HEADQUARTERS
DEPARTMENT OF THE ARMY

ARTEP 44-635-13-DRILL

PATRIOT CREW DRILLS
FOR
ENGAGEMENT CONTROL STATION
AND RADAR SET

JULY 2003

ARMY TRAINING AND EVALUATION PROGRAM
44-635-13-Drill

HEADQUARTERS DEPARTMENT OF THE ARMY
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PATRIOT Crew Drills for ENGAGEMENT CONTROL STATION AND RADAR SET

TABLE OF CONTENTS

Page

Preface ii

Chapter 1. Unit Training

1-1 General 1-1
1-2 Training Guidance 1-1
1-3 Safety Considerations 1-1
1-4 Evaluation Information 1-2

Chapter 2. Crew Drills

2-1 General 2-1
2-2 Crew Drill 44-5-D009 Emplace the ECS for Tactical Operations 2-1
2-3 Crew Drill 44-5-D010 Emplace the RS for Tactical Operations (Auto) 2-21
2-4 Crew Drill 44-5-D011 Prepare the ECS for Road March 2-37
2-5 Crew Drill 44-5-D012 Prepare the RS for Road March 2-48
2-6 Crew Drill 44-5-D023 Emplace (manual) the RS for Tactical Operations 2-63

Appendix A Individual Task-to-Drill Matrix A-1
Appendix B Illustrations B-1
Appendix C Emplace Protective Entrance (PE) C-1
Appendix D Emplace Corner Reflectors D-1
Appendix E Road March Corner Reflectors E-1
Appendix F Road March Protective Entrance (PE) F-1
Glossary Glossary-1
References References-1

*This publication supersedes ARTEP 44-635-13-Drill, dated 13 July 1992

PREFACE

1. Standardized drills are an essential element to the success of the Patriot ECS and RS on the battlefield. These drills provide performance measures and a collective sequential set of procedures that, when applied Army-wide, will minimize the impact caused by the turnover in personnel. These drills are for use by the trainers at battery and platoon level to train their crews to do the selected collective tasks correctly and rapidly. Drill training is an inseparable part of peacetime combat-oriented training, which improves proficiency in mission-oriented individual and collective tasks, maintains high combat readiness, and promotes cohesive teamwork and esprit de corps.

2. This drill publication is among a set of books that includes ARTEPs 44-635-11-Drill, 44-635-12-Drill, 44-635-13-Drill, 44-635-14-Drill, and 44-635-15-Drill. All contain Patriot standardized drill procedures.

3. This drill publication addresses crew drills for emplacement, march order, and ready-for-action procedures for the ECS and RS. This drill book is separated into chapters and appendixes with applicable information to assist the platoon leader in training his crew.

4. The target audience for this drill includes leaders, trainers, and evaluators of Patriot battalions organized under TOE 44-635.

5. Unless this publication states otherwise, masculine nouns and pronouns do not refer exclusively to men.

6. The proponent of this publication is HQ, TRADOC. To improve this publication, submit recommended changes on DA Form 2028 to: Commandant, United States Army Air Defense Artillery School, ATTN: ATSA-DT-WF, Fort Bliss, Texas 79916-3802.

CHAPTER 1

UNIT TRAINING

1-1. General. The goal of training is to produce combat-ready units that respond rapidly to known or suspected enemy activity to defeat the enemy. Drill training is a key factor in achieving that goal. It describes a training method for small units. This method requires training individual tasks, leader tasks, and collective tasks before the conduct of critical wartime missions. Leaders should tailor training to realistic, challenging, and attainable goals, while increasing the difficulty of conditions as the unit becomes more proficient.

a. A crew drill is a collective action that a crew must perform to use a weapon or piece of equipment successfully in battle or to preserve life. This action is a trained response to a given stimulus such as a simple leader's order or the status of the weapon or equipment. It requires minimal leader orders to accomplish and is standard throughout the Army.

b. These drills have many advantages:

(1) They are based on unit missions and the specific tasks, standards, and performance measures required to support mission proficiency.

(2) They build from simple to complex and focus on the basics.

(3) They link how-to-train and how-to-fight at small unit levels.

(4) They provide an agenda for continuous coaching and critiquing.

(5) They develop leaders, and build teamwork and cohesion under stress.

(6) They enhance the chance for individual and unit survival on the battlefield.

1-2. Training Guidance. Crew drills are trained using a talk-through, walk-through, and run-through method. You, of course, must be a master of the drill to train your soldiers to execute it. You may wish to periodically talk your soldiers through the drill explaining each soldier's role. Have them go through it slowly, on open ground, correcting any mistakes as they go. Whenever possible, train in a new environment in which you would expect to execute the drill in wartime. Train frequently in MOPP and be tough on yourself and your soldiers. Good teams execute instantly and with precision. Your team will pay a high price for failure if they do not.

1-3. Safety Considerations. During the conduct of a drill, all soldiers and leaders must be safety conscious. Prior to the beginning of a drill, all personnel must be briefed on specific safety measures to be observed during the conduct of the exercise.

1-4. Evaluation Information. The purpose of evaluating a drill is to determine if the unit can perform all of the performance measures within the allowed standards. During evaluation, concentrate on the unit's performance, not that of specific individuals. The best location for observers/controllers is one in which the actions of the entire unit can be observed. Use the drill book as a checklist. We recommend you do not use local checklists, as they can become negative training tools.

CHAPTER 2

CREW DRILLS

2-1. General. A crew drill is a collective action that a crew must perform to use a weapon or piece of equipment successfully in combat or to preserve life.

2-2. Crew Drill 44-5-D009.

TASK: Emplace the ECS for Tactical Operations (44-5-D009).

CONDITIONS: The ECS is in the march-order configuration and a general location to emplace the ECS has been selected. All components of the ECS are available and operable. A crew has been assigned to emplace and prepare the ECS for tactical operations in all environmental and NBC conditions, both day and night. As the ECS crew approaches the selected position, the ECS ground guide orients and positions the ECS to a designated spot and commands, "Halt vehicle."

STANDARD: Emplace and prepare the ECS for tactical operations by the performance measures as sequenced in this drill. Complete this drill in the time prescribed by the ORD.

Note: Allow additional emplacement time when fiber optic cables, corner reflectors, and NBC protective entrance assembly are to be installed. Allow additional emplacement time when performing this drill in MOPP4 per ARTEP 44-637-30-MTP (Figures 5-1 and 5-2).

SUPPORTING INDIVIDUAL TASKS: Supporting individual tasks for this drill are listed in Appendix A, Individual Task-To-Drill Matrix.

ILLUSTRATIONS: Figures 2-1 and 2-2.

SETUP INSTRUCTIONS: The following equipment, areas, and personnel must be provided for the drill to be trained correctly.

a. Resources. As a minimum, the following are required: One EPP, one ECS (truck-mounted), and one RS (semi-trailer mounted); all with basic issue items.

b. Training Site. The potential site must be large enough (10x20 meters) to prevent rotational hazards. The site should be as level as possible. The maximum allowable slope from front to back or side to side is 10 degrees.

c. Unit Instructions. The crew members will emplace and prepare the ECS for tactical operations at a designated location using the following procedures:

(1) Before the fire platoon arrives at the selected site, the RSOP team will decide the position of each FP vehicle and will emplace marker stakes and ground rods to show vehicle positions.

(2) All FP vehicles arrive on site at approximately the same time and stop a short distance from the selected FP site.

(3) One crew member from each vehicle serves as a ground guide to direct the driver to position the vehicle at the emplacement site. Crew members will position the RS first, the EPP second, the ECS third, and the AMG last.

TALK-THROUGH INSTRUCTIONS: The mission of the ECS is to provide control of all FP activities during normal air defense FP missions. The crew members must be able to emplace the ECS and prepare it for tactical operations where directed and within prescribed time limits.

a. Orientation. Before beginning drill training, ensure that each crew member knows the purpose of the drill and is briefed on safety awareness.

b. Safety/Fratricide. All soldiers who operate the ECS must know that safety hazards exist while operating the various items of equipment. These hazards can and have caused both death and severe injuries to operators. Be extremely careful when working around the ECS. Throughout the crew drill, observe all dangers, warnings, and cautions required to properly emplace the ECS. Munitions cannot distinguish friend or foe. Commanders, trainers, and leaders must plan, train, and stress all procedures that must be followed to avoid fratricide. These procedures include IFF, weapons control status, vehicle and aircraft recognition, corridors, routes, zones, flight levels, and other control measures.

c. Demonstration (Optional). If a nearby crew has successfully performed the drill, have that crew demonstrate the drill. Explain what is being done and why using the performance measures as a guide. After the demonstration, summarize.

d. Explanation. Explain the drill in the following manner:

(1) Show the crew members how the ECS should be emplaced using a diagram, Figures 2-1 and 2-2, a sand table, or a simple sketch in the dirt.

(2) Tell the crew members what their duties are in the drill.

(3) Read the performance measures of the drill to the crew members.

(4) Have crew members explain their performance measures to ensure that they understand them.

WALK-THROUGH INSTRUCTIONS:

a. Use the Crawl-Walk-Run Method of Training. Start the training slowly. Correct any mistakes the crew members make as they go. Do not proceed until the drill is done right. After the crew members demonstrate their proficiency at a slow pace, let them do it faster. However, remember that safety is never sacrificed for speed. Watch carefully to make sure the crew members achieve all of the standards for the drill.

b. Initiating Cue. The ECS ground guide orients and positions the ECS at the selected site and commands, "Halt vehicle."

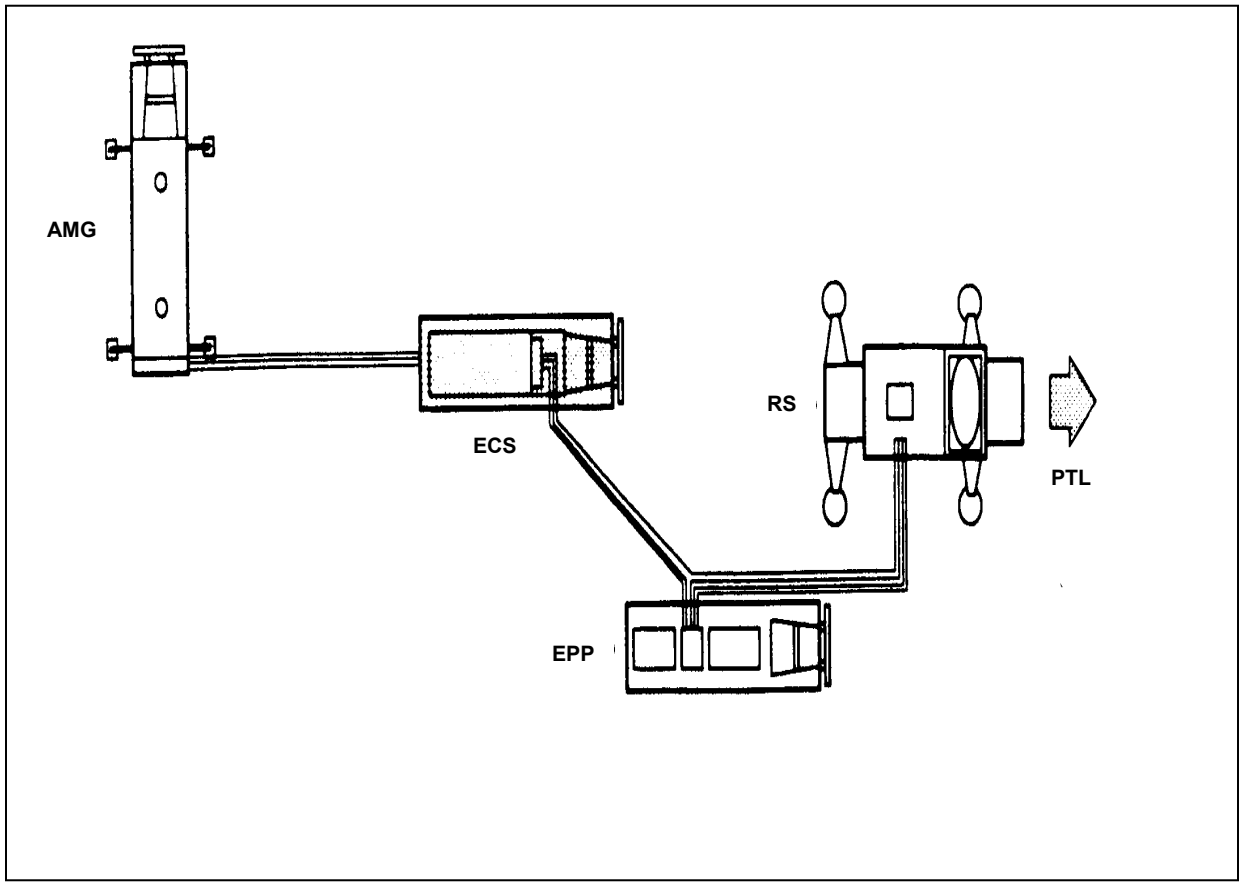


Figure 2-1. ECS emplacement

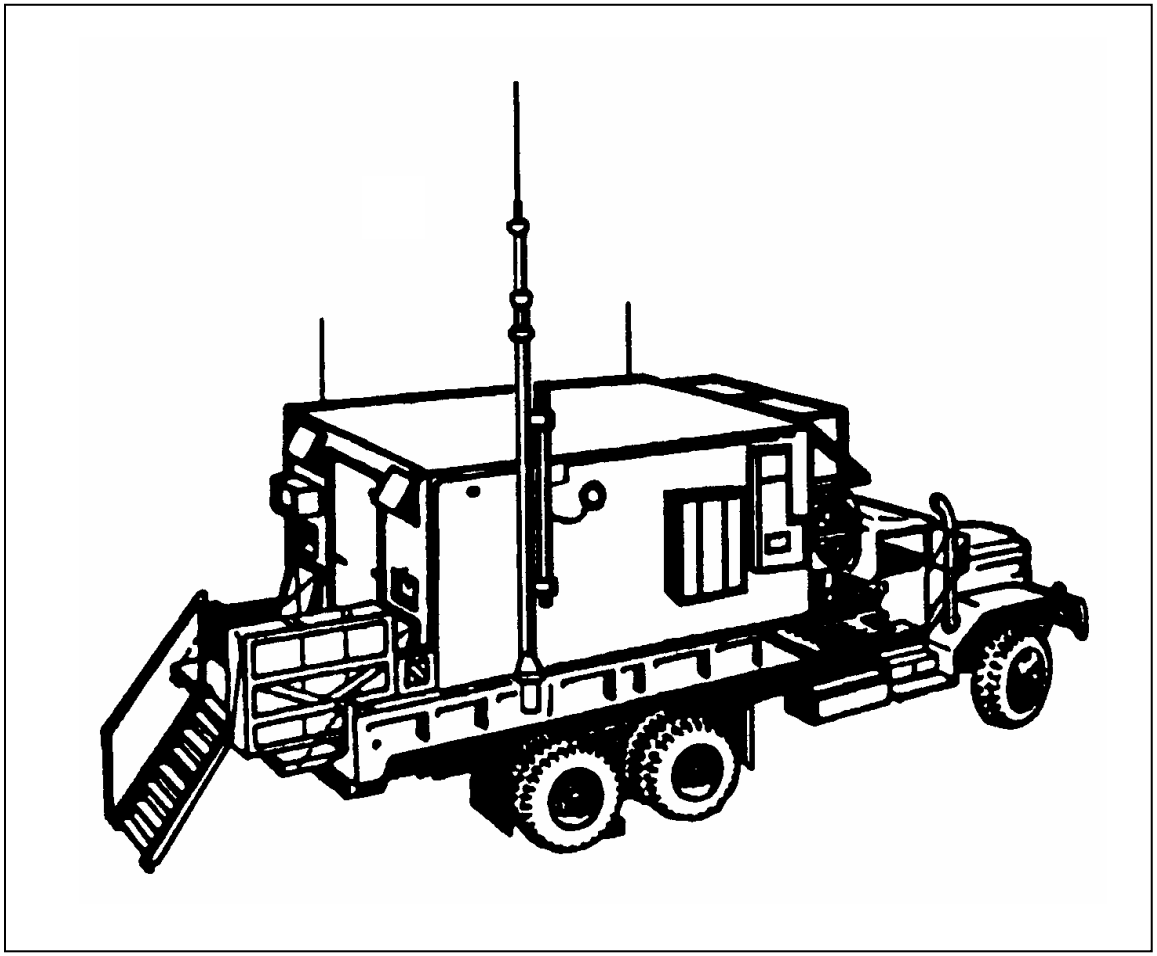


Figure 2-2. Emplaced ECS

PERFORMANCE MEASURES: Crew members complete their performance measures as they are stated and in the sequence shown. They must synchronize the completion of like-numbered performance measures.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
1. Maneuvers the ECS truck to the designated position and orients at marker stake as directed by CM 2.	1. Assists as needed.	1. Directs and orients CM 1 to properly position the ECS truck at the designated marker stake.
Note: For evaluation purposes, time starts here.		
a. Halts vehicle when directed and sets hand brake.		a. Commands, "Halt vehicle." (Refer to Appendix B.)
b. Sets the truck shift lever to neutral.		

DANGER
Do <u>not</u> stand directly in front of or in back of the vehicle <u>until</u> wheels are chocked.

2. When notified by CM 2 that truck wheels are chocked, exits vehicle.	2. Chocks ECS truck wheels.	2. CM 2 places wheel chocks.
	a. Notifies CM 1 that truck wheels are chocked.	

WARNING
To avoid damaging equipment and <u>before</u> releasing VHF antennas, ensure there are no overhead hazards or power lines. Stay clear of lanyards.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3

WARNING

Truck tailgate and boarding ladder are heavy. To avoid injury, two crew members are required to lower the tailgate and carry the ladder.

CAUTION

If corner reflectors are to be installed, do not fully release lanyards, as antennas may interfere with corner reflectors.

WARNING

Gloves must be worn any time crew members are handling cables.

3. Assists CM 2, lowers tailgate, and secures boarding ladder.	3. Assists CM 1 to lower tailgate and secures boarding ladder.	3. Unstows two roadside VHF whip antennas.

WARNING

To avoid injury, do not lean over antenna maintenance platform edge to reach data link antenna. Wear gloves when handling data link antenna.

WARNING

Before raising data link antenna, ensure there are no overhead hazards or power lines. Clear all people from antenna maintenance platform and those in path of antenna, particularly when lower mast section engages mast base retainer. Failure to observe close clearance between DLT base handle and ECS shelter may result in hand injuries.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3

CAUTION

Damage to lower mast section and mast base retainer can occur when excessive force is used to engage lower mast section with mast base retainer. Do not use excessive force when lowering mast section down to mast base retainer.

4. Raises and locks DLT platform in place.	4. Releases and swings PE to the side and secures. Unlocks shelter and secures lock.	4. Assists as required.
a. Hooks up and raises DLT.	a. Assists as needed.	

Note: If protective entrance A108 is to be used, refer to Appendix C for installation procedures at this time.

5. If PE is to be used, installs at this time.	5. Assists CMs 1 and 3.	5. Assists CMs 1 and 2.

CAUTION

Filter icing can occur at temperatures at or below 32 degrees Fahrenheit when there is ground fog or misty freezing rain. Under these conditions or when directed by the commander, set the handle on water intrusion duct to winter position to recirculate air within the ambient air cooling system. Check filters on rear of shelter for icing during emplacement, and if icing occurs filters should be removed until fog lifts or misty rain stops. If these conditions develop during operations, inspect filters periodically until conditions improve.

		6. Receives and records the magnetic heading of the AMG.

Note: CM 3 skips step 7 if corner reflectors are used.

7. Climbs into front of truck bed, opens and locks all air vent doors into position.	7. Opens and locks all rear air vent doors into position.	7. At roadside rear of ECS shelter, connects AMG power, control and RF cables.
a. At forward curbside water intrusion duct, sets handle to SUMMER or WINTER position.		

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3

CAUTION

If air conditioners are used in the cooling mode, the air conditioner covers must be opened to prevent equipment damage.

Note: If the outside temperature is 40 degrees Fahrenheit or below and only the heat mode is used, the air conditioner covers do not have to be opened.

8. Rolls up and secures air conditioner covers.	8. Ensures all air and fan doors are open.	8. Assists as required.

Note: Connect all grounds prior to power cable connections.

9. Unwinds and lowers RWCIU cable to CM 2.	9. Takes RWCIU cable from CM 1 and carries cable to RS.	9. Emplaces ground rod if required.
10. Lowers ground cable to CM 3 and ensures, connection to shelter terminal.	10. Assists as needed	10. Grounds ECS.

Note: If prime power and control cables are not available, CMs 2 and 3 will assist EPP crew members with deploying cables to the ECS.

11. Retrieves the ECS power and control cables from crew member.	11. Retrieves power and control cables from the EPP.	11. Assists with cables.

a. Connects ECS control cable to J3.

b. Connects ECS power cable to J1.

Note: Do not shut off truck engine until EPP power has been applied to the ECS.

WARNING

Do not block rapid shelter exit with open bay doors. Close doors immediately after task is completed.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3

WARNING

If CRT breaks, or damage is seen in the CRT (chips, scratches, or cracks), evacuate the ECS immediately and notify the battery maintenance office. Do not perform maintenance on damaged CRTs.

12. Enters ECS shelter and prepares switches for power-up and operation.

a. Obtains flashlight and sound-powered telephone from storage compartment.

b. Connects sound-powered telephone cable to COMM jack (if used). Establishes communications with EPP and RS crews.

c. At lighting control panel (A71), verifies that NORMAL-OFF-MAINTENANCE switch is set to NORMAL.

d. At air conditioner control panel (A69) (A70), verifies that MODE SELECTION switches are set to OFF.

e. Performs shelter equipment checkout at A66 power distribution panel.

(1) Ensures BATTERY POWER circuit breaker is set to ON.

(2) Ensures BATTERY POWER and POWER SUPPLY STATUS lamps are set to ON.

12. Assists CM 1 as required. If fiber optic cables are used, assists with connecting cables to ECS as soon as they are available.

a. Obtains operational software and documentation required.

b. Unstows chairs for manstations.

c. Loads ODS/EDR.

12. Assists as needed.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3

WARNING

If CRT breaks, or damage is seen in the CRT (chips, scratches, or cracks), evacuate the ECS immediately and notify the battery maintenance office. Do not perform maintenance on damaged CRTs.

(3) Ensures LIGHT CONTROL is set to ON.

(4) Ensures that AIR CONDITIONER ROADSIDE and CURBSIDE circuit breakers are set to ON.

WARNING

To avoid injury, ensure RS crew is ready for prime power.

