

***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**



# Tactical Communications Modernization Program

- **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 =

	<u>PRE-OIF</u>	<u>TCM AAO</u>
PRC-117	0	9,817
PRC-150	?	4,957
PRC-152	0	8,387*
PRC-153	0	49,360

\* Note: Does not include 13,653 DVA's and 15,068 SVA's



# Tactical Communications Modernization Program Phase 1

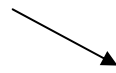


Single Vehicle Adapter (SVA)



Dual Vehicle Adapter (DVA)

AN/PRC-153  
IISR



AN/PRC-152



AN/PRC-117F



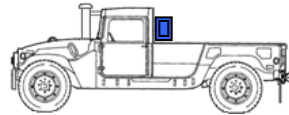
AN/PRC-150





# Tactical Communications Modernization Program

## Co HQ (x3/Bn)



Mounted in M998A1

## 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

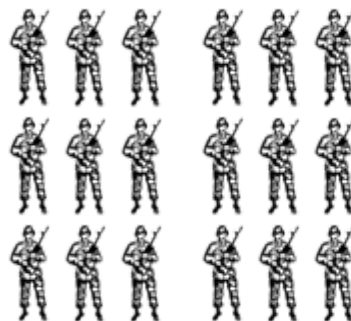
## RFL Plt (x3/Co x9/Bn)



## WPNS Plt (x3/Bn)



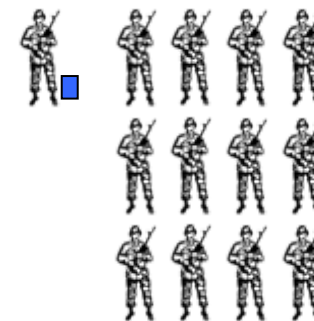
### MG Sect



### Mortar Sect



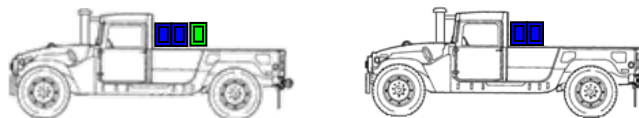
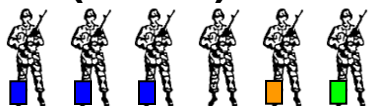
### Assault Sect





# Tactical Communications Modernization Program

Co HQ (x3/Bn)



Mounted in M1123A2s

## 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

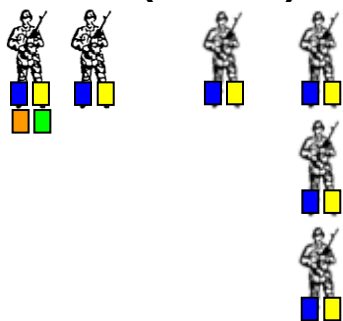
\*Corpsman IISR counted in H&S

RFL Plt (x3/Co x9/Bn)



“98” RFL  
Companies  
not counting  
MARCENT

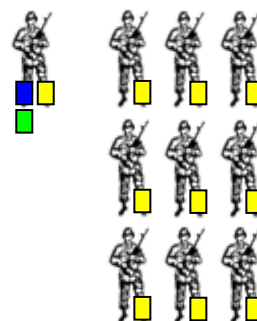
WPNS Plt (x3/Bn)



