

Headquarters
Eighth Army
Unit #15236
APO AP 96205-5236

Army in Korea
Pamphlet 750-9

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Maintenance of Supplies and Equipment

BATTERY MANAGEMENT PROGRAM

***This pamphlet is the first edition.**

FOR THE COMMANDER:

TOMMY R. MIZE
Colonel, GS
Chief of Staff

OFFICIAL:



GARRIE BARNES
Chief, Publications and
Records Management

Summary. This pamphlet provides guidance and establishes policies, responsibilities, and procedures for Eighth Army units, Major Subordinate Commands, assigned units, and attached units.

Applicability. This pamphlet applies to all Army units in the Korea Theater of Operations that possess equipment that rely on batteries to operate, including Communication and Electronics (C&E) equipments.

Supplementation. Supplementation of this pamphlet and establishment of command and local forms are prohibited unless prior approval is obtained from the Eighth Army, G4 (EAGD), Unit #15236, APO AP 96205-5236.

Forms. AK forms are available at http://8tharmy.korea.army.mil/g1_ag/.

Records Management. Records created as a result of processes prescribed by this pamphlet must be identified, maintained, and disposed of according to AR 25-400-2. Record titles and descriptions are available on the Army Record Information Management System (ARIMS) website at <https://www.arims.army.mil/>.

Suggested Improvements. Users of this pamphlet are invited to send comments and suggestions for improvement on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to Eighth Army, G4 (EAGD), Unit #15236, APO AP 96205-5236.

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Chapter 1

Introduction

1-1. Purpose

To provide guidance and set procedures for the use and maintenance of military and commercial standard non-rechargeable batteries, rechargeable, or reusable batteries within Eighth Army (8A) in accordance with (IAW) Department Army (DA) guidance. See appendix B, DA Policy of Rechargeable Battery Implementation and appendix C, DA Policy of Automotive Lead-Acid Battery Management.

1-2. References

Required and related publications are listed in appendix A.

1-3. Explanation of Abbreviations

Abbreviations used in this pamphlet are explained in the glossary.

1-4. General. The 8A Battery Management Program involves improving the existing technology to extend vehicle (lead-acid) and Communication-Electronic (C&E) dry cell battery life. Life cycle will improve in a variety of ways including adding additives in the electrolyte to slow the discharge rate in vehicle lead-acid batteries to using rechargeable C&E batteries for all training, garrison activities.

1-5. Responsibilities

a. Eighth Army G4:

(1) Prescribe policy, assign responsibility, and establish procedures for the 8A Battery Management Program.

(2) Responsible for supervising the program, to include recommending and approving changes, additions to the program, and conducting periodic reviews and analysis.

(3) Responsible for tracking battery expenditures within the Korea Theater of Operations (KTO) and providing data pertaining to the total quantity and total dollars spent for all battery on a monthly bases by National Stock Number (NSNs) and Major Subordinate Commands (MSCs). Provides and briefs the data during the 8A Monthly Sustainment Readiness Reviews (MSRR) when requested. A sample of the monthly battery MSRR expenditure report and power point slide are in Appendix D, Sample Monthly Battery Expenditure Reports and Slides from 8A G4.

(4) Include Battery Management Program as an inspectable area during each 8A Command Inspection Program (CIP).

(5) Coordinate battery related issues with Tank-Automotive Command, Communications Electronics Command, and Army Service Component Command representatives and provide updated information to 8A units.

b. Major Subordinate Commands:

(1) Responsible for supervising the program for all units assigned to or attached.

(2) Establish a Battery Management Program IAW this pamphlet.

(3) Ensure subordinate units establish a Standard Operating Procedure (SOP) to include battery shop operations.

(4) Appoint in writing, a primary and alternate Battery Management Program Manager.

(5) Include Battery Management Program as an inspectable area during each CIP.

(6) Provide subordinate units with annual battery expenditure targets; monitor, review, and analyze battery expenditures. Calculate annual battery expenditure targets based on previous Fiscal Year monthly average expenditures. Annually each October, re-establish expendable targets.

(7) Monitor and ensure units use rechargeable battery IAW DA Rechargeable Battery Implementation policy, Appendix B.

c. Battalion and unit Commanders:

(1) Maintain overall responsibility for enforcing a safe, effective and efficient battery management program.

(2) Establish a Battery Management Program IAW this pamphlet.

(3) Develop a SOP.

(4) Appoint in writing, a primary and alternate Battery Management Program Manager.

(5) Ensure to install battery mats on all vehicle and generator battery boxes.

(6) Conduct semi-annual battery management training.

(7) Establish a baseline requirement for primary and rechargeable batteries and maintain accountability of quantities on hand.

(8) Establish specific control on requisitioning procedures to prevent excessive battery request.

(9) Establish annual battery expenditure targets; monitor, review, and analyze the unit battery expenditures. Calculate annual battery expenditure targets from previous Fiscal Year monthly average expenditures. Annually each October, re-establish expendable targets.

Chapter 2 Policy and Procedures

2-1. Battery Maintenance Training

a. Integrate unit Battery Maintenance training into operator vehicle, generator, and communications/electronics equipment training that require batteries for operations.

b. Accomplish as part of the new personal initial and semi-annual operator training.

c. 19th Expeditionary Sustainment Command and 2d Infantry Division battery shop supervisor conduct semi-annual battery shop operations training.

d. Units maintain a record of all completed training for two years.

2-2. Primary and Rechargeable Battery Requirements

a. Primary battery requirements.

(1) Commanders determine unit baseline requirements for each type of primary battery for combat basic load and the required quantity will maintain on hand or on a valid requisition.

(2) Combat basic load for primary batteries refers to the quantity and type of batteries required to operate all equipment series on hand for the first 24-hours of combat operations.

(3) Table 1-1 of SB 11-6 provides specific data regarding primary battery types and quantities by end item equipment.

(4) Use appendix F, Power Website Program, to calculate the required quantity that a unit needs to establish as combat basic load.

b. Rechargeable battery.

(1) Required on hand quantity of rechargeable batteries is at least three batteries (or set) for each piece of equipment to have one battery in equipment, one battery charging, and one battery in transit. In units with charging station located far from the users, a maintaining a fourth battery is recommended.

(2) Commanders determine the number of chargers and adapters required based upon the number of rechargeable batteries needed to sustain unit operations.

2-3. Lead Acid Storage Battery

a. Units do not order or stock dry lead acid type batteries on Shop Stock. Wet charged batteries are the only authorized batteries for units to request or stock on Shop Stock.

b. With the exception of the Materiel Support Command-Korea (MSC-K) RIC (WET) and Alpha Company 302d Brigade Support Battalion RIC (WCC), no Supply Support Activity (SSA) is authorized to stock dry lead acid type batteries on Authorized Stockage List (ASL).

c. MSC-K at Camp Carroll, Bravo Company, 302d Brigade Support Battalion, and 2ID at Camp Casey commercial contract battery shops are authorized to perform out-of-vehicle battery charging. Unit mechanics are not authorized to conduct out-of-vehicle battery charging IAW DA message, Appendix C, DA Policy of Automotive Lead-Acid Battery Management.

d. 19th Expeditionary Sustainment Command and 2d Infantry Division (include BATTCAVE) will report their monthly battery shop production report to 8A G4, Battery Management Program Manager, ATTN: EAGD-OMR by 5th of each month. Figure 2-1 is a sample reporting format.