WARNING

Shock hazards exist. To avoid electrical shock, do not start generators until all RS and ECS cables are connected and cable connections have been confirmed with EPP crew.

f. Verifies with RS crew that the RS is ready for prime power. At generator control panel, sets GENERATOR POWER-RADAR switch to ON (red safety guard is down).

g. Notifies EPP crew that the ECS is ready for prime power.

h. At generator control panel, ensures that one GENERATOR-ON-LINE indicator is on before continuing.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
i. At generator control panel, sets the VOLTAGE PHASE TO NEUTRAL switch to PHASE A, PHASE B, and PHASE C. Ensures the VOLTAGE PHASE TO NEUTRAL meter reads 120 ±6 VAC for each setting of the switch. Returns the switch to PHASE A position.		
j. At power supply (A25), verifies that all circuit breakers are set to ON.		
k. If AMG power cables are connected, sets the UHF AMS PWR AMPL circuit breaker to ON at the A66 power distribution panel set.		
l. Powers up the ECS per TM 9-1430-600-10-1.		l. Notifies AMG when AC power is applied.

Note: If PE was installed, perform verify and checkout PE procedures per Appendix C.

13. If communications plan calls for corner reflectors, refers to Appendix D for installation.	13. If communications plan calls for corner reflectors, refers to Appendix D for installation.	13. If communications plan calls for use of corner reflectors, refers to Appendix D for installation.

WARNING

Before performing step 14, verify AMG is positioned and ready for prime power. Do not move antenna dishes until notified by AMG crew.

14. Assists as needed.	14. Powers up the lightweight computer unit (LCU), if equipped.	14. Performs AMG circuit checks.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
	a. Powers up A98 radio quick start or full load, as required.	a. Sets MAST SELECTOR to OFF and presses ALARM RESET. (Audible alarm shuts off; ALARM indicator is on.)
Note: Ensure data rate is set to 16,000 on A98.		
	b. Presses A99 computer reset.	b. Sets MAST SELECTOR to OFF and presses ALARM RESET. (Audible alarm shuts off.) c. At antenna control unit, ensures ANTENNA STOW 1, 2, 3, and 4 indicators are on. d. Sets ANTENNA POSITION AMS HEADING pointer to actual magnetic heading recorded during AMG emplacement. e. Sets ANTENNA SELECT switch to BITE and verifies that ANTENNA and AMS HEADING pointers are aligned. f. Notifies AMG crew to erect mast assemblies (the priority mast first). Sets mast assemblies per communications plan. g. At antenna mast monitor panel, sets MAST SELECTOR TO PRIORITY MAST SETTING (curbside or roadside). Ensures alarm does not sound and ALARM indicator is off and SWAY INDICATOR is in safe zone. Does the same procedure for the other mast.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3

WARNING

Do not proceed with next step until notified by AMG crew that antenna masts have been erected and extended per communications plan.

15. Assists as needed.	15. Assists as needed.	15. Aligns AMG antennas per communications plan.

CAUTION

Do not attempt to rotate ANTENNA POSITION-ANTENNA pointer past stop pointer. Antenna cannot be rotated through this area.

16. Assists as needed.	16. Assists as needed.	16. Connects UHF AN/GRC-103 terminal into system per communications plan.
17. Assists as needed.	17. Assists as needed.	17. Powers up and aligns the priority UHF AN/GRC-103 radios per commo plan. a. Energizes and loads KG-94A as described in TM 11-5810-365-10.

Note: Do not use order wire once party lines are established.

18. Assists as needed.	18. Assists as needed.	18. At OCU, verifies that party lines and communications circuits are operational. Ensures IDOCS, RLRIU, and CLS circuits are configured per communications plan. At the CMP, ensures FRONT/REAR switch is set to FRONT.
19. Informs OIC that the ECS is ready for initialization.	19. Assists as needed.	19. Assists as needed.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3

Note: Hard copies will be made of all tabs, assembled, and given to the TCO after completing initialization.

20. Loads TACI software (Manstation 1).	20. Assists as needed.	20. Assists as needed.

Note: If normal indications do not occur during initialization, refer to TM 9-1425-602-12-2.

a. Verifies that TAPE PRESENT indicator is green.

CAUTION
If FU disk is not securely installed, contents may become damaged or unusable during operations.

Note: Software starts and maintains TOD clock. Disregard all indicators on A61 (FP STATUS INDICATOR PANEL), until TOD clock is running.

b. At BITE indicator panel, sets COMPUTER CONTROL PROGRAM SELECT switch to TRAINING/ MAINTENANCE.	b. Notifies CM 1 that ODU and EDR are loaded and operational.
c. Presses COMP & SYS RESET switch indicator.	c. Proceeds to manstation.
d. Presses BOOTSTRAP INIT switch indicator.	d. At HCU, sets POWER switch to ON. Ensures POWER and ON LINE indicators are on.

e. Observes that the messages, "THE QUICK BROWN FOX…" and "TURN ON HCU," appear on the CRT and HCU printout, followed by IOCE and CPE run stream messages.

f. Observes that the messages, "MEMORY CONFIDENCE CHECK IN PROGRESS—TESTING PAGE XX," followed by "DISK OPERATING—CURRENTLY LOADING RECORD NUMBER XX," appear.

Note: If a descriptive error message with RUN TWUD appears, perform WCC diagnostics (TM 9-1425-602-12-2).

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3

g. Observes that "DISK OPERATING" appears and remains displayed for about 5 seconds.

21. Performs initialization per FORSCOM Air Defense TSOP, TM 9-1430-600-10-1, and local directives.

Note: CM 1 and CM 2 will work together to input tabular data and verify accuracy.

WARNING

To prevent injury, ensure all personnel are clear of the RS before entering any rotation command. Visual inspection is required.

WARNING

Radiation hazards exist. Visually inspect RS to ensure it is positioned correctly before radiating.

WARNING

Sound EXT ALERT for 10 seconds prior to any RS rotation or radiate command.

22. Observes that alert END MANUAL INPUT, Tab 98, appears. Presses ALERT ACK at appropriate time. Presses SEL TAB, types 98, and presses SEL TAB. (Tab 98 appears.) Enters data as directed. Presses ENTR TAB.

Note: Load K7 by SEL Tab 98 and enter a Y in TRANSITION TO K7 data field. If Tab 98 is used, go to step 32e.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
23. Observes that alert HARDCOPY LS DATA, Tab 85, appears. (Calls up Tab 85 for any LS that has a completed emplacement, and hard copy data for future use. Presses ALERT ACK. Selects Tab 81 and hard copy. 24. Observes that alert REVIEW HARD COPY DATABASE appears and presses ALERT ACK. Observes that ALERT ACK WRITES DATABASE appears and presses ALERT ACK to initiate writing of the database to FU disk. 25. Observes that "N" symbol appears on lower left section of CRT with a line oriented toward north, relative to the target line. 26. Observes that auxiliary message STORAGE MEDIUM BUSY and alert LOAD TACT SW appears. Clears message and alert by pressing ALERT ACK.		

Notes:

- Hard copies made of all tabs, will be assembled, and given to the TCO for review and verification.

- If no operator switch action is performed within 5 seconds of acknowledging the alert LOAD TACT SW OR SEL TAB 91/98, the alert REPLACE EDR TAPE appears.

- If this alert appears and internal data collection was done to record TACI, remove and replace it to prevent it from being overwritten during tactical operations.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3

27. Observes that switches DATA COLL and DATA HRDCPY (if on) go off.

28. Loads the operational K7 software. (Transition for PDB 5.)

a. At BITE indicator panel, sets COMPUTER CONTROL PROGRAM SELECT switch to TACTICAL (if necessary).

b. Presses COMP and SYS RESET switch indicator.

c. Presses BOOTSTRAP INIT switch indicator. Monitors radar initialization messages.

Note: Current database is displayed, as entered in Tab 98.

d. Observes that local search and track boundaries are displayed. Selects correct database. Presses ENTR TAB. Observes that PASSIVE SEARCH switch indicator comes on.

e. Observes that ACK STARTS DATA COLL—MEDIA OK? appears.

Note: Ensure the internal data collection device specified in Tab 90 is present.

f. Presses ALERT ACK; observes that DATA COLL switch comes on. (Internal data collection has begun.)

Note: External data collection is based on the entry made to Tab 90, page 2.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
g. Alert SELECT CONSOLE MODE appears. Presses ALERT ACK. Sets console mode for operations.		
29. Stands by until tactical operations begin.	29. Directs crew to prepare for tactical operations.	29. Stands by until tactical operations begin.

Notes:

- CREW PREPARES THE ECS FOR ACTION

- Safety/Fratricide. Munitions cannot distinguish friend or foe. All commanders, trainers, and leaders must plan, train, and stress all procedures, which must be followed to avoid fratricide. These procedures include IFF, weapons control status, vehicle and aircraft recognition, corridors, routes, zones, flight levels, and other control measures.

- The firing battery ECS has been properly emplaced at the designated location, powered up, and initialized. Equipment manning requirements and tactical actions conform to the SOA to which ordered. Required equipment checks have been performed to attain the necessary readiness posture in the required time.

- The following steps contain the necessary procedures for developing the firing battery into a ready-for-action (fully operational) status. These procedures provide broad guidance for the ECS crew members and are written in general terms to allow for tactical situation input.

- The ready-for-action procedures rely on a properly emplaced and initialized ECS.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
TACTICAL CONTROL ASSISTANT (TCA)	**TACTICAL CONTROL OFFICER (TCO)**	**COMMUNICATIONS OPERATOR**
30. Ensures the ECS has been initialized and the operational software is loaded.	30. Ensures the ECS has been initialized and the operational software is loaded.	30. Monitors UHF and VHF radios to ensure proper operation.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
TACTICAL CONTROL ASSISTANT (TCA)	**TACTICAL CONTROL OFFICER (TCO)**	**COMMUNICATIONS OPERATOR**
31. Selects switch and indicators according to TSOP.	31. Selects switch and indicators according to TSOP.	31. Checks RLRIU and ensures local address is correct.

Note: This check is necessary because netted TPTs may have been performed and the address changed.

32. Enters data in tactical tabs according to TSOP.	32. Enters data in tactical tabs according to TSOP.	32. Reports to TCO (CM 2), "Ready for action."

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
33. Determines missile status by observing the missile inventory tabs and FU status panel.	33. Observes FU status panel and ensures proper indications are displayed for the tactical situation.	

Notes:

- At FP status indicator panel, observe that all indicators for each LS entered go green.

- At control indicator, press MSL INVNT S/I. Observe that MISSILE STATUS, appears. Confirm all connected live missiles entered show no hazards. If a hazardous condition is indicated, notify the FP commander.

34. Observes BITE panel for abnormal indications.	34. Evaluates operational assessment tab.
35. Evaluates operational assessment tab.	35. Ensures equipment requirements are met.
36. Presses RADIATE ENABLE, according to TSOP. Reports to TCO (CM 2), "Ready for action."	36. Verbally reports to ICC, "ECS at battle stations (Blazing Skies)," and enters a green alert indication, using the tactical tab.

Note: For evaluation purposes, time stops here.

COACHING POINT: The performance measures are done in the sequence outlined. All crew members do their like-numbered tasks at the same time. When all the individual tasks have been mastered and all crew members can do their jobs without coaching, go for speed and remember to be safety-conscious. The more the drill is performed, the better the crew members will perform together.

RUN-THROUGH INSTRUCTIONS: The crew members should practice this drill until they can perform the drill according to the standard without using the drill book. The initial run-through should be conducted slowly. The crew members should change positions in order to learn all steps and standards.

PERFORM: When the crew members can perform this crew drill to standard, inform the platoon sergeant or platoon leader that the crew members are ready to be evaluated.

SUPPORTED T&EOs

ARTEP NUMBER	T&EO NUMBER	T&EO TASK TITLE
44-637-30-MTP	44-2-9004.44-P20P	Emplace the Firing Battery

2-3. Crew Drill 44-5-D010.

TASK: Emplace the RS for Tactical Operations (Auto) (44-5-D010).

CONDITIONS: The RS is in the march-order configuration and a general location to emplace the RS has been selected. All components of the RS are available and operable. A crew has been assigned to emplace and prepare the RS for tactical operations in all environmental conditions both day and night. As the crew approaches the selected position, the ground guide orients and positions the RS to a designated spot and commands, "Halt vehicle."

STANDARD: The crew must complete the RS automatic emplacement drill in the sequence, and within 25 minutes at MOPP0 through MOPP3 and in the time standards stated in ARTEP 44-637-30-MTP at MOPP4. Time is measured from when the crew chief (crewman 3) announces, "Halt vehicle."

Note: Allow additional emplacement time when performing this drill in MOPP4 per ARTEP 44-637-30-MTP (Figures 5-1 and 5-2).

SUPPORTING INDIVIDUAL TASKS: See Appendix A, Individual Task-To-Drill Matrix.

ILLUSTRATIONS: Figures 2-3 through 2-6.

SETUP INSTRUCTIONS: The following equipment, areas, and personnel must be provided for the drill to be trained correctly.

a. Resources.

(1) Radar set.

(2) Telephone set, sound-powered TA-1/PT.

(3) Screw driver, flat tip, 3/8 inches wide, 8 inches long.

(4) EPP, ECS, and AMG.

(5) Individual weapons, NBC protective clothing, and equipment.

b. Training Site. The potential site must be large enough (10x20 meters) to prevent rotational hazards. The site should be as level as possible. The maximum allowable slope from front to back or side to side is 10 degrees.

c. Unit Instructions. The crew members will emplace and prepare the RS for tactical operations at a designated location using the following procedures:

(1) Before the fire platoon arrives at the selected site, the RSOP team will decide the position of each FP vehicle and will emplace marker stakes and ground rods to show vehicle positions.

(2) All FP vehicles arrive on site at approximately the same time and stop a short distance from the selected FP site.

(3) One crew member from each vehicle serves as a ground guide to direct the driver to position the vehicle at the emplacement site. Crew members will position the RS first, the EPP second, the ECS third, and the AMG last.

TALK-THROUGH INSTRUCTIONS: The mission of the RS is to provide detection of tracks, tracking, and identification of tracks in the FP sector, and to guide the missile to its target. The crew members must be able to emplace and prepare the RS for tactical operations where directed within prescribed time limits.

a. Orientation. Before beginning drill training, ensure that each crew member knows the purpose of the drill and is briefed on safety awareness.

b. Safety/Fratricide. All soldiers who operate the RS must know that safety hazards exist while operating the various items of equipment. These hazards can and have caused severe injuries to operators. Be extremely careful when working around the RS. Throughout the crew drill, observe all dangers, warnings, and cautions required to properly emplace the RS. All commanders, trainers, and leaders must plan, train, and stress all procedures, which must be followed to avoid fratricide. These procedures include IFF, weapons control status, vehicle and aircraft recognition, corridors, routes, zones, flight levels, and other control measures. Munitions cannot distinguish friend or foe.

c. Demonstration (Optional). If a nearby crew has successfully performed the drill, have that crew demonstrate the drill. Explain what is being done and why, using the performance measures as a guide. After the demonstration, summarize.

d. Explanation. Explain the drill in the following manner:

(1) Show the crew members how the RS should be emplaced using a diagram, Figures 2-3 through 2-6, a sand table, or a simple sketch in the dirt.

(2) Tell the crew members what their duties are in the drill.

(3) Read the performance measures of the drill to the crew members.

(4) Have crew members explain their performance measures to ensure they understand them.

WALK-THROUGH INSTRUCTIONS:

a. Use the Crawl-Walk-Run Method of Training. Have crew members take their positions and perform the drill. Start the training slowly. Correct any mistakes the crew members make as they go. Do not proceed until drill procedures are done correctly. After the crew members demonstrate their proficiency at a slow pace, let them do it faster. However, remember that safety is never sacrificed for speed. Watch carefully to make sure the crew members achieve all of the standards for the drill.

b. Initiating Cue. As the RS crew approaches the selected position, the vehicle ground guide orients and positions the RS to a designated spot and commands, "Halt vehicle."

