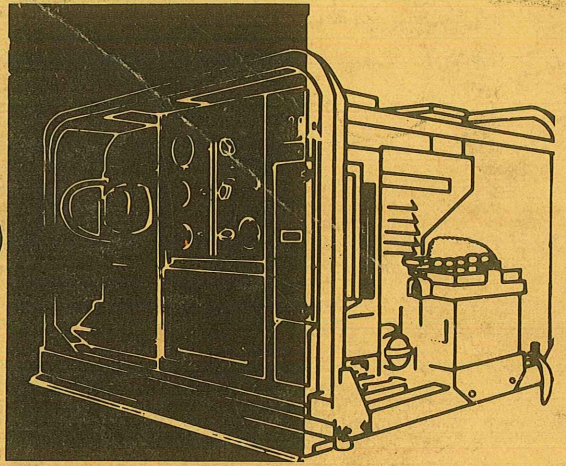
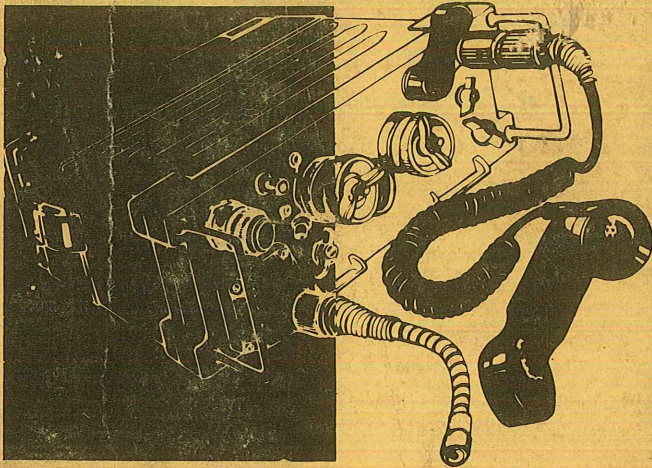


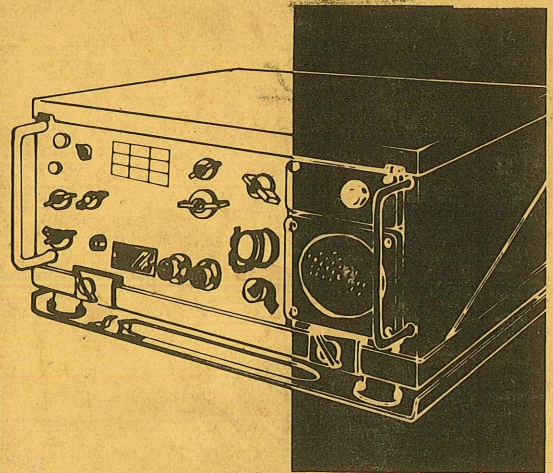
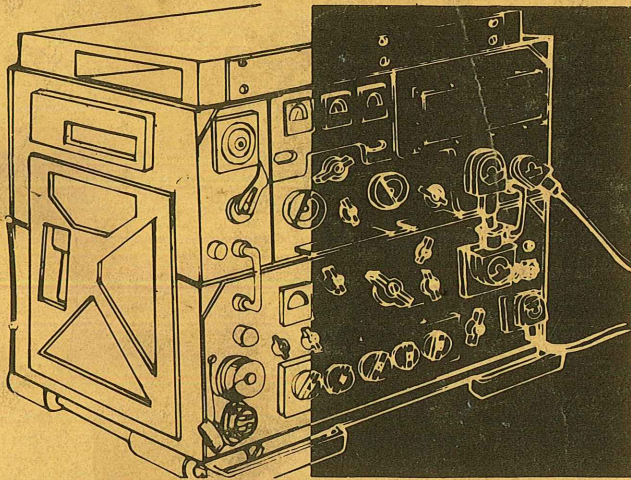
FM 11-05B

HEADQUARTERS  
DEPARTMENT OF THE ARMY

# SOLDIER'S MANUAL



## MOS 05B RADIO OPERATOR SKILL LEVELS 1 AND 2



JULY 1980

**Soldier's Manual**  
**MOS 05B, RADIO OPERATOR**  
**SKILL LEVELS 1 AND 2**  
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Whenever pronouns or other references denoting gender appear in this manual, they are meant to refer to either male or female--unless indicated otherwise.

## COMMANDER'S ATTENTION


Soldier's Manuals are designed to tell soldiers what tasks they must be proficient in to be MOS qualified. If soldiers follow the road map these manuals provide, they should progress readily to positions of responsibility commensurate with their aptitude and motivation.

Initial distribution of Soldier's Manuals will be made to the unit level, based upon assigned strength in the particular MOS and Skill Level. In the event additional manuals are needed by the unit for MOS study, libraries, or other training needs, requests for publications may be sent directly to the US Army Publications Center, 2800 Eastern Boulevard, Baltimore, MD 21220.

When soldiers are issued Soldier's Manuals by their units, they are responsible for retaining and maintaining them. If they transfer, they must return the manuals to their units.

Upon promotion, the soldier may order the next higher level through his/her unit.

This Soldier's Manual was prepared by the US Army Signal Center.

  
WILLIAM J. WILSMAN  
Major General, USA  
Commanding

## RESERVE COMPONENT

**ARMY NATIONAL GUARD - ARMY RESERVE**

You will be using this soldier's manual along with your Active Army counterpart.

This manual contains the common and critical tasks to be performed by soldiers in MOS 05B, Radio Operator. Some tasks may require modification due to differences in equipment, facilities, and training time available to you. Tasks that are written for reserve components are identified by (RC) in the task inventory list.

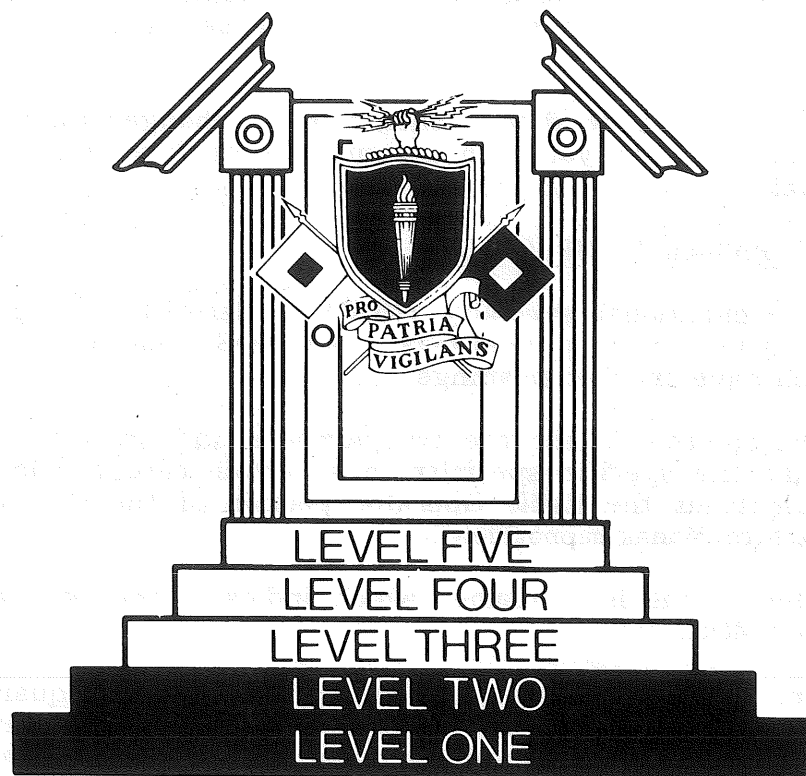
Many tasks that you learned in basic training (BT) and advanced individual training (AIT) are in this manual. Others are critical tasks that you must learn on your own. Training references and materials are available and you can get them through your unit. You will be tested on your ability to perform the critical tasks in this manual. It is to your advantage to start your study program NOW.

**NOTICE TO RESERVE COMPONENTS**

**This manual will not be effective for the Army National Guard and the Army Reserve until after the 1981 SQT. Do not (repeat do not) destroy FM 11-05B, dated 14 July 1978. Your SQT in 1981 will be based on FM 11-05B dated 14 July 1978.**

RESERVE COMPONENT

## Chapter 1 INTRODUCTION



### THE SOLDIER'S MANUAL AND YOU

This manual describes what the Army expects you to know and to be able to do as a Radio Operator, MOS 05B. In addition to job tasks, this manual tells you about the management and training systems designed to help you learn your job.

If you don't understand some parts of the manual or want to know more about promotion, see your NCO/supervisor. Take your superior's advice, it is based on knowledge and experience.

The Army wants and needs well-trained soldiers who want to get ahead. This manual and the assistance of your senior NCOs can lead to promotion.

Keep your manual up to date. When new or changed material is published, it will be given to you with instructions on how and where to put it in your manual.

### MILITARY OCCUPATIONAL SPECIALTY

A military occupational specialty (MOS) is defined as a grouping of closely related jobs or duty positions. An MOS code consists of five characters which have specific meanings.

**First Three Characters:** These are two numbers and one letter. Together, they identify the specific specialty in a certain career field. The 05B in your MOS identifies the Radio Operator portion of the Communications-Electronics Operator Management Field.

**Fourth Character:** This is a number which indicates the skill level of the individual in that MOS.

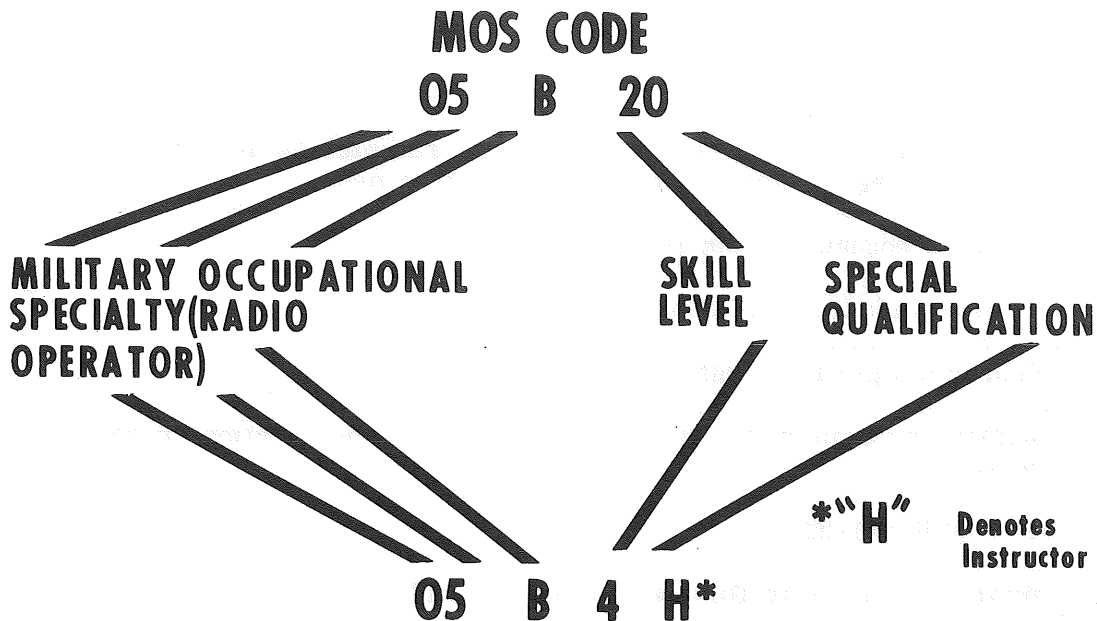
**Fifth Character:** This is a letter which identifies a special qualification in the MOS. The letter "O" will always be inserted as the MOS code if the individual has no additional special qualifications. Here are two examples of fifth character usage:

05B1H, Radio Operator - Qualified as an instructor.

05B10, Radio Operator - No special qualifications.

### SKILL LEVELS

The skill level is a means of showing your level of experience and knowledge in your MOS. The Army uses five skill levels and each is identified by the fourth character of the MOS code. 05B10 indicates MOS 05B Skill Level 1 (E1 through E4). 05B20 indicates MOS 05B Skill Level 2 (E5).



Skill Level 1 is the first step in your MOS; this is where you start as a helper. You will be able to do the simple tasks on your own, the difficult tasks you will do under close supervision of your NCO.

Skill Level 2 is the second step in your MOS; the tasks you did in Skill Level 1 should be routine now. Only the more difficult tasks will be performed under the general supervision of your NCO.

The following paragraphs list the duties of MOS 05B at Skill Levels 1 and 2.

**Skill Level 1 (AR 611-201):**

1. Installs and operates:
  - a. Field radio equipment.
  - b. Power generators.
  - c. Antennas.
  - d. COMSEC devices.
  - e. Radio Wire Integration (RWI) systems.
2. Operates 1/4-ton, 3/4-ton, 1 1/4-ton military vehicles.



3. Transmits and receives messages in radiotelephone and radiotelegraph modes in tactical and administrative nets.
4. Employs communication procedures.
5. Applies principles of communications security.
6. Performs operator's maintenance.
7. Maintains equipment maintenance forms and station records and reports.

**Skill Level 2 (AR 611-201):**

1. Must be able to perform all duties of Skill Level 1.
2. Serves as operator and supervisor at team level.
3. Assists in site selection.
4. Supervises installation and operation of radio equipment and COMSEC devices.
5. Prepares work schedules and supervises operator maintenance programs.
6. Supervises station/net operation.

**CONTENTS OF YOUR SOLDIER'S MANUAL**

In order to use your soldier's manual you will have to know some of the terms used in it. These terms are listed below:

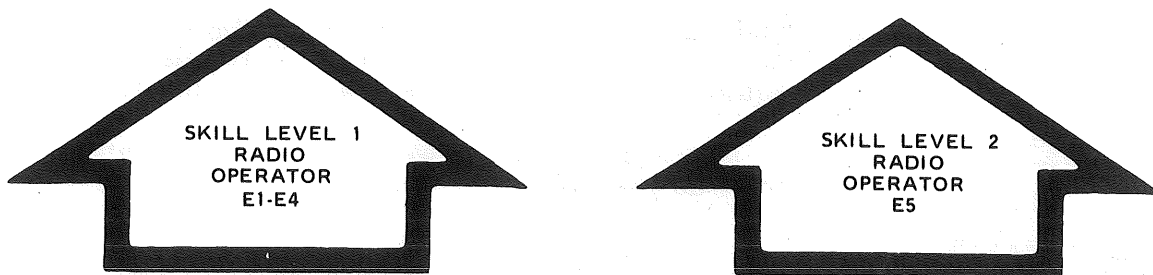
**Critical Skill Level Task:** A task which you must perform to do your job.

**Common Task:** A task common to every soldier in the Army at a given skill level, regardless of MOS.

GO NO GO: These terms are used in testing. If you are graded GO, you have passed; a NO GO means you have failed.

Job: The tasks performed by you in order to do your job.

Duty Position: This is a job in an MOS.



