



U N I T E D S T A T E S M A R I N E C O R P S

# U.S. Marine Corps (Ground) Liaison Report

9 December 2021

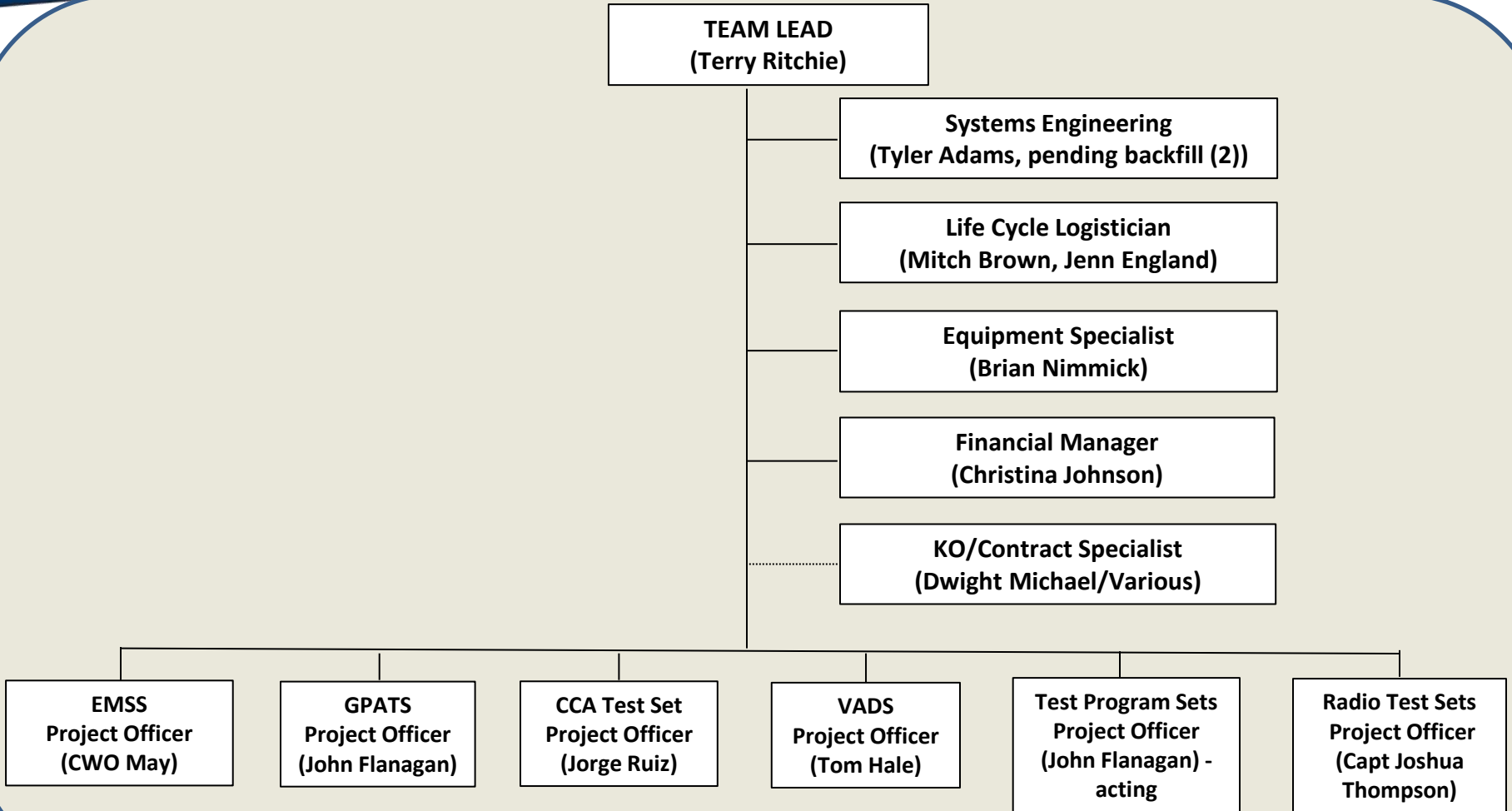
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# USMC ATE/TPS Overview

- General Purpose Automatic Test Systems (GPATS)
- Electronic Maintenance Support System (EMSS)
- Vehicle Automated Diagnostic System (VADS)
- Circuit Card Assembly (CCA) Test Station
- Ground Radio Maintenance Automatic Test System (GRMATS)
- Planned and Ongoing Efforts

# USMC ATS Team Organization (PMM-151.4)



# GPATS

- AN/USM-717(V)2 VIPER/T, AN/USM-657B(V)2 TETS
  - Supporting analog/digital Electronic Test Programs
- AN/USM-717(V)3 VIPER/T
  - Supports testing of:
    - Infrared (IR) and Image-Intensified (I2) night vision devices
    - Laser designators, illuminators, laser aiming devices, and laser range finders.