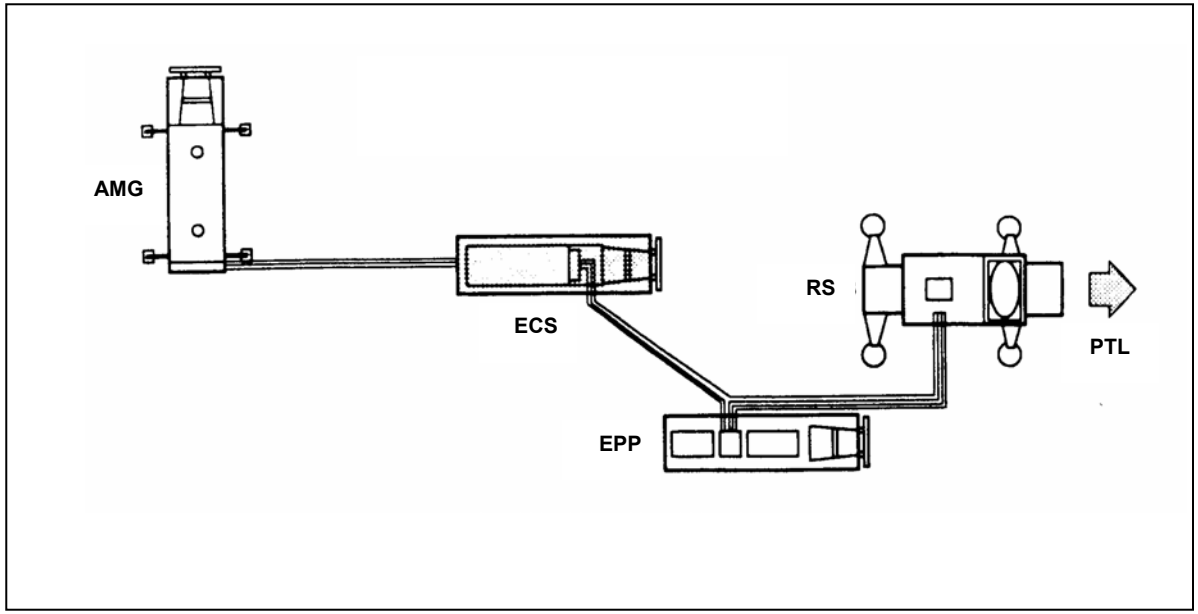


Figure 2-3. RS Emplacement

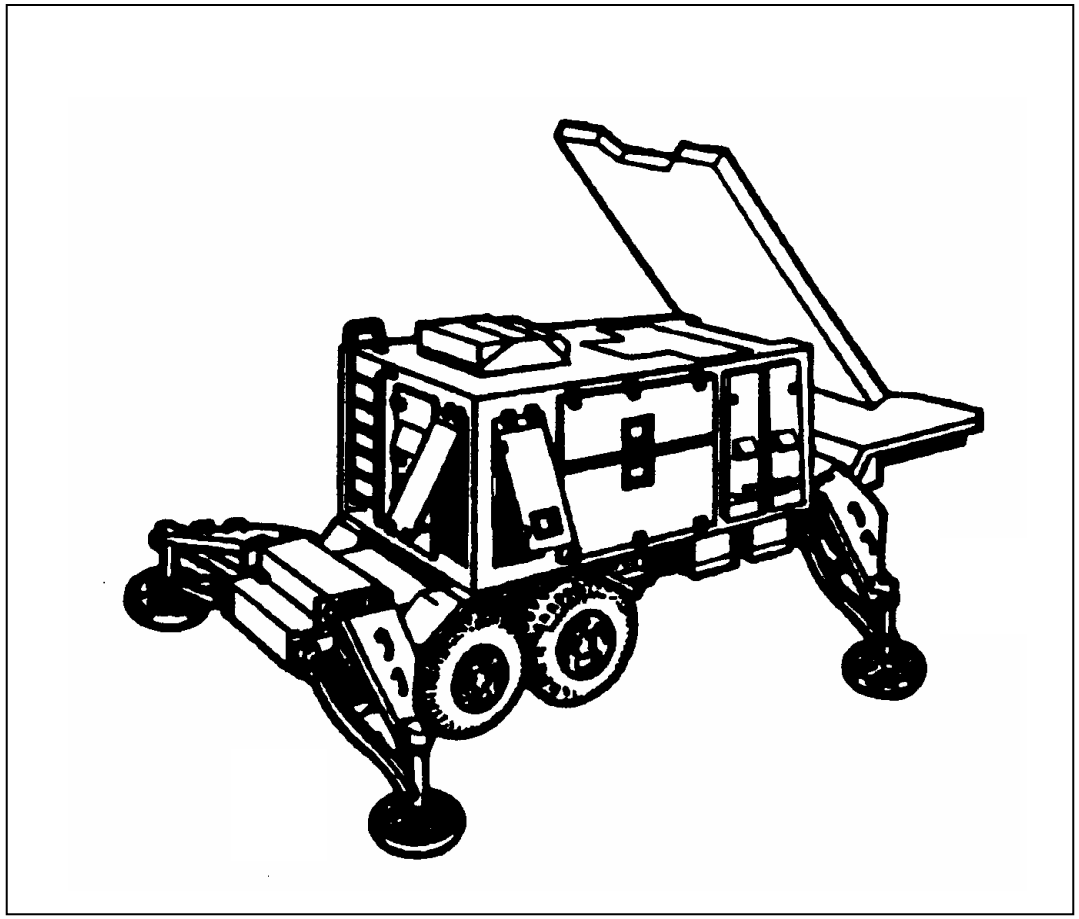


Figure 2-4. Emplaced RS

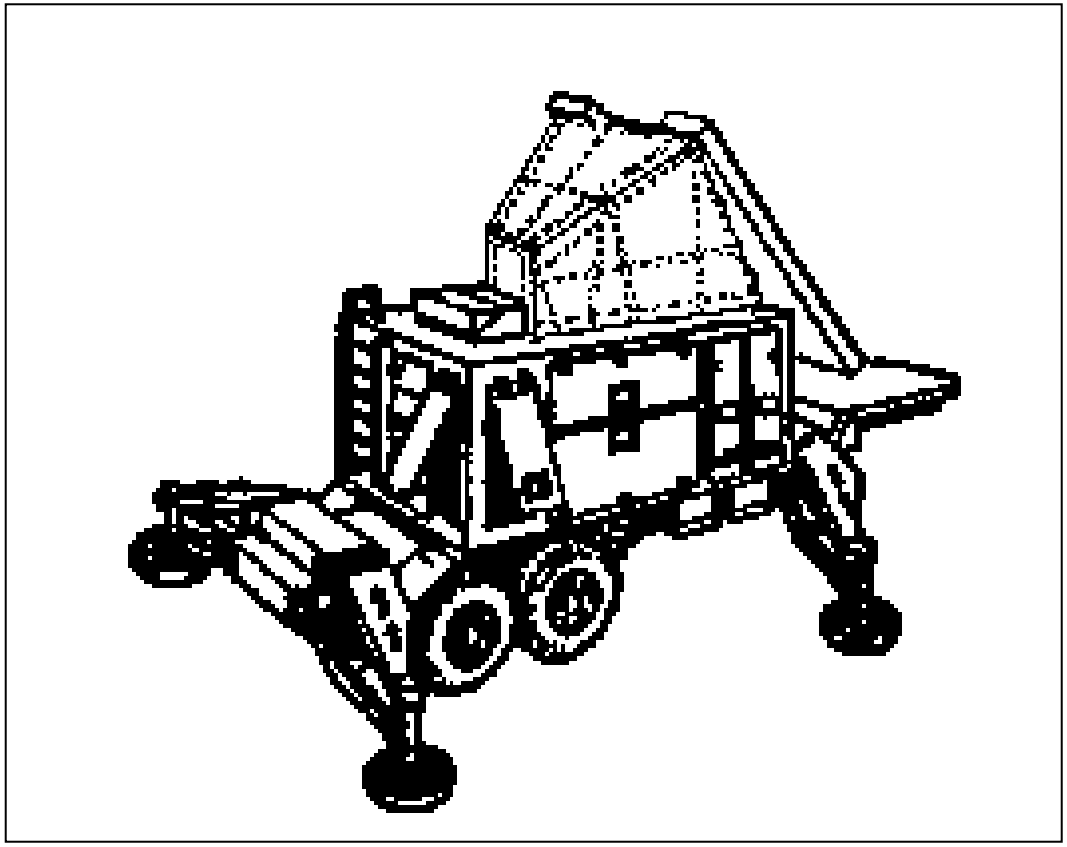


Figure 2-5. Emplaced RS with radar shroud

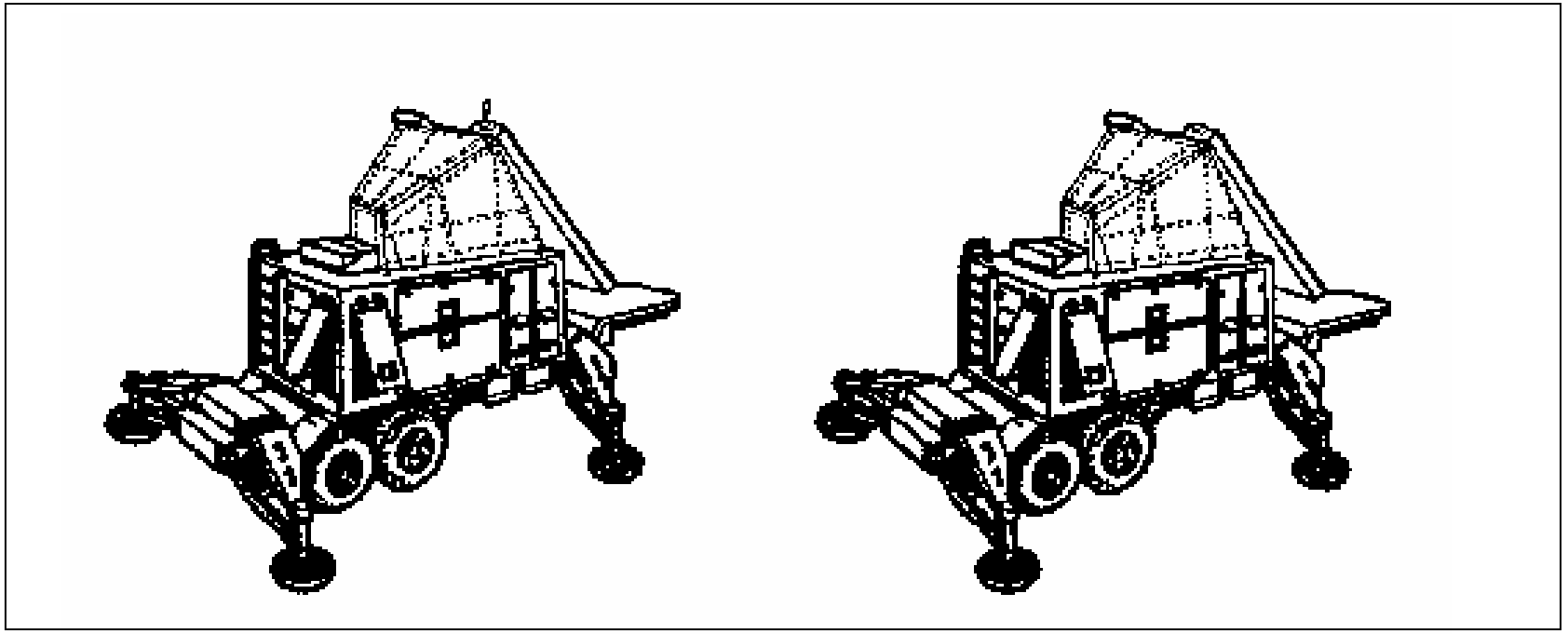


Figure 2-6. Emplaced RS with radar shroud and PLGR

PERFORMANCE MEASURES: Crew members complete their performance measures as they are stated and in the sequence shown. They must synchronize the completion of like-numbered performance measures.

WARNING

Exercise extreme caution during blackout conditions. Crew members should work in pairs. Second crew member uses a blackout flashlight to assist, when necessary, in such operations as M983 tractor coupling or uncoupling, outrigger deployment and antenna weather cover removal or installation.

WARNING

To reduce fire, carbon monoxide, and noise hazards, position the RS as far away from the EPP as the cable length and terrain allow.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
1. Maneuvers the RS to the designated position and orients at marker stake as directed by CM 2.	1. Directs and orients CM 1 to properly position the RS at the designated marker stake.	1. Assists CM 2 to properly position the RS at the designated marker stake.	1. Assists as needed.
Note: For evaluation purposes, time starts here.			
2. Halts vehicle, sets parking brake and trailer air supply to OFF. Leaves engine running.	2. Commands, “Halt vehicle.”		
3. Notifies CM 2, “Ready for wheel chocks.”	3. When notified by CM 1, places wheel chocks per Appendix B.	3. Assists as required.	3. Assists as required.
4. When notified by CM 2 that tractor is chocked, exits cab.	4. Notifies CM 1 that tractor wheels are chocked.		

CAUTION

Equipment damage may occur if safety chains are <u>not</u> disconnected <u>prior</u> to lowering outriggers.

WARNING

Personnel injuries may occur when deploying outriggers; clear area of personnel prior to movement.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
5. Chocks semitrailer's wheels and notifies CM 2 when completed.	5. Assists as required.	5. Emplaces ground rod (if required) and connects RS ground cable.	5. Assists CM 3.

CAUTION

Equipment damage may occur to semitrailer if outriggers' toggle switches are used in diagonal pairs or semitrailer is raised high enough to put pressure on the truck tractor's fifth wheel.

6. Releases outrigger safety chains on roadside	6. Releases outrigger safety chains on curbside	6. Assists as required.	6. Assists as required.
7. Takes up position at the curbside rear, and signals CM 2 to lower rear outriggers. Notifies CM 2 when outriggers touch the ground.	7. On signal from CM 1, lowers outriggers until they touch the ground.		
8. Takes up position at roadside front of trailer and directs CM 2 to lower front outriggers. Notifies CM 2 when they touch the ground.	8. Upon signal from CM 1, lowers front outriggers until both are touching the ground, and semitrailer weight is off the wheels.	8. Assists as required.	8. Assists as required.
	9. Sets outrigger power switch to off. Notifies CMs that outrigger power is off.		

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
DANGER **Crew members are <u>not</u> to stand <u>between</u> tandem wheels of tractor when coupling or uncoupling trailer. Trailer <u>must</u> be resting on both outrigger pads, and wheels should be firmly chocked.**			
10. Removes and stows trailer air brake lines and inter-vehicular cable. Does not disconnect 28 VDC cable at this time. 11. At fifth wheel, pulls out secondary and primary lock release handles until they are hooked in the OUT position.			
12. When signaled by CM 2, drives tractor forward until told to stop. Sets tractor brake and leaves engine running. Exits cab when notified by CM 2.	12. Removes tractor wheel chocks and directs CM 1 forward until fifth wheel clears trailer kingpin. Signals CM 1 to stop, chocks wheels, and notifies CM 1 to exit cab.	12. Assists CM 2.	12. Assists as needed.
	13. Assists CM 4 in removing ladder from storage area and positions as necessary to open air vents or bay doors. Opens air vents curbside and roadside.	13. Assists as needed.	13. Assisted by CM 2, removes ladder from storage and positions as necessary to open air vents or bay doors. Opens air vents curbside and roadside.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
14. Assists CM 2 with opening and securing both PDU door air vents.	14. With assistance from CM 1, opens and secures both PDU door air vents on RS forward exterior.	14. Opens top and bottom air vents on shelter rear entrance door.	14. Assists as needed.
	15. With CM 4, removes ladder from RS.		15. With CM 2, removes ladder from RS.
		16. Enters shelter and disengages azimuth stow lock. Ensures cap is on manual input drive and is hand-tight.	16. Opens curbside CLET door.
		17. Ensures all circuit breakers at A30 are set to ON. Inspects maintenance aisle for loose cables and tightens as needed. Exits RS shelter.	17. Opens rear CLET door.
18. Notifies CM 2 that RS is clear of personnel.	18. When notified by CMs 1 and 3 that the RS is clear, turns power on at outrigger control panel.	18. Notifies CM 2 that RS is clear of personnel.	
19. Assists CM 2.	19. Levels RS trailer.	19. Assists as needed.	19. Assists as needed.

DANGER

Death or serious injury can result if all four outriggers do <u>not</u> have firm contact with the ground.

20. Assists CM 2.	20. Verifies all four outrigger pads have firm contact with ground.	20. Assists CM 2.	20. Assists CM 2.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
21. When notified by CM 2 that RS is level, confirms all four outriggers have firm contact with the ground and at least one semitrailer wheel on each side is off the ground.	21. Signals CM 1 when trailer is level. Remains at outrigger control box.	21. Assists CM 1.	21. Assists CM 1.
	22. Sets outrigger control POWER switch to OFF.	22. Retrieves prime power cables.	22. Retrieves prime power cables.
23. Visually verifies radar set is in LOCAL.	23. Prepares RS for power by ensuring LOCAL/REMOTE is set to LOCAL, safety pin is installed at A112, and S-1 and S-2 toggle switches at A155 are off.		
24. With the assistance of CM 2, connects the prime power cables from EPP and RWCIU cable from ECS to antenna pedestal junction box.	24. With the assistance of CM 1, connects the prime power cables from EPP and RWCIU cable from ECS to antenna pedestal junction box.	24. Assists as needed.	24. Assists as needed
25. Visually verifies all vents are in an open position.	25. Establishes communications with the ECS. Reports RS is ready for prime power.	25. Assists as needed.	25. Assists as needed.
	26. With CM 4, positions ladder as necessary to energize RS. Note: If ambient air temperature is above 70 degrees Fahrenheit, S-7 need not be applied.		26. With CM 2, positions ladder as necessary.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
27. Assists as needed.	27. Sets 2A155 prime power S-1 and S-2 to ON and 2A112 switches to ON.		

CAUTION

Do not perform operator initiated self-test **WHEN** the ECS is running system operations software, otherwise erroneous faults will occur.

28. Assists as needed.	28. Powers up and checks IFF switches.	28. Assists as needed.	28. Ensures NFS passes self-test.
	29. Verifies that PLGR/GPS passed self-test, ensures "crypto" is present, and verifies current mode and position. Next, notifies ECS that PLGR/GPS is operational and crypto is present.		
	30. With CM 4, removes ladder from RS shelter.		30. With CM 2, removes ladder from RS shelter.

CAUTION

Failure to remove comparator travel cover before radiating will destroy comparator window.

WARNING

Observe boundary markings and NO STEP cautions when working on shelter roof. Proceed cautiously to avoid tripping.

32. Removes AWC and lowers to CM 3.	32. Assists as needed.	32. Receives and stows AWC.	32. Assists CM 2.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4

WARNING
Stand clear of antenna during antenna movement to avoid serious injury.

33. Notifies CM 2 when it is safe to elevate antenna to operating position.	33. Sets A155 S2 to ON. Elevates antenna to operating position when notified by CM 1. Next, sets A155 S2 to OFF.	33. Assists CM 1.	
34. Removes comparator cover.	34. Assists as required.	34. Assists CM 1.	34. Assists as required.

WARNING
Shroud assembly is heavy. Two people are required to emplace shroud. Use extreme caution when erecting shroud in high wind.

35. Emplaces radar shroud. Removes cover from roof and climbs down from roof.		35. Emplaces radar shroud. Removes cover from roof and climbs down from roof.	
36. Observes outrigger pads for movement during radar rotation. Immediately alerts CM 2 if any outrigger movement is noted. Ensures pads are firmly seated when rotation is complete.	36. Sets A155 S2 and A112 S8 switches to ON. Using ADLC, rotates (stops when notified) RS completely through 6400 mils, returning to the zero bullring setting.	36. Observes outrigger pads for movement during radar rotation. Immediately alerts CM 2 if any outrigger movement is noted. Ensures pads are firmly seated when rotation is complete.	36. Observes outrigger pads for movement during radar rotation. Immediately alerts CM 2 if any outrigger movement is noted. Ensures pads are firmly seated when rotation is complete.
	37. Sets A155 S2 and A112 S8 switches to OFF.		

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
	38. Checks RS level; if RS is not level, repeats step 19.		38. Visually verifies that RS is level.
39. When notified by CM 2, disconnects 28-VDC cable from semitrailer.	39. Stows ADLC.	39. Drains semitrailer air tank.	39. Assists as needed.
40. Enters vehicle and waits until notified by CM 3 and CM 4 that chocks are removed and stored.	40. Establishes commo with ECS.	40. Removes and stows curbside chock. Notifies CM 1 when completed.	40. Removes and stows roadside chock. Notifies CM 1 when completed.

DANGER
Death or serious injury can result if tractor wheels are <u>not</u> chocked to prevent tractor movement.

41. Drives tractor to designated parking area and performs after-operations PMCS.	41. Places RS in REMOTE. Sets A155 S-2 switch at ON and clears RS. Notifies ECS that area is clear.	41. Guides CM 1 to designated parking area, chock wheels, and assists CM 1 in performing after-operations PMCS .	41. Assists as required.

Note: For evaluation purposes, time stops here.

COACHING POINT: The performance measures are done in the sequence outlined. All crew members do their like-numbered tasks at the same time. When all the individual tasks have been mastered, and all crew members can do their jobs without coaching, go for speed and remember to be safety-conscious. The more the drill is performed, the better the crew members will perform together.

RUN-THROUGH INSTRUCTIONS: The crew members should practice this drill until they can perform the drill according to the standard without using the drill book. The initial run-through should be conducted slowly. The crew members should change positions in order to learn all steps and standards.

PERFORM: When the crew members can perform this crew drill to standard, inform the platoon sergeant or platoon leader that the crew members are ready to be evaluated.

SUPPORTED T&EOs

ARTEP NUMBER	T&EO NUMBER	T&EO TASK TITLE
44-637-30-MTP	44-2-9004.44-P20P	Emplace the Firing Battery

2-4. Crew Drill 44-5-D011.

TASK: Prepare the ECS for Road March (44-5-D011).

CONDITIONS: The ECS is emplaced and the battery has been ordered to occupy a new position. All components of the ECS are available and operable. A crew has been assigned to road-march the ECS in all environmental conditions both day and night. The crew receives the command, "March order."

STANDARD: March-order the ECS by the performance measures as sequenced in this drill. Complete this drill within 45 minutes in a training environment.

Notes:

- Allow additional march-order time when NBC protective entrance assembly, fiber optic cables, and UHF corner reflectors are removed.
- Allow additional march-order time when performing this drill in MOPP4 per ARTEP 44-637-30-MTP (Figures 5-1 and 5-2).

SUPPORTING INDIVIDUAL TASKS: Supporting individual tasks for this drill are listed in Appendix A, Individual Task-To-Drill Matrix.

ILLUSTRATIONS: Figure 2-7.

SETUP INSTRUCTIONS: The following equipment, areas, and personnel must be provided for the drill to be trained correctly.

a. Resources. As a minimum, the following are required: One EPP, one ECS (truck-mounted), one AMG (truck-mounted), and one RS (semitrailer-mounted). All are included with basic issue items.

b. Training Site. Emplaced ECS is in an area large enough (10x10 meters) to perform all operations for march order. The site should be as level as possible.

c. Unit Instructions. The crew members will march-order the ECS.

TALK-THROUGH INSTRUCTIONS: The battery has received a movement order to a new field position. The crew members have the responsibility to prepare the ECS for road march within the prescribed time limits.

a. Orientation. Before beginning drill training, ensure that each crew member knows the purpose of the drill and is briefed on safety awareness.

b. Safety/Fratricide. All soldiers who operate the ECS must know that safety hazards exist while operating various items of equipment. These hazards can and have caused severe injuries to operators. Be extremely careful when working around the ECS. Throughout the crew drill, observe all dangers, warnings, and cautions required to properly march-order the ECS. All commanders, trainers, and leaders must plan, train, and stress all procedures, which must be followed to avoid fratricide. These procedures include IFF, weapons control status, vehicle and aircraft recognition, corridors, routes, zones, flight levels, and other control measures. Munitions cannot distinguish friend or foe

c. Demonstration (Optional). If a nearby crew has successfully performed the drill, have that crew demonstrate the drill. Explain their actions using the performance measures as a guide. After the demonstration, summarize.

d. Explanation. Explain the drill in the following manner:

(1) Show the crew members how the ECS should be march-ordered using a diagram, Figures 2-7, a sand table, or a simple sketch in the dirt.

(2) Tell crew members what their duties are in the drill.

(3) Read the performance measures of the drill to the crew members.

(4) Have each crew member explain their performance measures to ensure that they understand them.

WALK-THROUGH INSTRUCTIONS:

a. Use the Crawl-Walk-Run Method of Training. Have crew members take their positions and perform the drill. Start the training slowly. Correct any mistakes the crew members make as they go. Do not proceed until drill procedures are done correctly. After the crew members demonstrate their proficiency at a slow pace, let them do it faster. However, remember that safety is never sacrificed for speed. Watch carefully to make sure the crew members achieve all of the standards for the drill.

b. Initiating Cue. The crew receives the command, “March order.”

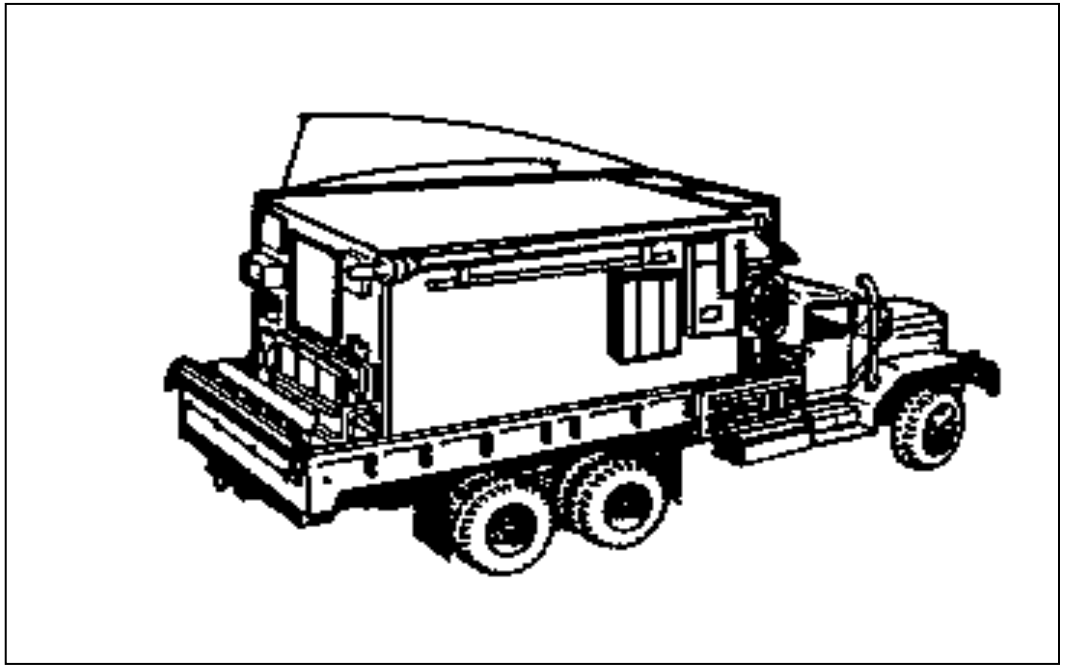


Figure 2-7. March-ordered ECS

PERFORMANCE MEASURES: Crew members complete their performance measures as they are stated and in the sequence shown. They must synchronize the completion of like-numbered performance measures.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
1. Receives march order.	1. Receives and confirms march order with ICC.	1. Receives march order.
Note: For evaluation purposes, time starts here.		a. Verifies that system control panel appears at LCU display screen (if equipped). Positions pointer and double-clicks on Shutdown icon. b. Positions pointer on Yes box and presses left execution key.
2. Disables RS. At control indicator panel, presses RADIATE DISABLE.	2. Turns AC power switch to OFF and light switch to MAINTENANCE.	2. Sets AMG antennas to stow.
		a. At antenna mast monitor panel (A139), sets MAST SELECTOR switch to OFF. b. Informs AMG crew that the mast stowage operation can begin.

WARNING

Do not block rapid shelter exit with open bay doors. Close bay doors immediately after completion.

WARNING

Before performing next step, sound external alarm and verify that RS is clear of personnel.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
3. Trains FU to stow position.	3. Stows MS 2 chair.	3. Powers down UHF radio relay terminal equipment.

Note: If holding memories are to be saved during power-down road march procedures, place the ON/STBY/ ZEROIZE-OFF switch to STBY and POWER ON/OFF switch to OFF. Ensure the KG-94A has a 9-VDC battery installed.

a. Selects Tab 09, types 07 in REORIENT COMMAND data field, and presses ENTER tab. Sounds external alarm for 10 seconds and receives confirmation that RS is clear from CM 2.	a. Visually confirms RS is clear of personnel.	
b. Observes that alert VERIFY AND REENTER INPUT appears. Presses ALERT ACK and then presses ENTER tab.		
c. Observes that alert RS REORIENTATION COMPLETE appears. Presses ALERT ACK and clears all alerts.	c. Visually confirms RS reorientation.	

Note: Must receive radar status before power-down.

4. Places all LSs in LOCAL.	4. Notifies launcher and RS crews that all equipment is in LOCAL and safe to approach.	4. Powers down LCU-CADCI equipment (if equipped).
		a. Waits for message, “SAFE TO POWER OFF” or “PRESS ANY KEY TO REBOOT” to appear, then sets LCU POWER switch to OFF.
		b. Removes LCU keyboard from shelf and slide pins into hinges. Folds up hinged keyboard and fastens case clamps.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
		c. At CADCI switch multiplexer unit power supply, sets AC PWR to OFF. d. Powers down the CADCI encryption units (A181 and A182).
Note: If power-down will be for a short period and codes need to be saved, set ON/STBY/ON switches to STBY.		
		e. Sets the CADCI cable driver (A183) POWER switch to OFF.
5. De-assigns launcher stations.	5. Assists as needed.	5. Stows and secures equipment and then exits shelter.
6. Updates FU database in Tab 08.	6. Assists as needed.	
Note: If required, perform IFF CODE HOLD. a. Presses SEL TAB, enters 06, and presses SEL TAB again. b. When Tab 06 appears, enters a "1" in MODE 4 CODE HOLD data field. Presses ENTR TAB. c. Presses SEL TAB, enters 08, and presses SEL TAB again.		
7. Presses COMP & SYS RESET. Notifies CM 2 to secure software. a. Stows CM 1's chair.	7. Removes data collection cartridge from EDR. Secures FU disk, training disk, data collection cartridge, and other classified material in safe. Installs shipping cartridges a. Closes and secures ODS and EDR	

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3

CAUTION
Check all equipment and slides to ensure they are secured to prevent possible damage during road march.