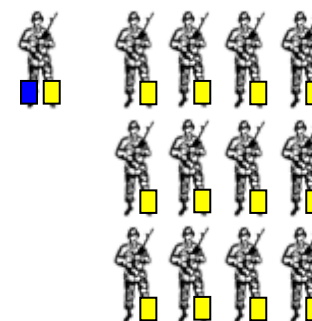
MG Sect



Mortar Sect



Assault Sect





# 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

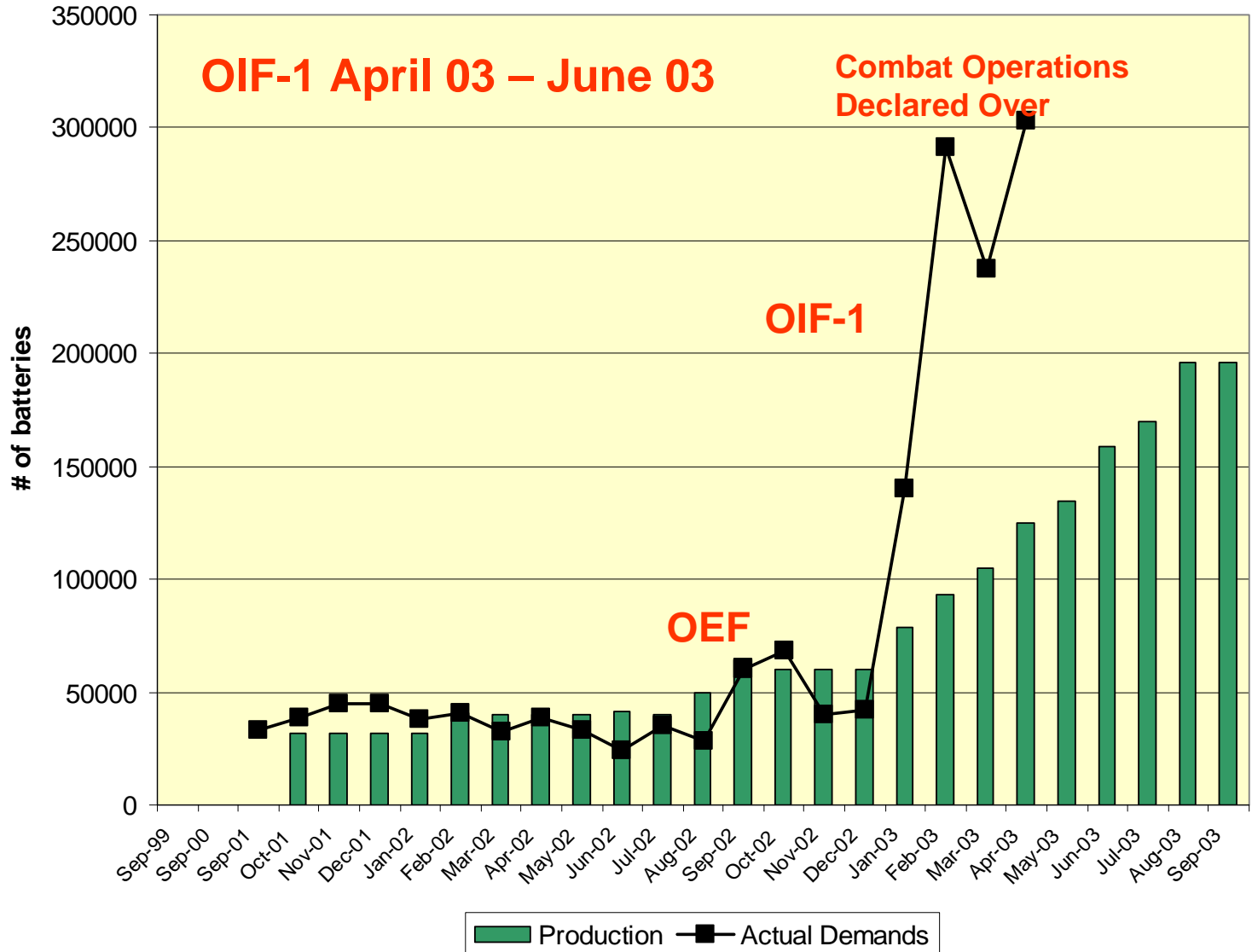


BA-8180





# BA-5590/U MONTHLY Battery Demands





# PM EPS Current Inventory

- **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

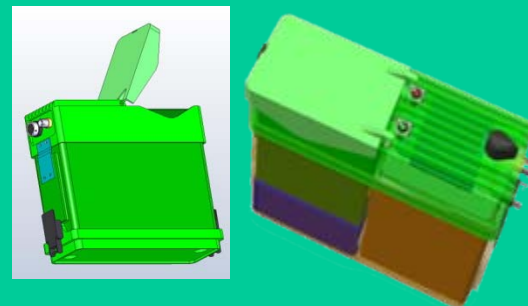
Power PRC-148,  
PRC-152 and  
PRC-153 from  
XX90 battery

### 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



# QP-1800 Inverter





# 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



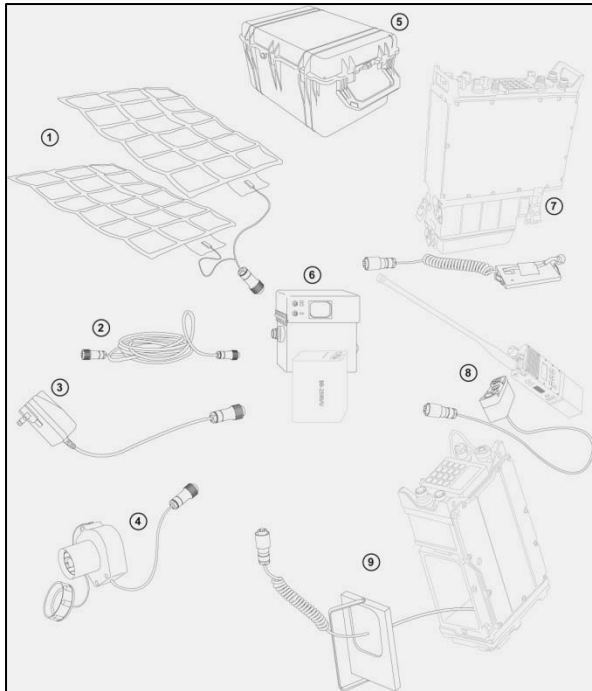
# Renewable Energy for the Small Tactical Unit