# GPATS Application Program Sets

- Currently Fielded GPATS Application Program Sets
  - 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-119A - LW155 LRU Diagnostics
  - AN/PSM-123 - LAV-25A2 LRU Screening/ Diagnostics
  - AN/PSM-120 - LAV Instrument Panels/ Heads-Up Display Diagnostics
  - AN/PSM-126 - Very Small Aperture Terminal 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)
  - AN/TSM-223 - LAV-Anti Tank LRU Diagnostics

# GPATS Application Program Sets

- Current TPS Efforts in Progress
  - AN/PSM-119A Lightweight 155 Howitzer Digital Fire Control System (DFCS) LRU APS
    - Fielding of upgraded kits in progress (only a few kits left)
    - Addition of a comm cable for mission computer (ECP)
  - AN/PSM-123 LAV-25
    - TPS development in process for:
      - Slip Ring Assembly
      - High Power Distribution Module
  - AN/PSM-117 Handheld and Weapon-Mounted Optics/ Laser Devices - (Additional TPSs)
    - TPS development in process for:
      - Scout/Squad Sniper Laser Range Finder
      - Ocular Interrupter (O/I)
      - Long Range Sniper Rifle Night Sight
      - Squad Thermal Sight
  - AN/PSM-130 LAV CCA APS
    - TPS Development for upgraded CCAs



# GPATS Modernization

- GPATS Modernization Program
  - Acquisition program to address current and anticipated obsolescence for GPATS (TETS and VIPER/T)
  - Completed efforts
    - Common Instrument Controller (CIC) Upgrade
      - Previous generation laptop/docking stations replaced with a modern PICMIG rugged COTS unit
      - 258 production CICs delivered
    - Transition to MS Windows 10
      - Integration complete by USMC Albany
    - TPS rehost validation in process
  - System Software Hardware Abstraction Layer (HAL) update
    - Phase II 2QFY22



# GPATS Modernization

- GPATS Modernization Program (Cont'd)
  - Radio Frequency Subsystem (RFSS) capability enhancement
    - Initial R&D effort completed Sep 2020 to externalize the RF subsystem
    - PXI COTS solution
    - Increase RF test capability up to 40GHz range
    - Initial integration completed
    - Follow-on pending future RF requirements from Marine Corps Combat Development Command (MCCDC) and supported Program Offices
  - Eliminate Secondary Chassis
    - PXIe Instrumentation Insertion Kit
      - Effort underway to replace the current VXI instruments (DMM, Counter/Timer, DSO, Function Generator, Arbitrary Waveform Generator) with PXIe equivalents
      - PXIe instruments to be located in Primary Instrument chassis
      - Initial integration effort completed in Jan 2021
      - AN/PSM-115 Sample TPS rehost/validation in process
    - Synchro Resolver/Simulator to be relocated to Primary Chassis
  - PDU Replacement/Modification
    - Support future GPATS requirements (TBD)



# 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
- Test and Diagnostics
- Displays Technical Data
- Support Maintenance Mentoring
- Network Connectivity

### FUTURE CAPABILITY:

- Software Update Service
- CBM+ Enabler
- Integrate software to replace the Vehicle Automated Diagnostic System



### SUPPORTED OCCFLDS:

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

Current (legacy): Fielded 2300

- 2141 AAV Mechanics
- 2147 LAV Mechanics
- 2146 Tank 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) in FY21 (TBD)
- 13XX (Engineer Maintenance) in FY21 (TBD)
- 28XX (Ground Electronics Maintenance) TBD
- 59XX (Electronics Maintenance) TBD

# Vehicle Automated Diagnostic System (VADS)

VADS is a lightweight, portable diagnostic system of modular design that is used to perform intrusive diagnostics on diesel engines, transmissions, central tire inflation, anti-lock braking, and other vehicle data bus systems. The vehicle communication interface is called the Test Adapter Vehicle (TAV) that is interfaced with an instrument controller with available USB port, DVD drive, Diagnostic Software and Windows based operating system. This is combined with a complete set of interconnect cables and transducers/adapters in one weather resistant transit case.



B70002B Analyzer Set, Vehicular



D70002B Analyzer Set, Vehicular



E70002B Analyzer Set, Vehicular

# VADS

## Weapon Families/ Weapon Systems Supported

- **“E” TAMCN ORDNANCE PLATFORMS**

- LAV
- AAV
- M88 TRACKED RECOVERY VEHICLE
- HIMARS

- **“B” TAMCN ENGINEER PLATFORMS**

- ATC / MAC 50
- MCT
- TRAM
- 120M GRADER
- WTS SCRAPER
- STREET SWEEPER
- BHL
- MMV
- BUFFALO
- MTL
- HUSKY
- HYEX
- AMC
- M9 ACE
- AMMPS GENERATORS

- **“D” TAMCN MOTOR TRANSPORT PLATFORMS**

- MTRV
- LVSR
- COUGAR
- MATV
- JLTV
- P19R
- MTRV WRECKER
- LVSR WRECKER
- HMMWV



# Circuit Card Assembly (CCA) Test Station

- The Circuit Card Assembly (CCA) Test Station is a shelter mountable unit that provides the capability to capture, digitize, and store signatures of known good components for reference with the test of similar CCAs and electronic modules for out of tolerance, deteriorating, or defective components on a wide variety of weapon systems.
- The CCA Test Station consist of the Huntron Pro-Track Tester model 32, PC Controller (Win 10) compliant, and accessories ESD Kit.
- The CCA Test Station features a variable range parameters resulting in hundreds of voltage, source resistance, and frequency combinations.