CONDITION CODE: A (NEW)		QTY	CONDITION CODE: F (Unserviceable)		QTY
RECEIVED	HAWKER BATTERY		RECEIVED	HAWKER BATTERY	
	EXIDE BATTERY			EXIDE BATTERY	
	OTHERS			OTHERS	
COMPLETED (Recharged)	HAWKER BATTERY		COMPLETED (Recharged)	HAWKER BATTERY	
	EXIDE BATTERY			EXIDE BATTERY	
	OTHERS			OTHERS	
CONDEMNED (Washed-Out)	HAWKER BATTERY		CONDEMNED (Washed-Out)	HAWKER BATTERY	
	EXIDE BATTERY			EXIDE BATTERY	
	OTHERS			OTHERS	

Figure 2-1. Sample Monthly Battery Shop Production Report

2-4. Standard Operating Procedures (SOP)

a. Units must establish a battery management plan and SOP IAW AR 750-1 and this pamphlet. Appendix K is an example of Battery Management Program SOP.

b. SOPs must include the following:

(1) Which primary communications and electronics batteries the units currently use and which rechargeable batteries to use instead of the primary batteries.

(2) The number of primary and rechargeable C&E batteries required annually for supporting the equipment on hand.

(3) The number of chargers required for supporting the equipment on hand.

(4) How best to logistically support the recharging of these batteries.

(5) Barriers to using rechargeable batteries and what actions will be taken to eliminate the barriers.

(6) Duties and responsibilities of Soldiers relating to the use and management of rechargeable batteries.

(7) The proper use, care, and maintenance of rechargeable batteries.

(8) Location using large number of primary batteries should develop a lithium (disposable) battery recovery and reuse program.

2-5. Assistance and Additional Information

a. 8A point of contact is 8A Support Operation Materiel Readiness Branch, 723-4430.

b. CECOM established a website home page which is a joint product of Combined Arms Support Command (CASCOM) and the CECOM Power Source Team. The web site includes information on batteries and chargers, lessons learned feedback from users worldwide, and new battery and charger system. The CECOM Web Site: <http://battery.army.mil/>.

Appendix A References

AR 200-1, Environmental Protection and Enhancement, 13 December 2007

AR 710-2, Supply Policy below the National Level, 28 March 2008

AR 725-50, Requisitioning, Receipt, and Issue System, 15 November 1995

AR 750-1, Army Materiel Maintenance Policy, 12 September 2013

DA PAM 710-2-1, Using Unit Supply System (Manual Procedures), 31 December 1997

DA PAM 710-2-2, Supply Support Activity Supply System: Manual Procedures, 30 September 1998

DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual, 22 August 2005

SB 11-6, FSC Class 6135 Primary Battery Supply and Management, 15 February 2010

TB 43-0134, Battery Disposition and Disposal, 19 May 2008

TM 11-6140-200-13, Operator's and Field Maintenance for Automotive Lead-Acid Storage Batteries, May 2011

10 & 20 Level Technical Manuals (TMs) for assigned vehicles and equipment

DA Rechargeable Battery Implementation Policy, 10 July 2003

DA Automotive Lead-Acid Battery Management Policy, 24 May 2002

Appendix B

DA Policy of Rechargeable Battery Implementation

SUBJECT: Rechargeable Battery Implementation Policy

10 July 2003

1. This memorandum reiterates and clarifies existing policy memorandum, subject as above, dated 29 Aug 97, that requires the use of rechargeable communications/electronics (C&E) batteries for military operations including training and garrison duty. The following guidance is applicable:

a. All units (except those that use less than 12 batteries per year) will use rechargeable C&E batteries for garrison duty and training (to include training at the Combat Training Centers) and shall develop Rechargeable Battery Standard Operating Procedures (SOPs). Peacekeeping operations shall also maximize use of rechargeable batteries where the commander deems appropriate. In addition, rechargeable batteries and their logistics planning shall be incorporated into units' training as a viable alternative power source during wartime.

b. Funding for rechargeable batteries and chargers will come from the unit's Operation and Maintenance Army (OMA) funds. While rechargeable batteries are initially more expensive than primary (non-rechargeable) batteries, their use over time results in significant savings. In addition, rechargeables reduce a unit's logistic footprint, reduce a unit's operating costs, improve safety in transport and disposal, and provide power independence for the front line War Fighter when primary batteries are in short supply. Initial costs should be recovered during the first few months of use. Replenishment of rechargeable batteries should be phased in over an extended period of time to minimize the impact on the unit's OMA funds. Using rechargeable batteries will not affect the supply or distribution of primary batteries but will significantly reduce their consumption and battery related Operations and Support costs.

c. Recharging and resupply of rechargeable batteries will be accomplished using existing unit funds and shall be coordinated with the unit's S4, S6, and/or Communication's Platoons.

d. Battalion level units and above must establish a battery management plan and SOPs. Guidance for preparing the plan is available on the United States Army Communications Electronics Command (USACECOM) website: <http://www.monmouth.army.mil/cecom/lrc/lrchq/power/rechargebat.html>. The information on the website is a joint product of Combined Arms Support Command (CASCOM) and the Communications Electronics Command (CECOM) Power Source Team. It also includes information on batteries and chargers, lessons learned, feedback from users worldwide, and new battery and charger systems. The plans and SOPs must include the following:

(1) Which primary C-E batteries the units currently use and which rechargeable batteries to use instead of the primary.

(2) The number of primary and rechargeable communications and electronics batteries required annually for supporting the equipment on hand.

(3) The number of chargers required for supporting the equipment on hand.

(4) How best to logistically support the recharging of these batteries.

(5) Barriers to using rechargeable batteries and what actions will be taken to eliminate the barriers.

(6) Duties and responsibilities of soldiers relating to the use and management of rechargeable batteries.

(7) The proper use, care, and maintenance of rechargeable batteries.

(8) Locations using large numbers of primary batteries should develop a lithium (disposable) battery recovery and reuse program.

2. Exceptions to this policy:

a. This policy does not apply to a unit's frontline wartime operations. Rechargeable use during wartime at Tactical Operations Centers, support units, and rear echelons is strongly encouraged in order to free critical primary assets for frontline units.

b. When the temperature exceeds the operational temperature range for rechargeable batteries, -4°F to 122°F, primary batteries will be used.

c. Primary batteries will be used when recharging is not practical such as when the time between re-supply actions requires users to stock an excessive amount of rechargeable batteries.