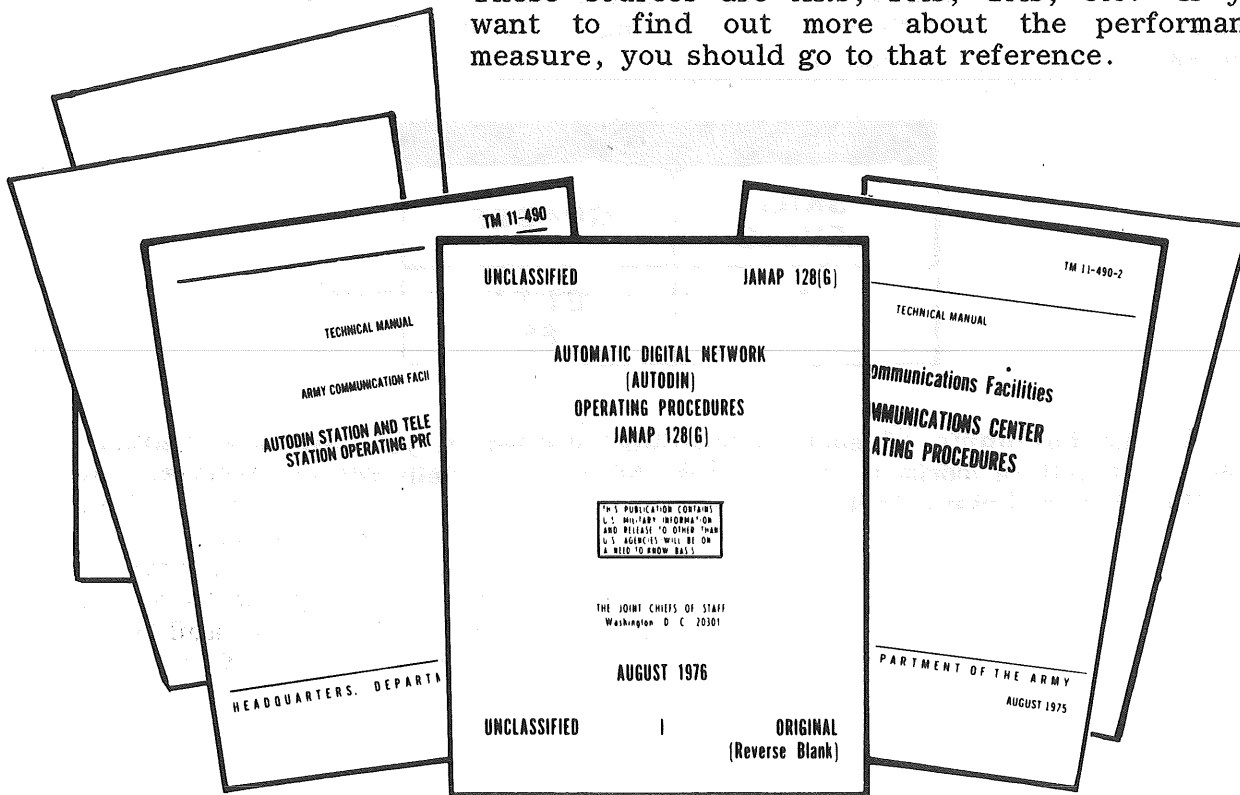
The manual lists and describes the critical tasks for Skill Level 1 and Skill Level 2 of your MOS. The following breakdown shows the grades for the skill levels in your manual:

SKILL LEVELS	GRADES
1 2	E1-E4 E5

At the beginning of each succeeding chapter in your soldier's manual, there is a list of common and critical tasks and their titles. These tasks are the most important parts of your job.

Each task is split into these parts:

- TASK:** A statement of what you must be able to do, for example: Install Generator Set, PU-619/M
- CONDITIONS:** The situation in which you must be able to do the task; e.g., a tactical or a nontactical situation under all weather conditions. It also lists the equipment and references that will be used.
- STANDARDS:** A statement of how well or how accurately you must do the task.
- PERFORMANCE MEASURES:** An outline of what you must know and do to complete the task.
- REFERENCES:** The written material needed to complete the task. These sources are ARs, FMs, TMs, etc. If you want to find out more about the performance measure, you should go to that reference.



YOUR MANUAL AND YOUR LEADERS

You are not the only one who will use this manual. Who else uses it?

**COMMANDER**

Plans your training, makes available training time and insures availability of training resources.



**COMMAND SERGEANT MAJOR**

Participates in the planning of your training.



**FIRST SERGEANT**

Participates in the planning of your training.



**PLATOON SERGEANT**

Participates in your actual training.



**TEAM CHIEF**

Participates in your actual training.



**ALL USE IT.....**

Your commander has a manual, in addition to the soldier's manual, which lists the common and critical tasks you are required to perform and the methods of training that can help you learn those tasks. It is called the Commander's Manual. The commander's manual provides your commander and supervisor with a means to help you with a training program. The soldier's manual and commander's manual are also designed to assist your commander and supervisor in evaluating your skills. Your ability to do your job will be based on how well you do the tasks listed in your soldier's manual.

## HOW TO USE YOUR SOLDIER'S MANUAL

You should begin to use your soldier's manual by studying, practicing, and mastering the tasks listed for Skill Level 1. You learned most of them in AIT. You learned others while working on the job. It really doesn't matter where or when you first learned a task. The important question is: how well can you do it now?

If you do not understand a certain task, ask your supervisor to explain it and to assist you in getting the right study aids and references. The senior NCOs and officers in your unit use the soldier's manual to help them plan your training and to evaluate your skills. Ask them for advice and help. They want to help you.

When you are sure that you have mastered all the Skill Level 1 tasks, proceed to the Skill Level 2 tasks. Continue to study and practice until you have mastered all the tasks for both Skill Levels 1 and 2.

Once you have been promoted to E5, you should immediately begin to master the Skill Level 3 tasks.

Two points to remember about the tasks in your soldier's manual:

To qualify for promotion, you must master the tasks for the grade in which you are now serving.

As you progress to higher skill levels, you remain responsible for all the tasks listed for the lower skill levels.

## ENLISTED PERSONNEL MANAGEMENT SYSTEM (EPMS)

The Army has adopted the EPMS to give you a better opportunity for attaining and maintaining skills through improved training programs. If you want to be successful, you must perform your assigned duties efficiently, take advantage of opportunities for training and promotion, and establish personal career goals.

One of the aims of EPMS is to provide a logical path of career development for soldiers. It also establishes a system of career-long training that prepares a soldier to take on duties at the next higher grade. The training consists of AIT for Skill Level 1, and periods of on-the-job experience (OJE) or formal training under the Noncommissioned Officer Education System (NCOES) for Skill Levels 2 through 5.

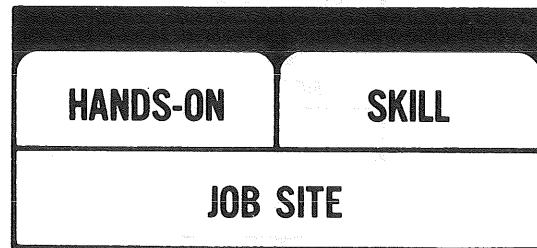
EPMS provides you with a fair and reasonable promotion system. Under EPMS, you must receive a passing score on your skill qualification test (SQT) before you can be considered for promotion. However, a passing score on your SQT does not guarantee promotion. You must be

recommended by your commander and satisfy all administrative requirements (e.g., time in grade, time in service, etc.). Your best recommendation is the manner in which you do your job and your personal behavior and efforts.

### SKILL QUALIFICATION TEST (SQT)

The SQT is a performance oriented test of your ability to do your job. The SQT will be composed of scorable units or subtests. The SQT score is based upon the number of scorable units you pass, e.g., if a scorable unit consists of four questions, you may be required to answer three correctly to get a GO or passing score for the unit. You will be informed of the standard for each scorable unit in your SQT Notice.

The SQT may be composed of three major components:



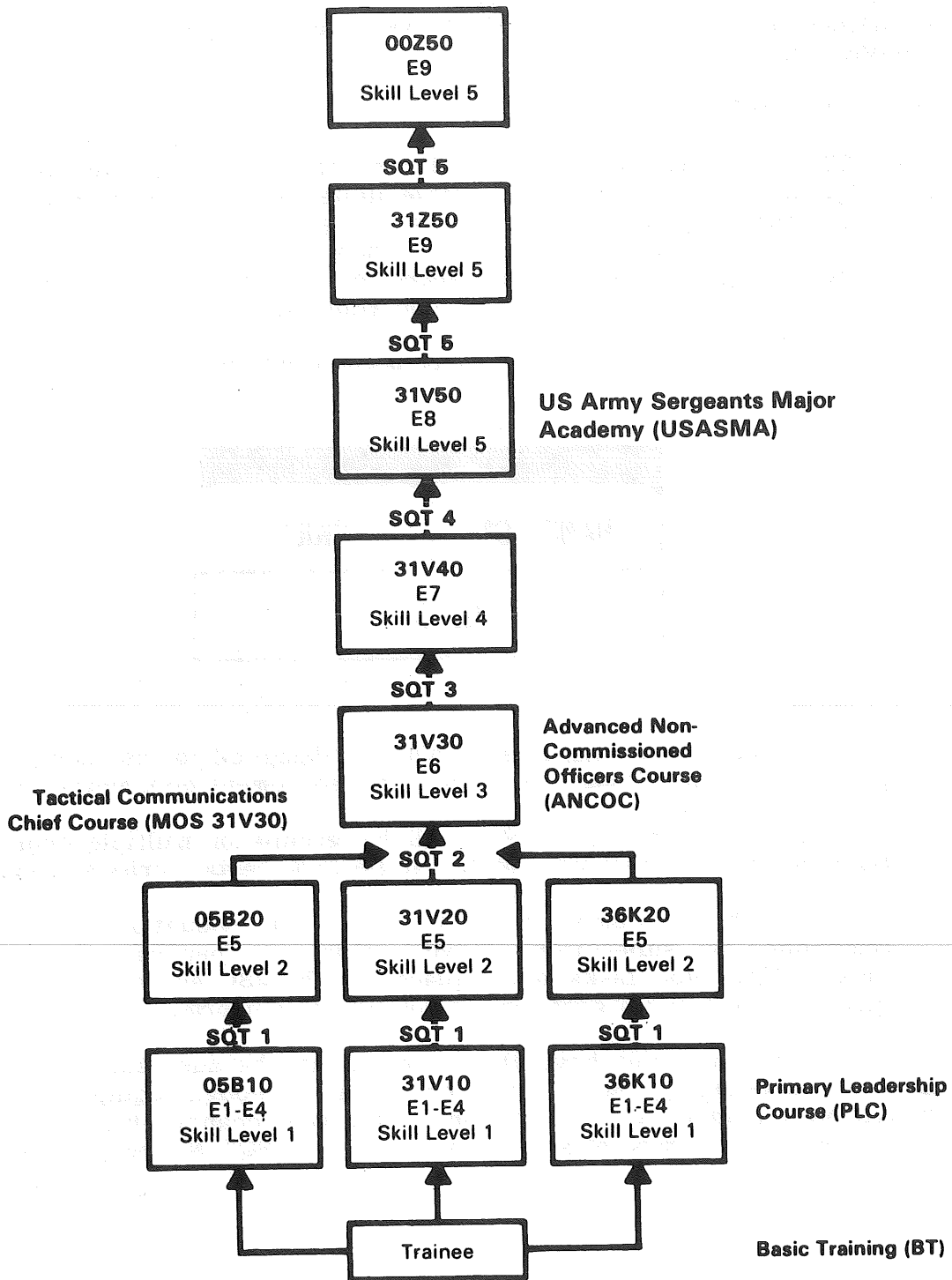
The Hands-On Component (HOC) is designed to test your ability to perform certain critical tasks using real equipment or training aids.

The Skill Component (SC) will be groups of multiple choice questions designed to test your ability to perform certain critical tasks.

The Job Site Component (JSC) will be an evaluation, made by your commander or supervisor, of your ability to perform certain critical tasks. The type tasks to be placed in the JSC are those that require physical skills and a great amount of time to perform.

Some SQTs may not have three components because they will be evaluating a low-density MOS, or there is not enough equipment, or not enough MOS holders at one location. This may change from year to year and you will be informed of such changes in your SQT Notice.

**SKILL AND TRAINING PROGRESSION FOR MOS 05B**



After the SQT has been taken and scored, you will receive a report showing your score and telling you which scorable units received a NO GO during your test.

The SQT score is used to verify your current skill level. Skill Level 1 MOS holders will take SQT-1 which will be composed of Skill Level 1 tasks. Skill Level 2 MOS holders will take SQT-2 which will consist of Skill Level 1 and 2 tasks.

Approximately 60 to 90 days before you are tested, you will receive an SQT Notice. This notice will list the tasks to be tested in each component of the SQT, and where you can find the tasks in the soldier's manual. It will give you examples of the type questions that will appear in the skill component and the performance tests that will appear in the hands-on and job site components.

IF YOU DO NOT RECEIVE YOUR SQT NOTICE AT LEAST 60 DAYS PRIOR TO THE TEST DATE, CONTACT YOUR SUPERVISOR OR COMMANDER.

#### ENLISTED EVALUATION SYSTEM

This system evaluates your ability to do your job, your attitude toward the military service in general, and your potential for increased responsibility and eventual promotion. As a soldier in grades E1 through E4, you will be evaluated by means of the SQT and a local (unit) evaluation report. The evaluation report gives your commander an indication of your attitude toward your job, how well you work with others, and your possible leadership ability. Using the results of the SQT and the evaluation report your commander can compare you with all soldiers in the unit having the same MOS, skill level, and pay grade. Your commander can determine your eligibility for:

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- Keeping your present MOS and skill level.
- Promotion to the next higher grade.
- Reenlistment.
- Schooling.

As a soldier in grade E5, you will be evaluated by means of the SQT and the Senior Enlisted Evaluation Report (SEER). The SEER is used by your supervisor to report information about your duty performance that cannot be measured by the SQT. Your attitude toward your job, how well you work with others as a team member, and your leadership ability are among the rated characteristics. If you get along with others and do your job satisfactorily, your SEERs will be good.



Your SQT and SEER scores will be important factors in your Army career. They will be used to compare you with all other soldiers in the Army having the same MOS, skill level, and pay grade. They will have a part in determining your eligibility for:

Keeping your present MOS and skill level.

Promotion to the next higher skill level.

Reclassification into a different MOS.

Staying in the Army.

Reenlistment.

Military and civilian schooling.

### SUMMARY

Your soldier's manual provides the basic parts of mutual interest to you and the Army--the critical tasks that you must be able to perform to be a successful soldier. Follow the step-by-step procedure as outlined and you will open the door to advancement.

STEP ONE: Use your soldier's manual and keep it updated.

STEP TWO: Know your MOS, skill level, and duty position.

STEP THREE: Find the critical tasks that you must master and use the references listed for each task. Refer to appendix B for tips in planning your training program.

STEP FOUR: Study and practice the critical tasks until you are sure you have mastered them. Ask the officers and NCOs in your unit for help.

STEP FIVE: Once you have mastered the critical tasks for your present MOS, skill level, and duty position, prepare for your SQT by studying and practicing the tasks listed in the SQT Notice.

If you follow the above steps, you will be able to progress through a rewarding Army career. The Army wants and needs well-trained soldiers who desire to advance through the ranks. This manual and the willing assistance of your NCOs are tools you can use to your advantage.

You are encouraged to submit recommendations or comments to improve this manual. Key your comments to the specific page, paragraph, and line of text for which the change is recommended. Provide reasons for each comment to insure understanding and complete evaluation. Use DA Form 2028 (Recommended Changes to Publications and Blank Forms) if available. However, if DA Form 2028 is not available, a letter will be acceptable. Address form or letter to:

Commander  
US Army Signal Center & Fort Gordon  
ATTN: ATZHTD-A  
Fort Gordon, Georgia 30905



CHAPTER 2  
SKILL LEVEL TASKS

This chapter deals with soldier's common tasks and technical tasks which have been identified as critical to Radio Operator. Skill Level 1 and Skill Level 2 tasks are included. It is your duty to master all the tasks for Skill Level 1. When you feel that you can perform these tasks, you should start on the tasks for Skill Level 2.

