Joint Service Power Expo

POWER FOR VEHICLE AND BATTERY OPERATED WEAPON SYSTEMS

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Expeditionary Power Systems, Marine Corps Systems Command

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Purpose

- Review the Tactical Communications Modernization (TCM) program and impact on the Marine Corps tactical radio inventory

- Review current (PM EPS) capabilities and future programs to support the power demands (under 2 kW) of this rapidly changing and increasing operational capability
Talking Points

- What is TCM?
- Radio Power Adapters
- DC to AC inverter requirements
- Battery chargers (COMM-ELEC)
- Renewable energy for small tactical units
- TCM impact on Tactical Vehicles
Several events led to a rapid expansion of the Marine Corps’ tactical radio inventory:

- Enhanced Company Operation (ECO) concept
- Planned force increase (202K) / OIF Reset
- Supplemental funding for radio procurement and fielding over a four year period
Enhanced Company Operations (ECO)

- Field C2 systems that support greater distribution of units
- Expand networks for communicating Commanders intent
- Enable “fire teams” to collect and pass (real time) battlefield intelligence
Tactical Communications Modernization Program

- Phase 1 - Modernize & Reset the Force (2006 – 2009)
  - Replace all legacy HF systems with PRC-150
  - Replace all legacy UHF systems with PRC-117
  - Field radios to support ECO requirements
  - Begin fielding of SVA/DVA vehicle radio mounts

- Phase 2 - Modernize & Reset the Force (2008 – 2010)
  - Replacement of vehicular SINCGARS systems with amplified, multi-band radio capabilities
  - Fielding of onboard radio systems to vehicle platforms that traditionally had no communications capability
**Tactical Communications Modernization Program Phase 1**

- ECO requirements + 202K increase + funding =

<table>
<thead>
<tr>
<th></th>
<th>PRE-OIF</th>
<th>TCM AAO</th>
</tr>
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<tbody>
<tr>
<td>PRC-117</td>
<td>0</td>
<td>9,817</td>
</tr>
<tr>
<td>PRC-150</td>
<td>?</td>
<td>4,957</td>
</tr>
<tr>
<td>PRC-152</td>
<td>0</td>
<td>8,387*</td>
</tr>
<tr>
<td>PRC-153</td>
<td>0</td>
<td>49,360</td>
</tr>
</tbody>
</table>

* Note: Does not include 13,653 DVA’s and 15,068 SVA’s
Tactical Communications
Modernization Program Phase 1

Single Vehicle Adapter (SVA)

Dual Vehicle Adapter (DVA)

AN/PRC-117F
AN/PRC-150
AN/PRC-152

AN/PRC-153 IISR
Tactical Communications Modernization Program

Co HQ (x3/Bn)

RFL Plt (x3/Co x9/Bn)

WPNS Plt (x3/Bn)

Pre-OIF Rifle Co Radios

T/O 6 Officer/176 Enlisted
- VHF-V (VRC-88): 1
- VHF-M (PRC-119): 6
- UHF-M (PRC-113): 1

Mounted in M998A1

Corpsman

MG Sect

Mortar Sect

Assault Sect
Tactical Communications Modernization Program

Co HQ (x3/Bn)

RFL Plt (x3/Co x9/Bn)

WPNS Plt (x3/Bn)

TCM

T/O 6 Officer/176 Enlisted

MBR-V (VRC-103): 1

MBR-M (PRC-117): 6

HFMR (PRC-150): 5

DVA (VRC-110): 2

THHR (PRC-148/152): 35

IISR (PRC-153): 176

*Corpsman IISR counted in H&S

“98” RFL Companies not counting MARCENT
Tactical Communications Modernization Program

- **Challenges**
  - Training “Every Marine a Rifleman”
    “Every Marine a Radio Operator”
  - Initial battery supply, resupply, annual budgets, HAZMAT & disposal

BA-5590  BA-5390  BA-8180
BA-5590/U MONTHLY Battery Demands

OIF-1 April 03 – June 03

Combat Operations Declared Over

OIF-1

OEF

# of batteries

Production

Actual Demands
Suit of alternative power devices to support different mission profiles (RPA’s / Power Supplies / Battery)
The “Last 10 Yards” …

- Resulting from the TCM program what additional alternative power capabilities does the Marine Corps need in order to support this increase in the tactical radio inventories?
Radio Power Adapters

Current Inventory

SSPA 12V
QTY 1599

MSPA 12V
QTY 1382

MRPA 12V
QTY 1303

MRC-93B 24V
QTY 1295

With increased fielding of PRC-117 & PRC-150 24V radios and drawdown of PRC-119 SINCGARS 12V radios the Marine Corps will need additional 24V RPA’s.