**Huntron Model 32  
AN/USM-726  
Tech Refresh**

# GRMATS

## Ground Radio Maintenance Automatic Test System (GRMATS)

- AN/USM-718A
- Performance testing and diagnostic tool for software defined radio testing
- Primarily used at intermediate level maintenance activities in conjunction with the Ground Radio Application Program Set (GRAPS)
- Currently exploring options for replacing legacy GRMATS systems



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
    - RT-1796 (PRC-117F)
    - RT-1694 (PRC-150)
    - AN/PRC-148 Urban (V2)
    - AN/PRC-148 Maritime (V1)
    - RT-1916 V1, V3 (PRC-152 V1, V3)
    - AN/VRC-111 VAA
    - AM-7588 VRC-103
    - RF-5833H
    - RF-300M 50W VRC-110
  - 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
- Tests PRC-152, PRC-150, PRC-148, PRC-117F and vehicle amplifiers

## Tactical Radio Intermediate Maintenance Activity Application Program Set (TRIAPS)

- AN/TSM-221A
- Used only at intermediate level
- COTS solution for PRC-117G and vehicle amplifier
- Will expand to test future NSA crypto-compliant, software radios
- Includes laptop, power supply, RF attenuators, power sensor, interface cables
- Radios added as fielded



# Planned and Ongoing ATS Efforts

- Foreign Military Sales (FMS) - LAV Support
  - Providing acquisition, technical and logistical support for the procurement of multiple ATS solutions to support FMS Light Armored Vehicle Platforms
    - Initial effort
      - (2) First Article Test (FAT) VIPER/T units, (4) production VIPER/T units, and (4) LAV-25A2 APS units delivered
      - Fielded initial VIPER/T and APS units to FMS customer Sep 2017
    - Production of (24) additional build-to-print VIPER/T units complete/delivered
    - Conducted fielding/training to FMS customer during Apr 2019
    - Completed development of (17) new TPSs for the FMS LAV-Anti-Tank (LAV-AT) weapon system. Full rate production of TPS hardware complete. Delivered to FMS customer Sep 2019.
    - Developed/implemented a dual-language user interface capability for FMS VIPER/T and associated TPSs
    - Additional spare parts for FMS VIPER/T and TPS sustainment procured/delivered

# Planned and Ongoing ATS Efforts

- DTS Study
  - Evaluating options for obsolescence of current GPATS VXI DTS
  - USMC focusing on sustainment of current system configuration
  - Study completed, results being compiled and evaluated
- USMC ATS IDIQ
  - Planned Tasking
    - ATE System Software, Maintenance, Enhancements
    - Logistics, Tech Manuals
    - TPS Development
    - FMS Support
  - Total Small Business Set-Aside
  - Awarded three (3) base contracts Sep 2020
  - One TPS development task awarded to date

# Planned and Ongoing ATS Efforts

- **Advanced Combat Vehicle (ACV)**
  - Working with the ACV Program Office to identify test requirements for vehicle electronics and electro-optical components
  - Drafting requirements document now
- **Stand-Alone Controller for Electro-Optic Testing**
  - Reduced footprint EO test system utilizing existing VIPER/T EO collimator
  - Funding potentially in FY24
- **Next Gen GPATS**
  - PXI/PXIe-based system
  - USMC evaluating requirements
  - RFI FY22
  - Funding potentially in FY23/24

# Planned and Ongoing ATS Efforts

- **Handheld Radio Test Set Replacement**
  - RFI (Sources Sought) released Sept 2018 requesting Industry feedback on the Purchase Description for replacement solution of legacy 3515N Handheld Radio Test Set. Responses were received and evaluated.
  - RFP issued July 2020 for up to 1408 total units over 5 years
    - Written technical and cost proposals
    - Two production representative HHRTS samples
  - Bids submitted Jan 2021
    - Three bidders submitted proposals and bid samples
  - Protest filed by Tel-Instrument Electronics Corp 14 Jan 2021
    - Denied, 19 April 2021
  - Proposal and bid sample evaluation ongoing by USMC and Naval Research Lab
- **TRIAPS Enhancement**
  - Replacement of GRMATS with TRIAPS-based all-in-one test solution
  - Multiple RFIs issued
  - Responses received and being evaluated
  - Potential to morph into a new system

Thank You!

**Questions?**