TASK LIST

SKILL LEVEL 1

<u>TASK NO</u>	<u>TITLE</u>	<u>PAGE</u>
031-503-1001	Perform Operator's Maintenance on an M17 Series Protective Mask	2-9
031-503-1002	Put on and Wear a Protective Mask	2-13
031-503-1003	Store Protective Mask with Hood in Carrier	2-17
031-503-1004	Recognize and Protect Self Against a CB Hazard	2-20
031-503-1005	Recognize and Protect Self Against a Nuclear Hazard	2-23
031-503-1006	Give Visual, Vocal, and/or Sound Alarms for Chemical or Biological Attack	2-26
031-503-1007	Decontaminate Self	2-28
031-503-1008	Decontaminate Individual Equipment	2-33
051-202-1001	Camouflage/Conceal Self and Individual Equipment	2-36
051-202-1002	Camouflage/Conceal Equipment	2-40
071-311-2001	Perform Operator's Maintenance on an M16A1 Rifle, Magazine, and Ammunition	2-42
071-311-2003	Load, Reduce a Stoppage, and Clear an M16A1 Rifle	2-55

<u>TASK NO</u>	<u>TITLE</u>	<u>PAGE</u>
071-311-2004	Battlesight, Zero an M16A1 Rifle	2-60
071-311-2007	Qualify with the M16A1 Rifle	2-66
071-327-0201	Maintain an Appropriate Level of Physical Fitness (Male Only)	2-69
071-327-0210	Maintain an Appropriate Level of Physical Fitness (Female Only)	2-72
071-331-0801	Use Challenge and Password	2-74
081-831-1001	Perform Mouth-to-Mouth Resuscitation	2-76
081-831-1004	Apply First Aid Measures to Stop Bleeding	2-79
081-831-1005	Give First Aid to Prevent Shock	2-85
081-831-1011	Give First Aid to a Nerve Agent Casualty	2-87
113-571-1003	Establish, Enter or Leave a Radio Net	2-90
113-571-1005	Send or Receive a Radiotelephone Message	2-93
113-573-1002	Prepare a Message for Transmission in 16-Line Format	2-98
113-573-4001	Encode and Decode Messages Using KTC-600 Tactical Operations Code	2-102
113-573-4002	Use KAL-61B with KTC-1400 Numerical Code to Authenticate Transmissions and Encrypt/Decrypt Numbers and Grid Zone Letters	2-106
113-573-6001	Recognize Electronic Countermeasures (ECM) and Implement Electronic Counter-Countermeasures (ECCM)	2-117
113-573-7001	Prepare an Interference (MIJI) Report	2-124
113-573-8005	Use an Automated CEOI	2-128
551-721-1007	Perform Before-Operation Maintenance	2-137
551-721-1008	Perform During-Operation Maintenance	2-140

<u>TASK NO</u>	<u>TITLE</u>	<u>PAGE</u>
551-721-1009	Perform After-Operation Maintenance	2-142
551-721-1011	Drive Vehicle With Manual Transmission	2-144
551-721-1012	Park Vehicle Parallel	2-145
551-721-1015	Drive Vehicle Off Road	2-147
551-721-1016	Drive Vehicle In Motor March or Convoy	2-148
551-721-1017	Utilize Vehicle Camouflage and Concealment	2-160
551-721-1018	Drive Vehicle Under Blackout Conditions	2-164
551-721-1020	Utilize Proper Defense Procedures When Ambushed or Attacked	2-167
551-721-1021	Take Passive Defense Measures Against Air Attacks	2-168
551-721-1028	Perform Vehicle Self-Recovery Using Winch	2-169
551-721-1029	Prepare Vehicle for Movement/Shipment	2-170
551-721-1030	Fill Out SF 91 (Operator's Report of Motor Vehicle Accident)	2-173
551-721-1031	Fill Out DD Form 518 (Accident Identification Card)	2-179
113-587-1001	Install Radio Set AN/PRC-77 or AN/PRC-25	2-181
113-587-2001	Operate Radio Set AN/PRC-77 or AN/PRC-25	2-184
113-587-3001	Perform Operator's Preventive Maintenance on Radio Set AN/PRC-77 or AN/PRC-25	2-187
113-587-1002	Install Radio Set AN/VRC-12	2-189
113-587-1004	Install Radio Set AN/VRC-46	2-195
113-587-1005	Install Radio Set AN/VRC-49	2-199

<u>TASK NO</u>	<u>TITLE</u>	<u>PAGE</u>
113-587-2005	Operate Radio Set AN/VRC-49	2-207
113-587-3002	Perform Operator's Preventive Maintenance Checks and Services on Radio Set AN/VRC-49	2-210
113-587-2003	Operate Radio Set AN/VRC-46 (AN/VRC-12 Series)	2-223
113-587-2004	Troubleshoot AN/VRC-46 (AN/VRC-12 Series)	2-225
113-587-1003	Install Radio Set AN/VRC-64	2-227
113-587-2002	Operate Radio Set AN/VRC-64	2-237
113-596-1018	Install RC-292 Antenna	2-241
113-596-3009	Perform Operator's Preventive Maintenance Checks and Services on Antenna RC-292	2-251
113-601-1003	Install Generator Set 3 KW, 28 V DC	2-254
113-601-2005	Operate Generator Set, 3 KW, 28 V DC	2-257
113-609-1001	Install and Operate Communications Security Equipment TSEC/KY-8	2-263
113-609-1002	Install and Operate Speech Security Equipment TSEC/KY-38	2-266
113-609-1003	Install and Operate Communications Security Equipment HYL-3/TSEC	2-269
113-609-2013	Operate KY-57 In Cipher Text Mode	2-272
113-618-1001	Install Radio Wire Integration (RWI) System	2-275
113-618-2001	Operate Radio Wire Integration (RWI) System	2-283
113-620-1001	Install Radio Set AN/GRC-106(*)	2-287
113-620-2001	Operate Radio Set AN/GRC-106(*)	2-291

<u>TASK NO</u>	<u>TITLE</u>	<u>PAGE</u>
113-620-3001	Perform Daily Preventive Maintenance Checks and Services on Radio Set AN/GRC-106(*)	2-299
113-620-2002	Perform Operator's Troubleshooting Procedures on Radio Set AN/GRC-106(*)	2-302
113-620-1002	(RC)Install Radio Set AN/GRC-109	2-306
113-620-2003	(RC)Operate Radio Set AN/GRC-109	2-310
113-620-3002	(RC)Perform Operator's Daily Preventive Maintenance on Radio Set AN/GRC-109	2-314
113-620-2004	(RC)Troubleshoot Radio Set AN/GRC-109	2-318
113-620-1021	(RC)Install Radio Set AN/GRC-19(*)	2-321
113-620-2012	(RC)Operate Radio Set AN/GRC-19(*)	2-326
113-620-1003	Install Radio Set AN/FRC-93	2-328
113-620-2005	Operate Radio Set AN/FRC-93	2-337
113-620-1004	(SF)Install Radio Set AN/PRC-74B	2-350
113-620-2006	(SF)Operate Radio Set AN/PRC-74B	2-358
113-622-1001	Install Radio Set, Control Group, AN/ GRA-6	2-360
113-622-2001	Operate Radio Set, Control Group, AN/ GRA-6	2-364
113-622-1002	Install Radio Set, Control Group, AN/ GRA-39	2-368
113-622-2002	Operate Radio Set, Control Group, AN/ GRA-39	2-374
113-623-3001	Prepare DA Form 2404 (Equipment Inspection and Maintenance Worksheet) as a Daily and Weekly Maintenance Report	2-377



## SKILL LEVEL 2

<u>TASK NO</u>	<u>TITLE</u>	<u>PAGE</u>
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071-328-5301	Inspect Personnel/Equipment	2-389
071-329-1006	Navigate From One Position on the Ground to Another Point	2-391
071-329-1015	Locate Unknown Point on a Map or on the Ground by Resection	2-393
874-896-2010	Prepare to Conduct Individual Training	2-397
874-896-2020	Conduct Individual Training	2-400
874-896-3050	Develop an Outline for Task Training	2-403
113-571-7001	Perform Station/Net Duties	2-408
113-571-7002	Inspect Station/Net Operations	2-411
113-574-1004	Operate in Radio Nets	2-415
113-587-7001	Inspect Installed Operational Radio Sets	2-418
113-596-7001	Inspect Construction of a Doublet Antenna	2-421
113-596-7014	Direct Installation of RC-292 Antenna	2-426
113-596-7015	Direct Dismantling of an Installed RC-292 Antenna	2-429
113-601-7001	Inspect Installed Operational Generator Sets	2-433
113-611-1001	Select Team Radio Site	2-436
113-618-7001	Inspect Installed Operational Radio Wire Integration System	2-438
113-622-7001	Inspect Installed Operational Radio Set Control Groups	2-442

<u>TASK NO</u>	<u>TITLE</u>	<u>PAGE</u>
113-623-7002	Inspect Performance of Preventive Maintenance at Team Level	2-445



**TASK****031-503-1001**

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**Perform Operator's Maintenance on an  
M17 Series Protective Mask**

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**CONDITIONS**

Given a dirty M17 series protective mask, carrier, accessories authorized to be stored in the carrier (per unit SOP), TM 3-4240-279-10, a pail of soapy water, a pail of clear rinse water, rags, and a small brush.

**STANDARDS**

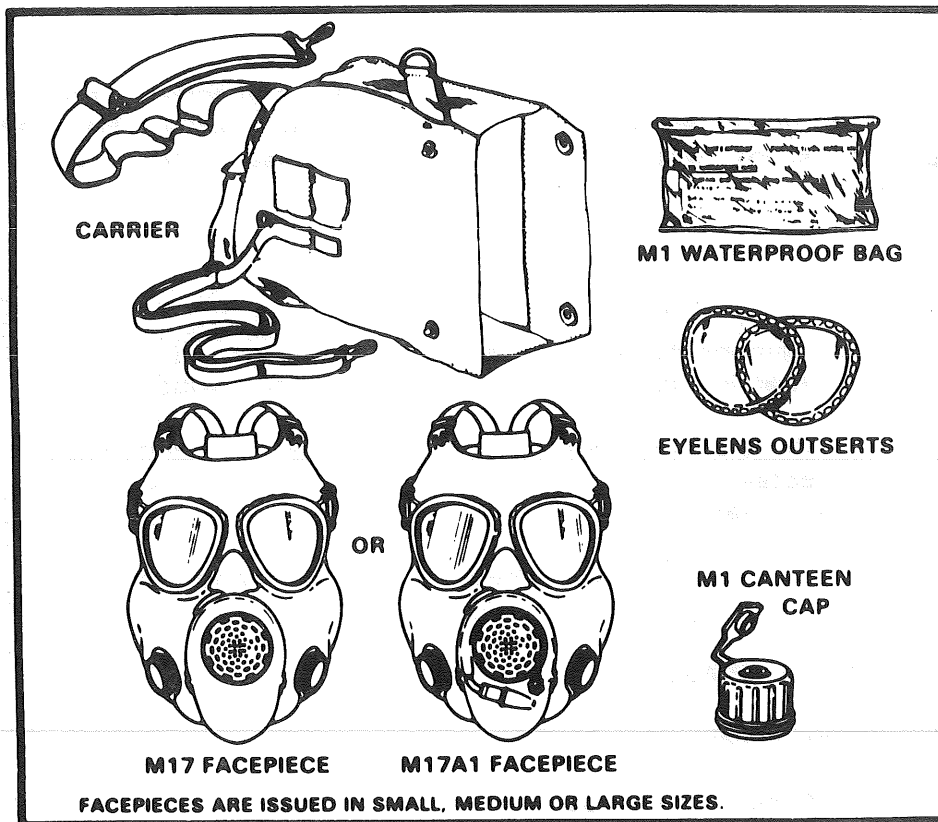
1. All components and accessories authorized by unit SOP are present; any that are missing are reported to your supervisor.
2. All deficiencies not requiring higher echelon support have been corrected. Those which do require such support are reported to your supervisor.
3. Mask and carrier are free of dirt, sand, and grit.

**PERFORMANCE MEASURES**

1. Inspect Mask and Carrier.
  - a. Remove the mask from the carrier and check to insure that all components are present (fig 1). Insure that accessories authorized by your unit SOP are present (fig 2). Inform your supervisor if any components or accessories are missing.
  - b. Check the carrier for superficial dirt, mildew, rips, torn straps, and missing hardware.
  - c. Check the facepiece for holes, tears, splits, and signs of deterioration of rubber parts.

**SKILL LEVEL 1**

- d. Check the filter elements to make sure that they are serviceable and properly installed.
- e. Check outserts for scratches, discoloration, or distortion that could affect vision.
- f. Check the head harness for dirt and mildew; worn, frayed, or broken straps; and missing clinch tips.
- g. If present, check the hood for holes, rips, tears, or excessive wear. The hood is unserviceable if it has more than two pinholes in any one panel.



**Figure 1. Protective mask and components.**

- h. Correct deficiencies which you are authorized to correct at your level. (See TM 3-4240-279-10, sec III, pp 3-5 thru 3-12.)
- i. Notify your supervisor of any deficiencies which must be corrected at a higher level.

2. Clean the Mask (Without Removing Filter Elements).
  - a. If there is a hood, keep it attached to the mask.
  - b. Remove the voicemitter-outlet cover, inlet valve caps, and eyelens outserts.
  - c. Clean the mask inside and out with a cloth dipped in warm, soapy water (wrung almost dry) or a brush with soft bristles, being careful not to wet the filter elements.
  - d. Rinse with a cloth dipped in warm, clear water (wrung almost dry).
  - e. Wipe the facepiece with a clean, lint-free cloth or air-dry.

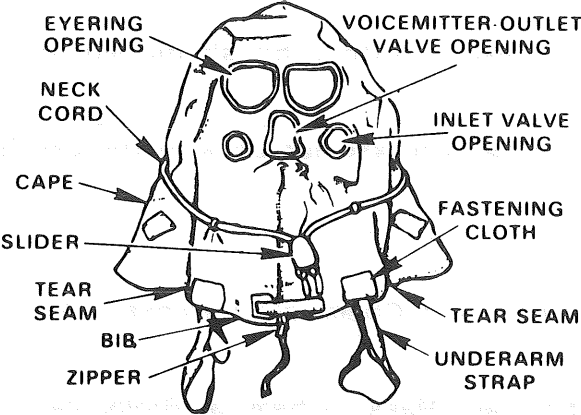
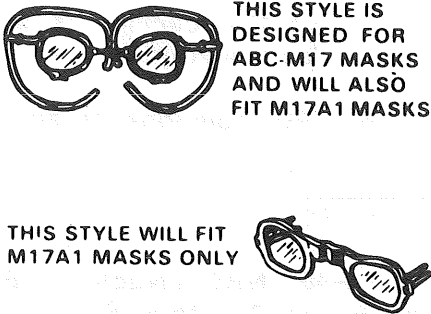
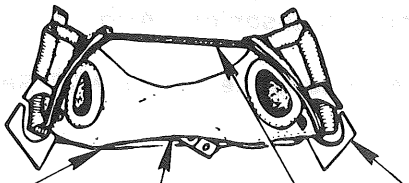
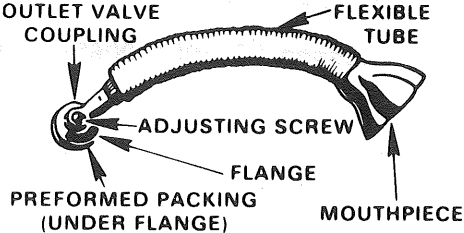
<p><b>ABC-M6A2 FIELD CB MASK HOOD</b></p>  <p>PROTECTS AREAS OF YOUR HEAD AND NECK, NOT COVERED BY YOUR MASK, AGAINST CB AGENT VAPORS, AEROSOLS, AND DROPLETS</p>	<p><b>OPTICAL INSERTS</b></p>  <p>THIS STYLE IS DESIGNED FOR ABC-M17 MASKS AND WILL ALSO FIT M17A1 MASKS</p> <p>THIS STYLE WILL FIT M17A1 MASKS ONLY</p> <p>AVAILABLE BY MEDICAL PRESCRIPTION</p> <p>IF YOU MUST WEAR GLASSES ASK YOUR SUPERVISOR TO LET YOU SEE TM 3-4240-279-20 AND P</p>
<p><b>ABC-M4 FIELD CB MASK WINTERIZATION KIT</b></p>  <p>SPECIAL INLET VALVE DISKS AND NOSECUP VALVE DISKS (STORED IN PREFILTER POCKET) WILL WITHSTAND EFFECTS OF EXTREME COLD</p> <p>PREVENTS FROST ACCUMULATIONS ON INLET VALVES DURING SUBZERO WEATHER (BELOW 0°F)</p>	<p><b>M1 RESUSCITATION TUBE FOR M17A1 ONLY</b></p>  <p>CONVERTS YOUR MASK INTO A LIFE-SAVING RESUSCITATION SYSTEM</p>

Figure 2. Protective mask accessories

- f. If the nosecup valve disks become detached while the mask is being cleaned, reinstall them.
  - g. Reassemble the mask.
3. Clean the Carrier.
- a. Empty the carrier pockets.
  - b. Brush the carrier both inside and outside to remove sand or grit.
  - c. If the carrier is soiled, clean it with a brush dipped in clear, cold water.
  - d. Put components and authorized accessories back in the carrier.

#### REFERENCES

FM 21-40, NBC (Nuclear, Biological, and Chemical) Defense, 14 Oct 77, app B, pp B-4 thru B-6.

TM 3-4240-279-10, Operator's Manual: Mask, Chemical-Biological: Field ABC-M17/M17A1 and Accessories, chap 3, pp 3-1 thru 3-14, Aug 75.

TM 3-4240-279-20 & P, w/C1 and 2, Organizational Maintenance Manual Including Repair Parts and Special Tools Lists: Mask, Chemical-Biological; Field, ABC M17/M17A1 and Accessories, Aug 75.

TEC Lesson 931-061-0065-A, NBC: Maintenance of the M17 Series Mask.

**TASK****031-503-1002**

---

**Put on and Wear a Protective Mask**

---

**CONDITIONS**

Wearing a protective mask carrier containing a prefitted M17 series protective mask and given an alarm for a surprise NBC attack, exposed to a chemical or biological attack without warning, or ordered to put on the mask.