8. De-energizes DLT, AN/VRC-90A (ICOM), and sets to STANDBY.

8. Sets VHF radios to STANDBY.

WARNING
To avoid injury, do not lean over antenna maintenance platform edge to reach mast clamp.

CAUTION
Damage to lower mast section and mast clamp can occur if mast clamp is not fully open when lowering data link antenna. Ensure mast clamp is fully open before lowering data link antenna.

9. Powers down the ECS per TM 9-1430-600-10-1.

9. Starts vehicles and disconnects FOCA.

9. Verifies with AMG crew that shelter power is no longer required and sets all distribution amplifier switches to OFF.

a. At generator control panel, plugs sound-powered headphones into COMM receptacle (if used).

a. After ECS power down, closes ECS rear air vent doors.

CAUTION
Turn off the GENERATOR-POWER TURBINES switch only in case of emergency shutdown.

b. Confirms with RS Crew that RS is ready for prime power shut-down.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
c. At generator control panel, lifts safety guards and sets GENERATOR POWER-RADAR and GENERATOR POWER-ECS switches to OFF.		
d. Notifies EPP crew that generators can be shut down. Stows telephone and flashlight, if used.	d. When generator power is off, notifies CM 3 to disconnect AMG cables.	d. When notified that the EPP is powered down, removes all AMG cables and replaces cable covers. Closes environmental covers and lays cables down for AMG crew recovery.
10. Lowers data link antenna.	10. Assists CM 1.	10. Assists as needed.

WARNING

Ensure all personnel are clear of the path of antenna to avoid injury. Damage to lower mast section and mast clamp can occur if excessive force is used. Failure to observe close clearance between DLT base handle and ECS shelter may result in injuries to the hands.

WARNING

To avoid injury, do not lean over antenna maintenance platform edge to reach data link antenna.

WARNING

Data link antenna may be hot. Wear protective gloves to keep from injuring hands.

11. Removes and stows data link antenna.	11. Closes and secures shelter and PE.	11. Assists as needed.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3

WARNING

Shock hazards exist; A66 UHF AMS PWR AMPL, A41 ANT CONT UNIT, and RRT circuit breakers must be shut off before disconnecting cables.

Note: If UHF corner reflectors were used, disassemble and stow per Appendix E.

12. Assists CM 3.	12. Assists CM 3.	12. If corner reflectors were used, disassembles and stows corner reflectors.
13. Stows DLT platform. Climbs into front truck bed.	13. Assists as needed.	13. Stows whip antennas.

WARNING

Shock hazards exist; shut down the EPP before disconnecting any cables. Confirm power down with EPP crew.

14. Disconnects ECS-EPP cables and stows RWCIU cable.	14. Assists CM 1 with ECS-EPP cables.	14. Assists as required.
a. Takes the ECS ground cable from CM 2; stows ground cable in truck bed.	a. Retrieves the ECS ground cable and passes the ground cable up to CM 1 for stowing in truck bed.	
b. Unties roadside and curbside air conditioner covers and secures covers.		

Note: If protective entrance A108 was installed, perform road march procedures per Appendix F.

15. Disassembles and stows PE (if used).	15. Disassembles and stows PE (if used).	15. Assists as needed.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3

WARNING
Two CMs are required to stow and secure boarding ladder and tailgate.

16. Assists CM 2.	16. Removes, disassembles, and stows the boarding ladder.	16. Assists as needed.
17. Assists CM 2	17. Unhooks and raises tailgate to a closed position and secures.	17. Assists as needed.
18. Enters ECS cab. Notifies CM 2 to remove wheel chocks.	18. Removes curbside and roadside wheel chocks from rear wheels and stows.	18. Assists as needed.
19. Verifies vehicle operations. Performs a safety inspection per SOP.	19. Assists as needed.	19. Assists as needed.
20. Moves vehicle forward six feet from stake and stops.	20. Assists as needed.	20. Grounds guide vehicle.

Note: For evaluation purposes, time stops here.

21. Reports that ECS is road-marched.	21. Assists EPP crew, as needed.	21. Reports that ECS is road-marched.

COACHING POINT: The performance measures are done in the sequence outlined. All crew members do their like-numbered tasks at the same time. When all the individual tasks have been mastered and all crew members can do their jobs without coaching, go for speed and remember to be safety-conscious. The more the drill is performed, the better the crew members will perform together.

RUN-THROUGH INSTRUCTIONS: The crew members should practice this drill until they can perform the drill according to the standard without using the drill book. The initial run-through should be conducted slowly. The crew members should change positions in order to learn all steps and standards.

PERFORM: When the crew members can perform this crew drill to standard, inform the platoon sergeant or platoon leader that the crew members are ready to be evaluated.

SUPPORTED T&EOs

ARTEP NUMBER	T&EO NUMBER	T&EO TASK TITLE
44-637-30-MTP	44-2-9044.44P20P	Perform March Order

2-5. Crew Drill 44-5-D012.

TASK: Prepare the RS for Road March (44-5-D012).

CONDITIONS: The RS is emplaced and the battery has been ordered to occupy a new position. All components of the RS are available and operable. A crew has been assigned to road-march the radar set in all environmental conditions both day and night. The crew receives the command, “March order.”

STANDARD: Road-march the RS by the performance measures as sequenced in this drill. Complete this drill within 25 minutes when in a training environment.

Note: Allow additional march-order time when performing this drill in MOPP4 per ARTEP 44-637-30-MTP (Figures 5-1 and 5-2).

SUPPORTING INDIVIDUAL TASKS: Supporting individual tasks for this drill are listed in Appendix A, Individual Task-To-Drill Matrix.

ILLUSTRATIONS: Figure 2-8.

SETUP INSTRUCTIONS: The following equipment, areas, and personnel must be provided for the drill to be trained correctly.

a. Resources.

(1) Radar set.

(2) Telephone set, sound-powered TA-1/PT.

(3) Screw driver, flat tip, 3/8 inches wide, 8 inches long.

(4) EPP, ECS, and AMG.

(5) Individual weapons, NBC protective clothing, and equipment.

b. Training Site. Emplaced RS is in an area large enough (10 x 20 meters) to perform all operations for march order. The site should be as level as possible. The maximum allowable slope from front to back or side to side is 10 degrees.

c. Unit Instructions: The crew members will road-march the RS.

TALK THROUGH INSTRUCTIONS: The battery has received a movement order to a new field position. The crew members have the responsibility to prepare the RS for road march within the prescribed time limits.

a. Orientation: Before beginning drill training, ensure that each crew member knows the purpose of the drill and is briefed on safety awareness.

b. Safety/Fratricide: All soldiers who operate the RS must know that safety hazards exist while operating the various items of equipment. These hazards can and have caused severe injuries to operators. Be extremely careful when working around the RS. Throughout the crew drill, observe all dangers, warnings, and cautions required to properly emplace the RS. All commanders, trainers, and leaders must plan, train, and stress all procedures, which must be followed to avoid fratricide. These procedures include IFF, weapons control status, vehicle and aircraft recognition, corridors, routes, zones, flight levels, and other control measures. Munitions cannot distinguish friend or foe.

c. Demonstration (Optional). If a nearby crew has successfully performed the drill, have that crew demonstrate the drill. Explain their actions using the performance measures as a guide. After the demonstration, summarize.

d. Explanation. Explain the drill in the following manner:

(1) Show the crew members how the RS should be march-ordered using a diagram, Figure 2-8, a sand table, or a simple sketch in the dirt.

(2) Tell each crew member what their duties are in the drill.

(3) Read the performance measures of the drill to the crew members.

(4) Have each crew member explain their performance measures to ensure that they understand them.

WALK-THROUGH INSTRUCTIONS:

a. Use the Crawl-Walk-Run Method of Training. Start the training slowly. Correct any mistakes the crew members make as they go. Do not proceed until the drill is done right. After the crew members demonstrate their proficiency at a slow pace, let them do it faster. However, remember that safety is never sacrificed for speed. Watch carefully to make sure the crew members achieve all of the standards for the drill.

b. Initiating Cue. The crew receives the command, “March order.”

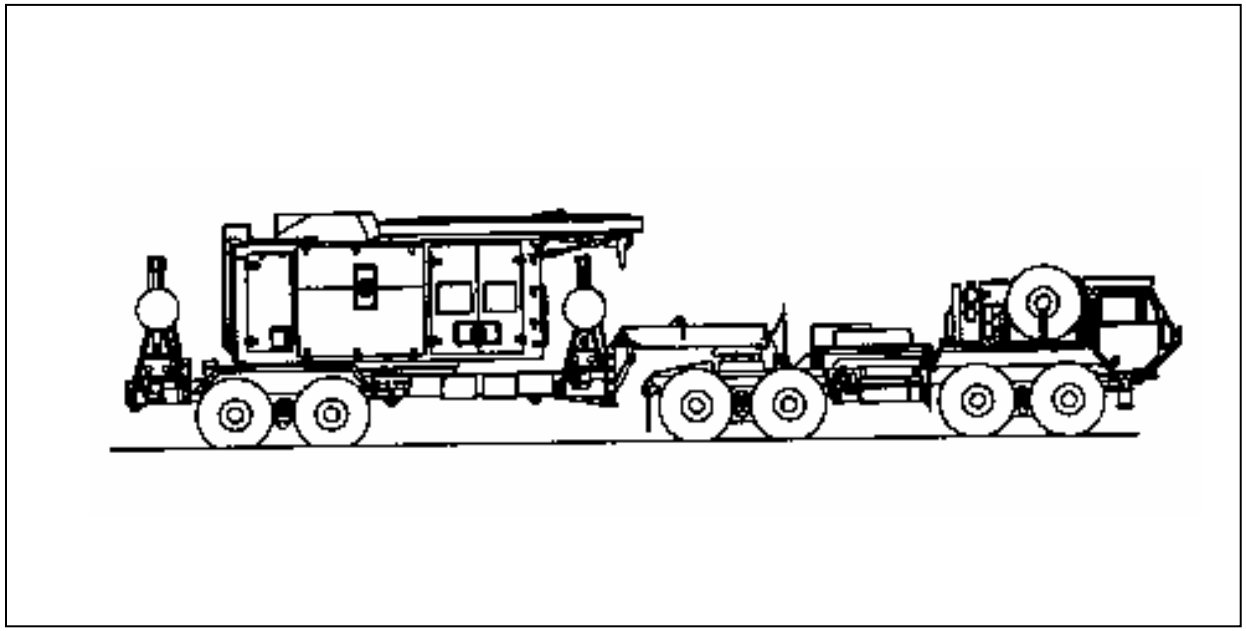


Figure 2-8. March-ordered RS

PERFORMANCE MEASURES: Crew members complete their performance measures as they are stated and in the sequence shown. They must synchronize the completion of like-numbered performance measures.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
1. Receives and confirms march order.	1. Receives and confirms march order.	1. Receives and confirms march order.	1. Receives and confirms march order.

Note: For evaluation purposes, time starts here.

WARNING

Do not approach the RS until the ECS has positioned the RS to stow. Ensure personnel are clear of the RS prior to movement of the M983.

2. Assists as needed.	2. Opens forward curbside utility bay doors. Places LOCAL/REMOTE switch to LOCAL and inserts safety pin. Turns S-2 off. a. Connects telephone (if used) and establishes communications with the ECS. b. Notifies ECS that the RS has been switched to LOCAL control and RS march-order procedures have started.	2. Assists as needed.	2. Assists as needed.
3. When directed by CM 2, maneuvers RS tractor back in front of trailer so the fifth wheel is just in front of trailer kingpin.	3. Clears trailer area of personnel. Guides CM 1 back in front of trailer so the fifth wheel is just in front of trailer kingpin.	3. Assists as needed.	3. Assists as needed.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
a. Halts vehicle and sets parking brake. b. Sets the tractor shift lever to NEUTRAL. Leaves engine running.	a. Commands, “Halt vehicle.”		

WARNING
Chock the tractor wheels before the driver leaves the cab.

4. When notified by CM 4 that chocks are emplaced, exits vehicle.	4. Places IFF in STANDBY or POWER DOWN IFF.	4. Assists CM 4 with chocking.	4. Obtains chocks and chocks tractor per Appendix B. a. Notifies CM 1 that the tractor wheels are chocked.

Notes:
- For the following steps, retrieve and use boarding ladder, when necessary.
- Use steps b-f to place IFF set in standby.
- Use step g to power down the IFF.

b. Assists as required.	b. Removes and installs ladder. c. On the MODE 4 panel, sets M4 CONTROL SELECTOR to LOCAL.	b. Assists as required.	b. Assists CM 2.

CAUTION
Perform steps below exactly as stated, or Mode 4 codes will be zeroed.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
	d. Pulls and rotates LOCAL M4 CONT to CODE HOLD, and holds. Sets AC PWR CB to OFF. Releases LOCAL M4 CONT switch after 15 seconds and sets to A or B, as required.		
e. Assists as needed.	e. On the processor, sets POWER AC and DC CBs to OFF. f. On the MODE 4 panel, sets M4 CONTROL SELECTOR to REMOTE. Sets AC CB to ON. g. On the processor, sets POWER AC and POWER DC CBs to OFF.	e. Assists as needed.	e. Assists as needed.

CAUTION

Be sure to secure metal flap inside of vent covers with latch before closing covers to prevent damage to honeycomb filters.

Note: Perform the next step only after blowers have stopped rotating.

5. Assists as needed.	5. Places radar set at minimum power. a. At radar control indicator panel, powers down per TM 9-1430-601-10-1.	5. Coordinates with CM 2 after power down and blowers stop running.	5. Coordinates with CM 2 after power down and blowers stop running.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4

CAUTION

After turning off LOW-LEVEL ELEX switch, verify antenna louvers are closed before turning off ENVIRON CONTROL switch.

	b. Informs CMs and ECS crew that the RS is at minimum power and AZ S2 is set to OFF.	b. Closes roadside bay and PDU doors.	b. Closes curbside bay and PDU doors.
		c. Closes shelter door vents.	c. Closes full-length CLET doors.
	d. Assists CM 3.	d. Assists as needed.	d. Stows boarding ladder.

WARNING

When working on the shelter roof, proceed cautiously to avoid tripping or falling. Observe NO STEP and CAUTION markings.

WARNING

Use extreme caution when stowing radar shroud assembly in high winds. Two personnel are required to stow shroud.

6. Stows radar shroud.	6. Stands by and observes CMs 1 and 3 for safe operations while stowing shroud.	6. Stows radar shroud.	6. Stands by and observes CMs 1 and 3 for safe operations while stowing shroud.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
7. Notifies CM 2 that it is clear and safe to lower antenna.	7. When notified by CM 1, turns switch S2 to ON and holds ELEVATE/STOW switch to STOW. Next, lowers antenna so high point is about 4 feet above shelter roof.		
8. Notifies CM 2 to halt antenna about 4 feet above shelter roof.	8. Turns S2 to OFF.		
9. Installs AWC and comparator cover.	9. Assists CMs 1 and 3 in installing AWC and comparator cover.	9. Coordinates with and assists CM 1 in installing AWC.	9. Observes CMs for safe operations while installing AWC and comparator cover.

CAUTION

To prevent damage to the mud flaps and outrigger control box, ensure mud flaps have been removed from tractor.

Note: Verify the shelter is clear of obstructions and personnel before lowering antenna.

10. If mud flaps are present, removes them from M983 tractor.	10. Turns on S2 AZ control switch and stows antenna. a. At radar status control indicator panel, holds ELEVATE/ STOW switch to STOW and lowers antenna until indicator illuminates. Releases switch.	10. Assists as needed.	10. If mud flaps are present, removes them from M983 tractor.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
	b. Ensures AZ ENABLE S8 switch is set to OFF. Closes and secures curbside utility bay doors.		
11. Connects M983 tractor cables to trailer.	11. At antenna pedestal junction box, sets POWER-SHELTER AZ/ANT EL S2 and PRIME POWER S1 to OFF.	11. Assists as needed.	11. Assists as needed.

WARNING

To avoid injury, ensure hinged access cover is secured when connecting IVC cable.

a. At tractor fifth wheel, pulls out fifth wheel's primary and secondary locks, releases handles, and locks in the OUT position.	a. Notifies CM 3 that POWER-SHELTER AZ/ANT EL S2 has been set to OFF.	a. Enters shelter and engages azimuth stow lock by pushing handle down.	
b. Installs electrical slave cable.	b. Notifies ECS crew that RS is ready for prime power shutdown.	b. Exits shelter and secures shelter door.	
c. Connects IVC cable and air hoses.		c. Informs ECS crew that RS is in a stowed azimuth position and stows phone (if used).	
d. Verifies fifth wheel jam plate is just below the trailer gooseneck.			

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
e. Verifies all connectors are correct and secured.			

WARNING
Shock hazards exist; shut down generators before disconnecting any cables.

12. When notified by the EPP crew that the generators are shut down, disconnects prime power and RWCIU cables from RS antenna pedestal. a. Covers cable connectors with dust covers and sets cables on ground.	12. When notified by the EPP crew that the generators are shut down, disconnects prime power and RWCIU cables from RS antenna pedestal. a. Covers cable connectors with dust covers and sets cables on ground.	12. Assists the EPP crew with retrieving and stowing RS power cables.	12. Assists the EPP crew with retrieving and stowing RS power cables.

DANGER
Do not permit anyone to stand directly behind tractor or semitrailer during coupling procedure. Death to personnel could result.

13. Assists as needed.	13. At outrigger control box, removes locking hook and opens cover. a. Positions red safety guard on POWER ON/OFF switch to ON.	13. Assists as needed.	13. Assists as needed.

CAUTION
Ensure outrigger switches are free from debris. Do not use outrigger switches in diagonal pairs.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4

CAUTION

To prevent equipment damage when raising outriggers, ensure outrigger pads have free movement all the way up to the stow position.

b. Positions self to roadside rear of RS semitrailer. Observes rear outriggers. Notifies CM 2 to stop raising outriggers when outrigger pads are about one to two feet above the ground.	b. Coordinates with CMs 1 and 3 until rear outriggers are one to two feet above ground, and then stops.	b. Provides assistance by observing outrigger operations, curbside rear.	
c. Checks outrigger pad for free movement. Notifies CM 2 to continue raising the outriggers to the stow position.	c. When notified by CMs 1 and 3, continues to raise the outriggers to the stow position.	c. Checks outrigger pad for free movement; notifies CM 2 to continue raising the outriggers to the stow position.	
d. Places chock block per Appendix B.		d. Provides assistance in placing semitrailer chock blocks. Notifies CM 2 when clear.	
e. Positions self to the roadside front of RS semitrailer and observes forward outriggers. Coordinates with CM 2.	e. Coordinates with CM 1; uses front outrigger to adjust height of semitrailer so that semitrailer kingpin plate is aligned with tractor's fifth wheel.		

CAUTION

Ensure all cables and hoses are clear of tractor fifth wheel and semitrailer kingpin plate.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4

DANGER

To prevent death to crew members, do not stand between tractor and semitrailer when guiding tractor to mate fifth wheel with semitrailer kingpin.

CAUTION

Do not run kingpin up guide ramps or into throat of fifth wheel. Damage to kingpin, guide ramps, or fifth wheel may result.

f. Enters tractor cab and pushes in TRAILER AIR SUPPLY control knob.	f. Removes tractor wheel chocks.	f. Removes tractor wheel chocks.

CAUTION

To prevent equipment damage when raising outriggers, ensure outrigger pads have free movement all the way up to the stow position.

g. Maneuvers M983 tractor back under semitrailer. Stops when signaled.	g. Guides tractor slowly back under semitrailer so kingpin is aligned with throat of fifth wheel. Signals CM 1 to stop.	g. Assists as needed.
Note: During tractor and semitrailer coupling operations, tractor operator should hold TRAILER HAND BRAKE control in ON position to apply semi-trailer brakes.	Note: Check that kingpin is in fifth wheel throat. Daylight should not be seen between top of fifth wheel plate and the kingpin.	

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
h. Slowly backs tractor, as directed by CM 2.	h. Slowly guides tractor back until tractor's fifth wheel coupling jaws are engaged around the semitrailer kingpin.		
i. Sets parking brake and places shift lever to NEUTRAL. Leaves engine running.	i. Chocks tractor wheels.	i. Provides assistance in placing tractor chocks.	
14. Assists as needed.	14. Raises front outriggers just above the ground.	14. Observes forward roadside outrigger and notifies CM 2 when outrigger is just off the ground.	14. Assists as needed.

DANGER

To prevent death or injury to crew members, do not stand between tractor and semitrailer when performing jerk test.

15. Performs tractor and semitrailer jerk test.	15. Performs tractor and semitrailer jerk test.	15. Coordinates with and provides assistance to CMs 1 and 2.	15. Assists as needed.
a. Returns to cab of tractor.	a. Removes tractor wheel chocks.	a. Removes tractor wheel chocks.	
b. Performs jerk test when notified by CM 2.	b. Notifies CM 1 to perform jerk test. Note: If coupling is not secure, have CM 1 slowly rock tractor back and forth until kingpin is securely locked in fifth wheel.		

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
c. Sets parking brake, places shift lever to neutral, and leaves engine running.	c. Chocks tractor wheels.	c. Chocks tractor wheels.	
d. When notified by CM 2, exits vehicle.	d. Notifies CM 1 that wheels are chocked.		
e. Verifies fifth wheel's primary and secondary lock handles are in a locked position.			

CAUTION

To prevent equipment damage when raising outriggers, ensure outrigger pads have free movement all the way up to the stow position.

16. Stows forward outriggers.	16. Stows forward outriggers.	16. Assists as needed.	16. Assists as needed.
a. Notifies CM 2 to stop raising outriggers when outrigger pads are about one to two feet above the ground.	a. At outrigger control panel, raises front outriggers one to two feet above ground, then stops.		
b. Checks outrigger pad for free movement and notifies CM 2 to continue raising the outriggers to the stow position.	b. Checks curbside outrigger pad for free movement. When notified by CM 1, continues to raise outriggers.	b. Disconnects and stows radar ground cable.	
	c. At outrigger control panel, sets POWER/OFF switch to OFF and closes red safety guard. Closes and secures cover.		

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
Note: Ensure outrigger safety chains are connected prior to road travel.			
17. Connects roadside outrigger safety chains	17. Connects curbside outrigger safety chains.	17. Assists as needed.	17. Assists as needed.
18. Enters tractor cab. Moves tractor forward slowly and stops to check brakes. Moves upon command.	18. Removes and stows semitrailer and tractor chocks and notifies CM 1. Performs vehicle safety inspection per unit SOP.	18. Informs ECS that RS is ready for road march.	18. Assists as needed.

