



UNITED STATES MARINE CORPS

U.S. Marine Corps (Ground) Liaison Report

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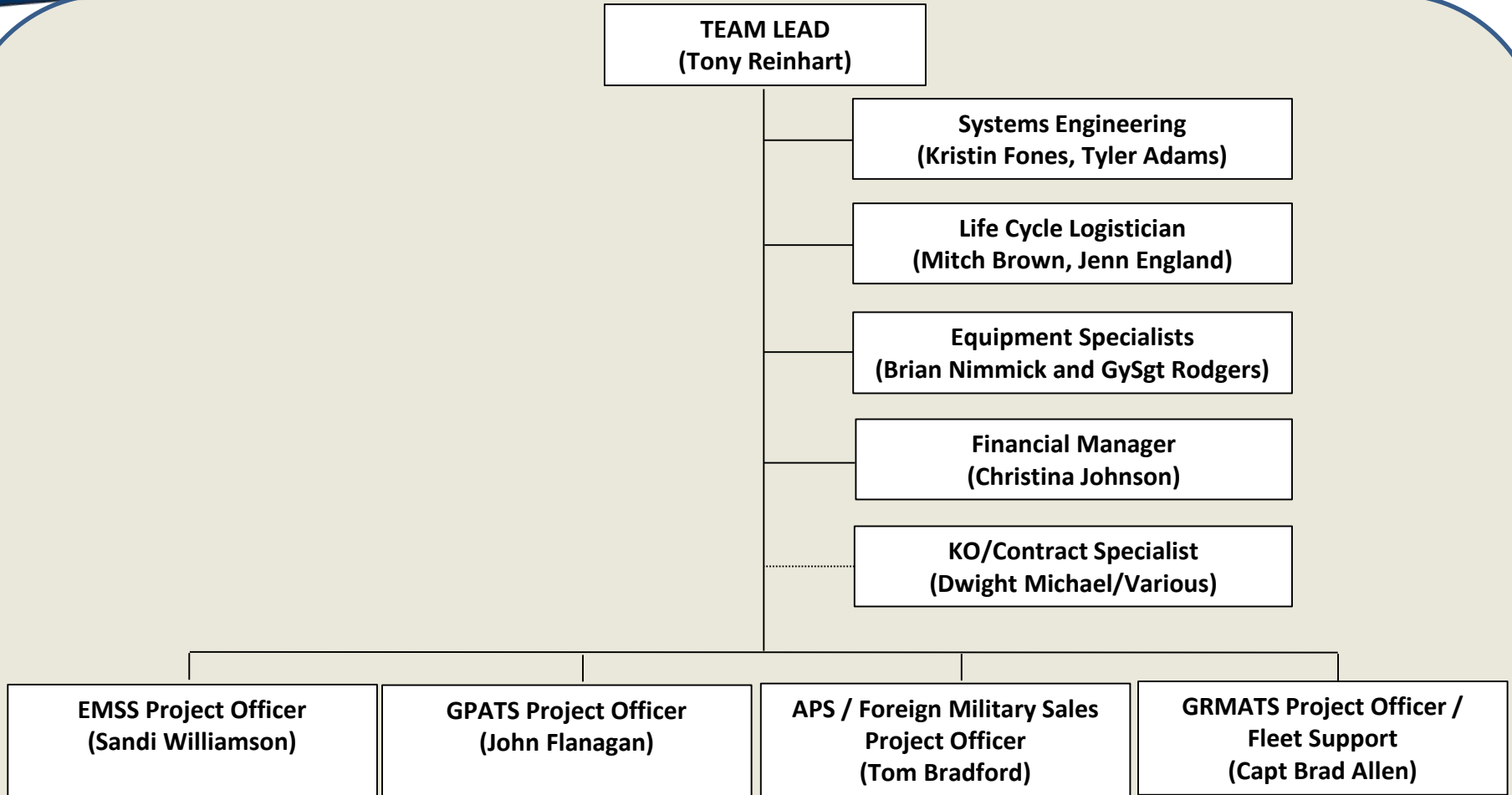
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USMC ATE/TPS Overview