**STANDARDS**

1. The protective mask is properly put on, cleared, and checked within 9 seconds after the alarm.
2. If the hood is present, it is pulled over the shoulders, zipped, and drawstrings adjusted within an additional 6 seconds. The underarm straps are secured before continuing operations.
3. The mask (and hood) are worn for at least 6 hours while performing duties.

**PERFORMANCE MEASURES**

1. Stop breathing.
2. Remove headgear. Open the carrier with the left hand. (Headgear may be placed between the legs or on the muzzle of a rifle held between the legs.)
3. Hold the carrier open with the left hand and with the right grasp the mask just below the eyepieces and remove the mask.
4. Grasp the facepiece with both hands, sliding the thumbs up inside so that the facepiece is opened to the fullest extent.



5. Place chin in chin pocket, then pull the head harness over the head making sure that all head straps are straight and the head pad is centered.

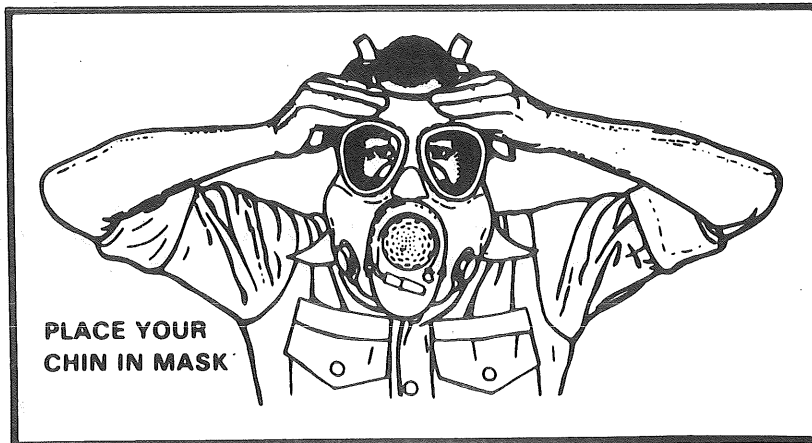


Figure 1. Step 1.

6. Smooth the edges of the facepiece on the face with an upward and backward motion of hands, pressing out all bulges to get an airtight seal.

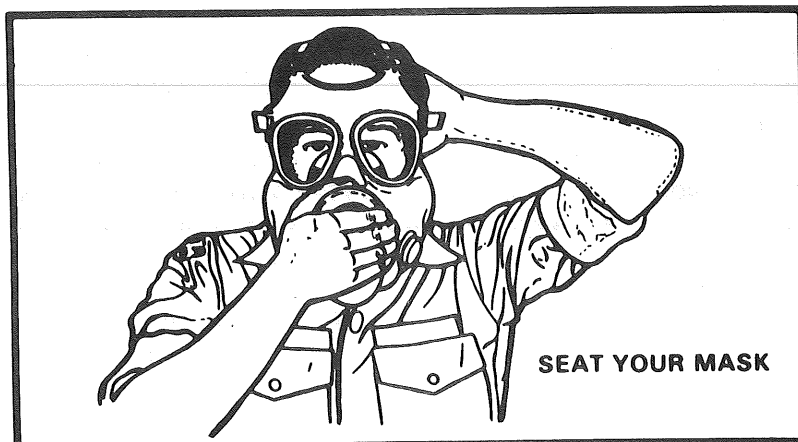


Figure 2. Step 2.

7. To clear any gas from the mask, cup the heel of your hand over the outlet valve and blow hard. (For the M17A1 you must also place the other hand over the voicemitter.)

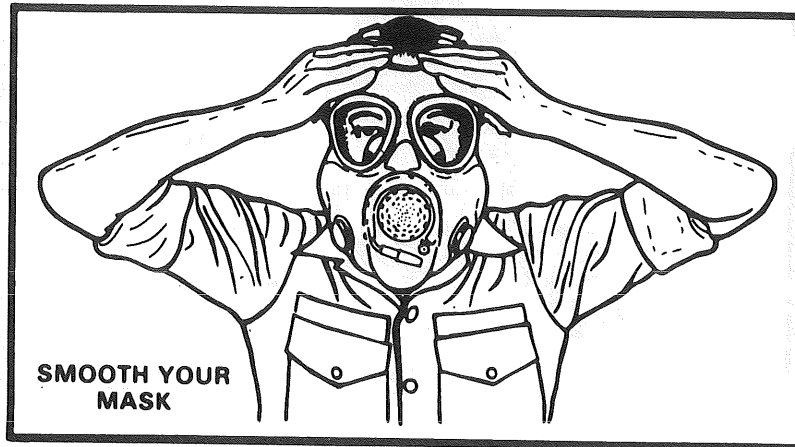


Figure 3. Step 3.

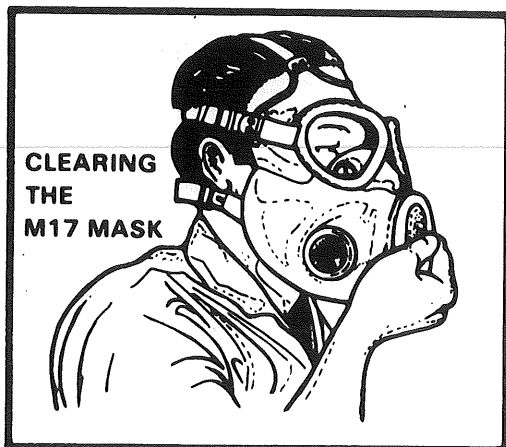


Figure 4. Step 4 for M17 mask.



Figure 5. Step 4 for M17A1 mask.

## SKILL LEVEL 1

8. Check for leaks by placing the palms of your hands over the inlet valve caps, breathing in lightly, and holding your breath. If there are no leaks, the mask should suck in toward your face and stay that way until you breathe out.

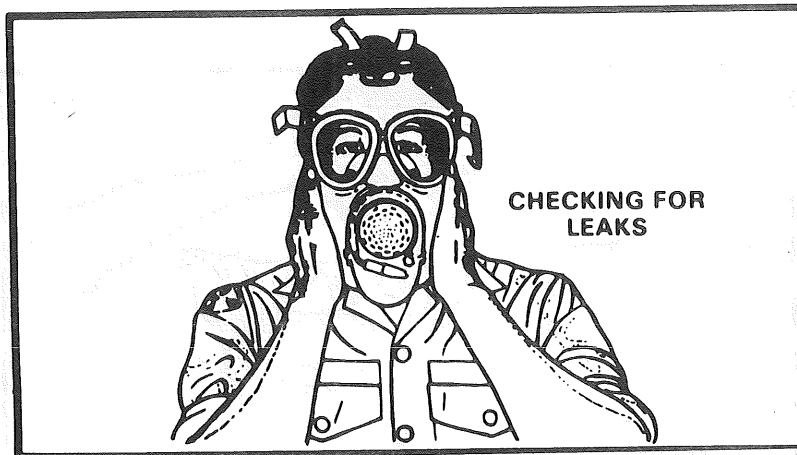


Figure 6. Step 5.

9. If you have a protective hood, pull it over the shoulders, zip it, and adjust the drawstring.
10. Replace the headgear.
11. Give the alarm (task 031-503-1006) and continue the mission. (If you have a protective hood, secure the straps under the arms before continuing the mission.)

## REFERENCES

FM 21-40, NBC (Nuclear, Biological, and Chemical) Defense, 14 Oct 77, app D, p D-1.

FM 21-41, Individual NBC Defense, Oct 77, pp 25 thru 27.

TEC Lesson 931-061-0060-F, NBC: The Mask.

TEC Lesson 931-061-0061-F, NBC: Masking and When to Do It.

# TASK

## 031-503-1003

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### Store Protective Mask With Hood in Carrier

---

#### CONDITIONS

After removing the protective mask with hood, given a carrier.

#### STANDARDS

1. Mask is stored in carrier with eyelens facing up and out.
2. Opening to faceblank is not covered by the folded hood.

#### PERFORMANCE MEASURES

1. Open all hood straps and zipper.
2. Grasp opening of mask and head harness in left hand. Allow the hood to hang over the faceblank. Grasp the upper portion of hood in right hand (fig 1).

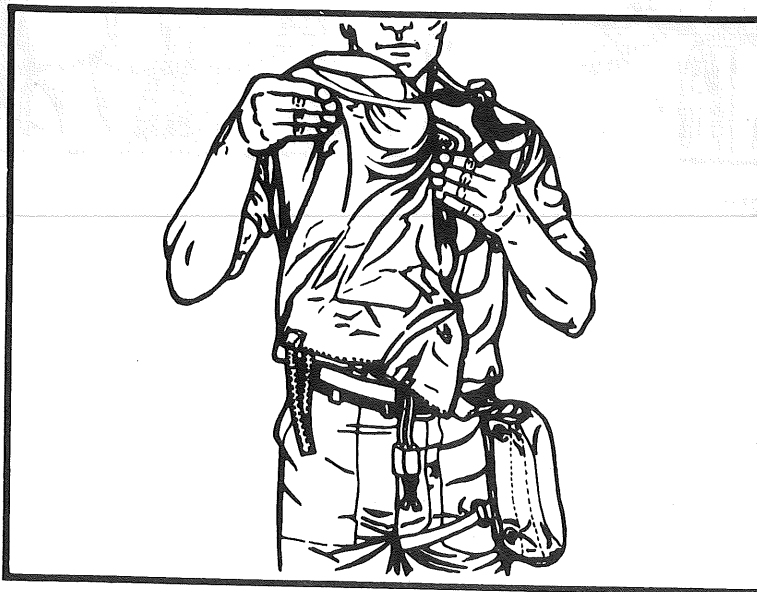


Figure 1

3. Fold the hood over the left side of the faceblank (fig 2) and hold in place with the left hand (fig 3).



Figure 2

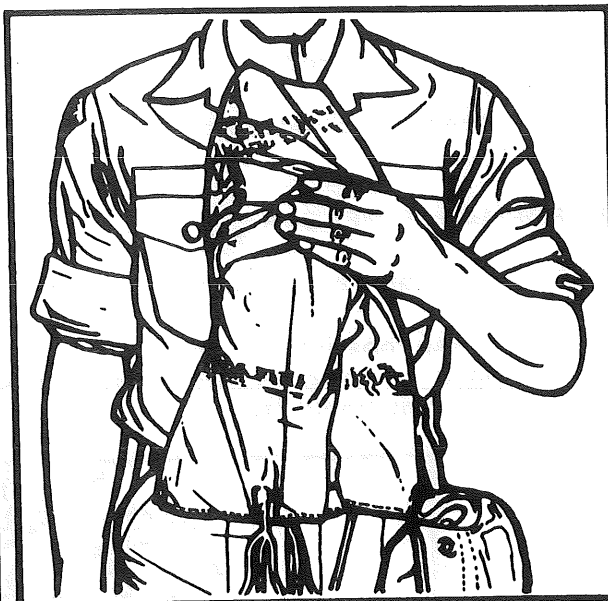


Figure 3

4. Fold the hanging portion of the hood upward on the left side of the mask. Grasp and hold in place with the fingers, holding the fold on the left side of the mask. Insure the straps are enclosed in the fold (fig 4).



Figure 4

5. Insert mask with folded hood into carrier with eyelens facing up and out (fig 5).

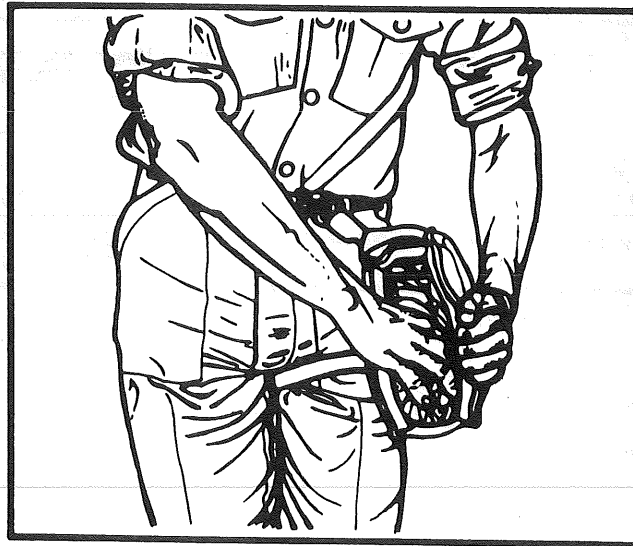


Figure 5

6. Snap the carrier shut.

REFERENCES

None

# TASK

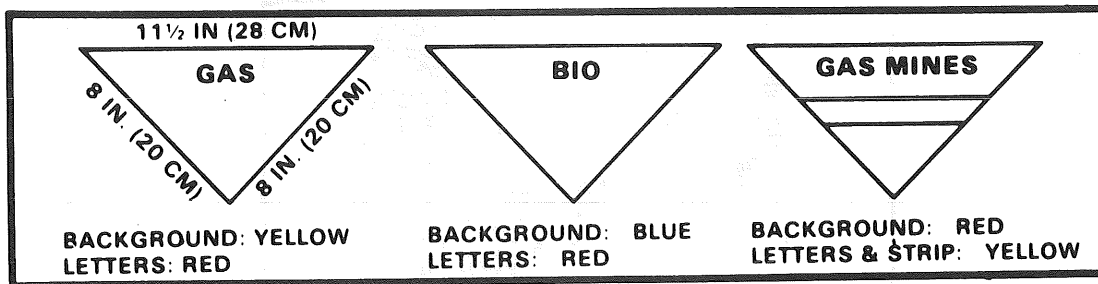
## 031-503-1004

### Recognize and Protect Self Against a CB Hazard

#### CONDITIONS

Given all standard protective equipment and any one of the following indicators of a CB hazard:

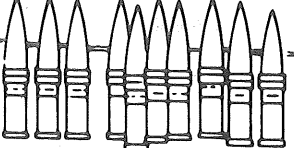
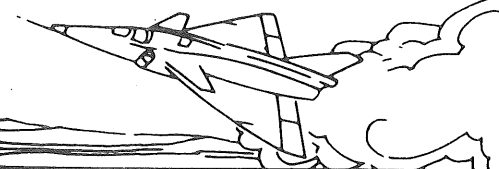

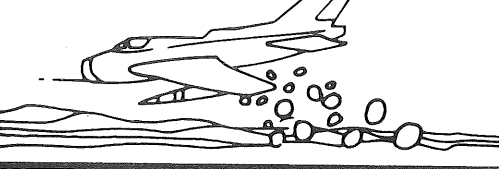

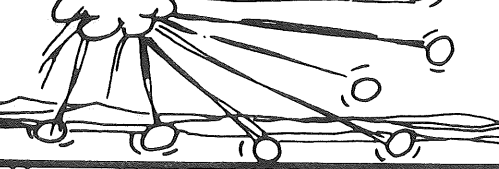
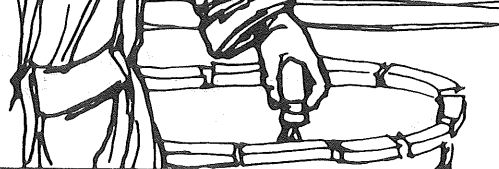
1. Contamination markers.



NOTE: The front surface of the marker is facing away from the contaminated area.

2. Any artillery, mortar, rocket, or aircraft attack near your position.
3. Any smoke, mist, vapor, or droplets from an unknown source are in the area.
4. Explosions.
5. A standard alarm; e.g., a metal-on-metal (clanging) sound, a shout of "GAS" or "SPRAY," the automatic chemical agent alarm which sounds similar to a police siren.

6. Detection of a chemical or biological delivery method

	<p><b>SHELLS</b>-that explode less powerfully than HE rounds.</p>
	<p><b>AIRCRAFT SPRAYING</b>-a mist or fog.</p>
	<p><b>VECTORS</b>-insects that are new in your area, or large swarms of insects.</p>
	<p><b>AERIAL BOMBS</b>-bombs or containers that contain bomblets pop rather than explode and cause only minor damage</p>
	<p><b>AEROSOL GENERATORS</b>-any kind of device that is spraying a mist or fog.</p>
	<p><b>GUIDED MISSILES AND ROCKETS</b>-bomblets that seem to have little immediate effect.</p>
	<p><b>MISCELLANEOUS</b>-many people sick for no known reason.</p>



7. Any of the following symptoms appear:
  - a. Running nose.
  - b. Choking and/or tightness in the chest and throat.
  - c. Dimming of vision or difficulty in focusing.
  - d. Irritation of the eyes.
  - e. Increase in breathing rate and/or difficulty in breathing.
  - f. Stinging sensation.
8. Any suspicious actions.