Under Development



# SOLAR PORTABLE ALTERNATIVE COMMUNICATION EQUIPMENT SYSTEM (SPACES) & MULTIPURPOSE SOLAR DEVICE (MSD)



## Notional Multipurpose Solar Device (MSD) Kit

- 1) Solar Panel(s)
- 2) Power Cord
- 3) AC Adapter Cord
- 4) NATO Adapter Cord
- 5) 12V DC Car Adapter
- 6) Zinc Air Battery Adapter
- 7) Waterproof Case
- 8) Power Manager
- 12) Two-wire Output Cable



## 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](mailto:pm_eps@nmci.usmc.mil)

**POWER FOR MANPACKED  
RADIO COMMUNICATIONS EQUIPMENT**



**" IN EVERY CLIME AND PLACE "**



# Every Marine a Radio Operator

## TRAINING REMAINS A CHALLENGE

Welcome to the USMC Distance Learning Training - Microsoft Internet Explorer

### Power Management: Communication Equipment Operators

Menu Resources Help Audio Replay Show Text Back Next Exit

**Topic Title**  
Charging Procedures

While these battery charging procedures can be followed with any type of rechargeable battery, we will focus on one of the most widely used batteries, the BB-390. To learn the procedures, click each step in the bulleted text.

Battery Charging Procedures:

- [Step 1: Purge your stocks](#)
- [Step 2: Perform quick checks](#)
- [Step 3: Condition batteries](#)
- [Step 4: Record charge/recharge cycle](#)
- [Step 5: Properly transport and store](#)
- [Step 6: Conduct PM](#)
- [Step 7: Perform corrective Maintenance](#)
- [Step 8: Manage rechargeable stocks](#)
- [Step 9: Conduct dual battery swaps](#)



Click the NEXT button to continue.

**Power Management for Communication Equipment Operators.**

**Available at [www.marinenet.com](http://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**



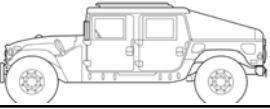
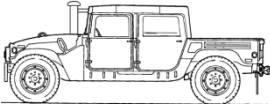
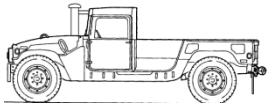

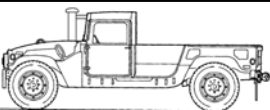
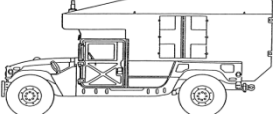

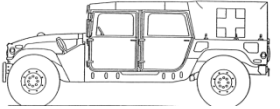







# THHR Vehicle Adaptor

TCM Methodology

D-TAMCN	Vehicle Type	Radio Type/Configuration	
D00307K		Dual Vehicle Adaptor (DVA)	
D00327K		Dual Vehicle Adaptor (DVA)	
D00347K		Dual Vehicle Adaptor (DVA)	
D00227K		Single Vehicle Adaptor (SVA)	
D00337K		Single Vehicle Adaptor (SVA)	
D10017K		Dual Vehicle Adaptor (DVA)	
D10027K		Dual Vehicle Adaptor (DVA)	
All Other	<b>MTVR, LVSF, etc.</b>	Single Vehicle Adaptor (SVA)	



# 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

Welcome to the USMC Distance Learning Training - Microsoft Internet Explorer

## Automotive Battery Maintenance Management: Motor Transport Officers and SNCOs

ARMASAFE BATTSHOP



Menu Resources Help Audio Replay Show Text Back Next Exit

### Five Phases of the Battery Maintenance Management Plan



#### Dispose of Batteries

Batteries that you deem unrecoverable (Code H) must be disposed of properly. You are responsible for packaging lead acid batteries for turn in to the local Defense Reutilization and Marketing Office (DRMO) 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



Battery Management

Lighting & Power Distribution



Mobile Electric Power



Environmental Control Equipment



Advanced Power Sources



Cargo Containers



Policy



Training Tool



Reference Data



Safety Messages



PQDR & Warranty



Field Service Reps

**Mission Statement**  
*To be the Marine Corps source for development, acquisition, testing, systems integration, product improvement, fielding, and life cycle support of power and environmental control units and cargo containers.*

[www.marcomsyscom.usmc.mil/sites/pmeps](http://www.marcomsyscom.usmc.mil/sites/pmeps)



# QUESTIONS ?



*Operations in Afghanistan, August 2008*