3. In an effort to reduce consumption, the Deputy Assistant Secretary of the Army for Integrated Logistics Support (DASA (ILS)), in cooperation with the Office of the Deputy Chief of Staff, G-4 (ODCS, G-4), will also add power generation and power consumption issues to the ILS Checklist to aid the Army Independent Logistician, Program Executive Officers/Program Managers, and Army Research and Development centers in assessing their product support strategies. Entries will include:

a. Have trade-off analyses been conducted to evaluate the use of embedded battery chargers?

b. Does the system design incorporate the use of long life or rechargeable batteries?

c. Has the system design considered the use of built in power indicators?

4. This policy shall be disseminated to all subordinate activities. Subordinate elements shall obtain the information listed on the USACECOM website and use it as part of their daily management tools.

5. Point of contact for this action is Mr. Kris Keydel, Commercial (CML) (703) 614-3914, DSN 224-3914, e-mail: kris.keydel@hqda.army.mil. Technical questions should be addressed to Mr. Don Brockel, CECOM, CML (732) 532-4948, DSN 992-4948, e-mail: donald.brockel@mail1.monmouth.army.mil. Logistics questions should be addressed to Mr. Chris Cigal, CASCOM, CML (804) 730-2406, DSN 687-2406, e-mail: cigalc@lee.army.mil.

LLOYD T. WATERMAN
Brigadier General, GS
Director of Sustainment

Appendix C

DA Policy on Automotive Lead-Acid Battery Management

Sent: Friday, May 24, 2002 7:47 AM

Subject: New Automotive Lead-Acid Battery Maintenance Policy

- A. DALO-SMM 211616z Nov 79 Management of Lead-Acid Batteries
- B. Lead-Acid Battery Meeting Hosted By DALO-SMR Aug 99 Wash DC
- C. Automotive Lead-Acid Battery Maintenance Summit Hosted by CASCOM/DCD-ORD Nov 99
- D. Battery Meeting Hosted by III CORPS 8-9 Feb 00
- E. FORSCOM Battery Summit Apr 00 Fort Hood TX
- F. Technical Manual 9-6140-200-14 Sep 98
- G. Automotive Battery Maintenance Integrated Product Team (IPT) Meeting 13 Mar 01
- H. TACOM Vehicle Battery Management Office Brief to Chief of Ordnance 25 Jun 01

1. Reference a directed responsibility for batteries to different maintenance levels in peace and wartime and is rescinded.
2. Purpose of this message is to establish a new automotive lead-acid battery maintenance policy to ensure maintenance requirements, responsibilities, and procedures are consistent and aligned across the full spectrum of potential operations. This policy also supports promising emerging technologies.
3. The following automotive lead-acid battery maintenance policy, doctrine, and procedures resulted from references (above) and subsequent staffing actions.
 - a. Equipment operators/crew are responsible for visually inspecting installed lead-acid batteries for cleanliness and obvious damage (case, filler caps, battery cables, terminal posts, rust, corrosion, etc.) IAW applicable 10 technical manual. Operators/crew will report faults, using the Army maintenance management system (TAMMS), to their unit/organizational maintenance activity for action. Operator/crew will also perform required cleaning of battery compartments (after coordinating with unit/organizational maintenance for proper removal and re-installation of batteries). Local command policy may augment these actions to take climate and other circumstances into consideration.
 - b. Unit/organizational maintenance activities are authorized to perform 3a above, plus add instilled water (as required), install, remove, test, and conduct recharging of batteries installed in/on authorized equipment (using testers and chargers authorized at the organizational maintenance level). Local command policy may augment these actions to take climate and other circumstances into consideration. Applicable CONUS and host country turn-in and disposal procedures apply.
 - c. Direct support (DS) or equivalent and higher level maintenance activities retaining a battery maintenance and recovery mission are authorized to perform 3a and 3b above, plus properly fill/activate, charge/re-charge, issue/re-issue, diagnose, test, recover, and temporarily store serviceable/unserviceable batteries and related support materiel. However, this is intended to be the exception rather than the rule -- ideally, DLA consignment program or local contract will initially fill and charge batteries and issue them wet to units. Use of the DLA consignment program or other local contract is preferred and encouraged. Local command policy may augment these actions to take climate and other circumstances into consideration. Applicable CONUS and host country turn-in and disposal procedures apply.

4. If DLA consignment program or contractor support is unavailable (during or shortly after initial deployments to an area of operations), it may be desirable for a direct support (DS) or equivalent and higher level maintenance activity to temporarily operate a regulatory compliant battery shop (fixed or mobile). These maintenance activities can return unserviceable, recoverable batteries to serviceable condition and provide serviceable batteries to supply support activities (SSA) and/or supported units. If unable to return batteries to serviceable condition, applicable unit turn-in and disposal procedures apply. During initial stages of deployment, a supply of automotive batteries can accompany the unit until more sustained support (units, contractors, DLA battery consignment, etc.) can provide requisite support. Units have the authority to retain their existing battery shops, e.g., deployable ISO shelter-mounted battery shop, LIN: T09966 (or equivalent) and are not required to turn-in those battery shops at this time. However, units should ensure these battery shops are operated in an OSHA/EPA compliant manner.

5. Automotive battery maintenance tasks and safety procedures still apply.

a. Follow applicable procedures for maintaining automotive lead-acid storage batteries. This information is contained in operator, unit, direct/general support maintenance manual for lead-acid storage batteries, army technical manual 9-6140-200-14 (Sep 1988 or later). Post Scripts (PS) magazine articles and individual equipment technical manuals will continue to address automotive battery maintenance. These publications are available at <http://www.logsa.army.mil>.

b. Specific safety precautions are summarized here:

(1) Use adequate eye protection when working with automotive batteries. Do not smoke, use open flames, make sparks, or create other ignition sources near batteries. Open flames or sparks near batteries can cause an explosion.

(2) Remove all metal jewelry, i.e., rings, id tags, watches, and bracelets. If jewelry or tools contact battery terminals, a direct short will cause instant heating of the metal object, equipment damage, and injury.

(3) Do not remove batteries from vehicle battery compartment unless compartment is corroded or for battery replacement. Do not pull battery cables during visual inspection. Only unit maintenance soldiers are authorized to disconnect or replace batteries.

6. To preserve the operational integrity, efficiency, and reliability designed into military vehicles and equipment, commanders are required to use batteries prescribed by the associated Technical Manual. Additionally, commanders are encouraged to use approved battery maintainers (plug-in or solar panels are examples) to sustain battery levels during periods of extended storage or inactivity. These items may be separately purchased.