#### STANDARDS

1. Individual is protected by putting on the mask and securing openings in clothing.
2. All personnel are alerted to the danger.

#### PERFORMANCE MEASURES

1. Mask as described in task 031-503-1002.
2. Secure all openings in your clothing.
3. Sound the alarm as described in task 031-503-1006.
4. If the mission permits, seek overhead cover.

#### REFERENCES

FM 21-40, NBC (Nuclear, Biological, and Chemical) Defense, 14 Oct 77, chap 1, pp 1-10 thru 1-18; chap 5, pp 5-2, 5-3.

FM 21-41, Individual NBC Defense, Oct 77, pp 7, 8, 13-17.

#### SQT ADMINISTRATIVE INSTRUCTIONS

An on-target chemical agent attack can be simulated using the Simulator Projectile Airburst Liquid (SPAL) M9 or a spray of water combined with the detonation of artillery simulators.

**TASK****031-503-1005**

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**Recognize and Protect Self Against a Nuclear Hazard**

---

**CONDITIONS**

Given a sudden, unwarned nuclear detonation, a warning that a nuclear attack is imminent, or the presence of a standard NATO radiological contamination marker.

**STANDARDS**

1. Immediately protect yourself from the initial effects by falling to the ground or,
2. Quickly take the best available cover or,
3. Recognize the marker and inform your supervisor.

**PERFORMANCE MEASURES**

1. When Subjected to an Unexpected Nuclear Attack:

**NOTE:** A nuclear burst can be recognized by the great amount of heat, light, and blast produced and the mushroom-shaped cloud that forms following the explosion.

- a. Close your eyes and drop down inside an armored vehicle or fall face down to the ground immediately, your head in the opposite direction of the detonation.

**NOTE:** If you have a choice between falling directly on the ground or taking two steps and jumping into a ditch, you must fall directly on the ground. In the time it takes to go those two extra steps, you can sustain serious injury.

- b. Cover all exposed portions of the skin (e.g., hands under your body, your face down, your shoulders forward to cover the back of your neck, and your helmet on).
- c. Remain down until the blast wave passes over you and the debris stops falling.
- d. Check for injury or damage to weapons and equipment.

2. When Warned of an Imminent Nuclear Attack:

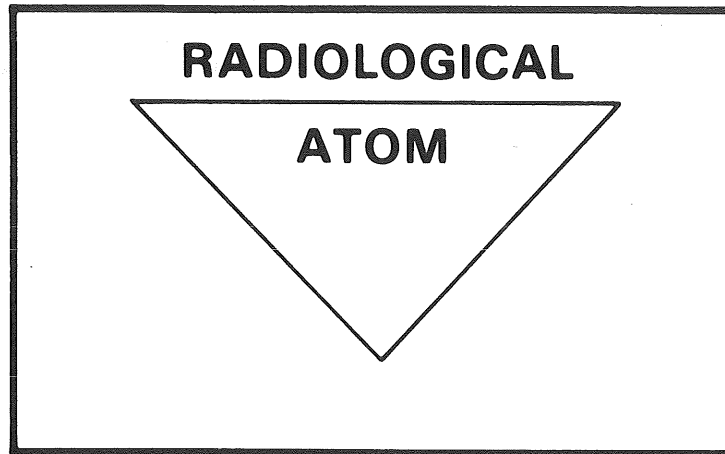
- a. Place yourself in best protective position possible.



ORDG 1018

NOTE: An armored vehicle is excellent protection.

- b. Remain in the shelter until the blast wave passes over you and debris stops falling.
  - c. Check for injury or damage to weapons and equipment.
3. Standard NATO Markers. When you encounter a standard NATO radiological contamination marker, notify your supervisor.



#### REFERENCES

FM 21-40, NBC (Nuclear, Biological, and Chemical) Defense, 14 Oct 77, chap 2, pp 1-5 thru 1-7; chap 3, p 3-2.

# TASK

## 031-503-1006

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### Give Visual, Vocal, and/or Sound Alarms for Chemical or Biological Attack

---

#### CONDITIONS

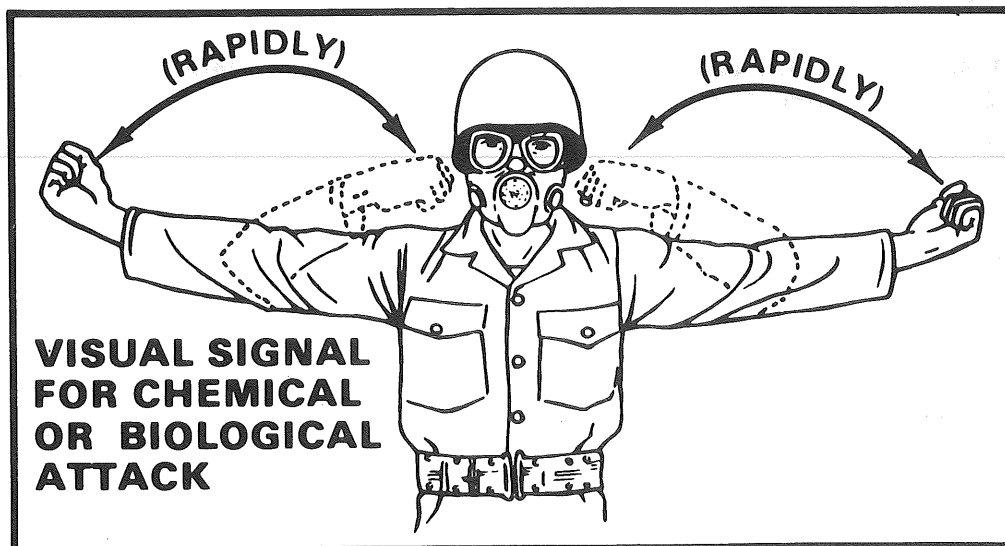
In a field environment, wearing all individual combat equipment, masked, and exposed to a surprise chemical or biological attack.

#### STANDARDS

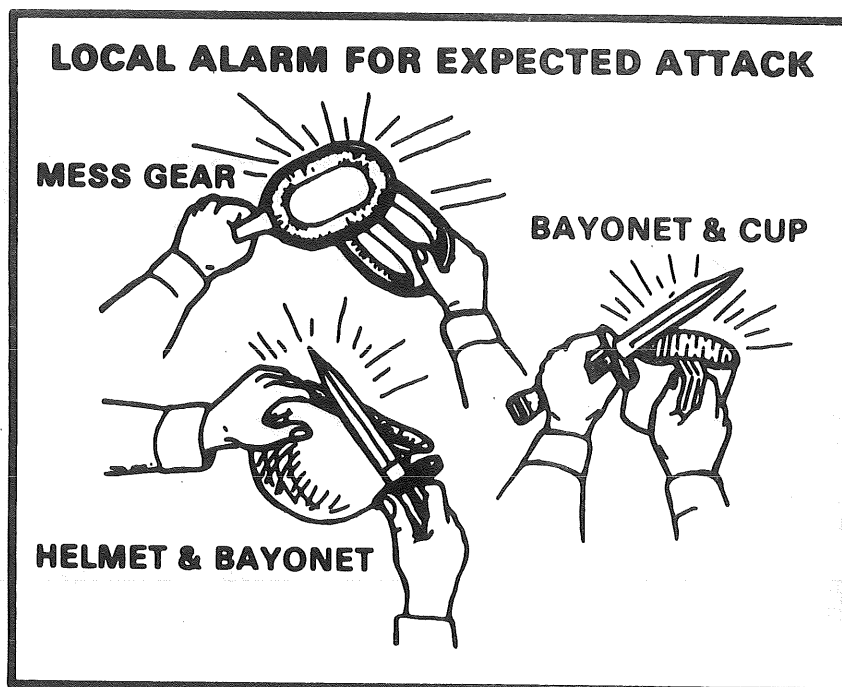
The signal or signals used are performed correctly.

#### PERFORMANCE MEASURES

1. Determine the most appropriate signal or signals to use.
2. Give the signal or signals.
  - a. Visual Signal. Extend both arms horizontally sideways with fists doubled, facing up, and rapidly move the fists to the head and back to the horizontal position. Repeat at least three times.



- b. Vocal Signal. Yell "SPRAY" for a chemical or biological spray attack and "GAS" for an attack by any other means.
- c. Sound Alarm. Rapidly strike metal-on-metal to produce a loud clanging noise.



#### REFERENCES

FM 21-40, NBC (Nuclear, Biological, and Chemical) Defense, 14 Oct 77, chap 6, p 6-7.

FM 21-60, Visual Signals, Dec 74, chap 2, p 2-1.

# TASK

## 031-503-1007

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### Decontaminate Self

---

#### CONDITIONS

Given all standard NBC protective equipment, the M13 and M258 decontamination kits, and contamination on the skin. (Contamination normally would result from exposure to a direct chemical attack or passage through a chemically contaminated area.)

#### STANDARDS

All contamination on the skin is properly removed.

#### PERFORMANCE MEASURES

1. If you are not already masked, mask according to task 031-503-1002.
2. If the situation permits, seek cover.
3. For contamination on your face:
  - a. Extract the M31 kit from your protective mask carrier.
  - b. Take the fuller's earth pad (skin pad) from the M13 kit.
  - c. Close your eyes, grasp the chin portion of your mask and pull the mask away from your face far enough to allow you to touch the fuller's earth pad to your nose.
  - d. Make two quick wipes from your nose across the lower portion of your face to each ear and one wipe across the chin.
  - e. Replace the mask on your face.

- f. Clear your mask.
  - g. Check your mask.
  - h. Dispose of the pad.
  - i. If contamination was only on your face, put on all protective clothing not already on.
4. For contamination on your skin:
- a. Grasp your M258 kit (fig 1) carried on the belt of your protective mask carrier.



Figure 1



- b. Open the kit (fig 2).

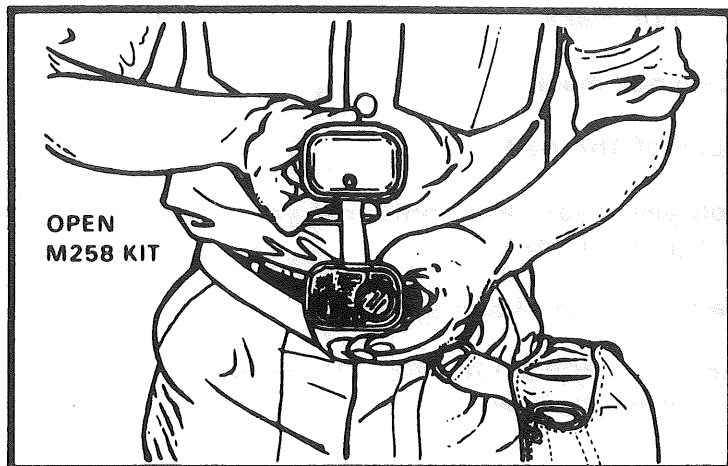


Figure 2

- c. Take out a piece of gauze and soak up any liquid on your skin. DO NOT WIPE. If the liquid is thick and won't soak into the gauze, use one of the sticks as a spoon to remove it.
- d. Take out capsule 1 and punch a hole in the side near the bottom of the capsule with the spike attached to the cover of the kit.
- e. Wet a gauze pad (fig 3) with the solution from the capsule and wipe (fig 4) off the remaining sticky material.

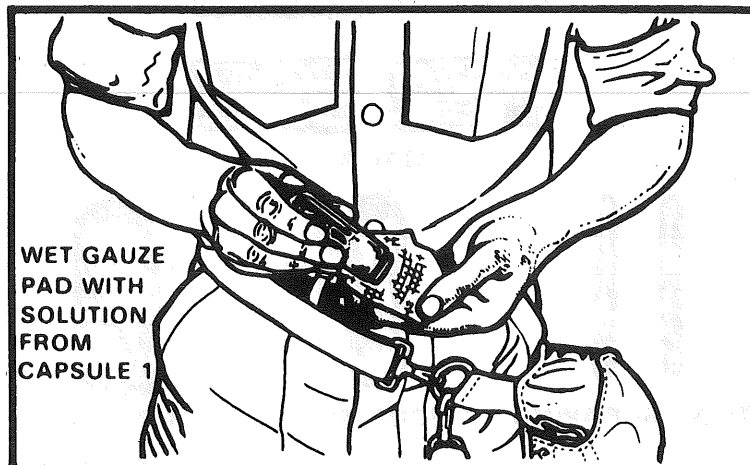


Figure 3

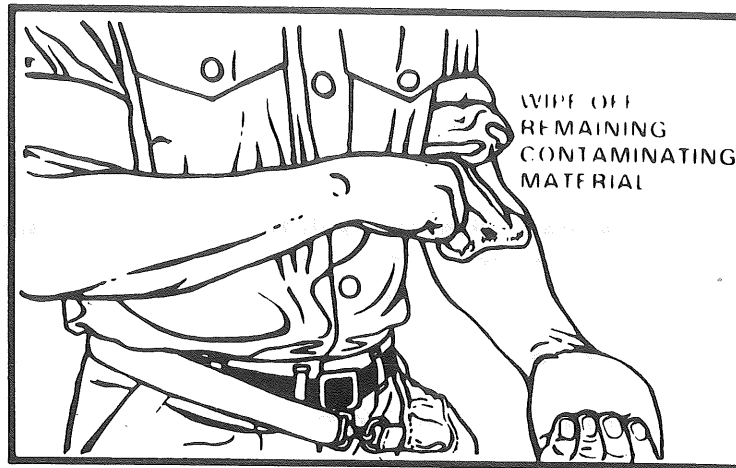


Figure 4

- f. Dispose of the pad.
- g. Take out capsule 2 and break the glass vial inside the capsule on a hard, blunt edge such as your boot heel (fig 5).



Figure 5

- h. Shake the capsule hard at least 12 times so that everything is well mixed.
- i. Puncture capsule 2 the same way you did capsule 1.

## SKILL LEVEL 1

- j. Wet a gauze pad with the solution from the capsule, blot the contaminated area with the solution, and make sure you cover the entire contaminated area.
- k. Dispose of the pad.
- l. Put on all protective clothing not already on.

## REFERENCES

FM 21-41, Individual NBC Defense, Oct 77, pp 58-64.

## SQT ADMINISTRATIVE INSTRUCTIONS

The M58 training kit will be used in all training situations. The M258 kit will be used only for actual chemical agents.

**TASK****031-503-1008**

---

**Decontaminate Individual Equipment**

---

**CONDITIONS**

After being exposed to a chemical agent attack, passing through an area contaminated with an agent or operating in an area contaminated with a chemical agent, wearing all protective clothing, given an M13 individual decontaminating and reimpregnating kit.

**STANDARDS**

Contamination is removed to the extent that the chemical agent detector kit will indicate a safe level.

**PERFORMANCE MEASURES**

1. Extract the M13 kit (fig 1) from the protective mask carrier.
2. Remove the fuller's earth pad and, if required, decontaminate the interior surface of your protective mask by:
  - a. Blotting the contamination with one side of the pad.
  - b. Turning the pad over.
  - c. Slapping the pad against the mask to spread the powder.
  - d. Rubbing the powder in, using the pad.
3. Remove the cloth bag and use it to decontaminate the exterior of the mask, clothing, and individual equipment by:
  - a. Crushing dye capsule and mixing thoroughly inside the bag.

NOTE: Do not crush the dye capsule unless actual contamination is present.

- b. Dusting the contaminated area.
- c. Inspecting clothing for red or brown color.
- d. Noting if red or brown color is present. If present, the cutter is used to remove spots larger than one-eighth inch.

NOTE: This does not apply to the overgarment which has an inner liner of charcoal to neutralize the contamination.

- e. Rubbing the powder on equipment when using the bag.
- f. Cleaning and oiling metal equipment.