With increased fielding of PRC-152 & PRC-153 12V Hand Held radios the Marine Corps will need additional 12V unique RPA’s.

50K PRC-153 / 8K PRC-152
Radio Power Adapters

NEXT GENERATION

HH-RPA
Testing in progress
Power PRC-148, PRC-152 and PRC-153 from XX90 battery

24V Tower
RFP Released
Source Selection in progress

Single 24V RPA
Dual input Battery/120VAC
Outputs to 24VDC, radio, UPS capable
DC to AC Inverters

Current Inventory (QP-1800)

- Semi-ruggedized.
- Runs from vehicle 24VDC.
- Connects using supplied NATO slave cable.
- Output is 115VAC True Sine Wave, 1800W.

Next Generation

3 Phase 2000 Watt Inverter

RFP pending release
COMM-ELEC Battery Charge

Current Inventory

- SPC Bench Top Charger
- VMC Vehicle Mounted Charger

Next Generation

- VMC Lite
- Less weight
- Small foot print
- Focused on Rifle Company requirements
- RFP Mid May 2009
Renewable Energy for the Small Tactical Unit Under Development
Currently undergoing User Evaluation

The SPACES MSD collects energy from various sources (solar, DC/AC, Vehicle) to recharge BB-2590 batteries and to power external devices (12V radios).
Every Marine a Radio Operator
TRAINING REMAINS A CHALLENGE

Available from pm_eps@nmci.usmc.mil

POWER FOR MANPACKED
RADIO COMMUNICATIONS EQUIPMENT

"IN EVERY CLIME AND PLACE"
Power Management for Communication Equipment Operators.

Available at www.marinenet.com
TCM Impact on Tactical Vehicles

- Capabilities continue to be added to HMWWV platforms
  - Blue Force Tracker
  - EPLRS
  - IED Jammers
  - DVA/SVA
  - Inverters
<table>
<thead>
<tr>
<th>D-TAMCN</th>
<th>Vehicle Type</th>
<th>Radio Type/Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>D00307K</td>
<td><img src="image1.png" alt="D00307K Diagram" /></td>
<td>Dual Vehicle Adaptor (DVA)</td>
</tr>
<tr>
<td>D00327K</td>
<td><img src="image2.png" alt="D00327K Diagram" /></td>
<td>Dual Vehicle Adaptor (DVA)</td>
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<tr>
<td>D00347K</td>
<td><img src="image3.png" alt="D00347K Diagram" /></td>
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<tr>
<td>D00227K</td>
<td><img src="image4.png" alt="D00227K Diagram" /></td>
<td>Single Vehicle Adaptor (SVA)</td>
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<td>D00337K</td>
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<td>Single Vehicle Adaptor (SVA)</td>
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<tr>
<td>D10017K</td>
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<td>Dual Vehicle Adaptor (DVA)</td>
</tr>
<tr>
<td>D10027K</td>
<td><img src="image7.png" alt="D10027K Diagram" /></td>
<td>Dual Vehicle Adaptor (DVA)</td>
</tr>
<tr>
<td>All Other</td>
<td>MTVR, LVSR, etc.</td>
<td>Single Vehicle Adaptor (SVA)</td>
</tr>
</tbody>
</table>
Vehicle Battery Support

Been around for a long time
Vehicle Battery Support

- Challenges
  - Vehicle battery preventive corrective maintenance not taught in formal schools
  - Use of battery consignment programs
  - Replacement costs are hidden from the user
Vehicle Battery Support

- Marine Corps efforts
  - Continue to procure/field battery maintenance equipment
  - Continue to provide on-site training
  - Introduction at formal schools
Marine Net

Five Phases of the Battery Maintenance Management Plan

Dispose of Batteries

Batteries that you deem unrecovarable (Code H) must be disposed of properly. You are responsible for packaging lead acid batteries for turn in to the local Defense Utilization and Marketing Office (DUMO) or for pick up through the Vehicle Battery Consignment Program (VBCP).

References:
- SOP chapter 9 - Battery Charging and Battery Shop Operations

Click the icon to access the SOP and review this section.

Click the NEXT button to continue.
Expeditionary Power Systems

www.marcorsyscom.usmc.mil/sites/pmepps
QUESTIONS

- Use picture...
- Get Quantity compared to other tactical equipment (rifles, pistols, etc.)
- Note the lack of training on radios compared to other high-density assets.

Operations in Afghanistan, August 2008