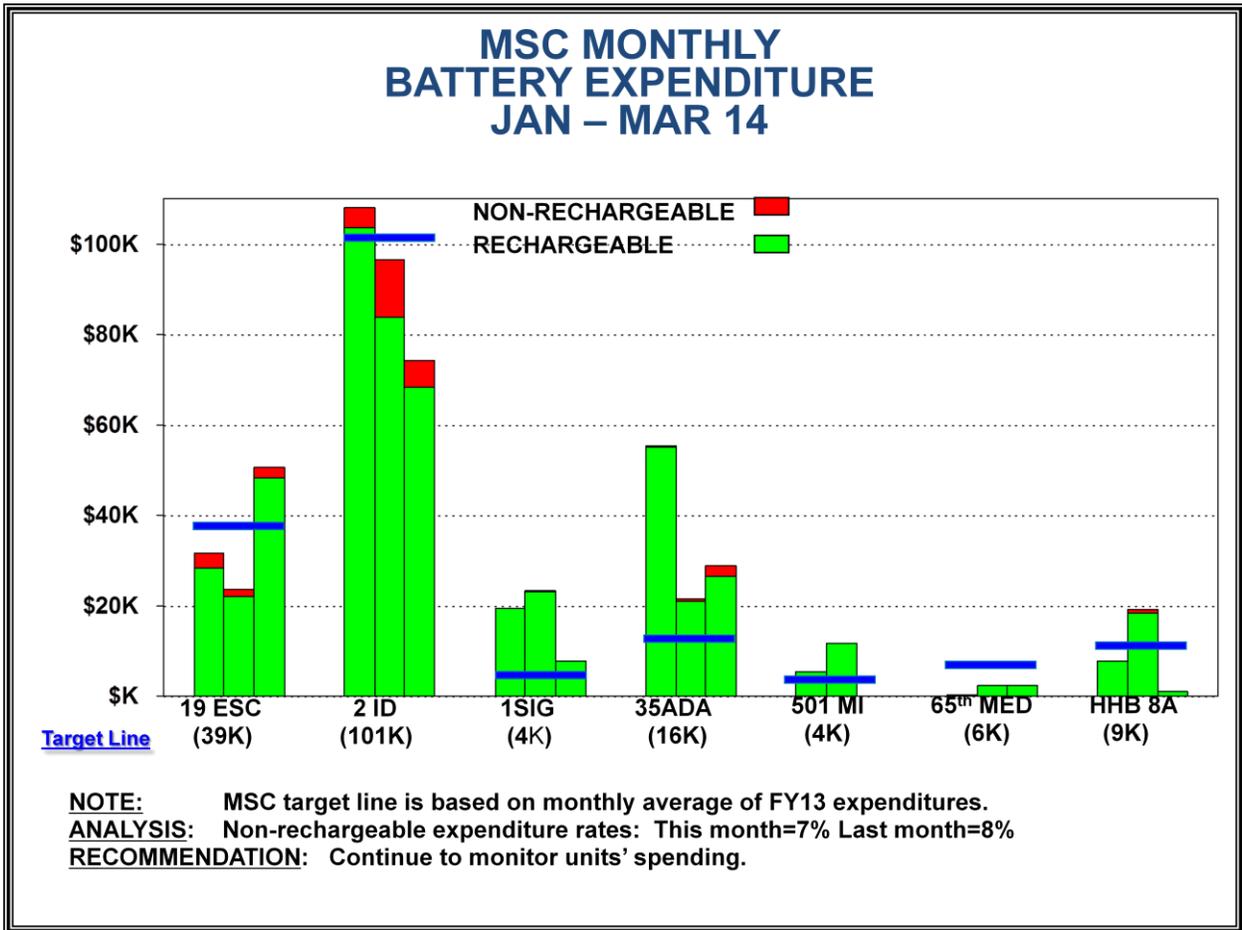
7. This message is to provide interim instructions pending updates of the appropriate official publications.

8. HQDA POC for this action is Mr. Kris Keydel, DSN 224-6423, E-MAIL; kris.keydel@hqda.army.mil. TACOM POC is Mr. Jim Miodek, DSN 786-8751, E-MAIL; miodekj@tacom.army.mil. CASCOP POC is Mr. Chad Myers, DSN 687-0760, E-MAIL; myers5@lee.army.mil.

Appendix D
Sample Monthly Battery Expenditure Reports from Eighth Army G4

docno	fsc	niin	nomen	qty	price	ext_price	DODAAC	MSC
W81G6W40630997	6140	01-485-1472	BATTERY,STORAGE	4	343.22	1,372.88	W81G6W	1ST SIG BDE
W81G6P40620006	6140	01-485-1472	BATTERY,STORAGE	2	343.22	686.44	W81G6P	1ST SIG BDE
W81G6T40770006	6140	01-485-1472	BATTERY,STORAGE	2	343.22	686.44	W81G6T	1ST SIG BDE
W81G6P40420019	6140	01-485-1472	BATTERY,STORAGE	1	343.22	343.22	W81G6P	1ST SIG BDE
W90YUN40580007	6140	01-490-4317	BATTERY,STORAGE	5	246.54	1,232.70	W90YUN	1ST SIG BDE
						4,321.68		
W81P9P40794002	6135	00-835-7210	BATTERY (1) NONRECH	1	8.81	8.81	W81P9P	35TH ADA BDE
W81P9P40734002	6135	00-900-2139	BATTERY,NONRECHARGE	7	11.17	78.19	W81P9P	35TH ADA BDE
W81P9P40794003	6135	00-900-2139	BATTERY,NONRECHARGE	1	11.17	11.17	W81P9P	35TH ADA BDE
W81P9P40734001	6135	00-900-2139	BATTERY,NONRECHARGE	7	11.17	78.19	W81P9P	35TH ADA BDE
						176.36		
W81K7540629000	6140	01-374-2243	BATTERY,STORAGE	1	165.46	165.46	W81K75	35TH ADA BDE
W801C040719007	6140	01-378-8232	BATTERY,STORAGE	1	164.27	164.27	W801C0	35TH ADA BDE
W81X3N40649003	6140	01-485-1472	BATTERY,STORAGE	4	343.22	1,372.88	W81X3N	35TH ADA BDE
W81X3G40219013	6140	01-493-8357	BATTERY,STORAGE	3	322.51	967.53	W81X3G	35TH ADA BDE
						2,670.14		
W81P9P40644019	6160	01-184-0643	RETAINER,BATTERY	2	12.53	25.06	W81P9P	35TH ADA BDE
						25.06		
W81L6B40620900	6135	00-826-4798	BATTERY,NONRECHARGE	10	3.09	30.90	W81L6B	501ST MI BDE
W81JX040839001	6135	01-301-8776	BATTERY,NONRECHARGE	6	3.03	18.18	W81JX0	501ST MI BDE
						49.08		
W90P4P40700001	6135	01-214-6441	BATTERY,NONRECHARGE	1	90.86	90.86	W90P4P	65TH MED BDE
						90.86		
W90CUV40620015	6140	01-476-8945	BATTERY,STORAGE	1	476.78	476.78	W90CUV	65TH MED BDE
W90CUV40620014	6140	01-476-8945	BATTERY,STORAGE	1	476.78	476.78	W90CUV	65TH MED BDE
W90R0P40790001	6140	01-529-7226	BATTERY,STORAGE	2	171.48	342.96	W90R0P	65TH MED BDE
						1,296.52		
W90ERB40512104	6135	01-333-6101	BATTERY,NONRECHARGE	11	21.53	236.83	W90ERB	EUSA
W90ERB40512103	6135	01-398-5922	BATTERY,NONRECHARGE	11	14.82	163.02	W90ERB	EUSA
W56F0V33369001	6135	01-438-9450	BATTERY,NONRECHARGE	1	150.96	150.96	W56F0V	STB-K
						550.81		
W90E0Y40809018	6140	01-490-4313	BATTERY,STORAGE	1	96.25	96.25	W90E0Y	STB-K
						96.25		
W91YJR40620004	6140	01-378-8232	BATTERY,STORAGE	1	164.27	164.27	W91YJR	USAMC
W91YJR40690014	6140	01-485-1472	BATTERY,STORAGE	4	343.22	1,372.88	W91YJR	USAMC
W91YJR40650002	6140	01-485-1472	BATTERY,STORAGE	7	343.22	2,402.54	W91YJR	USAMC
						3,939.69		
						13,216.45		

Appendix E
 Sample Slides for Battery Expenditure



Note: Units should maintain subordinate units' battery expenditures slides on file for tracking purpose for 2 years.