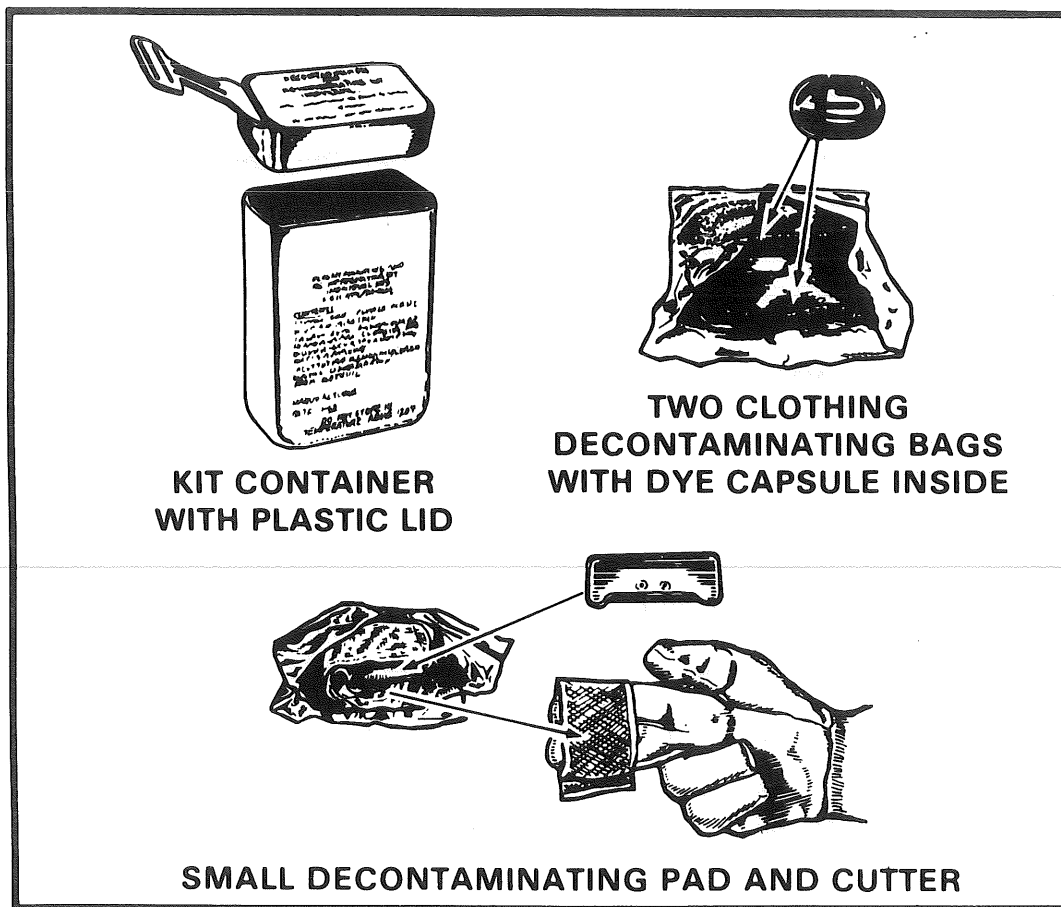


Figure 1. M13 kit.

REFERENCES

FM 21-40, NBC (Nuclear, Biological, and Chemical) Defense, 14 Oct 77, app B, pp B-7 and B-9.

FM 21-41, Individual NBC Defense, Oct 77, pp 65, 66.

SQT ADMINISTRATIVE INSTRUCTIONS

That portion of the procedure which requires crushing of the dye capsule will be simulated. Only in the event of an actual chemical contamination will the capsule be crushed.

# TASK

## 051-202-1001

### Camouflage/Conceal Self and Individual Equipment

#### CONDITIONS

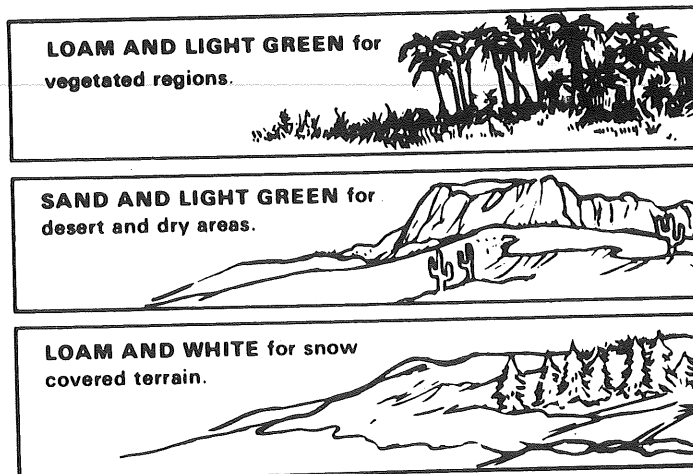
During daylight, given camouflage paint stick(s), individual weapon, load-bearing equipment (LBE), helmet complete with accessories, a snowsuit (white sheet or mattress cover) if appropriate, burlap gar-nishing strips or cloth strips, charcoal or burnt cloth residue, and mud (if appropriate to area).

#### STANDARDS

Within 15 minutes, shade shiny areas of exposed skin with dark color and shadow areas with light color. Clothing, LBE, and weapon out-lines will be altered and irregular patterns added to blend with the predominant color of the background in the area.

#### PERFORMANCE MEASURES

1. Guide for skin camouflage. Exposed skin reflects light and attracts the enemy's attention. Even very dark skin will reflect light because of its natural oil. Camouflage face paint sticks are issued in three standard two-tone sticks as follows:



LOAM AND LIGHT GREEN for vegetated regions.

SAND AND LIGHT GREEN for desert and dry areas.

LOAM AND WHITE for snow-covered terrain.

2. To camouflage exposed skin.
  - a. Paint the shiny areas (forehead, cheekbones, nose, and chin) with a dark color.



(1) Slits in burlap allow insertion of natural material.



(2) Rubber bands, or expedient bands made from old inner tubes or burlap strips, secure natural materials. (Note position of band.)



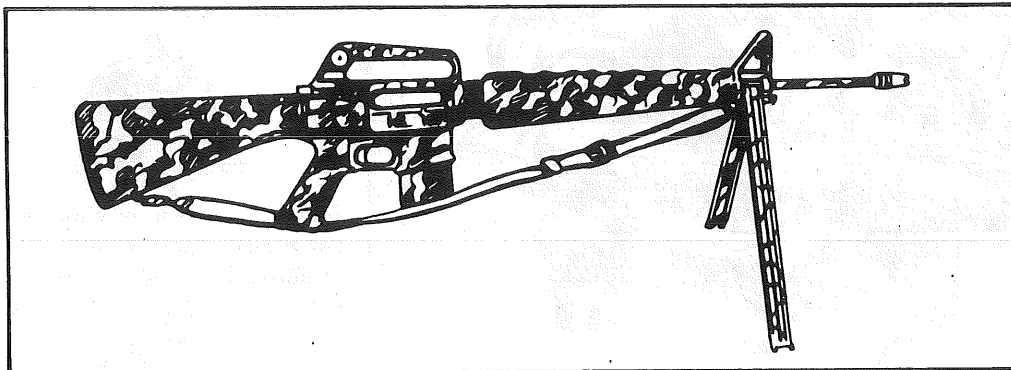
(3) A disruptive paint pattern, with the pattern carried across the curved lines of the edges, especially those seen from the front.

- b. Paint the shadow areas (around the eyes, under the nose, and under the chin) with a light color.
- c. Paint the exposed skin on the back of your neck and hands with irregular patterns.
- d. When applying camouflage, use the buddy system--work with another person and check each other.



## SKILL LEVEL 1

3. To camouflage the helmet.
  - a. The outline of the helmet is one of the striking features of your equipment, and its curved shape can be easily identified by the enemy. You should attempt to break up the outline of your helmet. There are several ways of doing this.
  - b. Improvised helmet covers can be made of pieces of burlap, other cloth, or sandbags.
4. To camouflage your weapon.
  - a. One of the easiest ways to change the outline of your weapon is by wrapping it with burlap strips or strips of cloth dyed to match the background.
  - b. Pattern painting the weapon is also good. Shiny parts can be covered by cloth, paint, or mud.
  - c. Care must be taken when camouflaging a weapon not to cause interference in the sighting and firing of the weapon.



5. To camouflage your uniform:
  - a. Combat uniforms can be stained and dyed with a little imagination.
    - (1) You can make a uniform blend with the terrain by dyeing it or by attaching bow ties of colored burlap.
    - (2) A mixture of mud and grease or crankcase oil may be used to stain your uniform.
  - b. The important thing is to make the clothing look less like a uniform and more like the terrain in which it is to be worn.
    - (3) When operating in snow-covered terrain, you can make a snowsuit from a sheet, mattress cover, or other white cloth.



6. To blend with your surroundings.

Blending is the use of camouflage materials on, over, and around an object so that it appears to be part of the background. For example, a soldier can apply stick paint to exposed skin, and add burlap, paint, and live vegetation to helmet, clothing, and LBE so that it will closely resemble or blend into the background.

#### REFERENCES

FM 5-20, Camouflage, May 68.

TEC Lesson 937-061-0030-F, Cover, Camouflage, and Concealment, Part 1.

**TASK****051-202-1002****Camouflage/Conceal Equipment****CONDITIONS**

During daylight, given an item(s) of military equipment in a field location, natural camouflage materials (foliage, grass, mud, snow, etc.) appropriate to area, camouflage net(s), and basic issue equipment.

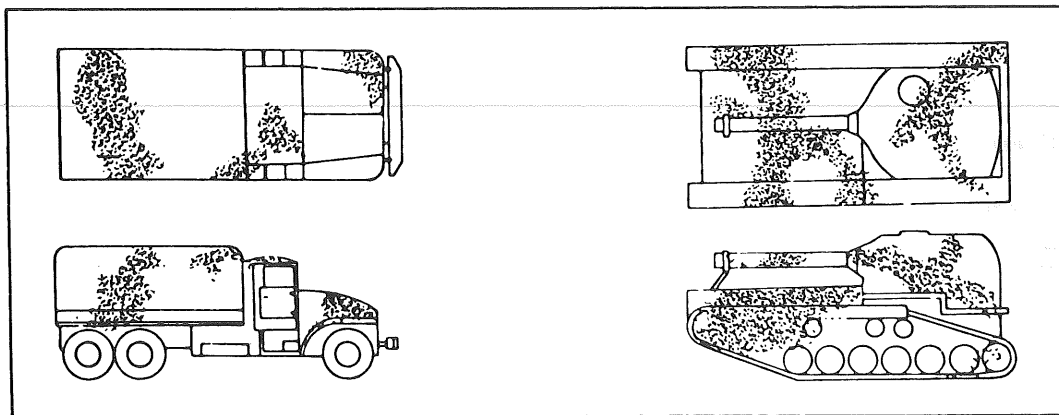
**STANDARDS**

Conceal shiny parts and cover remaining areas of the equipment in irregular patterns, and alter outlines to blend with the predominant terrain background pattern in the area.

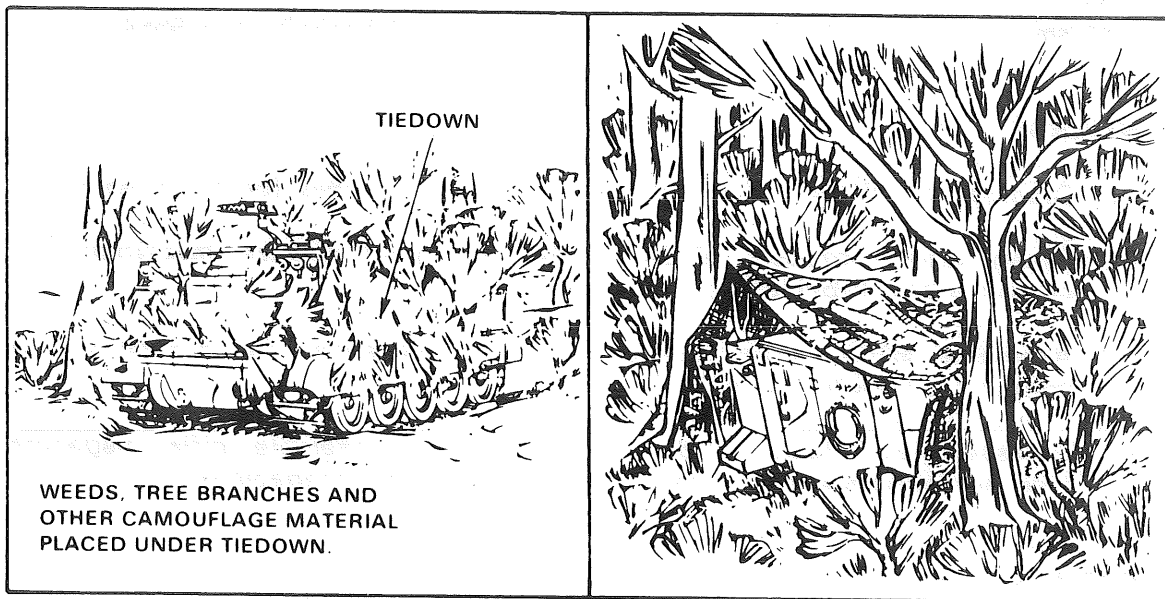
**PERFORMANCE MEASURES**

To camouflage and conceal equipment, follow these examples:

1. Use pattern paint, mud, etc., to cover shiny areas of equipment in irregular patterns so the item will blend with the color of natural surroundings.



2. Use natural materials (foliage, grass, mud, etc.) and man-made materials to alter the shape and size of the equipment.



#### REFERENCES

FM 5-20, Camouflage, May 68.

FM 7-7, The Mechanized Infantry Platoon and Squad, Sep 77.

TEC Lesson 937-061-0030-F, Cover, Camouflage, and Concealment, Part I.

# TASK

## 071-311-2001

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### Perform Operator Maintenance on an M16A1 Rifle, Magazine, and Ammunition

---

#### CONDITIONS

Given an M16A1 rifle, magazine, 5.56-mm ammunition (combat only), and small arms maintenance equipment case (FSN 8465-00-781-9564).

#### STANDARDS

1. Disassemble M16A1 rifle IAW performance measures for disassembly.
2. Clean and lubricate M16A1 rifle IAW performance measures for cleaning and lubricating.
3. Assemble M16A1 rifle IAW performance measures for assembly and conduct a function check.
4. Disassemble, clean, and lubricate, then assemble rifle magazine IAW performance measures for care of the rifle magazines.

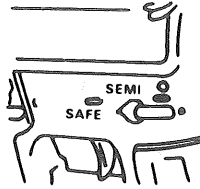
#### PERFORMANCE MEASURES

1. CLEAR YOUR RIFLE



Clear Your Rifle steps a thru e.

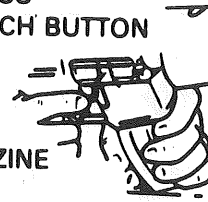
- a Place selector on SAFE. If weapon is not cocked, lever cannot be pointed toward SAFE.



- b Remove magazine.

PRESS CATCH BUTTON

PULL MAGAZINE DOWN



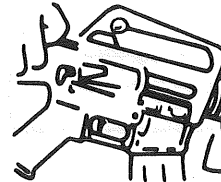
- c To lock bolt open, pull charging handle rearward, press bottom of bolt catch, allow bolt to move forward until it engages bolt catch. Return charging handle to forward. If you haven't before, place on SAFE.

PULL CHARGING HANDLE

BOLT CATCH

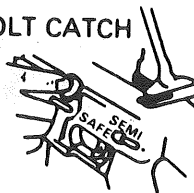


- d Eyeball receiver and chamber to insure these areas contain no ammo.


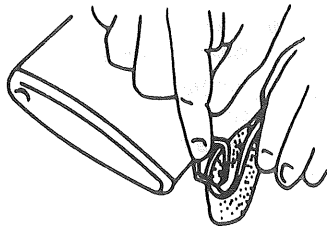
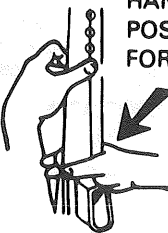
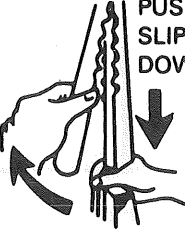
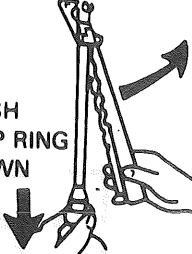
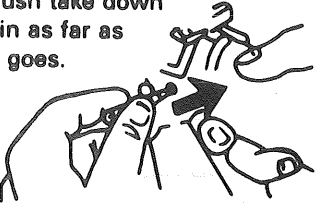
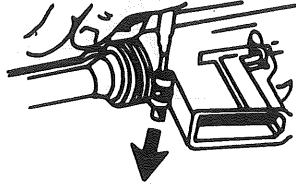
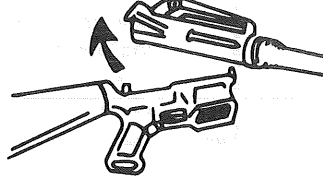
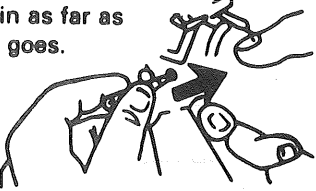
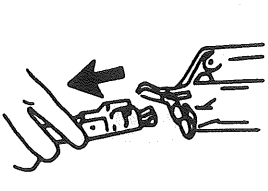
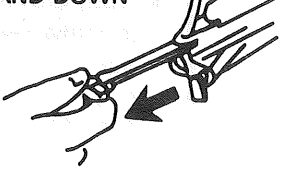
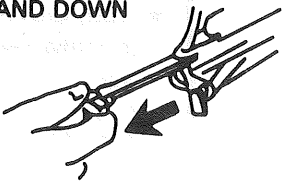


- e With selector lever pointing toward SAFE, allow bolt to go forward by pressing upper portion of bolt catch.