Note: For evaluation purposes, time stops here.

COACHING POINT: The performance measures are done in the sequence outlined. All crew members do their like-numbered tasks at the same time. When all the individual tasks have been mastered and all crew members can do their jobs without coaching, go for speed and remember to be safety-conscious. The more the drill is performed, the better the crew members will perform together.

RUN-THROUGH INSTRUCTIONS: The crew members should practice this drill until they can perform the drill according to the standard without using the drill book. The initial run-through should be conducted slowly. The crew members should change positions in order to learn all steps and standards.

PERFORM: When the crew members can perform this crew drill to standard, inform the platoon sergeant or platoon leader that the crew members are ready to be evaluated.

SUPPORTED T&EOs

ARTEP NUMBER	T&EO NUMBER	T&EO TASK TITLE
44-637-30-MTP	44-2-9044.44P20P	Perform March Order

2-6. Crew Drill 44-5-D023.

TASK: Emplace (Manual) the RS for Tactical Operations (44-5-D023).

CONDITIONS: The RS is in the march-order configuration and a general location to emplace the RS has been selected. All components of the RS are available and operable. A crew has been assigned to emplace and prepare the RS for tactical operations in all environmental conditions both day and night. As the crew approaches the selected position, the ground guide orients and positions the RS to a designated spot and commands, "Halt vehicle."

STANDARD: The crew must complete the RS automatic emplacement drill in the sequence, and within 25 minutes at MOPP0 through MOPP3 and in the time standards stated in ARTEP 44-637-30-MTP at MOPP4. Time is measured from when the crew chief (crewman 2) announces, “Halt vehicle.”

Note: Allow additional emplacement time when performing this drill in MOPP4 per ARTEP 44-637-30-MTP (Figures 5-1 and 5-2).

SUPPORTING INDIVIDUAL TASKS: See Appendix A, Individual Task-To-Drill Matrix.

ILLUSTRATIONS: Figures 2-3 through 2-6.

SETUP INSTRUCTIONS: The following equipment, areas, and personnel must be provided for the drill to be trained correctly.

a. Resources.

(1) Radar set

(2) Telephone set, sound-powered. TA-1/PT.

(3) Screw driver, flat tip, 3/8 inches wide, 8 inches long.

(4) EPP, ECS, and AMG.

(5) Individual weapons, NBC protective clothing, and equipment.

b. Training Site. The potential site must be large enough (10x20 meters) to prevent rotational hazards. The site should be as level as possible. The maximum allowable slope from front to back or side to side is 10 degrees.

c. Unit Instructions. The crew members will emplace and prepare the RS for tactical operations at a designated location using the following procedures:

(1) Before the fire platoon arrives at the selected site, the RSOP team will decide the position of each FP vehicle and will emplace marker stakes and ground rods to show vehicle positions.

(2) All FP vehicles arrive on site at approximately the same time and stop a short distance from the selected FP site.

(3) One crew member from each vehicle serves as a ground guide to direct the driver to position the vehicle at the emplacement site. Crew members will position the RS first, the EPP second, the ECS third, and the AMG last.

TALK-THROUGH INSTRUCTIONS: The mission of the RS is to provide detection of tracks, tracking, and identification of tracks in the FP sector, and to guide the missile to its target. The crew members must be able to emplace and prepare the RS for tactical operations where directed within prescribed time limits.

a. Orientation. Before beginning drill training, ensure that each crew member knows the purpose of the drill and is briefed on safety awareness.

b. Safety/Fratricide. All soldiers who operate the RS must know that safety hazards exist while operating the various items of equipment. These hazards can and have caused severe injuries to operators. Be extremely careful when working around the RS. Throughout the crew drill, observe all dangers, warnings, and cautions required to properly emplace the RS. All commanders, trainers, and leaders must plan, train, and stress all procedures, which must be followed to avoid fratricide. These procedures include IFF, weapons control status, vehicle and aircraft recognition, corridors, routes, zones, flight levels, and other control measures. Munitions cannot distinguish friend or foe.

c. Demonstration (Optional). If a nearby crew has successfully performed the drill, have that crew demonstrate the drill. Using the performance measures as a guide, explain what is being done and why. After the demonstration, summarize.

d. Explanation. Explain the drill in the following manner:

(1) Show the crew members how the RS should be emplaced using a diagram, Figures 2-3 through 2-6, a sand table, or a simple sketch in the dirt.

(2) Tell the crew members what their duties are in the drill.

(3) Read the performance measures of the drill to the crew members.

(4) Have crew members explain their performance measures to ensure they understand them.

WALK-THROUGH INSTRUCTIONS:

a. Use the Crawl-Walk-Run Method of Training. Have crew members take their positions and perform the drill. Start the training slowly. Correct any mistakes the crew members make as they go. Do not proceed until drill procedures are done correctly. After the crew members demonstrate their proficiency at a slow pace, let them do it faster. However, remember that safety is never sacrificed for speed. Watch carefully to make sure the crew members achieve all of the standards for the drill.

b. Initiating Cue. As the RS crew approaches the selected position, the vehicle ground guide orients and positions the RS to a designated spot and commands, “Halt vehicle.”

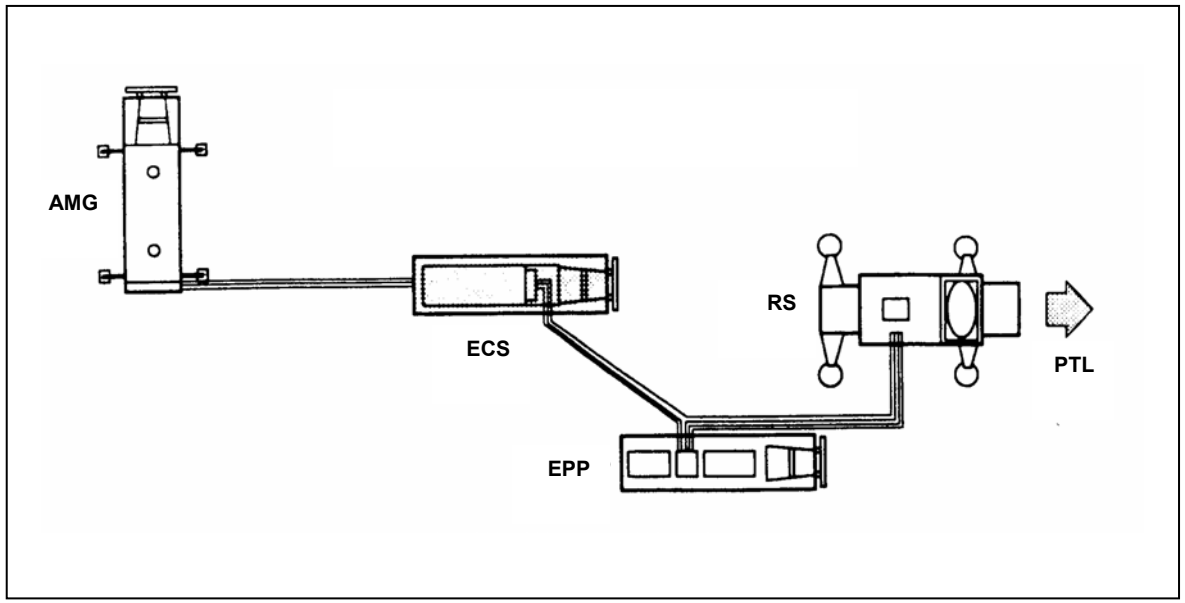


Figure 2-3. RS emplacement

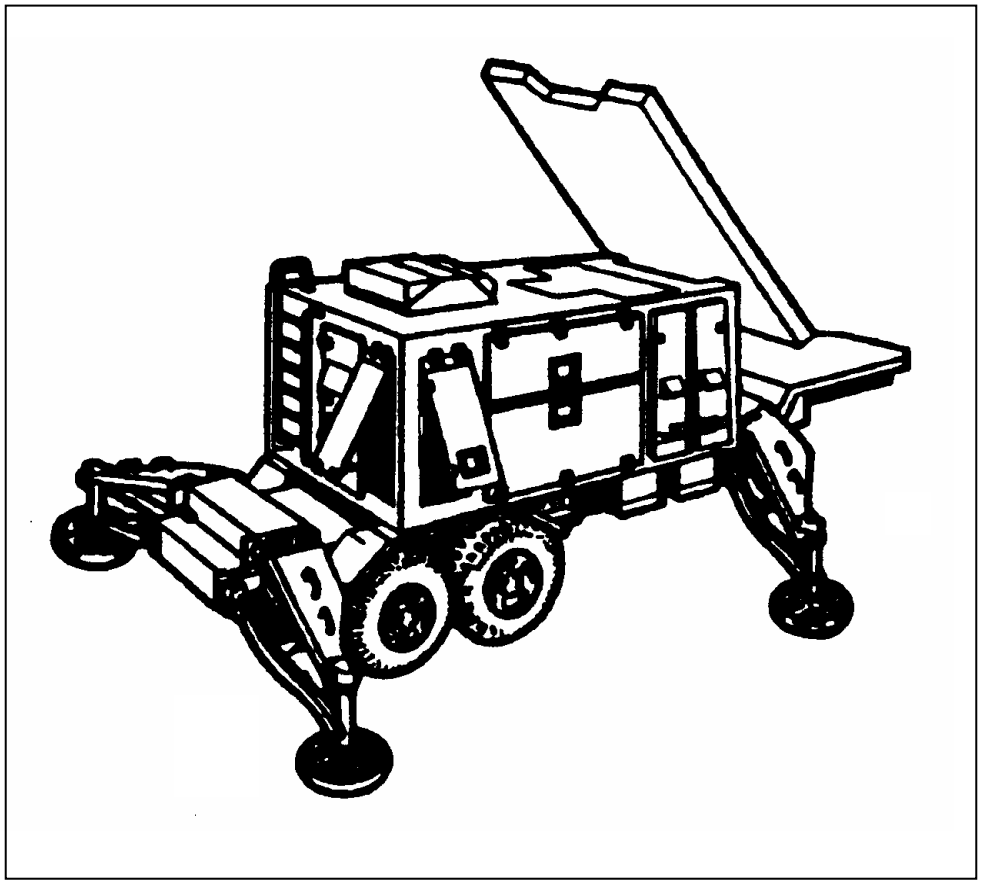


Figure 2-4. Emplaced RS

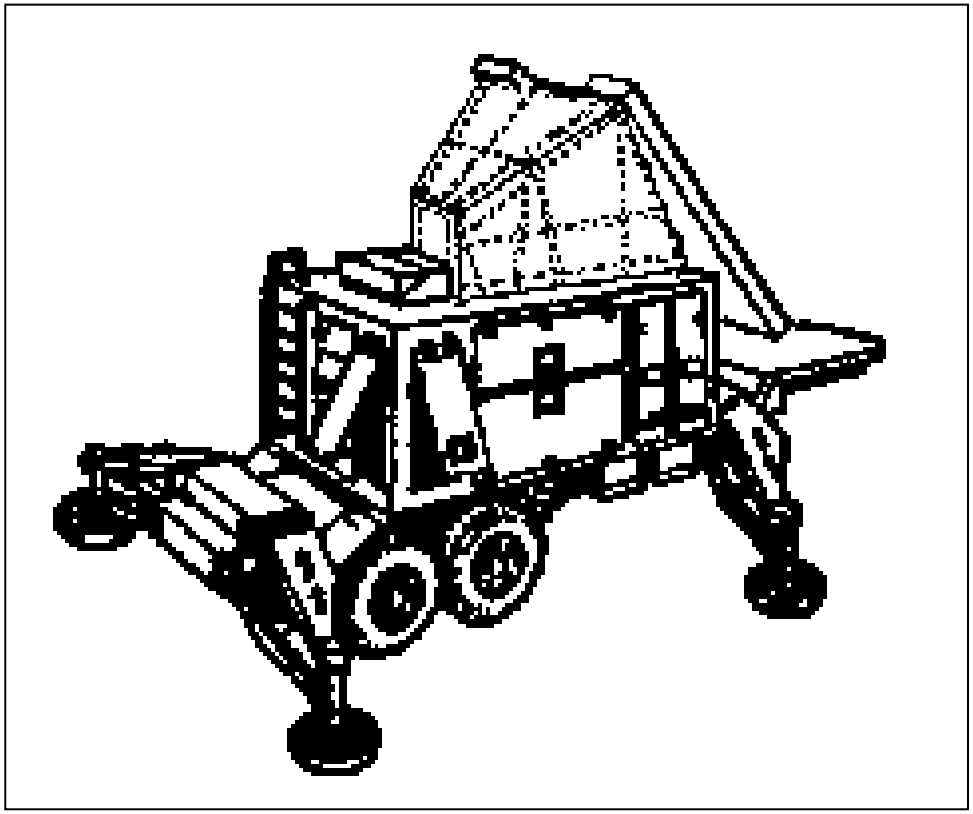


Figure 2-5. Emplaced RS with radar shroud

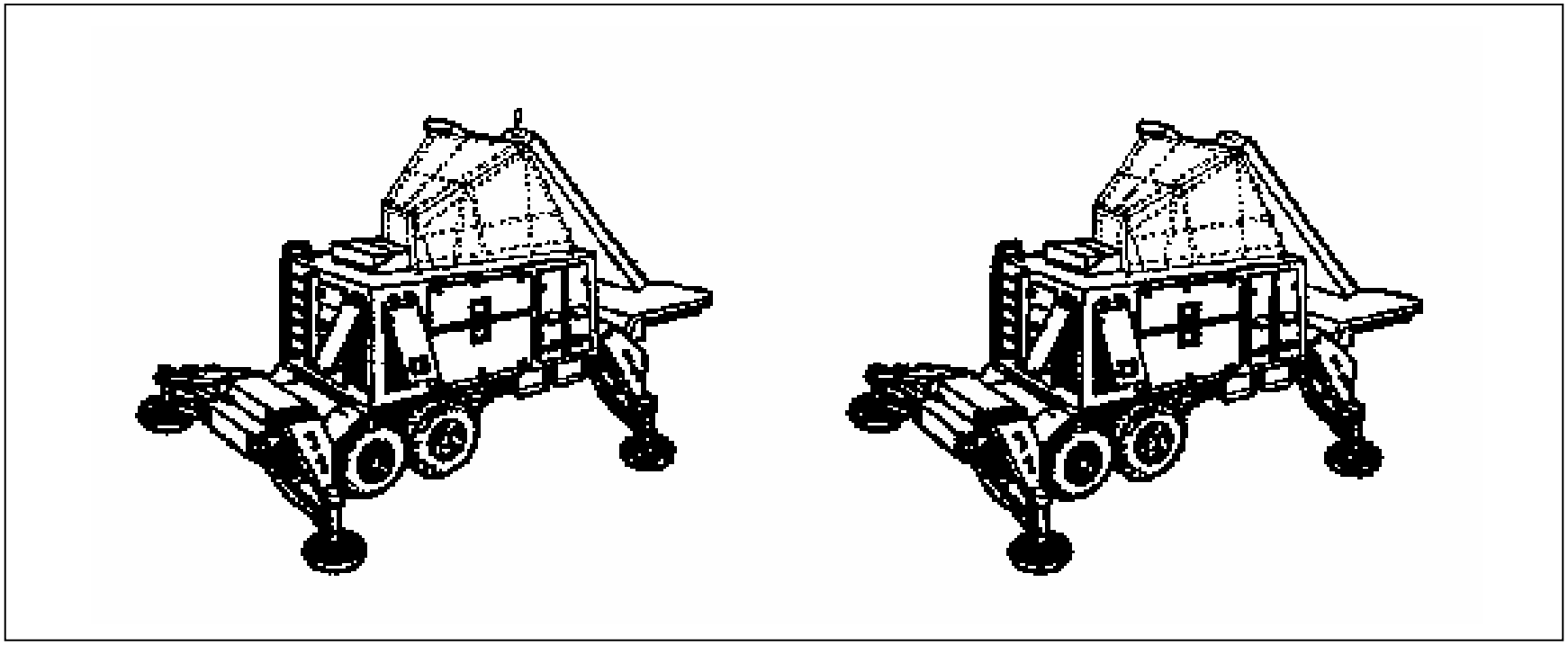


Figure 2-6. Emplaced RS with radar shroud and PLGR

PERFORMANCE MEASURES: Crew members complete their performance measures as they are stated and in the sequence shown. They must synchronize the completion of like-numbered performance measures.

WARNING

Exercise extreme caution during blackout conditions. Crew members should work in pairs. Second crew member uses a blackout flashlight to assist, when necessary, in such operations as M983 tractor coupling or uncoupling, outrigger deployment, and antenna weather cover removal or installation.

WARNING

To reduce fire, carbon monoxide, and noise hazards, position the RS as far away from the EPP as the cable length and geography allow.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
1. Maneuvers the RS to the designated position and orients at marker stake as directed by CM.	1. Directs and orients CM 1 to properly position the RS at the designated marker stake.	1. Assists CM 2 to properly position the RS at the designated marker stake.	1. Assists as needed.
Note: For evaluation purposes, time starts here.			
2. Halts vehicle, sets parking brake, sets trailer air supply to OFF, and leaves engine running.	2. Commands, “Halt vehicle.”		
3. Notifies CM 2, “Ready for wheel chocks.”	3. When notified by CM 1, places wheel chocks per Appendix B.	3. Assists CM 2.	3. Assists CM 2.
4. When notified by CM 2 that tractor is chocked, exits cab.	4. Notifies CM 1 that tractor wheels are chocked.		

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4

CAUTION
Equipment damage may occur if safety chains are not disconnected prior to lowering.

5. Releases outrigger safety chains on roadside and notifies CM 2.	5. Releases outrigger safety chains on curbside.	5. Installs ground rod (if required) and connects RS ground cable with adjustable wrench.	5. Assists CM 3.

WARNING
Personnel injury may occur when deploying outriggers; clear area of personnel prior to movement.

CAUTION
Equipment damage may occur to semitrailer if outrigger toggle switches are used in diagonal pairs.

6. Chocks semitrailer wheels and notifies CM 2 when completed.	6. Employs outriggers.		
7. Takes up position at the curbside rear, and signals CM 2 to lower rear outriggers. Notifies CM 2 when outriggers touch the ground.	7. On signal from CM 1, lowers outriggers until they touch the ground.		

CAUTION
Equipment damage may occur if semitrailer is raised high enough to put pressure on tractor's fifth wheel.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
8. Takes position at roadside front of trailer and directs CM 2 to lower front outriggers. Notifies CM 2 when they touch the ground.	8. Upon signal from CM 1, lowers front outriggers until both are touching the ground and semitrailer weight is off the kingpin.	8. Assists as required.	8. Assists as required.

DANGER

Crew members are <u>not</u> to stand <u>between</u> tandem wheels of tractor when coupling or uncoupling trailer. Trailer <u>must</u> be resting on both outrigger pads, and wheels should be firmly chocked.

	9. Sets outrigger power switch to OFF. Notifies CMs that outrigger power is off.		
10. Removes and stows trailer air brake lines and inter-vehicular cable. Does not disconnect 28-VDC cable at this time.			
11. At fifth wheel, pulls out secondary and primary lock release handles until they are hooked in the OUT position.			

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
12. When signaled by CM 2, drives tractor forward until told to stop. Sets tractor brake and leaves engine running. Exits cab when notified by CM 2 that wheels are chocked.	12. Removes tractor wheel chocks and directs CM 1 forward until fifth wheel clears trailer kingpin. Signals CM 1 to stop and chock wheels. Notifies CM 1 to exit cab.	12. Assists CM 2.	12. Assists as needed.
13. Assists as needed.	13. Assists CM 4 in removing ladder from storage area and positions as necessary to open air vents or bay doors. Opens air vents curbside and roadside.	13. Assists as needed.	13. Assisted by CM 2, removes ladder from storage and positions as necessary to open air vents or bay doors. Opens air vents curbside and roadside.
14. Assists CM 2 with opening and securing both PDU door air vents.	14. With assistance from CM 1, opens and secures both PDU door air vents on RS forward exterior.	14. Opens top and bottom air vents on shelter rear entrance door.	14. Assists as needed.
	15. With CM 4, removes ladder from RS.		15. With CM 2, removes ladder from RS.
16. Assists as needed.	16. Assists as needed.	16. Enters shelter and disengages azimuth stow lock. Ensures cap is on manual input drive and is hand-tight.	16. Opens curbside CLET door.
17. Assists as needed.	17. Assists as needed.	17. Ensures all circuit breakers at A30 are set to ON. Inspects maintenance aisle for loose cables and tightens as needed. Exits RS shelter.	17. Opens rear CLET door.
18. Notifies CM 2 that the RS is clear of personnel.	18. When notified RS is clear, turns on power at outrigger control panel.	18. Notifies CM 2 that the RS is clear of personnel.	18. Assists as needed.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
19. Assists CM 2.	19. Levels RS trailer.	19. Assists as needed.	19. Assists as needed.
20. Assists CM 2.	20. Verifies that all four outrigger pads have firm contact with ground.	20. Assists CM 2.	20. Assists CM 2.
21. When notified by CM 2 that RS is level, confirms all four outriggers have firm contact with the ground and at least one semitrailer wheel on each side is off the ground.	21. Signals CM 1 when trailer is level. Remains at outrigger control box.	21. Assists CM 1.	21. Assists CM 1.

DANGER
Death or serious injury can result if all four outriggers do <u>not</u> have firm contact with the ground.

