑ Data rates of up to 384 kbps (limited to 64 kbps by current radio hardware)
  - ❑ Priority-based access to voice, data, and video, on demand
- Employs direct sequence spread spectrum WCDMA waveform leveraged from 3G commercial mobile technologies
  - Adaptive power control to provide the required quality of service to each user while simultaneously maximizing system capacity
  - IPv4/IPv6 provides global roaming connectivity to the DoDIN*
  - Designed for significant future growth as capacity demand increases

* DoDIN: Department of Defense Information Network

Systems Overview

The MBR II Family of Systems (FoS) includes the RT-1949C/D (Firmware v4.5.0B MUOS Capable) as the basic functional component for all configurations. The AN/PRC-117G(V)2(C) includes two antenna kit configurations that support MUOS: 1. At-the-Pause for stationary operations, 2. Dismounted for On-the-Move. The AN/VRC-114(V)1 antenna kit reuses the existing X-Wing antenna with an inline diplexer.



AN/VRC 114(V)1 with MUOS X Wing Antenna Kit

AN/PRC-160 High Frequency Radio (Manpack)

Marine Corps Employment: Beyond Line of sight (BLOS) to provide long range Voice and data communications even in jammed and challenging environments
Common Uses: Chat, FTP, data transmission, and Situation Awareness (PLI via GPS)
Additional Features: Internet Protocol (IP)
Modernized Crypto: Yes

AN/PRC-160 High Frequency Radio Characteristics

Frequency Range 1.5-59.999 MHz
Power Output 1.5 to 20 Watts
Net Presets: 75
Weight: 9 lbs w/battery
Crypto Classification: Up to Top Secret
Data Transmission: Data rates of up to 120 kbps (bandwidths from 3 kHz to 24 kHz)
GPS: Embedded and External
Additional Features: Frequency Hopping

AN/PRC-158 Multi Channel Radio Manpack

Marine Corps Employment: Line of sight (LOS) and Satellite communications to provide long range voice and data communications

Common Uses: Chat, FTP, data transmission, and Situation Awareness (PLI via GPS)

Additional Features: Internet Protocol (IP), Cross-banding and Retrans Capable

Modernized Crypto: Yes

AN/PRC-158 Multi Channel Radio Manpack

Frequency Range 30 to 2,500 MHz (2.5 GHz)
Power Output Up to 20 Watts
Net Presets: 99
Weight: 12.7 lbs w/battery
Crypto Classification: Up to Top Secret
Data Transmission: Data rates of up to 64 kbps (bandwidths waveform dependent)
GPS: Embedded
Additional Features:

AN/PRC-158 Multi Channel Radio Manpack

Waveforms

- Adaptive Network Wideband Waveform (ANW2)
- -SINCGARS
- Integrated Waveform (SatCom)
- DAMA (SatCom)
- Very High Frequency/Ultra High Frequency Line of Sight (VULOS)
- Havequick (Air-to-Ground)
- Saturn (Air-to-Ground)
- Mobile User Objective System (MUOS)

AN/PRC-158 Multi-Channel Radio Manpack

Frequency Ranges:

30 MHz-2.5 GHz
Narrowband (NB):
VHF: 30-225MHz
UHF: 225-520 MHz, 762-874 MHz
SATCOM:
TX: 243-270 MHz
RX: 292-318 MHz
Wideband (WB):
UHF: 225-520 MHz
L-BAND: 762 MHz-2.5 GHz

QUESTIONS?