Appendix F Power Website Program to calculate Combat Basic Load

POWER

What is POWER?

- POWER is a Microsoft Excel based application, enables you to better estimate battery needs.
- Simple step-by-step process.
- Relevant information is presented to assist you in making the proper choices in regards to battery type, frequency of changing the battery etc.
- After making your final choices, you will be able to save the information by adding it to a spreadsheet with the touch of a button.

Why POWER?

- POWER will tell you exactly which batteries will work in your device.
- POWER will give you runtimes for most devices.
- Many runtimes can be adjusted for temperatures.
- POWER can be used to create a Battery UBL, or just to compare different battery options and to determine which is best for a mission profile. Download: Log-in to the AK (<https://www.us.army.mil>)

POWER OPTIMIZER FOR THE WARFIGHTER'S ENERGY REQUIREMENTS
Created by USA CE-LCMC, Power Sources Team, Ft. Monmouth, NJ

Distribution authorized to U.S. Government agencies and their contractors for official use or for administrative or operational purposes only.

White Areas require user input

1) Select an End Item

Choose Item by: Item List: AN/PRC-117F, AN/PRC-119, AN/PRC-119A, AN/PRC-119C, AN/PRC-119, AN/PRC-119

POC: USA CE-LCMC, Ft. Monmouth, NJ
Ari Herman
email: ari.herman@us.army.mil
Phone: (732) 532-6763 DSN: 992-6763
Please Reference: Release Candidate 1.1. 12/19/06

The selected item is the AN/PRC-119F, Radio Set (SINGARS), . NSN: 5820-01-451-8252

2) Select the temperature conditions in which the end item will be used: Normal Temperature (10F to 122F)

Battery option(s)	Qty	Run Time	Units	Note:	Total Batt. Weight	Units
BA2590	1	33	hrs		2.3	lbs
BA5390	1	50	hrs		3.0	lbs
BB2590	1	31	hrs		3.2	lbs
BB390	1	23	hrs		3.9	lbs
BA8180	1	165	hrs		6.0	lbs

*Note: Batteries listed here may differ than those listed in the TM of some older devices. For a list of which Batteries have become obsolete, and their replacements, please see the tab labeled "Replaced"

3) Given the above options, which battery do you wish to use: BA5390

Battery	NSN	# per Package	Description	Specific Information
BA-5390AU	6135015176060	4	Battery, Non-Rechargeable, Lithium-Manganese Dioxide	WITH SOCI
BA-5390U	6135015010833	4	Battery, Non-Rechargeable, Lithium-Manganese Dioxide	WITHOUT SOCI

4) Choose which version you wish to use: BA-5390AU

5) The BA5390 is estimated to last 49.5 hrs in the AN/PRC-119F, Radio Set (SINGARS), at Normal Temperature (10F to 122F)
The battery will be swapped out after.... 48 hrs of use
You are using 97% of the battery's total estimated capacity

6) Input the number of AN/PRC-119F to be powered: 43 devices

7) Input the number of hours per day the end item will be in operation: 24 hrs

Steps 8 and 9 are for rechargeable batteries only.
For more information on rechargeable batteries and chargers see the tab labeled "Rechargeable Info"

8) How frequently will the warfighter be resupplied with charged batteries? ... Every: 9 hrs

9) What is the TOTAL number of rechargeable batteries that will be needed to support operations for EACH device? (e.g. add 1 for the device, 1 for backup, 1 in transit etc.): 4

Battery	Battery NSN	Batt. per package	# of devices	Device
BA-5390AU	6135-01-517-6060	4	43	AN/PRC-119F

Minimum Requirements

	# of Batteries	# Pkg to order	Total Weight (lbs)
1 day mission	43	10.8	129.0
3 day mission	86	21.5	258.0
30 day mission	645	161.3	1,935.0

To download: Log-in to AKO and type <https://www.us.army.mil/suite/doc/5859304> into the address bar and choose the option to **save** the file.

Appendix G
Vehicle Battery and Chargers NSN

Vehicle Battery and Chargers NSN

- 2HN:** 12 Volt, NSN 6140-00-057-2553 (Dry Charged)
12 Volt, NSN 6140-01-390-1969 (Wet Charged)
12 Volt, GE 45 A Gel, NSN 6140-01-446-9554. Authorized for MSE Shelter
- 4HN:** 24 Volt, NSN 6140-00-059-3528 (Dry Charged)
24 Volt, NSN 6140-01-374-5802 (DLA Dry Charged)
24 Volt, NSN n6140-01-390-1968 (Wet Charged)
- 6TL:** 12 Volt, NSN 6140-01-210-1964 (Dry Charged)
12 Volt, NSN 6140-01-051-4900 (Wet Charged)
12 Volt, NSN 6140-01-051-7795 (DLA Wet Charged)
- 6TLFP:** 12 Volt, NSN 6140-01-431-1172 (Over packed)
12 Volt, NSN 6140-01-441-1697 (Wet Charged)
- 6TMF:** 12 Volt, NSN 6140-01-446-9498 (Dry Charged, Over packed)
12 Volt, NSN 6140-01-446-9506 (Wet Charged) Type III
12 Volt, NSN 6140-01-469-9184 (W/O Acid Over packed)
- GEL:** German, NSN 6140-12-190-9027
US, NSN 6140-01-439-0616
Authorized in FOX vehicle only
- Optima:** NSN 6140-01-457-4339, 875 CCA/120RC "800U"
Used on Generator only, i.e. 3Kw, 5Kw, etc.