- General Purpose Automatic Test Systems (GPATS)
- Ground Radio Maintenance Automatic Test System (GRMATs)
- Electronic Maintenance Support System (EMSS)
- Application Program Sets (APS)
- On-going and Planned Programs

USMC ATS Team Organization (PMM-151.4)



Systems Supported by GPATS

- LAV-25A2
 - Eight-wheeled amphibious armored reconnaissance vehicle built by GDLS Canada
 - A2 upgrades include electric drive turret and improved optics (ITSS)
 - US and FMS
 - Items tested: Turret and Gun drive/electronics
- LAV-AT (variant of LAV-25)
 - LAV fitted with TOW-II Anti-Tank Guided Missile launcher
 - Items tested: Turret and Gun drive/electronics
- M1A4 Saber
 - M41 TOW Improved Target Acquisition System (ITAS)
 - Anti-tank missile system
 - Replacement for legacy TOW2
 - Items tested: Target Acquisition Subsystem, Fire Control Subsystem, TOW Interface Unit, Position/ Attitude Determination System, Vehicle and A/C power units, cables.



Systems Supported by GPATS

- AN/TSC-181B Very Small Aperture Terminal (VSAT)
 - Integrated Commercial Off-the-Shelf (COTS) satellite communication (SATCOM) system
 - Operates in Ka, Ku and X-Band
 - Fielded in Small, Medium and Large variants
 - Items tested: 21 total LRUs across all variants
- AN/TPQ-46A Firefinder Radar
 - Weapon-locating radar designed to detect and track incoming artillery and rocket fire to determine the point of origin for counterbattery fire
 - Operates up to 4 GHz
 - Items tested: 14 CCAs
- Lightweight M777 155mm Howitzer
 - USMCs primary indirect fire weapon system
 - Utilizes a Digital Fire-Control System
 - Items tested: All DFCS LRUs



Systems Supported by GPATS

- Electro Optics
 - Testing of multiple handheld and weapon-mounted optics and laser devices.
 - Thermal Devices
 - Image-Intensified (I²) Devices Enhanced Night Vision Goggles
 - Laser designators, illuminators and aiming devices
 - Laser Rangefinders
 - Non-lethal devices (i.e. dazzlers)



UUT Examples:

- AN/PAS-22 Long Range Thermal Imager
- AN/PAS-13D Heavy Weapon Thermal Sight
- AN/PAS-28 Medium Range Thermal Bi-ocular
- AN/PVS-24A Individual Weapons Sight Image Intensifier

Systems Supported by GRMATs

- USMC Tactical Radios
 - PRC-117F/G Harris Multiband Manpack
 - PRC-150 Harris Falcon II Manpack
 - PRC-148 Thales Multiband Inter/Intra Team Radio (MBITR)
 - PRC-152A Harris Falcon III SDR
- Tactical Remote Sensor System
 - Provides ground surveillance for continuous, unattended, remote, all-weather detection, location determination, and monitoring of enemy activity
 - Originally supported by a variant of the GRM-122
 - Items tested: RCVR/XMTRs, Imager, Signature Data Recorder, VHF Preamp



HAND-HELD PROGRAMMER-MONITOR (HHPM)



ENCODER-TRANSMITTER UNIT - II (ETU-II)



SIGNATURE DATA RECORDER - II (SDR-II)



IMAGER-II



RT-1847 RADIO REPEATER

GPATS

GPATS Radio Frequency (RF) Variant

- **AN/USM-717(V)2**
 - VIPER/T (Astronics) RF Variant
- **AN/USM-657B(V)2 RF**
 - TETS (ManTech) RF Variant
- **Systems are form, fit, functionally the same**
- **Support Test Program Sets that require RF capabilities in addition to analog/digital**
- **(134) systems deployed for USMC users**



GPATS

GPATS Electro-Optic (EO) Variant

- **AN/USM-717(V)3**
 - 76 systems deployed
- **Consists of a core test system with a separately managed EO subsystem**
- **Supports testing of multiple EO devices:**
 - Infrared (IR) and Image-Intensified (I2) night vision devices
 - Laser designators, illuminators, laser aiming devices, and laser range finders.
- **(75) total EO systems deployed for USMC users**