22. Assists as needed.	22. Sets outrigger control POWER switch to OFF.	22. Retrieves prime power cables.	22. Retrieves prime power cables.
23. Visually verifies radar set is in LOCAL.	23. Prepares RS for power by ensuring LOCAL/REMOTE is set to LOCAL, that safety pin is installed at A112, and that S-1 and S-2 toggle switches at A155 are set to OFF.		
24. Connects the prime power cables from EPP and RWCIU cable from ECS to antenna pedestal junction box.	24. Assists CM 1.	24. Assists as needed.	24. Assists as needed.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
25. Visually verifies all vents are in an open position.	25. Establishes commo with the ECS and reports that RS is ready for prime power.	25. Assists as needed.	25. Assists as needed.
26. Assists as needed.	26. With CM 4, positions ladder as necessary to energize RS.	26. Assists as needed.	26. With CM 2, positions ladder as necessary.
Note: If ambient air temperature is above 70 degrees Fahrenheit, S-7 need not be applied.			
27. Assists as needed.	27. Sets 2A155 prime power S-1 and S-2 to ON and 2A112 switches to ON.		
28. Assists as needed.	28. Powers up and checks IFF switches.	28. Removes two M2 aiming circles. Notifies CM 2 that RS is clear.	28. Assists CM 3. Moves away from RS.
Notes: • RSOP team may have set up an M2 aiming circle at the NREF location. Check its position and level before taking final measurements. • If light is limited, the M51 instrument light should be installed in eye slot. • Hand light can be used for leveling and reading scales or illuminating radicle by placing hand light on plastic reflector on top of telescope.			
29. Assists as needed.	29. Assists as needed.	29. Sets up tripod and NREF M2 aiming circle.	29. Sets up tripod and RS M2 aiming circle.
30. Assists as needed.	30. Assists as needed.	30. Levels the NREF M2 aiming circle. a. Rotates the instrument 1600 mils, and turns only third screw to center the bubble in the horizontal level.	30. Levels the RS aiming circle. a. Rotates the instrument 1600 mils, and turns only third screw to center the bubble in the horizontal level.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
		b. Returns instrument to first position and centers bubble. Next, returns to second position and centers bubble. Repeats until bubble remains centered in both positions.	b. Returns instrument to first position and centers bubble. Next, returns to second position and centers bubble. Repeats until bubble remains centered in both positions.
		c. Checks all four positions. If out more than one graduation, turns instrument in for repair.	c. Checks all four positions. If out more than one graduation, turns instrument in for repair.
Note: Sighting on the north-bearing stake from NREF M2 aiming circle is greatly improved during nighttime emplacements through the use of reflective tape attached to stake. If the stake is too far from NREF M2 aiming circle that it cannot be illuminated from aiming circle position, another crew member will be required to go to the north bearing stake and direct a flashlight toward the NREF M2 aiming circle.			
31. Assists as needed.	31. Assists as needed.	31. Assists as needed.	31. Assists as needed.
		a. Reads azimuth shown on tag of NREF stake. Records on Radar Location/Alignment Data Form whether reading is— (1) True north. (2) Magnetic north. (3) Grid north.	
		b. Sets NREF M2 azimuth to azimuth on tag of NREF stake using upper motion (recording).	

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
		c. Uncovers lower (nonrecording) knobs and rotates instrument toward NREF stake. Centers telescope cross lines on base of NREF stake. Closes lower (nonrecording) knob covers. Note: If unable to see stake, direct CM 4 to use blackout flashlight. d. Checks that azimuth set (see 31b) is still correct.	
32. Assists as needed.	32. With CM 4, removes ladder from RS shelter.	32. Assists as needed.	32. With CM 2, removes ladder from RS shelter.
33. Assists as needed.	33. At radar status control indicator panel, presses and holds ELEVATE/STOW switch to elevate position until antenna is about four feet above shelter roof. Sets A155 S2 to OFF.	33. Assists as needed.	33. Assists as needed.

WARNING
While working on shelter roof, proceed cautiously to avoid tripping or falling.

34. Removes AWC and lowers to CM 2.	34. Receives and stows AWC.	34. Assists CM 1.	34. Assists CM 2.

WARNING
Stand clear of antenna during movement to avoid serious injury.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
35. Notifies CM 2 when it's safe to elevate antenna.	35. Sets A155 S2 to ON. Elevates antenna to operating position. Sets A155 to OFF.	35. Assists CM 1.	35. Assists as needed.
36. Removes comparator cover.	36. Assists as needed.	36. Assists as needed.	36. Assists as needed.
37. Emplaces radar shroud. Removes cover from roof and climbs down from roof.	37. Assists as needed.	37. Emplaces radar shroud. Removes cover from roof and climbs down from roof.	37. Assists as needed.

Note: RS will be rotated to promote settling and to ensure all outriggers are firmly on the ground.

WARNING

To prevent injury, clear <u>all</u> personnel from RS trailer roof, semitrailer, and shelter rotation area.

38. Observes outrigger pads for movement during radar rotation. Immediately alerts CM 2 if any outrigger movement is noted. Ensures pads are firmly seated when rotation is complete.	38. Sets A155 S2 and A112 S8 switches to ON. Uses the ADLC to rotate (stops when notified) RS 6400 mils and return to zero bullring setting.	38. Observes outrigger pads for movement during radar rotation. Immediately alerts CM 2 if any outrigger movement is noted. Ensures pads are firmly seated when rotation is complete.	38. Observes outrigger pads for movement during radar rotation. Immediately alerts CM 2 if any outrigger movement is noted. Ensures pads are firmly seated when rotation is complete.
39. Assists as needed.	39. Sets A155 S2 and A112 S8 to OFF.	39. Assists as needed.	39. Assists as needed.
40. Assists as needed.	40. Checks RS level. If RS is not level, repeats step 19.	40. Assists as needed.	40. Visually verifies that RS is level.
41. When notified by CM 2, disconnects 28-VDC cable from semitrailer.	41. Stows ADLC. At outrigger control box, sets power to OFF and notifies CM 1. Closes red safety guard. Closes cover and secures.	41. Assists as needed.	41. Drains semitrailer air tank.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3	CREW MEMBER 4
42. Enters vehicle and waits until notified by CMs 3 and 4 that the chocks are removed and stored.	42. Establishes communications with the ECS.	42. Removes and stows chock and notifies CM 1 when complete.	42. Assists CM 3.
43. Drives tractor to designated area. Perform after-operations PMCS.		43. Guides CM 1 to designated area and chocks wheels. Assists CM 1 with after-operations PMCS.	
	44. Places RS in REMOTE. Sets A155 S2 to ON and clears RS. Notifies ECS that area is clear.		

Note: For evaluation purposes, time stops here.

Note: When long-term emplacements are anticipated, roll and cross-roll measurements should be taken every 24 hours with the RS at the PTL, and then recorded as a reference. Subsequent daily measurements should be compared to this reference. Differences of 2 mils or greater require reinitialization. Use supplementary roll and cross-roll procedures per TM 9-1430-601-10-1. The following procedures are performed after the RS has been rotated to the PTL and mapping has been completed. The ECS will notify the RS CMs when mapping is done and radar is safe to approach.

COACHING POINT: The performance measures are done in the sequence outlined. All crew members do their like-numbered tasks at the same time. When all the individual tasks have been mastered and all crew members can do their jobs without coaching, go for speed and remember to be safety-conscious. The more the drill is performed, the better the crew members will perform together.

RUN-THROUGH INSTRUCTIONS: The crew members should practice this drill until they can perform the drill according to the standard without using the drill book. The initial run-through should be conducted slowly. The crew members should change positions in order to learn all steps and standards.

PERFORM: When the crew members can perform this crew drill to standard, inform the platoon sergeant or platoon leader that the crew members are ready to be evaluated.

SUPPORTED T&EOs

ARTEP NUMBER	T&EO NUMBER	T&EO TASK TITLE
44-637-30-MTP	44-2-9044.44P20P	Perform March Order

APPENDIX A

INDIVIDUAL TASK-TO-DRILL MATRIX

A-1. General. The following matrix identifies individual tasks from STP 44-14E1-SM and STP 44-14E24-SM-TG, which support each ECS and RS crew drill. A "B" or a "D" in the column below the crew drill number indicates individual tasks that support a drill. A "B" indicates tasks that are trained before the drill, and a "D" indicates tasks that are trained during the drill.

Individual Task Number and Soldier Manual Task Title	**44-5-D009** Emplace the ECS for Tactical Operations	**44-5-D010** Emplace the RS for Tactical Operations (Auto)	**44-5-D011** Prepare the ECS for Road March	**44-5-D012** Prepare the RS for Road March	**44-5-D023** Emplace (Manual) the RS for Tactical Operations
441-084-1403 Perform ECS Emplacement	B				
441-084-1407 Perform ECS Initialization	B				
441-084-1415 Perform ECS March Order			B		
441-083-1100 Perform RS Emplacement		B			
441-083-1471 Activate Fire Unit	B				
441-083-1104 Perform RS March Order				B	
441-084-1108 Operate the HEMTT Series Vehicle		B		B	

Individual Task Number and Soldier Manual Task Title	**44-5-D009** Emplace the ECS for Tactical Operations	**44-5-D010** Emplace the RS for Tactical Operations (Auto)	**44-5-D011** Prepare the ECS for Road March	**44-5-D012** Prepare the RS for Road March	**44-5-D023** Emplace (Manual) the RS for Tactical Operations
551-721-1364 Drive Vehicle with Automatic/Semiautomatic Transmission	B		B		
441-083-1474 Deactivate Fire Unit			B		

APPENDIX B

ILLUSTRATIONS

B-1. Visual Signals. This section describes various arm-and-hand signals and flashlight signals used by Patriot crew members. Visual signals should be used when audible signals may be lost due to loud equipment or vehicle noise. Visual signals are especially useful for guiding and directing Patriot crew members during emplacement, road march, and missile reload procedures.

a. Arm-and-Hand Signals. Good visibility is essential for arm-and-hand signal communications. A crew member using these signals must have line of sight with the other crew member to which signals are directed. Use flashlight signals at night. Figure B-1 shows some arm-and-hand signals. Signals illustrated with a single-headed arrow indicate the signal is not continuously repeated. However, the signals may be repeated at intervals until acknowledged or until the desired action is taken. Signals illustrated with a double-headed arrow are repeated continuously until acknowledged or until the desired action is taken. See FM 21-60 for additional visual signals.

b. Visible Flashlight Signals. Figure B-2 shows standard flashlight signals. Flashlight signals can be used to control movement when visibility is limited.

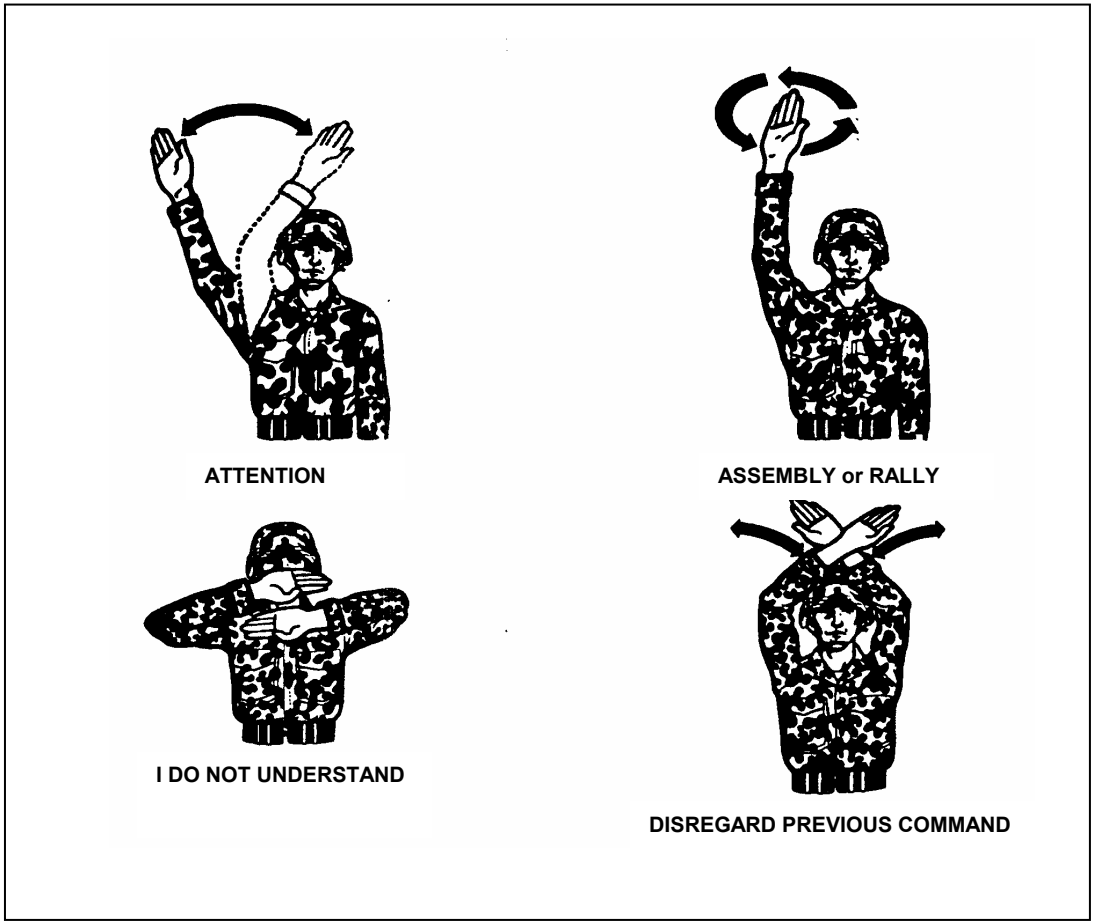


Figure B-1. Arm-and-hand signals

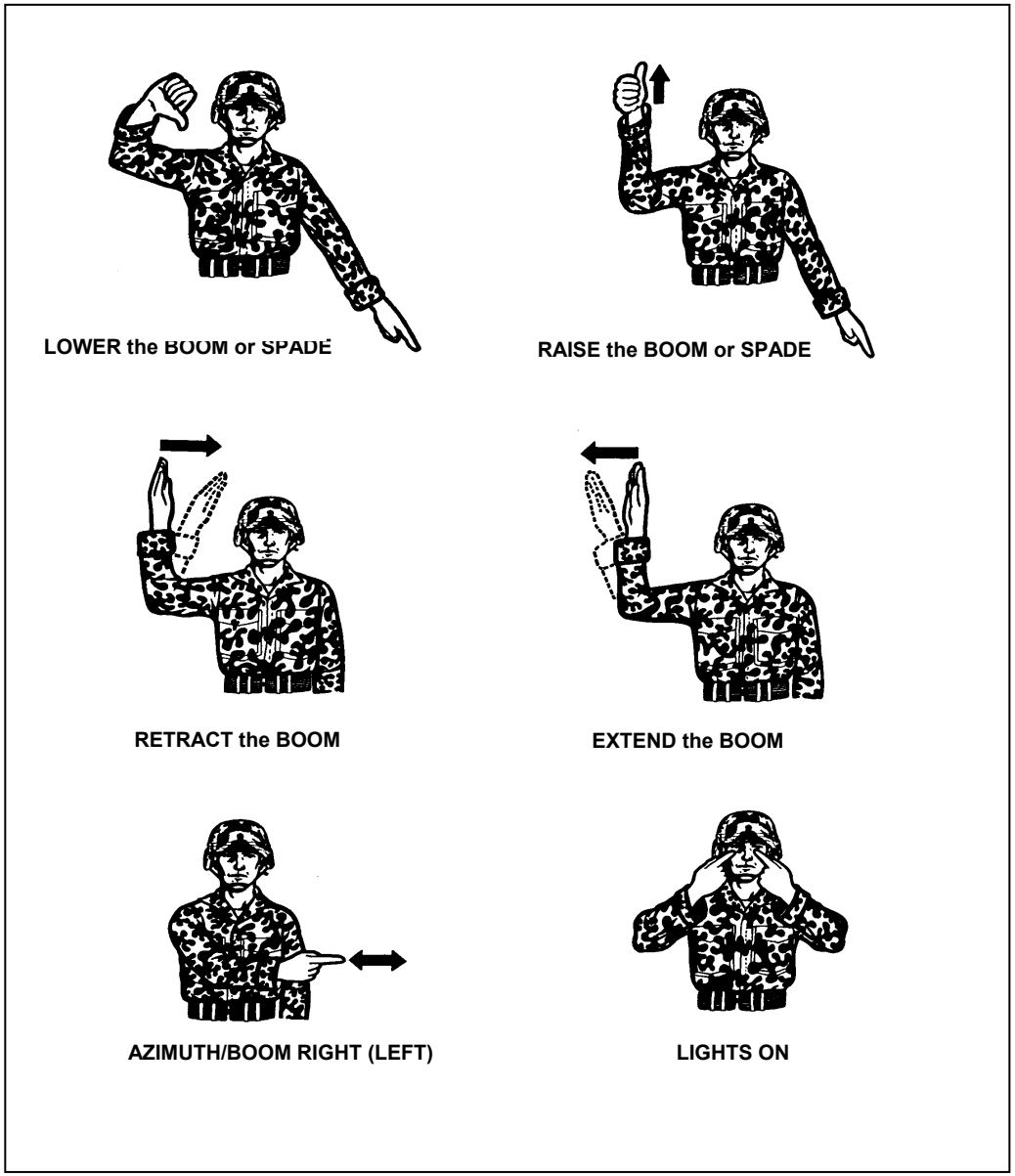


Figure B-1. Arm-and-hand signals (continued)

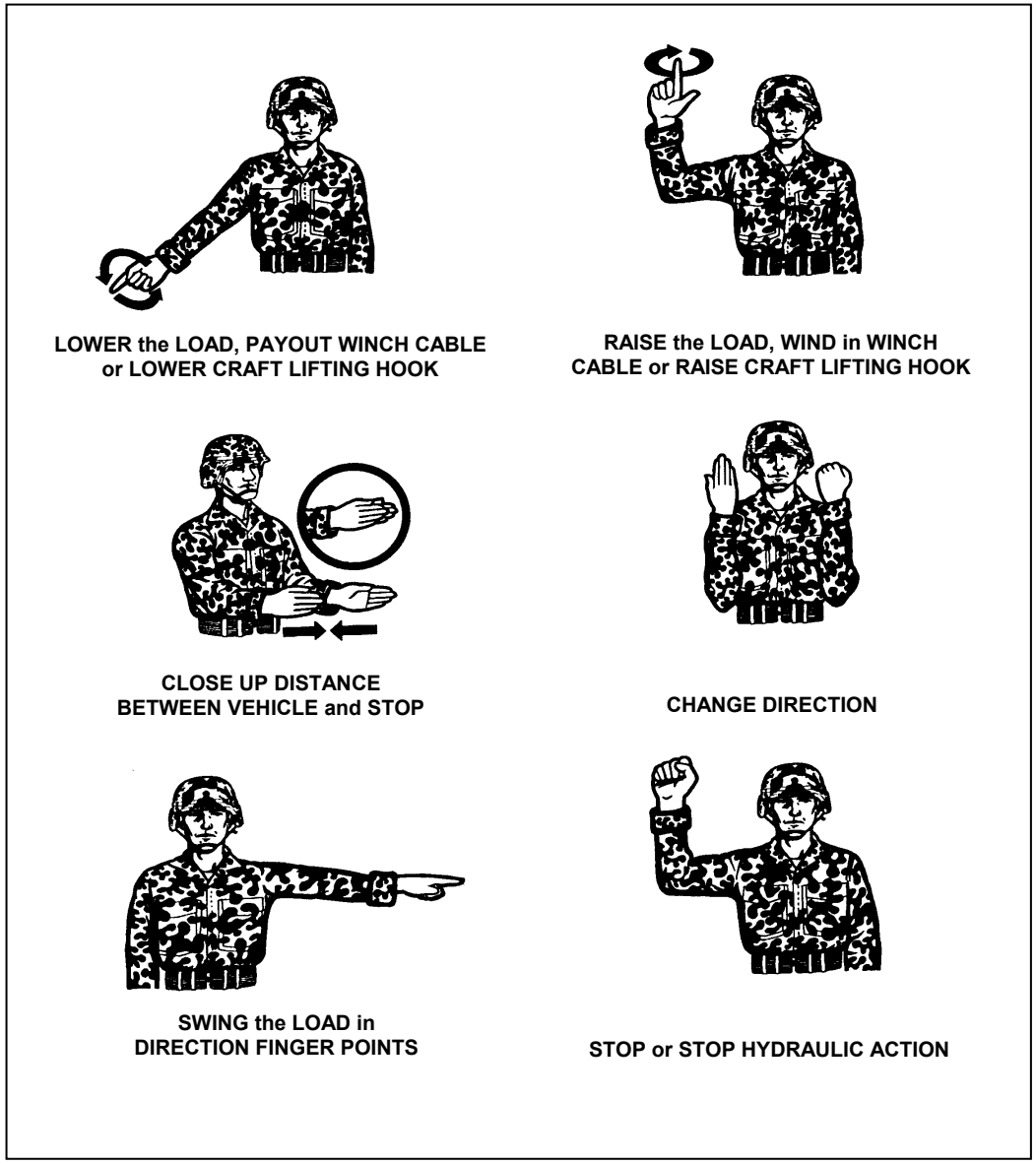


Figure B-1. Arm-and-hand signals (continued)

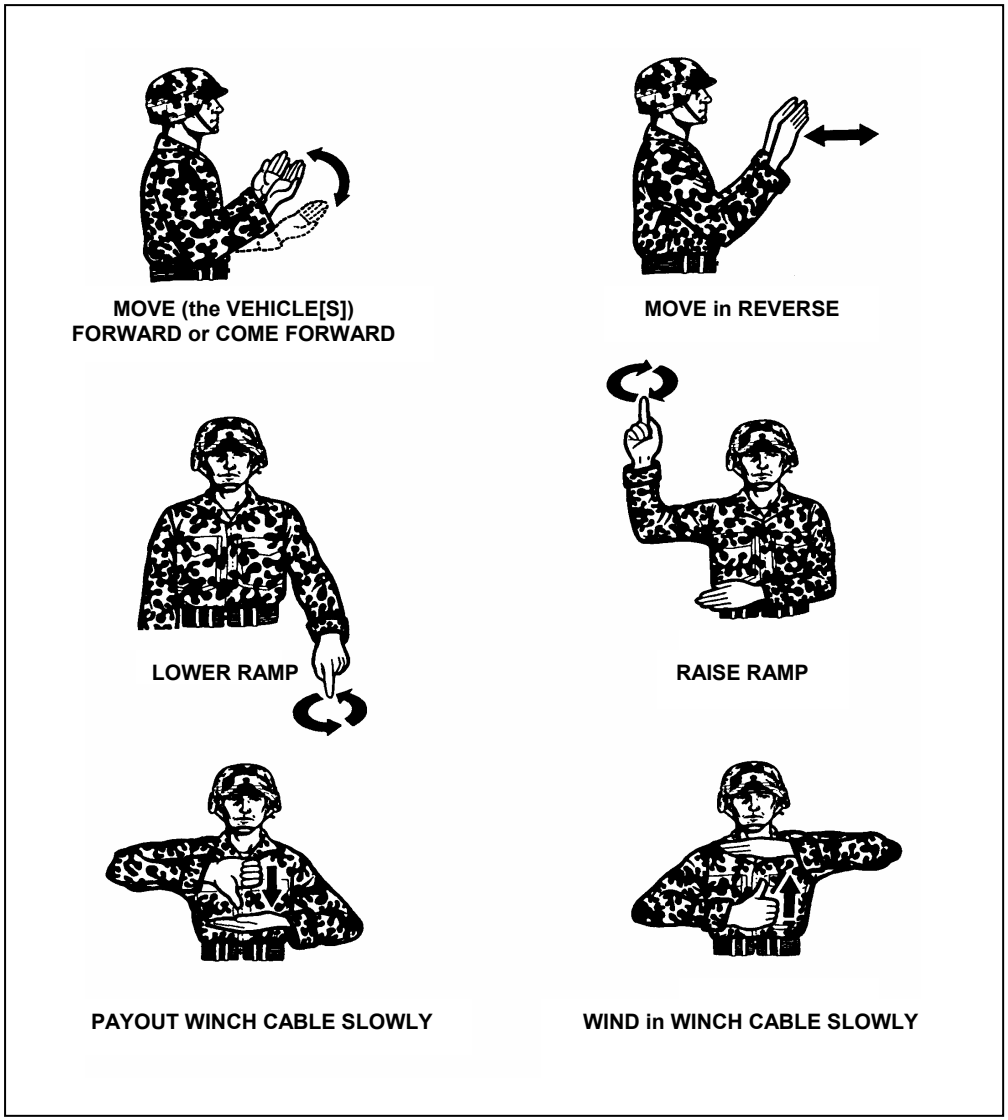


Figure B-1. Arm-and-hand signals (continued)