Hand Held Battery Testers:

- Medtronic's** Micro400, NSN 6625-01-433-6786
Micro450, NSN 6625-01-454-0821
Micro500, NSN 6625-01-466-1075
- Snap On** YA201, NSN 6130-01-447-7294
MBT-1, NSN 6130-01-463-8499

Battery Chargers:

Battery Charger w/NATO Connector: NSN 6130-01-446-4132

Single Charger
NSN: 6130-01-447-1815

Multi-Charger
6130-01-443-3557

Gel Battery Charger
6130-01-454-2015

AA Charging on a Standard Army Charger

AA Charging on a Standard Army Charger

- Charges any commercial NiMH AA Batteries.
- Provides NiMH AA battery charging from the PP-8498/U, Standard Army Charger.
- NSN: 5940-01-493-7622; \$84.42
- Available: Now



**PP-8498/U- Soldier Portable Charger
NSN# 6130-01-495-2839= \$1,855**

**Extended Mission Times
Lighter Soldier Loads
Reduced Logistics
Lower Costs**

Questions about the rechargeable program call:
Don Brockel at CECOM: DSN 992-4948 (732) 532-4948 or
e-mail CECOM: donald.brockel@us.army.mil
CECOM also has a website for the latest battery information at:
www.monmouth.army.mil/cecom/lrc/lrchq/power/rechargebat.html

**Appendix I
Rechargeable Battery Program**

US ARMY RECHARGEABLE BATTERY PROGRAM
CECOM, Ft. Monmouth, NJ
Transforming The ARMY...one charge at a time.

<u>End item example</u>	<u>Battery NSNs:</u>	<u>Required Adapters for PP-8444 or PP-8498</u>	<u>Adapter NSN</u>
SINGGARS, M22,	6140-01-490-4316	AP-2590/390 (J-6358B/P)	5940-01-501-3312
SINGGARS, M22, javelin, ++	6140-01-490-4317	AP-2590/390 (J-6358B/P)	5940-01-501-3312
AN/PRC-126	6140-01-490-4313	AP-388 (J-6357A/P)	5940-01-493-6388
MELIOS. AN/PVS-6	6140-01-419-8191	AP-516 (J-6356/P)	5940-01-427-9183
Dragon Thermal sight	6140-01-419-8193	AP-503 (J-6355/P)	5940-01-427-9247
TWS, AN/PAS-13	6140-01-493-8092	AP-2847 (J-6354/P)	5940-01-427-9278
REMBASS	6140-01-071-5070	AP-557 (J-6523A/P)	5940-01-492-7238
HTU	6140-01-490-4311	AP-2600 (J-6521/P)	5940-01-467-8813
PLGR, CAM...	6140-01-490-5372	AP-2800 (J-6587/P)	5940-01-493-6750
Any Nickel metal Hydride AA	n/a	AP-AA (J-6589/P)	5940-01-493-7622
AN/PRC-148	6140-01-487-1153	NEW FOR PP-8498 ONLY:	5940-01-493-6751

BA-5800 alternative: "AA" adapter which holds 8 "AAs": NSN: 6160-01-385-4358, \$10.96, *Does not work in CAM!*

Chargers

<u>Description</u>	<u>NSN</u>	<u>COMMENTS #1</u>	<u>COMMENTS #2</u>
Universal battery charger		Should order PP-8498	Chargers 2 bats / 2 hrs
Soldier Portable Charger	6130-01-495-2839	Holds 4 adapters = 8 batteries	Uses same adapters as 8444
Charge on The Move	6130-01-527-2726	Holds 4 B-390/2590s	+MBITR, 2800, 516,388,2847

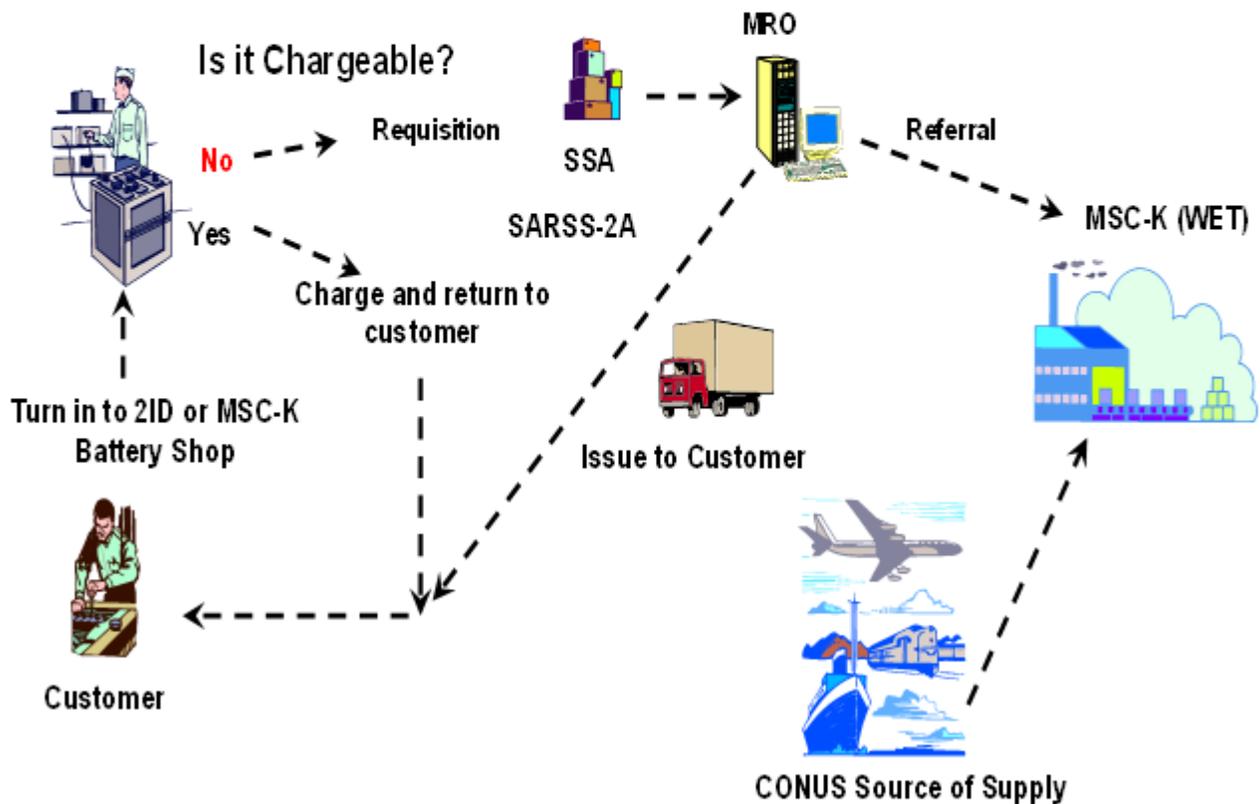
Charger ancillary devices and Other Key items.