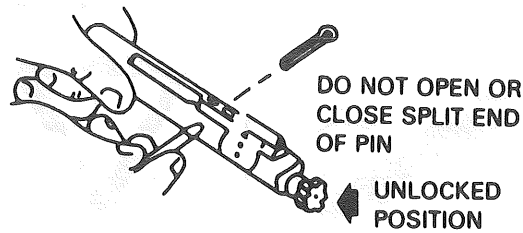
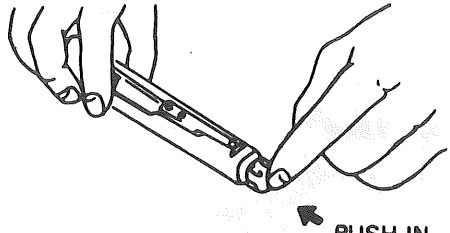
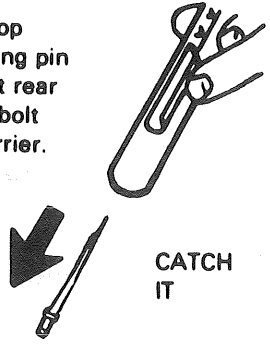
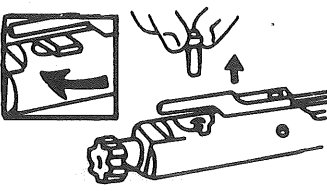
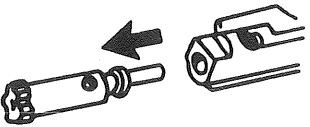
BOLT CATCH



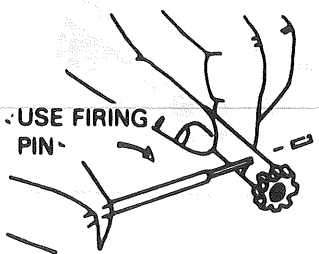
2. DISASSEMBLY

<p><b>a</b> <b>first CLEAR YOUR RIFLE</b></p> 	<p><b>b</b> Remove sling.</p> 		
<p><b>c</b> Remove handguards. <b>NOTE</b> → Remove &amp; clean only if dirt &amp; corrosion can be seen through vent holes.</p>	<p><b>HANDS POSITIONED FOR REMOVAL</b></p> 	<p><b>PUSH SLIP RING DOWN</b></p> 	<p><b>PUSH SLIP RING DOWN</b></p> 
<p>Push take down pin as far as it goes.</p> 	<p><b>d</b> Pivot upper receiver from lower receiver.</p> 	<p><b>e</b> Push receiver pivot pin.</p> 	<p><b>f</b> Separate upper and lower receivers.</p> 
<p><b>g</b> Pull back charging handle and bolt carrier.</p> 	<p><b>h</b> Remove bolt carrier and bolt.</p> 	<p><b>i</b> Remove charging handle.</p> 	

DISASSEMBLY (cont).

 <p>DO NOT OPEN OR CLOSE SPLIT END OF PIN</p> <p>UNLOCKED POSITION</p> <p>j Remove firing pin retaining pin.</p>	 <p>PUSH IN</p> <p>k Put bolt assembly in lock position.</p>	
<p>l Drop firing pin out rear of bolt carrier.</p>  <p>CATCH IT</p>	 <p>GIVE CAM PIN A 1/4 TURN AND LIFT OUT.</p> <p>m Remove bolt cam pin.</p>	 <p>n Remove bolt assembly from carrier.</p>

NOTE: Perform steps o thru r only when parts are dirty or damaged.



USE FIRING PIN

o Remove extractor pin.

**NOTE**

Press top of extractor to check spring function.

See your ARMORER

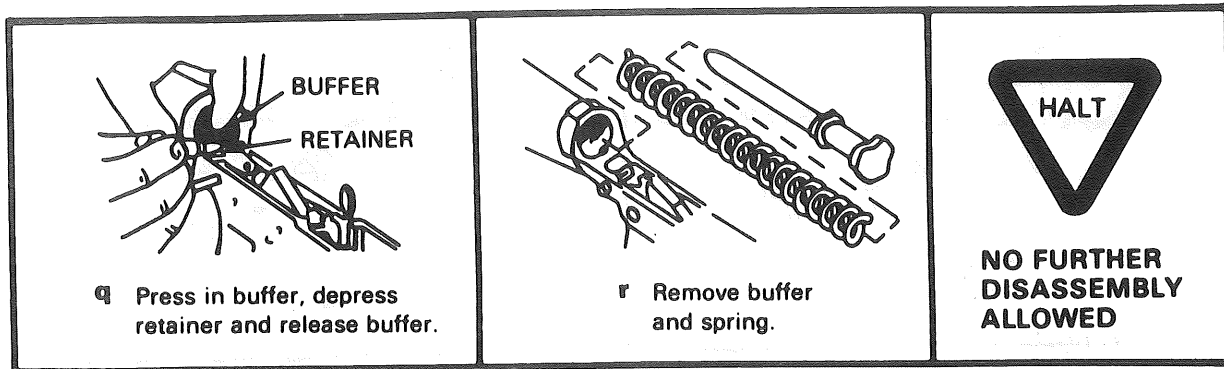
Do not damage tip of firing pin.

**DON'T SEPARATE SPRING FROM EXTRACTOR**



p Remove extractor and spring.

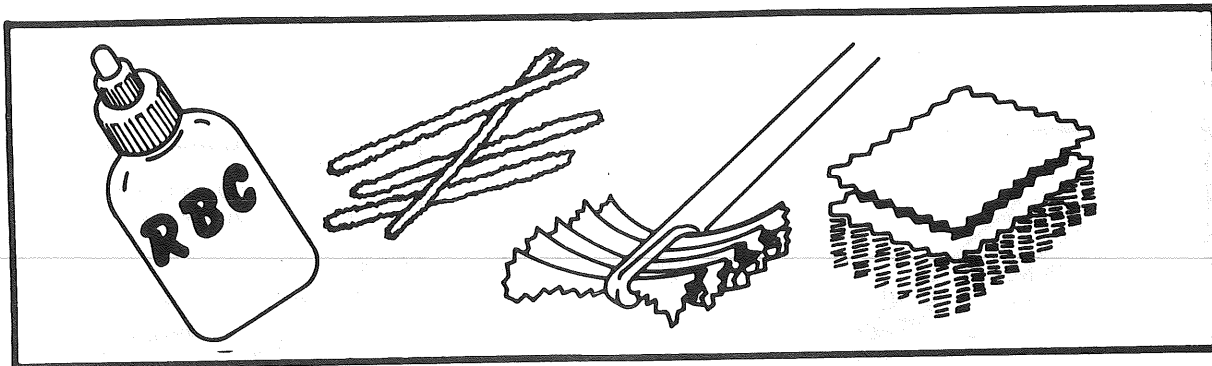




### 3. CLEAN . . . LUBE . . . INSPECT

With the rifle disassembled, thoroughly clean, inspect and lube, so that you have a reliable weapon you can always depend on.

After firing, clean your weapon for 3 consecutive days with rifle bore cleaner (RBC). Wipe dry and lube according to lubrication instructions.



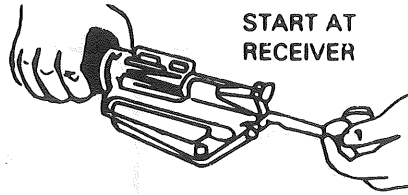
Cleaning materials: swabs, pipe cleaners, and RBC are expendable items that are available from company supply.

If any parts are missing or defective, see your ARMORER.

a. CLEANING upper and lower receiver group

**CLEAN WITH RBC**

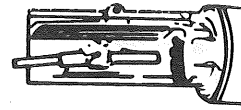
- All Areas of Powder Fouling, Corrosion, Dirt & RUST
- Bore & Chamber
- Locking Lugs
- Gas Tube



GO RIGHT THRU THE FLASH SUPPRESSOR



BORE BRUSH (DON'T REVERSE DIRECTION WHILE IN BORE)



BARREL LOCKING LUGS AND GAS TUBE

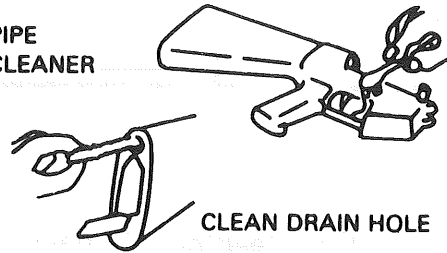
Use a worn bore brush to get outside surface of protruding gas tube (get sides and bottom from bottom of receiver)

- All Areas of Powder Fouling, Corrosion, and Dirt
- Wipe Dirt from Trigger Mechanism
- Clean Buffer and Inside Lower Receiver Extension

**CAUTION**

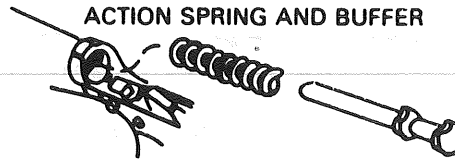
Do not use wire brush or any type of abrasive material to clean aluminum surfaces

PIPE CLEANER

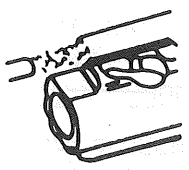

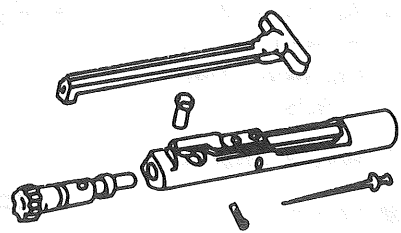
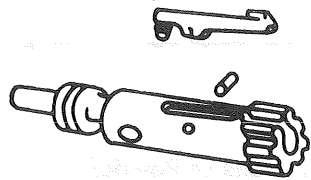


CLEAN DRAIN HOLE

ACTION SPRING AND BUFFER



b. CLEANING bolt carrier group

<ul style="list-style-type: none"> <li>● Outer &amp; Inner Surfaces of Bolt Carrier</li> <li>● Carrier Key</li> <li>● Firing Pin Recess and Firing Pin</li> <li>● Firing Pin Hole (Use Pipe Cleaner There)</li> <li>● Carbon Deposits &amp; Dirt from Locking Lugs</li> <li>● Areas Behind Bolt Ring and Under Lip of Extractor</li> </ul>	<p style="text-align: center;">WORN BORE BRUSH</p>  <p style="text-align: center;">GET THAT LAST 1/16" TOOL</p>  <p style="text-align: center;">CARRIER KEY</p>	 
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c. LUBRICATE

After cleaning all parts, lightly lubricate with LSA the lugs in barrel extension, bore, and chamber. Lightly lubricate the bolt carrier. Lubricate slide cam pin area, piston rings, outside bolt body, and in bolt carrier key.

**CAUTION:** Apply only a light coat of LSA to firing pin and firing pin recess.

Coat all other surfaces with lubricant. Apply a light coat of LSA to buffer, action spring, and inner surfaces of lower receiver extension. Use generous amount inside lower receiver and on all components.

**LUBE GUIDE**

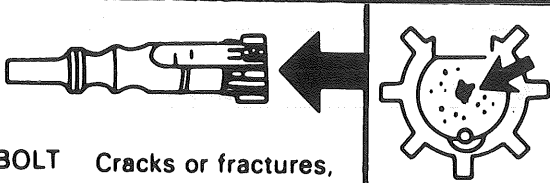
Under all but the coldest arctic conditions, LSA is the lubricant to use on your rifle. Remember to remove excessive oil from the bore before firing.

Lightly Lube - A film of oil barely visible to the eye.

Generously Lube - Heavy enough so that it can be spread with the finger.

**d. INSPECT - before assembly**

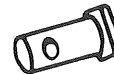
**WARNING: DO NOT interchange bolts between rifles**



**BOLT** Cracks or fractures, especially in the cam pin hole area. Bolts that contain pits extending into the firing pin hole need replacing



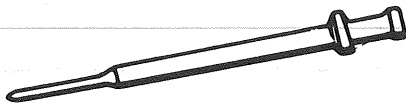
**FIRING PIN RETAINING PIN**  
Bent, busted, badly worn



**CAM PIN** - Cracked, chipped or missing



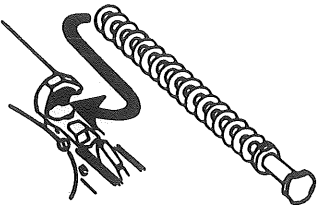
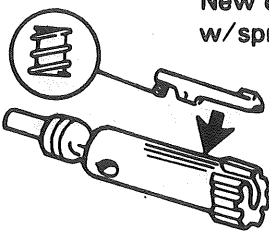
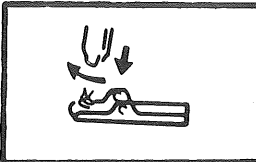
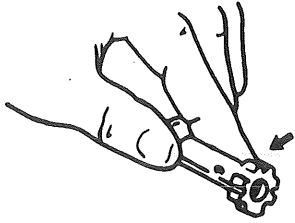
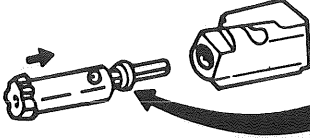
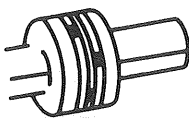
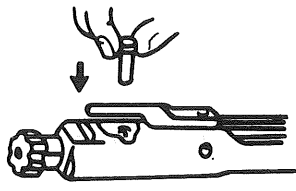

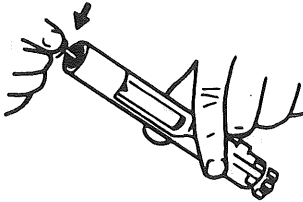
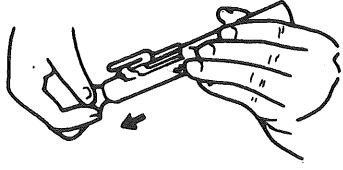
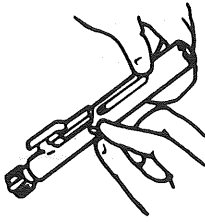
**EXTRACTOR AND EXTRACTOR SPRING** - Check extractor for chipped or broken edges in the area of the lip that engages the cartridge rim.