GPATS

- GPATS Modernization Program
 - Acquisition program initiated to address current and anticipated obsolescence for GPATS (TETS and VIPER/T)
 - Common Instrument Controller (CIC) Upgrade
 - Replace current controller (laptop/docking station) with a modern solution
 - Contract wrapping up to provide two first article units and 258 production CICs
 - Transition to MS Windows 10
 - Graphical User Interface (GUI) Update
 - EO Modularization
 - Field calibration capability
 - Downsized EO capability



- GPATS Modernization Program (Cont'd)
 - Radio Frequency subsystem capability enhancement
 - R&D effort underway to externalize the RF subsystem
 - Increase RF test capability to 40GHz range
 - PDU Replacement
 - Reduce size and weight
 - Power system using 120VAC 20A circuit
 - Address safety concerns
 - Eliminate Secondary Chassis
 - VXI carrier cards
 - PXI instruments

EMSS

Electronic Maintenance Support System (EMSS)

- Program Description: EMSS provides a rugged, lightweight, one-man portable maintenance aid designed to enhance combat service support to MAGTF forces in both deployed and garrison environments. EMSS provides the maintainer with networked tools and electronic information which enables sustained performance and readiness of weapons systems. EMSS provides diagnostic capabilities, access to technical information, and access to GCSS-MC when connected to the MCEN-N.

CURRENT CAPABILITY:

- One-Man Portable Maintenance Aid
- External Equipment Hardware Interfaces
- Host Maintenance Applications
- Display Technical Data
- Support Maintenance Mentoring
- Network Connectivity

FUTURE CAPABILITY:

- Software Update Service
- Enable Reach Back
- Test and Diagnostics

SUPPORTED OCCFLDS:

EMSS serves as an At-Platform maintenance aid for the following MOSs:

Current (legacy): Fielded 2000

- 2141 AAV Mechanics
- 2147 LAV Mechanics
- 2171 Electro-Optical Maintenance Repair
- 3521 MT Mechanics

(New Program Of Record) – ACAT IV(M): Add MOSs:

Total fielding of 10.000

- 11XX (Utilities Maintenance)
- 13XX (Engineer Maintenance)
- 28XX (Ground Electronics Maintenance)
- 59XX (Electronics Maintenance)

GRMATS

Ground Radio Maintenance Automatic Test System (GRMATS)

- **AN/USM-718A**
- **AAO reduction (562 to 334) in order to align systems primarily with intermediate level maintenance activities**
- **Hardware upgrade to I7 processor and SSD in FY18**
- **SW upgrade in FY18**



AN/USM-718A (GRMATS 7200)

GRMATS Application Program Sets

- Currently Fielded GRMATS Application Program Sets
 - AN/PSM-127 – Ground Radio Application Program Set (GRAPS) – Multiple Software-Defined Radio System Components
 - AN/TSM-221 – Tactical Radio Intermediate Maintenance Activity Application Program Set (TRIAPS) – AN/PRC-117G Radio and Vehicle Amplifier Unit (VAU)
 - AN/PSM-131 – Tactical Remote Sensor System (TRSS) LRU Diagnostics

GRMATS Application Program Sets

- Ground Radio Application Programs Sets (GRAPS)
 - GRAPS are essentially TPS kits used in conjunction with AN/USM-718A GRMATS for testing USMC tactical radios
 - AAO reduction to 224
 - Tests PRC-152, PRC-150, PRC-148, PRC-117F and vehicle amplifiers



GRMATS Application Program Sets

- TRIAPS (Tactical Radio IMA Application Program Set)
 - AAO of 61 only at intermediate level
 - Fielded as COTS solution for PRC-117G and vehicle amplifier
 - Configuration upgrade in FY18 to streamline testing and hardware
 - Eventual AAO to match GRMATS as replacement for GRAPS as new radios are fielded
 - Expandable for testing of other radios
 - Includes laptop, power supply, RF attenuators, power sensor, various interface cables