<u>Description</u>	<u>NSN</u>	<u>COMMENTS #1</u>	<u>COMMENTS #2</u>
DC cable: PP-8498 & 8444 to power 2 PP-8444s (DC)	5940-01-501-6714	24 volt, vehicle DC cable	Uses 24 v Nato Slave outlet
to power 2 PP-8444s (DC)	5995-01-491-8634	power 2, 8444s from DC	only connects to J-6362A/U
to power 2 PP-8498s (DC)	5995-01-505-7883	power 2, 8498s from DC	only connects to J-6362A/U
BB-390, Self discharge cap	6130-01-490-4310	conditions your BB-390's	Plus, quick check
COTM bulk adapter/2847	5940-01-468-0314	Hold 5 BB-2847s	Sequences to next bat

**Questions about the rechargeable program call:
 Don Brockel at CECOM: DSN 992-4948 (732) 532-4948 or
 e-mail CECOM: donald.brockel@us.army.mil
 CECOM also has a website for the latest battery information at:
www.monmouth.army.mil/cecom/lrc/lrchq/power/rechargebat.html**

Vehicle Battery Flow -Chart

● Only Wet or Hawker Batteries



8A Vehicle Battery Flow Chart
 Questions about this chart call:
8A SPO Materiel Readiness Branch 723-4430

Appendix K

Sample of Battery Management Program SOP

1. GENERAL

This appendix establishes policies and assigns responsibilities for XXX BDE Unit Battery Management Programs. The XXX BDE battery management program provides guidance on the use and maintenance of standard batteries and rechargeable/reusable batteries.

This program involves improving the existing technology to extend vehicle (lead-acid) and C-E (dry cell) battery life. This ranges from additives in the electrolyte to slow the discharge rate in vehicle lead-acid batteries to using rechargeable C-E batteries for all training, garrison activities and Operations Other Than War (OOTW).

2. REFERENCES:

- a. AR 750-1, Army Materiel Maintenance Policy and Retail Maintenance Operations, 20 September 2013.
- b. SB 11-6, FSC Class 6135 Primary Battery Supply and Management, 1 June 2003.
- c. TM 9-6140-200-14, Operator's, Unit, Direct Support and General Support Maintenance Manual for Lead-Acid Storage Batteries, 11 SEP 98
- d. 10 & 20 Level Technical Manuals (TMs) for assigned vehicles and equipment.
- e. TB 43-0134, Battery Disposition and Disposal, 1 October 1996.
- f. AR 200-1, Environmental Protection and Enhancement, 23 April 1993.
- g. Rechargeable Battery Implementation Policy, 10 July 2003.
- f. New Automotive Lead-Acid Battery Maintenance Policy, 24 May 2003.

3. RESPONSIBILITIES

- a. Brigade Support Operations (SPO) will:
 - (1) Be responsible for overall supervision of the program for the units assigned to and attached to MSC.
 - (2) Establish a Battery Management Program in according with (IAW) this regulation.
 - (3) Ensure subordinate units establish a Standard Operating Procedure (SOP) include battery shop operations.
 - (4) Include Battery Management Program in Command Inspection Program (CIP).
- b. Commanders will:
 - (1) Have overall responsibility for an effective and efficient battery management program within their unit.

- (2) Establish a Battery Management Program.
- (3) Develop a unit Standard Operating Procedure (SOP)
- (4) Appointing in writing, a primary and alternate Battery Management Program Manager.
- (5) Ensure battery mats are installed on all vehicles and generators battery box.
- (6) Conduct semi-annual Battery Management Training.
- (7) Establish a baseline requirement for primary and rechargeable batteries and maintain accountability of quantities on hand.
- (8) Establish specific control on requisitioning procedures to prevent all unnecessary ordering from operators.
- (9) Establish annual battery expenditure targets and monitor, review and analyze the unit battery expenditures.

4. BATTERY MAINTENANCE TRAINING

- a. Units will integrate Battery Maintenance training into operator training on all vehicles, generators and communications/electronics battery.
- b. This will be accomplished as part of the initial training of new personnel and semi-annually for all operators.
- c. Units will conduct semi-annual battery shop operations training to shop personnel.

5. PRIMARY BATTERY

- a. Commanders will determine unit's baseline requirements for each type of primary battery and required quantity will maintain on hand or on valid requisition.
- b. For the purpose of this program, baseline for primary batteries refers to the quantity and type of batteries need to operate all equipment on hand for one 24-hour day.

6. LEAD-ACID BATTERIES. To preserve the operational integrity, efficiency, and reliability designed into military vehicles and equipment, commanders are required to use batteries prescribed by the associated technical manual.

- a. Equipment operators/crews are responsible for visually inspecting installed lead-acid batteries for cleanliness and obvious damage in accordance with applicable operator technical manuals. Operators/crews will report faults using the TAMMS to their Field maintenance activity for action.
- b. Field level maintenance activities are authorized to inspect, add distilled water, install, remove, test, and conduct recharging of batteries installed in/on authorized equipment.
- c. Field and Sustainment-level maintenance activities retaining a battery maintenance and recovery mission are authorized to inspect, add distilled water, install, remove, test, and conduct recharging of batteries installed in/on authorized equipment, properly fill/activate, charge/recharge,

issue/reissue, diagnose, test, recover, and temporarily store serviceable/unserviceable batteries and related support materiel.

d. Commanders will ensure that all battery shops are operated in an Occupational Safety and Health Organization/Environmental Protection Agency compliant manner.

e. Commanders will use approved battery maintainers (plug-in or solar panels are examples) to sustain battery levels during periods of extended storage or inactivity.

f. Units will not order or stock dry lead acid type batteries on shop stock. Wet charged batteries are only authorized batteries for units to request or stock on shop stock.

g. No SSA will stock dry lead acid type batteries on ASL. Only SSAs authorized to stock dry lead type batteries are MSC-K RIC (WET) and 702nd MSB RIC (AG6).

h. The only maintenance shop allowed out-of vehicle battery charging is the authorized battery shop.

7. RECHARGEABLE BATTERY

a. All units should use rechargeable communications-electronics batteries. The required on hand quantity of rechargeable batteries should be at least three batteries (or set) for each piece of equipment. This allows for one battery in equipment, one battery charging and one battery in transit. In units where the charging station is located fairly far from the users, a fourth battery maybe practical.

b. Commanders will determine the number of chargers and adapters required based upon the number of rechargeable batteries needed to sustain unit operations.

8. LEAD ACID BATTERY MANAGEMENT. Lead acid storage batteries contain sulfuric acid, which can cause severe burns. Avoid contact with skin, eyes and clothing. Wear safety goggles/face shield and gloves. If Battery Electrolyte is spilled, take immediate action stop its corrosive (burning) effects:

a. External: Flush with cold water to remove all acid.

b. Eyes: Flush with cold water 15 minutes. Get medical attention immediately.

c. Internal: Drink large amounts of water or milk. Follow with milk of magnesia, beaten egg or vegetable oil. Seek medical attention at once.

d. Clothing: Wash at once with cold water. Neutralize with baking soda or household ammonia solution.

e. Vehicle: Lead acid battery gases can explode. Do not smoke, have open flames or other ignition sources, or make sparks around a battery especially if the caps are off. If a battery is boiling and forming, it can explode and cause injury to you. Always remove all watches, rings, ID tags and jewelry when working on or around batteries. Never lay wrenches and tools on or around the batteries.