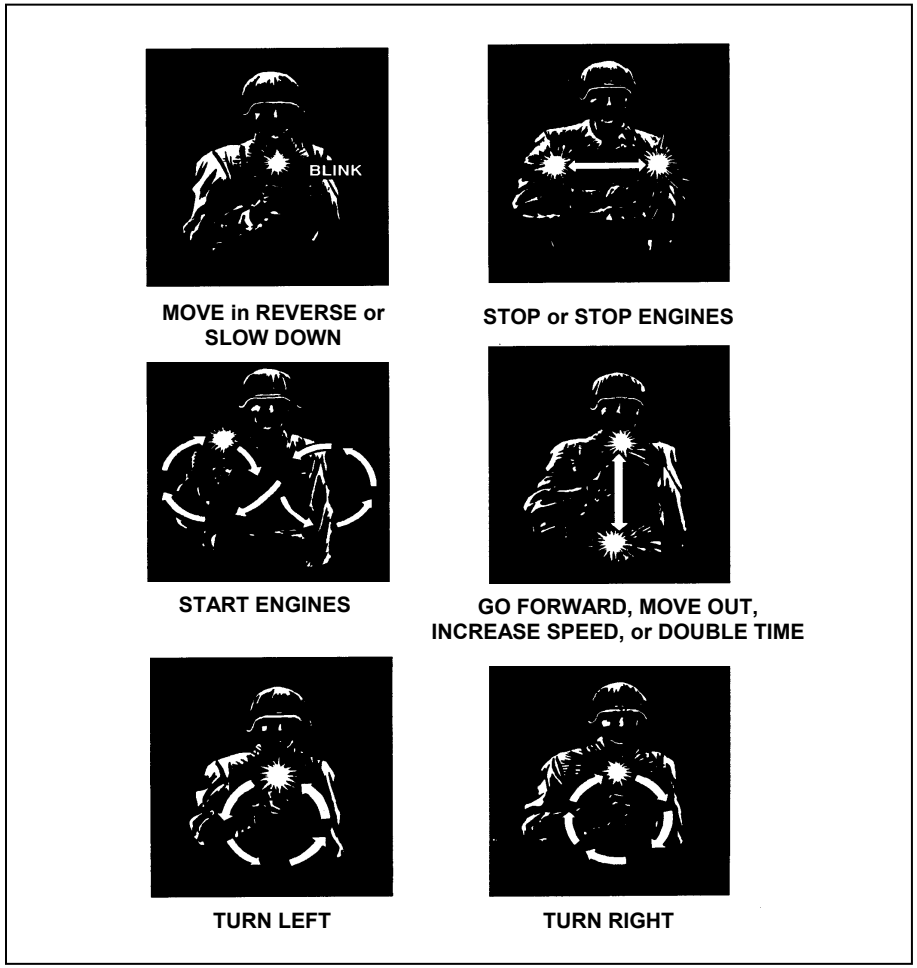


Figure B-2. Flashlight signals

B-2. Chocking. A chock is a wedge or block used for blocking the movement of a wheel. Chock blocks are stored on all wheeled vehicles. They are used to chock the wheels when the vehicle (tractor or trailer) is being emplaced or is temporarily parked and left unattended with the engine at idle. Safety is the reason for chocking vehicles. Chocking prevents damage to equipment or physical harm to individuals. Figures B-3 through B-7 illustrate the proper method for chocking the Patriot vehicles.

Notes:

- Chock block, NSN 2540-00-678-3469, rubberized triangular block is for use on 5-ton vehicles and smaller.
- Chock block, NSN 2540-01-165-6136, wood rectangular block is for use on 10-ton vehicles and semitrailers.

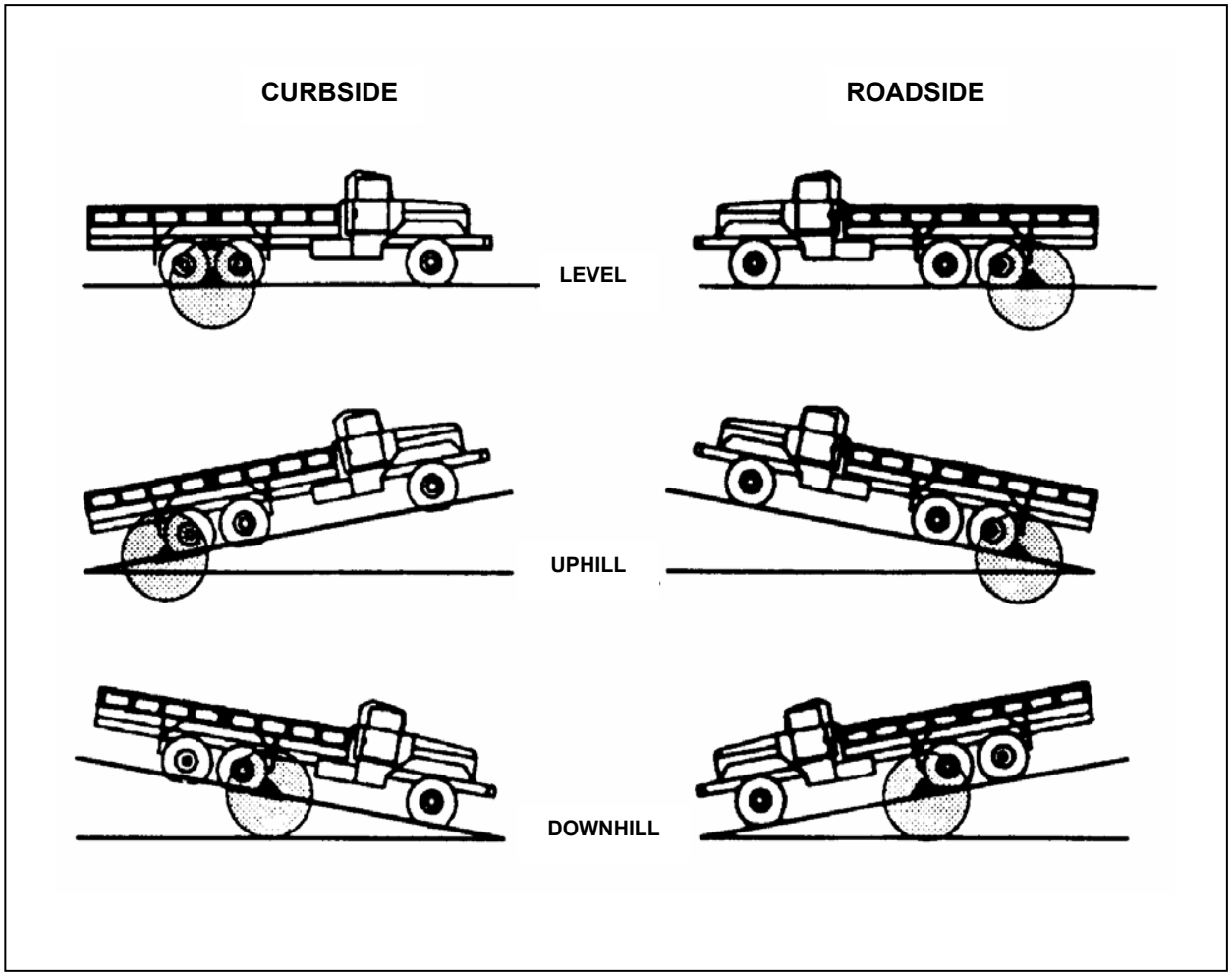


Figure B-3. Chocking the ECS, ICC, CRG, EPP, and AMG trucks

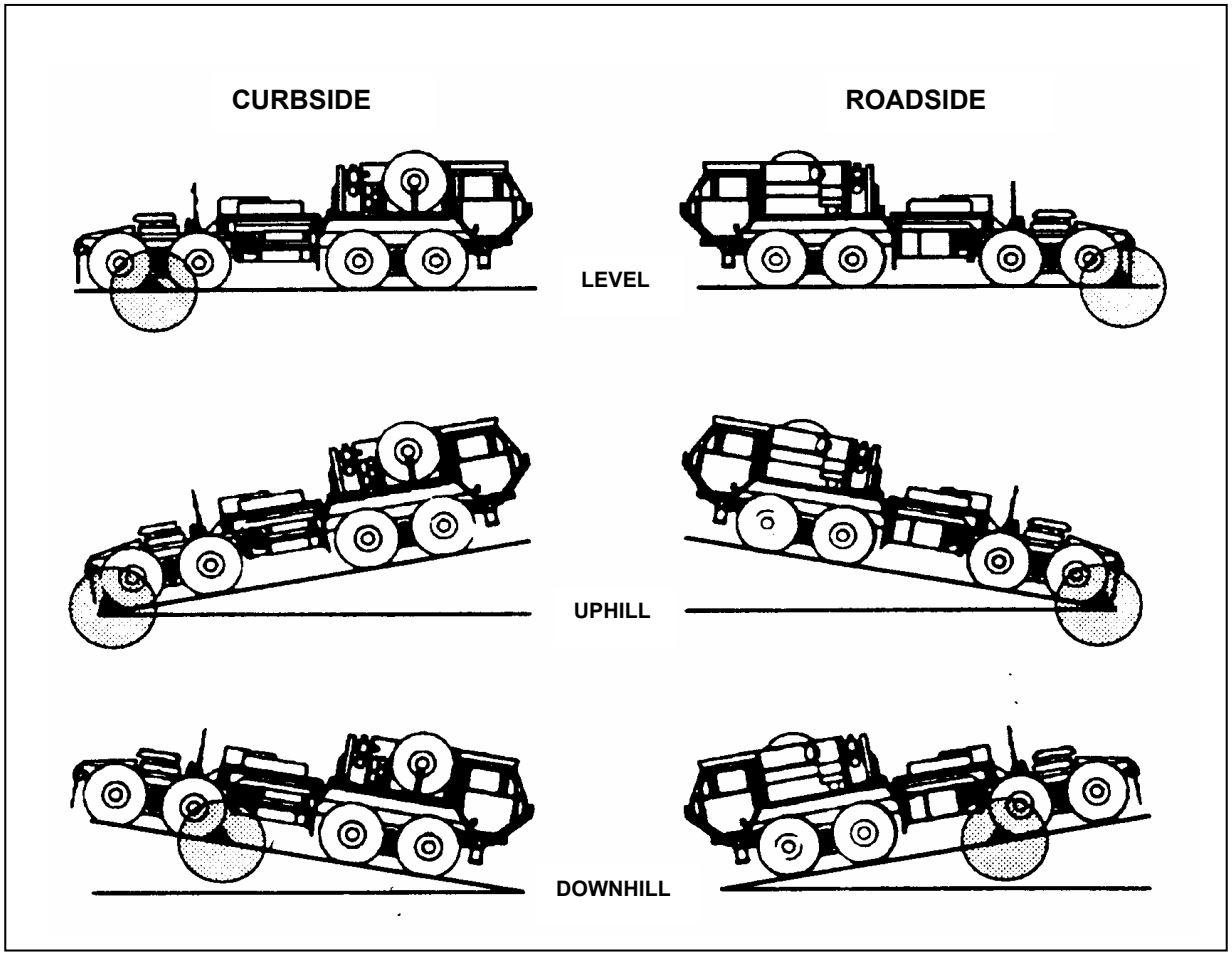


Figure B-4. Chocking the HEMTT

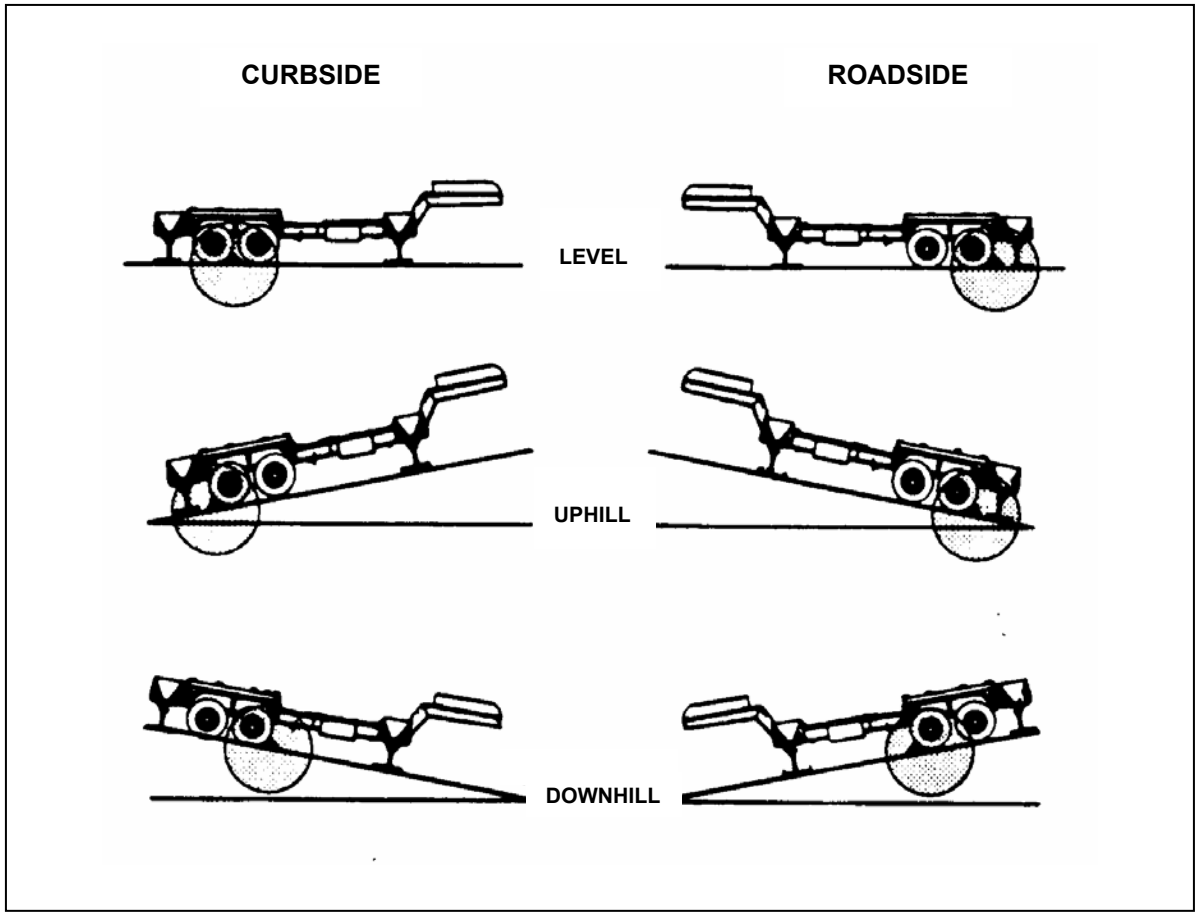


Figure B-5. Chocking the LS and RS semitrailer

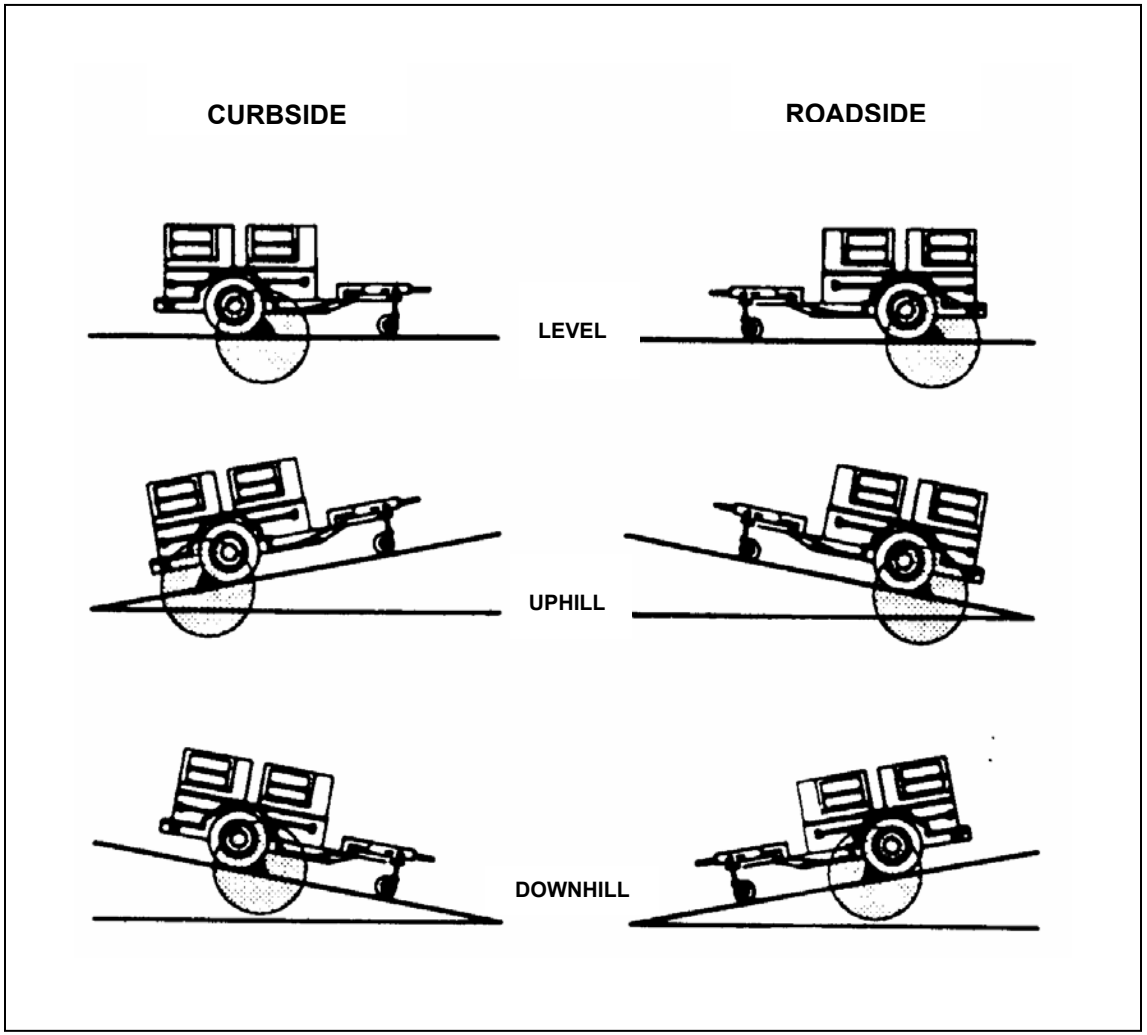
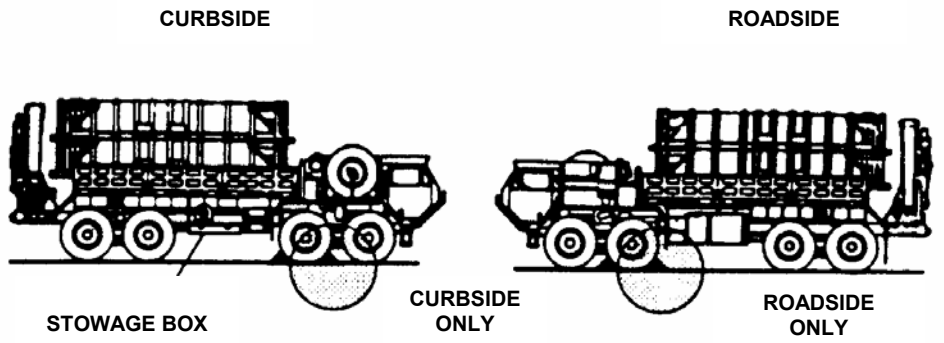
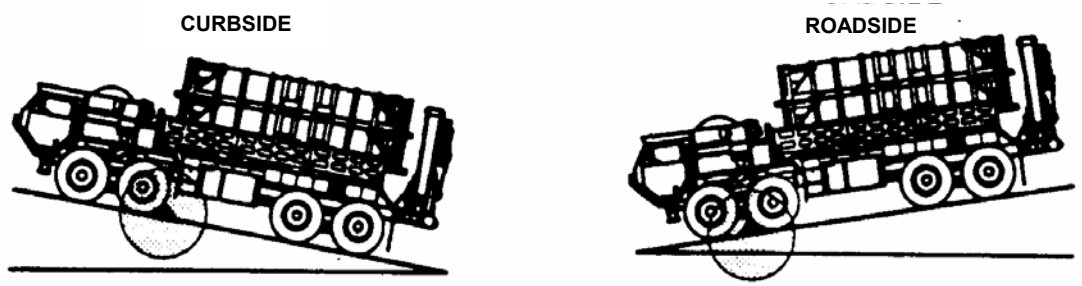


Figure B-6. Chocking the EPU trailer



If GMT is level from front to back, place one chock block in front of rear forward curbside wheel and behind rear forward roadside wheel.



If GMT is facing uphill, place chock blocks behind rear pair of forward wheels, both curbside and roadside.

If GMT is facing downhill, place chock blocks in front of the rear pair of forward wheels, both curbside and roadside.

Figure B-7. Chocking the GMT

APPENDIX C

EMPLACE PROTECTIVE ENTRANCE (PE)

PERFORMANCE MEASURES: Crew members complete their performance measures as they are stated and in the sequence shown. They must synchronize the completion of like-numbered performance measures.

Note: Perform the following crew drill procedures when the PE A108 is to be installed during emplacement.

WARNING

The PE weighs 142 pounds. To void injury, three people are required to erect and install the PE, and four people are required to lift.

Note: Instructions are on plates on top of PE (outside) and on curbside wall (inside).

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
Note: During assembly, keep air duct hoses free of dust and dirt.	1. At PE A108 storage rack, gets cable W100, air duct hoses, and hose adapters from storage box.	1. Helps CM 2 with equipment to install the PE.
2. Assembles 5 air duct hoses on the ground (to be used later).	2. At storage rack, releases travel lock and swings storage rack away from shelter door. Locks in position.	
	3. Releases straps and removes PE from storage rack. Sets PE down on truck bed.	3. Helps CM 2 remove PE from storage rack and sets PE down.
	4. Aligns PE on truck bed.	4. Helps CM 2 align PE on truck bed.

Note: Ensure the electrical connector faces roadside and that carrying handles face truck bedsides.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
	5. At roadside of PE, connects W100J20 to J20 electrical connector.	
6. At top of PE, removes air inlet cap. Connects and secures one end of air duct hose to PE inlet.	6. Releases the latches that secure the PE's top and bottom shells.	6. Helps CM 2 release PE shell latches.