GPATS Application Program Sets

- Currently Fielded GPATS Application Program Sets
 - AN/PSM-105 - AN/TRC-170 LRU/CCA Diagnostics (pending disposal)
 - AN/PSM-109 - AN/TPQ-46 LRU/CCA Diagnostics (pending disposal)
 - AN/PSM-112 - LAV-AT (Legacy) LRU Diagnostics
 - AN/PSM-115 - AAV MSQ-115 Diagnostics
 - AN/PSM-117 - Handheld and Weapon-Mounted Optics/ Laser Devices
 - AN/PSM-118 - LAV-25 Chain Gun Functional Test
 - AN/PSM-119 - LW 155 LRU Diagnostics
 - AN/PSM-123 - LAV-25A2 LRU Screening/ Diagnostics
 - AN/PSM-120 - LAV Instrument Panels/ Heads-Up Display Diagnostics
 - AN/PSM-129 - Saber Anti-Tank Weapon System LRU Diagnostics
 - AN/PSM-130 - LAV-25A2 CCA Diagnostics
 - AN/TSM-220 - Power Systems (Power Supplies, Conditioners, Chargers)

GPATS Application Program Sets

- Current Efforts in Progress
 - AN/PSM-126 Very Small Aperture Terminal (VSAT) LRU APS
 - 24 new TPSs, 6 LRIP units
 - TPS development completed March 2017. Full-rate production planned for Jan 2018. (62 units)
 - AN/PSM-119 Lightweight 155 Howitzer Digital Fire Control System (DFCS) LRU APS
 - TPS upgrades in progress at ATSD Picatinny Arsenal, NJ
 - AN/TSM-223 Light Armored Vehicle – Anti-Tank Weapon System (LAV-ATWS)
 - 15 new TPSs, 2 LRIP units
 - TPS development in progress at ATSD Picatinny Arsenal, NJ
 - Development completed Feb 2017. Production (21 units) on-going with fielding planned for Jan 2019.

GPATS Application Program Sets

- Current Efforts in Progress (Cont'd)
 - AN/PSM-117 Handheld and Weapon-Mounted Optics/ Laser Devices - (Additional TPSs)
 - Effort underway to develop TPSs for the AN/PAS-13G with ballistic capability and the STORM Laser Range Finder (LRF). Both components of the Shoulder-Mounted Anti-Tank Weapon (SMAW) Mod 2
 - Planning to incorporate TPSs for new Scout Sniper LRF and Ocular Interrupter devices.

Planned and Ongoing ATS Efforts

- Planned ATS Efforts
 - Advanced Combat Vehicle (ACV)
 - Working with the ACV Program Office to identify test requirements for electronic and electro-optical components.
 - LAV-25 Driver's Instrument Panel and Slip Ring Upgrades
 - Planned ECPs to add new TPSs for upgraded system components to existing AN/PSM-120 and PSM-123 APSs
 - WI-FI Application Module (WAM)
 - At-system test capability for system fault isolation
 - Handheld Radio Test Set Replacement
 - RFI (Sources Sought) released on 23 Aug 2017 requesting Industry feedback on a replacement solution for the legacy 3515N Handheld Radio Test Set
 - RF-7800I Intercom System and AN/PRC-158 Radio System Support
 - Conducting research to identify viable organic test solutions.
 - M1A1 Tanks CCA APS development – GPATS possible replacement for DSESTS

Ongoing Efforts

- LAV Foreign Military Sales (FMS) Support
 - Providing acquisition, technical and logistical support for the procurement of multiple ATS solutions
 - (2) First Article Test (FAT) VIPER/T units, and (4) production VIPER/T units, and (4) LAV-25A2 APS units procured/delivered
 - Procurement of (15) additional build-to-print VIPER/T units is in progress
 - Executing build-to-print effort with ATSD, Picatinny for additional (15) LAV-25A2 APS
 - Planning fielding of initial VIPER/T and APS units to FMS customer during Sep 2017
 - LAV-Anti-Tank Guided Missile (LAV-ATGM) test programs under development at ATSD, Picatinny. (17 new TPSs)
 - Planning to develop and implement a dual-language user interface capability for all FMS VIPER/T and APSs
- PMO will develop an ATS portfolio life cycle management plan and road map for FY 2020 through FY 2035
 - The Intent is to identify and map requirements for the next generation of GPATS/GRMATS
 - Identify any required JCIDS requirements documents and actions
 - Conduct a Business Case Analysis (BCA) to identify and compare potential courses of action.

Thank You!

Questions?