9. OPERATOR PMCS PROCEDURES (LEAD ACID):

a. Check Electrolyte level. Electrolyte level must be about ½ inch over top of plates. Some batteries have lips or indicators to show where the Electrolyte level should be. If level is low add distilled water.

b. If water is added or fluid is boiling or the outside temperature is near or below the freezing point, run the vehicle engine for fifteen minutes to allow the water to mix with the electrolyte.

c. Make sure the vent holes in the vent caps are open to permit escape of gasses. Make sure vent caps are screwed on tightly.

d. Inspect terminals, posts, clamps, cables, battery hold-downs and battery boxes for corrosion. If corrosion is present notify unit maintenance for assistance. To reduce battery damage, do not remove batteries from vehicle except during scheduled maintenance or for battery replacement. Organizational maintenance personnel will perform battery removal/replacement.

e. Place a LIGHT coat of grease on all posts and terminals. Keep grease from between post terminals. Ensure rubber grommets are in place to keep cables from being cut on the edge of holes.

10. OPERATION UNDER USUAL CONDITIONS (LEAD ACID):

a. Report poor engine performance. Proper tune-up, timing and other adjustments will make the Battery last longer.

b. Engine idling at very low RPM, when accessories are applying loads, will discharge batteries. Do not idle engines just to keep warm; this will damage the battery and can shorten engine life.

c. If batteries are overcharging, notify maintenance personnel for voltage regulator adjustment on alternator/generator as applicable.

11. HOT WEATHER OPERATION (LEAD ACID): Battery electrolyte should be checked more often in hot weather. In extreme heat battery electrolyte water evaporates faster than in colder weather.

12. COLD WEATHER OPERATION (LEAD ACID):

a. In freezing weather, when engine is not easily started, turn off engine switches and check to ensure that batteries are not frozen. Take off all battery caps and check each cell, if ice or frost is present inside any cell, the battery is frozen.

b. Notify field level maintenance shop for removal and replacement or servicing of batteries. Freezing of a battery can break the case, crack and buckle the plates and separators. A frozen battery will not be used to operate equipment and will not be placed on a battery charger. Battery plates may be damaged or the electrolyte may break down. A frozen battery should be taken indoors to thaw out slowly.

13. FIELD LEVEL MAINTENANCE (LEAD ACID):

a. Batteries will not be stacked on top of each other.

b. Store batteries away from warm air ducts and sunlight. The hotter the storage area, the faster the batteries will discharge. Store in a cool, dry place.

c. **Do not store batteries in the Battery shop, work areas, administrative areas or where other PLL items are stored.**

d. Do not remove Electrolyte from batteries during storage.

e. Do not move batteries from place to place unless absolutely necessary.

14. TESTING (LEAD ACID): A multi-meter and optical battery/antifreeze tester will be used to test batteries. Consult TM - 20 and DA Pam 750-33 for use of this equipment.

15. WATER (LEAD ACID):

a. Water for use in lead acid batteries will be distilled water.

b. In emergencies a good grade of drinking water may be used. **Do not use mineral waters.**

c. Any time water is added, run vehicle for 30 minutes before shutdown.

16. REMOVAL (LEAD ACID):

a. Removal will be done organizational maintenance personnel only.

b. Negative terminals will always be removed first.

c. To avoid damage to posts and terminals, use the proper wrenches and a terminal remover.

17. CLEANING (LEAD ACID):

a. Electrolyte and battery corrosion can cause personal injury. Wear goggles and gloves for protection.

b. Use a wire brush to clean corrosion from battery hold-downs at least monthly. Soak hold downs in a solution of baking soda and water, ½ pound soda to 1 gallon of water, rinse and dry hold downs. Apply epoxy or bituminous coating to the hold-downs, clean and coat battery box in the same manner.

c. Clean all battery clamps and terminals with the post and terminal cleaning tool.

18. INSTALLATION (LEAD ACID):

a. Remove all watches, rings and ID tags before working with batteries.

b. Ensure all switches radios and electrical loads are turned off.

c. Ensure replacement batteries are the correct electrical capacity.

d. Ensure batteries are replaced in the correct position. If engine is cranked with connections reversed, the rectifier diodes and engine wiring harness will be damaged beyond repair.

e. Do not hammer terminals on to the posts; this can cause internal and external damage. If clamps are too tight, they can be spread wider.

f. Always connect positive terminals first and negative terminals second.

g. Always refer to TM – 20 manual on battery installation and final.

h. Apply a light coat of GM to or procedures check terminals.

19. STORAGE (LEAD ACID):

a. Units will not order or stock dry lead acid type batteries on shop stock. Wet charged batteries are only authorized batteries for units to request or stock on shop stock.

b. SSA will stock dry lead acid type batteries on ASL. IAW BDE Maint SOP Annex Q, the only maintenance shop allowed out-of vehicle battery charging is the authorized battery shop. Under no circumstances, will organizational/unit mechanics accomplish out-of-vehicle battery charging.

20. DRY CELL BATTERIES. Primary and rechargeable battery requirements:

a. Primary battery: For the purpose of this program, baseline for primary batteries refers to the quantity and type of batteries need to operate all equipment on hand for one 24-hour day.

(1) Commanders will determine unit's baseline requirements for each type of primary battery.

(2) The required primary battery quantity will be maintained on hand or on valid requisition.

(3) Table 1-1 of SB 11-6 provides specific data regarding primary battery types and quantities by end item equipment.

b. Rechargeable battery.

(1) Required on hand quantity of rechargeable batteries should be at least three batteries (or set) for each piece of equipment. This allows for one battery in equipment, one battery charging and one battery in transit. In units where the charging station is located fairly far from the users, a fourth battery maybe practical.

(2) Maintain the number of chargers and adapters required based upon the number of rechargeable batteries needed to sustain unit operations.

(3) Keep a list and stock of primary communications and electronics (C-E) batteries the units currently use and which rechargeable batteries to use instead of the primary batteries.

(4) Have an inventory of the number of primary and rechargeable C-E batteries required annually for supporting the equipment on hand.

(5) Have the number of chargers required for supporting the equipment on hand.

(6) Determine how best to logistically support the recharging of these batteries.

- (7) Eliminate barriers to using rechargeable batteries
- (8) Soldiers using rechargeable batteries will take proper care and use of rechargeable batteries.
- (9) Location using large number of primary batteries should develop a lithium (disposable) battery recovery and reuse program.
- (10) Communications-Electronics Command (CECOM) has established the following website for Battery Management: <http://battery.army.mil>.

Glossary
Abbreviations

ARIMS	Army Record Information Management System
ASL	Authorized Stockage List
BATTCAVE	Battery Charging and Verification Equipment
CIP	Command Inspection Program
C&E	Communication –Electronic
DA	Department of the Army
DODAAC	Department of Defense Address Activity Code
EMO	Electronic Media Only
IAW	In Accordance With
ID	Infantry Division
KTO	Korean Theater of Operations
MSC	Major Subordinate Command
MSRR	Monthly Sustainment Readiness Review
NSN	National Stock Number
SOP	Standard Operating Procedures
SSA	Supply Support Activity
TAMMS	The Army Maintenance Management System
TM	Technical Manuals