WARNING

Top shell is heavy. Use two people to support top shell unit until two rear supports are secure.

7. Stands on ladder in front of PE shelter. Helps CMs 2 and 3.	7. Stands on roadside and raises top shell until fabric walls are taut.	7. Stands on curbside and helps CM 2 with raising top shell until fabric walls are taut.

a. Opens PE door and keeps door open until doorframe detent pins are inserted.

Note: Detent pins are inserted correctly when they protrude through the frame.

b. At hinge side and latch side of doorframe interior, inserts detent pins.

c. Extends rear supports and mates top ends with fittings in top shell. Inserts detent pin in each support.

d. Lowers angle braces onto brackets and inserts detent pin into each bracket.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
e. Notifies CMs 2 and 3 that supports and angle braces are secured.	e. When notified by CM 1 that supports and braces are secured, lets loose of the top shell.	e. When notified by CM 1 that supports and braces are secured, lets loose of the top shell.
8. Helps CMs 2 and 3 pull out the interface flap.	8. Together with CM 3, pulls the PE interface flap outward. Straightens it to form a rectangular opening.	8. Together with CM 2, pulls the PE interface flap outward. Straightens it to form a rectangular opening.
9. Helps CMs 2 and 3 align PE interfacing with the shelter.	9. Together with CM 3, aligns the PE interface flaps with shelter interface channels.	9. Together with CM 2, aligns the PE interface flaps with shelter interface channels.
10. Helps CMs 2 and 3 insert the interface flaps into the interface channels. Pushes flap edges to depth indicated by arrows on fabric. From interior of PE, tightens screws on interface channels. Notifies CMs 2 and 3 when completed.	10. With help from CMs 1 and 3, inserts the interface flaps into the interface channels. Holds until CM 1 tightens screws.	10. With help from CMs 1 and 2, inserts the interface flaps into the interface channels. Holds until CM 1 tightens screws.

Notes:

- Each air duct hose section has an arrow for airflow direction. When installing hoses, make sure arrows are pointed in direction of airflow. Keep air duct hoses free of dust and dirt.

- Airflow is from the gas particulate filter unit (GPFU) to each air conditioner unit and to the PE unit.

11. Hands CM 2 the assembled air duct hoses.	11. Takes the assembled air duct hoses from the CM 1 and connects them to the hose installed in PE top inlet.	
12. Takes the loose end of the air duct and air duct hose along the roadside of shelter to the forward end of the truck bed.	12. Hands the assembled air duct hoses to the CM 1 for connection to the GPFU tee adapter.	12. Helps CM 1 with the air duct hose assembly along roadside. Secures hose to shelter with shelter straps.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
13. Climbs into forward end of truck bed and connects the air duct hose from the PE to the GPFU tee adapter.	13. Hands CM 3 the PE W100 cable.	13. Takes the PE W100 cable, lying along the roadside of shelter, away from CM 2 and hands it up to CM 1 for connection.
14. Takes the PE W100 cable from CM 3 and connects W100 P5 to J5 at the GPFU.	14. Acquires the needed air duct hoses to connect the GPFU to each air conditioner. Hands them up to CM 1 for installation.	
15. Takes the air conditioner air ducts from CM 2; connects and secures air ducts to the air conditioners and to the GPFU tee adapter.	15. Helps CM 1 with the air conditioner air ducts.	
16. Ensures the air door on the bottom of the GPFU tee adapter is closed. Removes the air inlet cap on the GPFU.	16. Verifies the PE has been property installed before system checkout procedures are performed.	

DANGER

Failure to modular collective protection equipment or shelter air seals can lead to death or serious illness when operating in a CBR environment. Be sure to perform required inspections and checkout procedures <u>after</u> maintenance.

17. Verifies that PE and shelter doors are closed.

18. At lighting control panel A71, verifies that NORMAL-OFF-MAINTENANCE switch is set to NORMAL.

19. At distribution box A66, sets GAS FILTER UNIT to ON.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
Note: Ensure air conditioners are on whenever the GPFU is on and ensure adequate pressure is available for the shelter. 20. At distribution box, verifies the AIR COND ROADSIDE and AIR COND CURBSIDE are on. 21. At air conditioner control panels A69 and A70, sets controls to desired operating conditions. 22. At compartment control module A48, performs the following checkout procedures: a. Sets all service circuit breakers to ON (pushes in). b. Sets POWER to ON. c. Observes that MASK indicator comes on and that warning horn sounds for approximately 30 seconds while shelter is being pressurized. d. Observes that MASK indicator and audible horn goes off after approximately 30 seconds. e. If MASK indicator and audible horn do not go off, checks seals at all equipment panels, doors, and air ducts for air leakage per TM 3-4240-285-20&P.		

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
f. Observes that DUST FAN DEFECT and CHANGE FILTER are off. Presses each indicator to ensure it lights. g. Observes that ENTRANCE-LOW and ENTRANCE-OCCUPIED are off. Presses each indicator to ensure it lights.		
23. Notifies CM 2 to enter the PE to check the system.	23. Enters the PE, closes the door, and checks the PE system. 24. At PE control panel, performs the following: a. Sets switch to RED. Dome lamp comes on red. b. Sets switch to WHITE. Dome lamp comes on white. c. Observes that WARNING-LOW PRESSURE is off. Presses indicator to ensure it lights. d. Sets TIMER to 5. Observes that PURGE comes on.	
25. After being notified by CM 2, observes that ENTRANCE-OCCUPIED comes on when timer is used.	25. Enters shelter and notifies CM 1 the PE timer is set.	

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3

Notes:

- Protective entrance purge procedures, steps 26 through 32, are used to purge the shelter of contaminants after maintenance, or at anytime contamination is known or suspected to have occurred.

- Perform steps 26 through 32 if time permits. If time does not permit, return to step 7 of Crew Drill 44-5-D009 and continue with drill procedures.

- Perform PE purge procedures as time permits.

26. Ensures air conditioners are on.		
27. At distribution box, ensures GAS FILTER UNIT is set to ON.		
28. At compartment control module, ensures POWER is set to ON.		
29. Notifies CM 2 to open and hold the PE door. After CM 2 holds the PE door open, the ENTRANCE-LOW PRESSURE indicator comes on at the compartment control module.	29. When notified by CM 1, holds open the PE door. At PE control panel, LOW PRESSURE indicator comes on and alarm sounds.	
30. Notifies CM 2 to partially unlatch shelter door. After CM 2 unlatches the shelter door, at compartment control module, MASK indicator comes on.	30. When notified by CM 1, partially unlatches shelter door just enough for low-pressure alarm to sound.	
31. Notifies CM 2 to close shelter door. After the shelter door is closed, the low-pressure alarm and ENTRANCE-LOW PRESSURE and MASK indicators go off.	31. When notified by CM 1, closes shelter door.	

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3

WARNING

When entering PE, ensure LOW PRESSURE indicator is off on control panel before starting the five-minute timer to ensure a full five-minute purge cycle.

32. Closes PE door. Prior to entering shelter, performs the five-minute PE purge procedure.

a. At control panel, waits until LOW-PRESSURE indicator is off, then sets timer.

b. Observes PURGE comes on. Waits until purge cycle is complete before entering the shelter.

Notes:

- Contact the CBR officer or follow the unit SOP for air monitoring and removing the protective mask after shelter purge has been completed.
- Refer to unit SOP for use, entry, exit and PE operating procedures.
- Set the GAS FILTER UNIT to OFF at the distribution box A66 whenever the use of the PE is not necessary.
- Return to Crew Drill 44-5-D009 and continue with drill procedures after performing PE purge procedures.

APPENDIX D

EMPLACE CORNER REFLECTORS

PERFORMANCE MEASURES: Crew members complete their performance measures as they are stated and in the sequence shown. They must synchronize the completion of like-numbered performance measures.

Note: Perform the following crew drill procedures when a communications plan calls for the use of corner reflectors.

WARNING

To avoid injury, do not block shelter exit with open bay doors. Close door immediately after task is completed.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
1. Selects and connects UHF RRT 1, 2, and 3 for use with corner reflectors. a. At distribution box, ensures that NOT SECURE PWR RRT 1, 2, and 3 are off.	1. Selects and connects UHF RRT 1, 2, and 3 for use with corner reflectors. a. Refers to communications plans and opens access bay doors of selected RRTs.	1. Selects and connects UHF RRT 1, 2, and 3 for use with corner reflectors. a. Ensures connections for RRTs to be used with corner reflectors are as shown below:

Nomenclature	RRT-1	RRT-2	RRT-3
Radio Receiver R-1329	A31	A18	A6
Radio Transmitter T-983	A32	A19	A17
RF cable 2 (2)	W425	W426	W427
RF cable 1 (1)	W459	W456	W453

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
WARNING **Two people are required to retrieve corner reflectors. Use extreme caution in high winds.**		
2. Assembles and installs corner reflectors.	2. Assembles and installs corner reflectors.	2. Assembles and installs corner reflectors.
a. Helps CMs 2 and 3 assemble and install corner reflectors.	a. Helps CM 3 retrieve corner reflectors from storage bag in storage area.	a. Retrieves corner reflectors from storage bag in storage area with help from CM 2.
	b. Climbs onto the ECS shelter rear, and waits for CM 3 to provide mast supports.	b. At exterior curbside of ECS, removes the hardware required to install corner reflectors from the storage compartment: (1) Mast supports. (2) Mast clamps. (3) Mast rotating fixtures. (4) Antenna-to-mast adapters.
	c. Takes mast supports from CM 3, installs on mast support angle brackets, and secures.	c. Gives CM 2 the mast supports to install.
		d. Removes two dipole elements, corner reflectors, and cables from storage bag.
e. Helps CM 3 spread reflector assemblies.		e. Spreads reflector assemblies to fully open position.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
f. Helps CM 3 connect the cable, dipole element, and reflector.	f. Retrieves mast sections from storage area.	f. Uses W463 or W464 cable. Feeds cable through mounting socket and connects to dipole element. Connects dipole element to reflector.
g. Helps CM 3 set up the correct polarization with the corner reflectors.	g. Connects lower mast section, mast camp, and upper mast section together. Ensures mast clamp position is under FWD or AFT on each mast. Attaches mast-rotating fixture on lower mast section.	g. Per the communications plan, attaches antenna-to-mast adapters to reflectors for horizontal or vertical polarization.

WARNING

Three people are required to install corner reflectors. If antenna is <u>not</u> held securely, it may fall and injure personnel or damage equipment. Use extreme caution in high winds. Equipment is hard to control.

Note: Before raising roadside corner reflector, ensure the rear VHF whip antenna is lowered or out of the way for safe installation of the corner reflector antenna.

h. Helps CM 3 with each antenna assembly.	h. Climbs up on the ICC/CRG shelter and prepares to take the antenna assembly from CMs 3 and 1 for installation	h. Per the communications plan, takes the correct corner reflector to curbside and or roadside.
i. Helps CMs 2 and 3.	i. Installs the antenna assembly, curbside and or roadside, and secures.	i. Assists CM 2 install curbside and or roadside antenna assembly.
	j. Wraps RF cables around upper mast section and ensures cables are secure. Passes RF cables to CM 3.	j. Takes RF cables from CM 2 and wraps RF cables around lower mast section. Ensures cables are secure.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
3. Connects RF cables to connector panel and adjusts corner reflectors.	3. Connects RF cables to connector panel and adjusts corner reflectors.	3. Connects RF cables to connector panel and adjusts corner reflectors. a. Using communications plan, identifies RRTs to be used with corner reflectors and connects RF cables from each antenna assembly to connector panel A26.

Note: Adjust corner reflectors from maximum signal reception when communications have been established.

b. Helps CMs 2 and 3. Adjusts the corner reflectors for maximum signal reception.	b. Loosens mast clamp on each corner reflector. Uses handle to rotate each antenna assembly to the azimuth, directed by communications plan for maximum signal reception. c. Climbs off of the ECS.	b. Helps CMs 1 and 2; adjust the corner reflectors for maximum signal reception.

Note: Return to step 18 of Crew Drill 44-5-D009 and continue with the drill procedures.

APPENDIX E

ROAD MARCH CORNER REFLECTORS

PERFORMANCE MEASURES: Crew members complete their performance measures as they are stated and in the sequence shown. They must synchronize the completion of like-numbered performance measures.

Note: Perform the following crew drill procedures for disassembling and stowing corner reflectors.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3

WARNING

To avoid injury to personnel and damage to equipment, ensure that the antenna is being supported while disassembling antenna mast.

1. Disassembles and stows corner reflectors.	1. Disassembles and stows corner reflectors.	1. Disassembles and stows corner reflectors.
Note: Ensures roadside rear VHF whip antenna is pulled down before corner reflector removal.		
		a. Disconnects RF cables from connector panel A26.
b. Helps CM 3 unwraps RF cable from lower mast section (roadside).	b. Climbs onto the ECS shelter rear; waits for RF cables from CMs 1 and 3.	b. Unwraps RF cables from lower mast section (curbside).
c. Helps CM 3 remove RF cable from loop clamp, secures loop clamp, and passes RF cable up to CM 2.	c. Takes RF cables from CMs 1 and 3 and unwraps RF cables from upper mast sections.	c. Removes RF cable from loop clamp, secures loop clamp, and passes RF cable up to CM 2.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3

WARNING

Three people are required to hold antenna in place while dismounting antenna mast.

WARNING

Equipment is hard to control. Use extreme caution in high winds. Personnel injury and equipment damage may occur if antenna is <u>not</u> held securely.

d. Holds antenna mast in place while removing the quick-release pin from mast guide bracket. Inserts pin in mast clamp.	d. Helps CM 1 hold corner reflector until it is lowered.	
e. Carefully lifts mast assembly from mast support until mast disengages from mast guide bracket.	e. Helps CM 1 control corner reflector until it is lowered.	e. Helps CM 1 lift and control the mast assembly.
f. Carefully lowers mast assembly to ground while upper mast section remains in mast guide bracket.	f. While maintaining control of the upper mast section, rotates and removes the dipole element from corner reflector.	f. Helps CM 1 lower the mast assembly down to a safe location.
	g. Disconnects RF cable from dipole element.	
h. Takes reflector assembly and dipole element from CM 2. Folds reflector assembly to stow position.	h. Removes reflector assembly from antenna to mast adapter. Hands down the dipole element and reflector assembly to CMs 1 and 3.	h. Helps CM 1 with corner reflector parts.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
i. Disassembles the lower mast assembly. Takes any components from CM 2.	i. Disassembles the upper mast assembly and lowers parts down to CM 1 or CM 3.	i. Helps CM 2 lower upper mast assembly components.

2. Repeats step 1 above to disassemble the other corner reflector (curbside or roadside).

3. Returns the hardware required by disassembly of corner reflectors to exterior curbside storage compartment.

   a. Mast supports.

   b. Mast clamps.

   c. Mast rotating fixtures.

   d. Antenna to mast adapters.

WARNING

Two people are required to stow corner reflectors. Equipment is hard to control. Use extreme caution in high winds. Failure to use caution may result in personnel injury and equipment damage may occur.

4. Returns corner reflectors, dipole elements, and cables to storage bags (curbside).

5. Returns the mast sections to storage area in truck bed.

Note: Return to step 16 of Crew Drill 44-5-D011 and continues with the drill procedures.

APPENDIX F

ROAD MARCH PROTECTIVE ENTRANCE (PE)

PERFORMANCE MEASURES: Crew members complete their performance measures as they are stated and in the sequence shown. They must synchronize the completion of like-numbered performance measures.

Note: Perform the following crew drill procedures for removal and stowing of PE A108 during march order.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
1. At compartment control module A48, sets POWER to OFF.	1. Assists as required.	1. Assists as required.
2. At lighting control panel A71, verifies that NORMAL-OFF-MAINTENANCE switch is set to OFF.		
3. At distribution box A66, sets GAS FILTER UNIT to OFF.		
4. Goes to forward truck bed at GPFU and disconnects W100 P5 from J5. Installs dust caps.		
5. Disconnects and removes all air duct hoses between air conditioners and GPFU tee adapter.		
a. Installs all cover caps on tee adapter.		

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3
b. Opens air door on bottom of tee adapter.		
Note: Keep air duct hoses free of dust and dirt.		
6. Disconnects air duct hose from GPFU to PE and hands it down to CM 2. Gives PE W100 cable to CM 3.	6. Takes the air duct hose from CM 1 and disassembles the five sections. Leaves one hose section connected to PE.	6. Takes the PE W100 cable from CM 1, coils cable, and disconnects W100 P20 from J20 on PE roadside.
7. Climbs down from forward end of the truck bed and enters the PE to loosen screws on interface channel.	7. Positions to curbside of PE.	7. Positions to roadside of PE.
8. Steps out of PE, helps CMs 2 and 3 pull PE away from shelter.	8. Pulls PE away from shelter after CM 1 steps out.	8. Pulls PE away from shelter after CM 1 steps out.
9. Cleans PE floor and removes foreign objects.	9. Folds interface flap inside PE until it is flush with PE wall.	9. Helps CM 2 fold interface flap.
CAUTION PE door must be securely latched and remain latched during removal procedures.		
10. Enters PE, closes, and latches PE door.		
WARNING **Top shell is heavy. Two people are needed to support top shell.**		
11. Helps CM 2 support PE top shell. Ensures that interface side of PE is firmly supported.	11. Supports PE top shell.	11. Helps CM 2 support PE top shell.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3

CAUTION
Support upper portion of rear support to prevent PE from collapsing.

12. Continues to support PE top shell. a. Removes detent pin from angle brace. b. Pulls detent from middle of rear support. c. Raises angle brace and secures to rear support using detent pin. d. At top of rear support, pulls support free from upper shell. e. Folds rear support and angle brace. Guides folded joint of support into holding bracket. f. Removes remaining rear support. g. Exits PE; closes and latches door. h. At latch side of doorframe, removes detent pin. i. At hinge side of doorframe, removes other detent pin. j. Pushes inward on center of door.	12. Continues to support PE top shell.	12. Continues to support the upper shell.

CREW MEMBER 1	CREW MEMBER 2	CREW MEMBER 3

CAUTION

PE sidewall air duct must be tucked in so that it lays flat and clears folded support assemblies.

13. Helps tuck all fabric inside bottom shell.	13. Continues to carefully lower top shell down to bottom shell. Tucks fabric walls as shell is lowered.	13. Helps CM 2 lower the top shell to the bottom shell.

14. Before engaging top shell with bottom, ensures that all fabric clears mating surfaces.

15. Aligns top and bottom shells.

16. Engages and secures latches.

17. Removes air duct hose from top shell air inlet. Installs inlet cap.

18. Stores air duct hoses, hose adapters, and W100 cable in PE storage rack.

19. Places PE in storage rack; ensures that J20 electrical connector faces top of rack and air duct faces curbside.

20. Secures PE with straps.

Note: Return to step 18 of Crew Drill 44-5-D011 and continue with drill procedures.

GLOSSARY

AC, ac
Active Component; assistant commandant; alternating current; aircraft

ack
acknowledge; acknowledgement; acknowledged

ACP
airspace control point; Allied Communication Publication

ADLC
azimuth drive local control

AMG
antenna mast group

amp
amplifying; amplifier

AMS
antenna mast set

ant
antenna

ARTEP
Army Training and Evaluation Program

attn
attention

auto
automatic

AWC
antenna weather cover

az
azimuth

B
before

BCT
basic combat training; battle coordination team; brigade combat team

BITE
built-in test equipment

CADCI
common air defense communications interface

CB
common battery; circuit breaker

CBR
chemical, biological, and radiological

CLET
cooler liquid electron tube

CLS
contractor logistics support; colocated switch

CM
crew member; cruise missile

coll
collect; collective

comm (commo)
communications

comp
computer

config
configuration

CPE
collective protection equipment

CRG
communications relay group

CRT
cathode ray tube; combat readiness training

crypto
cryptography; cryptographic

D
during; daily; demonstration

DA
Department of the Army

DC, dc
District of Columbia; direct current

DCT
digital communications terminal

DD
Department of Defense (form)

DLT
data link terminal

DOD
Department of Defense

ECS
engagement control station

EDR
embedded data recorder (Patriot)

EGA
electronically generated form; extended graphics adapter

EMO
electronic media only

EPP
electric power plant

EPU
electric power unit

ext
external; exterior

FOCA
fiber-optic cable assembly

FORSCOM
United States Army Forces Command

FP
fire platoon; firing position; firing point

FU
fire unit

GMT
guided missile transporter

GPFU
gas particulate filter unit

GPS
gunner primary sight; Global Positioning System

HCU
hard copy unit; high-capacity computer unit

HEMTT
heavy expanded mobility tactical truck

HQ
headquarters

Hz (HZ)
hertz (cycles per second)

ICC
information and coordination central; information control center

ICOM
integrated COMSEC; imbedded communications

IDOCS
integrated digital operator control station

IFF
identification, friend or foe

invnt
inventory

IOCE
input/output control diagnostics

IVC
inter-vehicular cable

Kbs
kilobytes per second

kw
kilowatt

LCU
launcher control unit; lightweight computer unit

LS
launching station; launching section

mils
A metric measurement of direction from a known bearing.

MOPP
mission-oriented protective posture

ms; MS
manstation; milliseconds, mobilization station

MTP
mission training plan; MOS training plan

NBC
nuclear, biological, and chemical

NFS
north finding system

NREF
north reference

OCU
operations control unit; operators console unit (THAAD)

ODS
Optical Disk System; operator decision specification; Operation Desert Storm

ODU
optical disk unit

OF
observed fire; optional form; overlapping fires

OIC
officer in charge

ord, ORD
ordnance; operational requirements document

PDB
post deployment build (Patriot); power distribution box

PDU
power distribution unit

PE
pulse expansion; protective entrance; practical exercise

PLGR
precision lightweight GPS receiver

PMCS
preventive maintenance checks and services

prelim
preliminary

PTL
primary target line

pwr
power

RF
radio frequency

RLRIU
routing logic radio interface unit

RRT
radio relay terminal

RS
radar set; radio set; readiness station (USA term); Roving Sands; roadside

RSOP
reconnaissance, selection, and occupation of position; readiness standing operating procedure(s)

RWCIU
radar weapons control interface unit

S/I
switch-indicator

sel
select

SINCGARS
single-channel ground and airborne radio system

SOA
state of alert

SOI
signal operation instructions

SOP
standing operating procedure

STP
soldier training publication

sys
system

T&EO
training and evaluation outline

TACFIRE
tactical fire

TACI
tactical initialization

TAMMS
The Army Maintenance Management System

TB
technical bulletin

TCA
tactical control assistant

TCO
tactical control officer

TM, tm
technical manual; theater missile; team

TOD
time of day

TOE
table of organization and equipment

TPT
troop proficiency trainer; target practice tracer

TRADOC
Training and Doctrine Command

TSEC
telecommunications security

TSOP
tactical standing operating procedure

TWUD
tactical weapon control computer unit diagnostics

UHF
ultrahigh frequency

vac
volts alternating current

VDC
volts direct current

VHF
very high frequency

WCC
weapons control computer

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