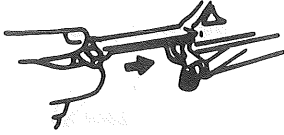
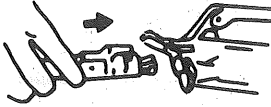
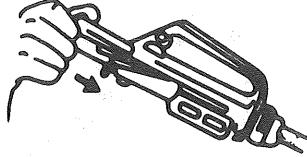
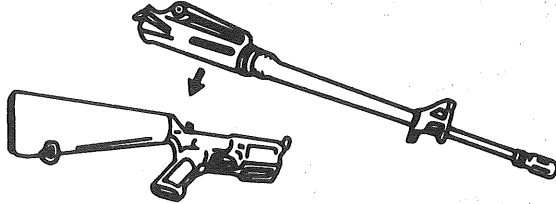
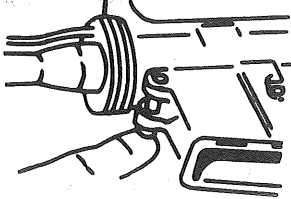
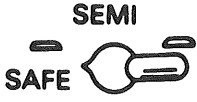
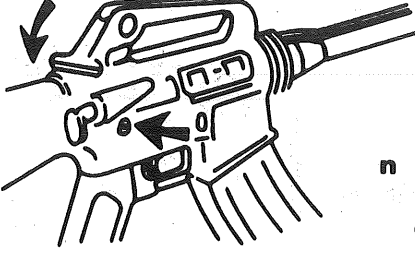
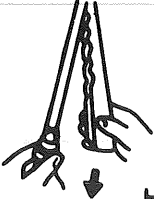
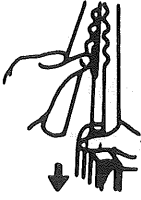
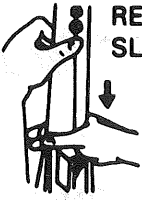
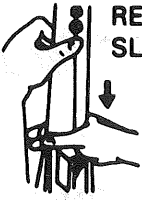
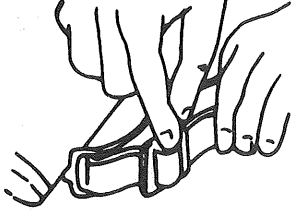
**FIRING PIN** - Bent, cracked or blunted end

**IF PARTS ARE MISSING OR DEFECTIVE, SEE YOUR ARMORER**

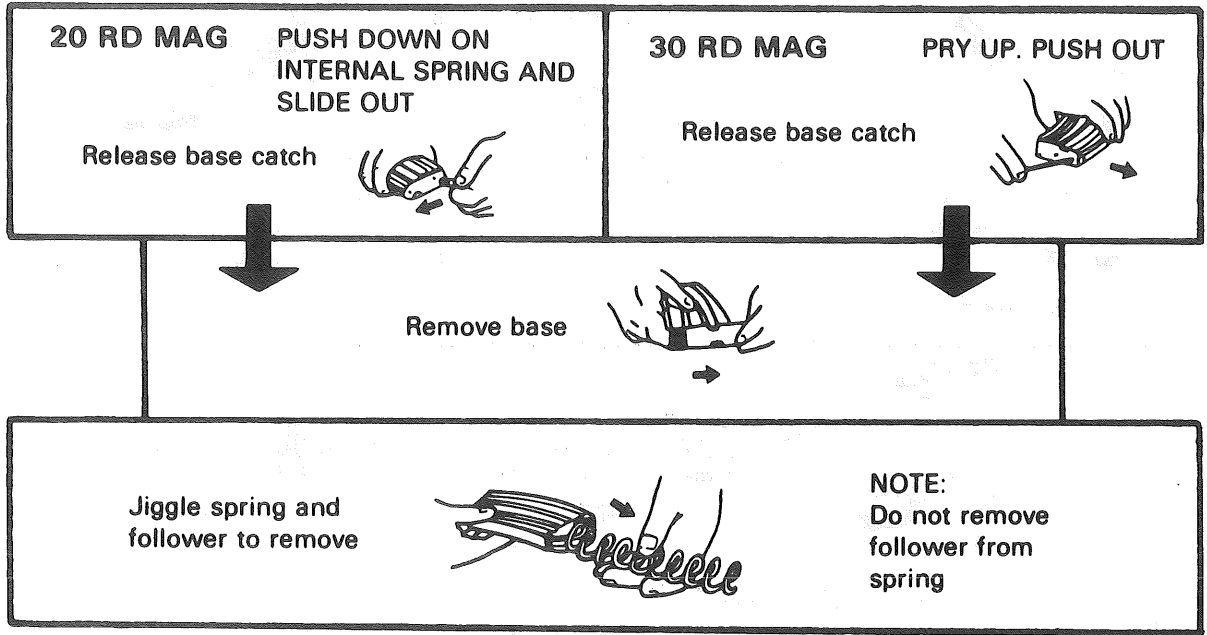
4. ASSEMBLY

 <p>a Insert spring and buffer</p>	<p>New extractor has a silicone insert w/spring. Be sure not to lose it</p>  <p>b Insert extractor and spring</p> <p>If the spring comes loose, put the large end of spring in the extractor and seat</p> 	
 <p>c Push in extractor pin</p>	<p><b>WARNING</b> Don't switch bolts between rifles</p>  <p>d Slide bolt into carrier</p>  <p>STAGGER RING GAPS TO STOP GAS LOSS</p>	
 <p>e Replace bolt cam pin</p>	 <p>GIVE CAM PIN A 1/4 TURN AFTER ASSEMBLY</p>	<p>FIRING PIN</p>  <p>f Drop in and seat</p>
 <p>g Pull bolt back</p>	<p><b>NOTE</b></p>  <p>h Replace retaining pin</p> <p>Firing pin should not fall out when bolt carrier group is turned upside down</p>	

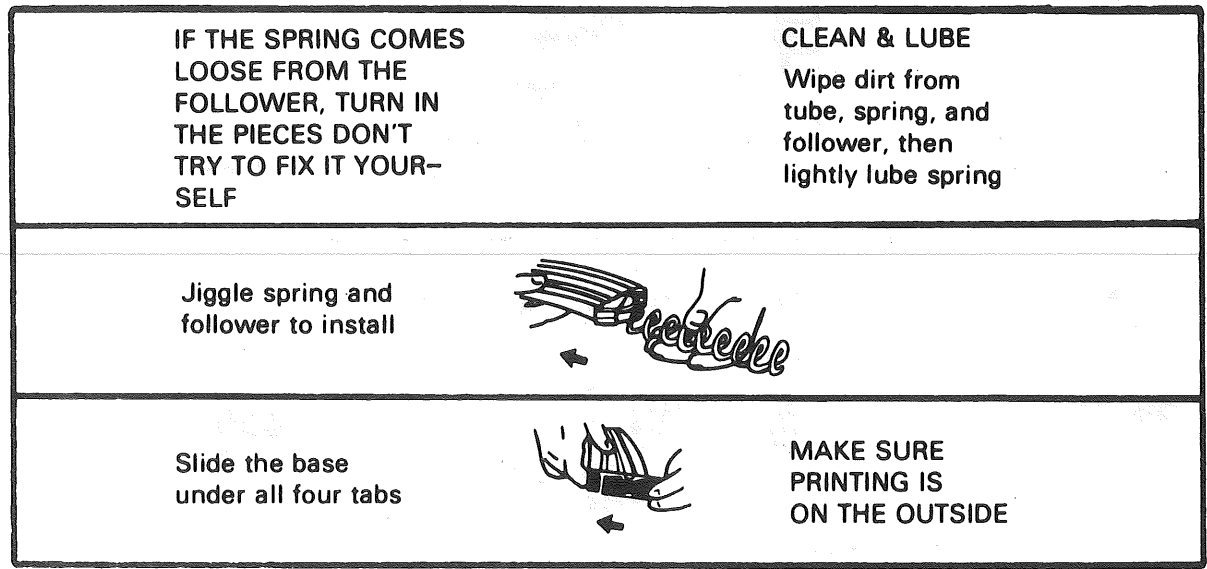
ASSEMBLY (cont).

 <p><b>i Engage, then push charging handle part way</b></p>	<p><b>BE SURE BOLT IS STILL UNLOCKED</b></p>  <p><b>j Slide in bolt carrier group</b></p>	 <p><b>k Push in charging handle and bolt carrier group together</b></p>
 <p><b>l Join upper and lower receivers</b></p>		 <p><b>m Engage receiver pivot pin</b></p>
<p><b>CAUTION:</b> Selector lever must be on safe or semi before closing upper receiver</p> 	 <p><b>n Close upper and lower receiver groups. Push in takedown pin</b></p>	
 <p><b>o PUT HANDGUARDS IN PLACE</b></p>  <p><b>p Replace sling</b></p>  <p><b>q HOLD SLIP RING DOWN</b></p>  <p><b>r CHECK FOR FULL ENGAGEMENT</b></p> <p><b>RELEASE SLIP RING</b></p>		 <p><b>p Replace sling</b></p>

### 5. MAGAZINE DISASSEMBLY

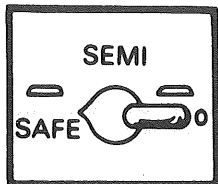


### 6. MAGAZINE ASSEMBLY



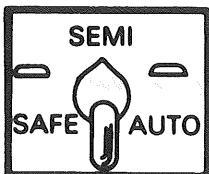
7. FUNCTIONAL CHECK

(REMOVE MAG . . . CHECK CHAMBER)



SELECTOR LEVER ON: *safe*

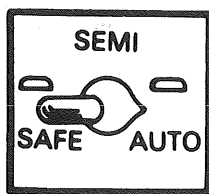
Pull charging handle to rear and release. Place on safe. Pull trigger. Hammer should not fall.



*semi*

Place selector in semi. Pull trigger and hold to rear. Hammer should fall. Pull charging

handle to rear and release. Release trigger and pull again. Hammer should fall.



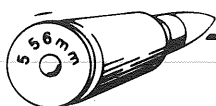
*auto*

Place selector in auto. Pull charging handle to rear and release. Pull trigger and hold to rear, hammer should fall. Pull

charging handle to rear and release. Release trigger and pull again. Hammer should not fall.

8. CLEANING AMMUNITION

Cleaning Ammunition. Use a clean, dry cloth to wipe dirt and foreign matter from ammunition. Do not coat with oil.

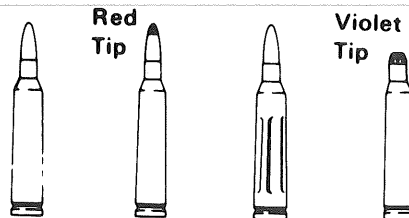


**WARNING**

**DO NOT FIRE . . .**

- Seriously corroded ammunition
- Dented cartridges
- Cartridges with loose bullets
- Cartridges exposed to extreme heat (135°) until they have cooled

Use only authorized ammo that is manufactured to US specs.



Ball, M193      Tracer, M196      Dummy, M199      Blank, M200

**KEEP DRY, CLEAN, AND FREE OF CRUD. YOUR LIFE DEPENDS ON IT!**



NOTE: The following items should be cleaned to insure that your weapon works properly. They are also subject to inspection by an NCO.

Bolt	Gas Tube and Ports
Sights	Stock Drain Hole
Receiver	Bore and Flash Suppressor
Charging Handle	Magazine Catch and Magazine Well
Handguards	

He'll check the overall condition of the SIGHTS, BIPOD, STOCK, AND HANDGUARDS.

So, be prepared, keep it clean and lubed.

#### REFERENCES

TM 9-1005-249-10, Operator's Manual: M16A1 Rifle, Apr 77 (pages 9 thru 33).

TEC Lesson 939-071-0010-F, Disassembly and Assembly of the M16A1 Rifle.

TEC Lesson 939-071-0011-F, Maintaining the M16A1 Rifle.

C 21-1-3, M16 Maintenance Card.

**TASK****071-311-2003**

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**Load, Reduce a Stoppage, and Clear  
An M16A1 Rifle**

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**CONDITIONS**

Given an assembled and operational M16A1 rifle, a magazine loaded with either live or blank ammunition. Performance of this task with blank ammunition can be accomplished either in garrison or in the field. Live firing requirements are only applicable to actual combat situations or range firing.

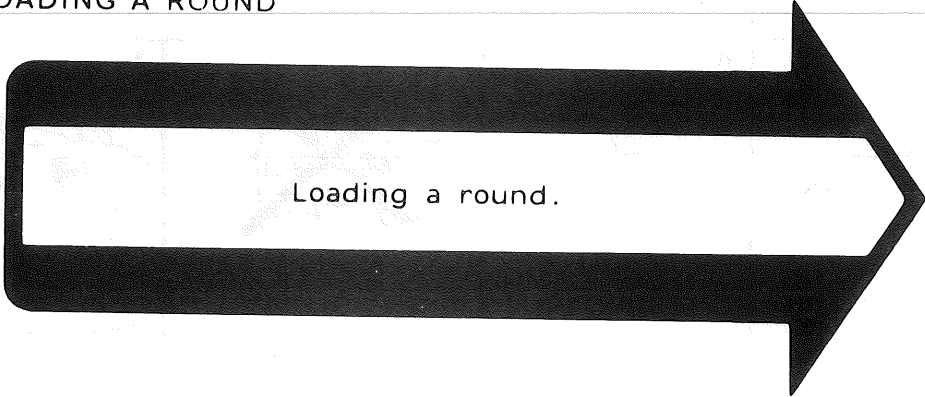
**STANDARDS**

In accordance with the performance measures:



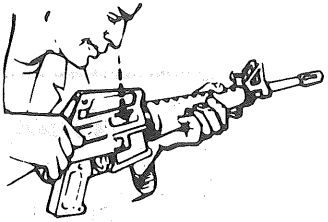

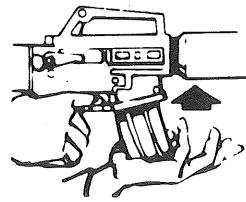
1. Load and chamber a round within 5 seconds.
2. Eliminate stoppages, either real or simulated, within 10 seconds, by using immediate action.
3. Clear the M16A1 rifle within 10 seconds.

**PERFORMANCE MEASURES**

1. **LOADING A ROUND**

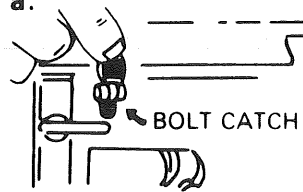



Loading a round.

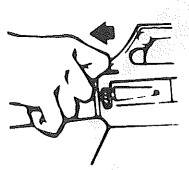
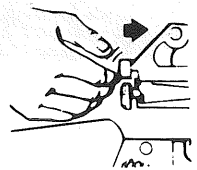
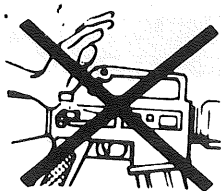

<p>a.</p> 	<p>b.</p>  <p>With hammer cocked, place selector lever on SAFE.</p>	<p>c.</p>  <p>Open bolt and eyeball chamber. Clear?</p>
<p>d.</p>  <p>Push upward until magazine catch engages and holds magazine.</p>	<p>e.</p>  <p>Tap upward to make sure it's seated right.</p>	<p>f.</p> <p>MAGAZINE MAY BE LOADED WITH BOLT ASSEMBLY OPEN OR CLOSED</p>

2. CHAMBERING A ROUND.

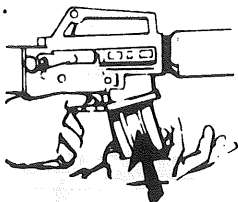
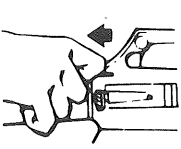
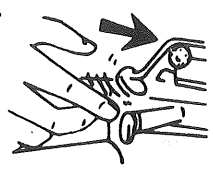
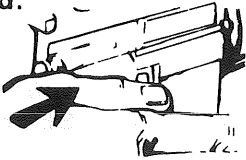
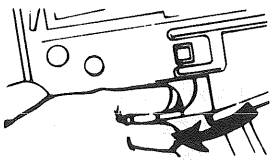
BOLT ASSEMBLY OPEN

<p>a.</p>  <p>BOLT CATCH</p> <p>Depress upper portion of bolt catch.</p>	<p>b.</p>  <p>FORWARD ASSIST</p> <p>Tap forward assist to insure bolt is fully forward &amp; locked.</p>
---	--

BOLT ASSEMBLY CLOSED

<p>c.</p>  <p>Pull charging handle fully rearward.</p>	<p>d.</p>  <p>Release the charging handle.</p>	<p>e.</p>  <p>Never "ride" the charging handle. Let it go on its own.</p>	<p>f.</p>  <p>FORWARD ASSIST</p> <p>Tap forward assist to insure bolt is fully forward &amp; locked.</p>
---	---	--	--

3. IMMEDIATE ACTION. If your rifle stops firing before you do, remember: S-P-O-R-T-S. That key word will help you remember the following actions: Slap, Pull, Observe, Release, Tap, Shoot.

<p>a.</p>  <p><b>SLAP</b> upward on magazine to make sure it's properly seated.</p>	<p>b.</p>  <p><b>PULL</b> charging handle all the way back. <b>OBSERVE</b> ejection of case or cartridge. Eyeball chamber and check for obstruction.</p>	<p>c.</p>  <p>If cartridge or case is ejected or chamber is clear, <b>RELEASE</b> charging handle to feed new round. (Don't ride the charging handle.)</p>
<p>d.</p>  <p><b>TAP</b> forward assist.</p>	<p>e.</p>  <p>Now <b>SHOOT</b>. If it won't fire, look for trouble and apply remedial action.</p>	

4. REMEDIAL ACTION.

**WARNING:** If your rifle stops firing with a live round in the chamber of a hot barrel, remove the round fast. However, during training, if you cannot remove it within 10 seconds, wait 15 minutes with the rifle pointing in a safe direction. This way you won't get hurt by a possible ammo cook-off, which could happen 10 seconds after contact with a hot chamber.

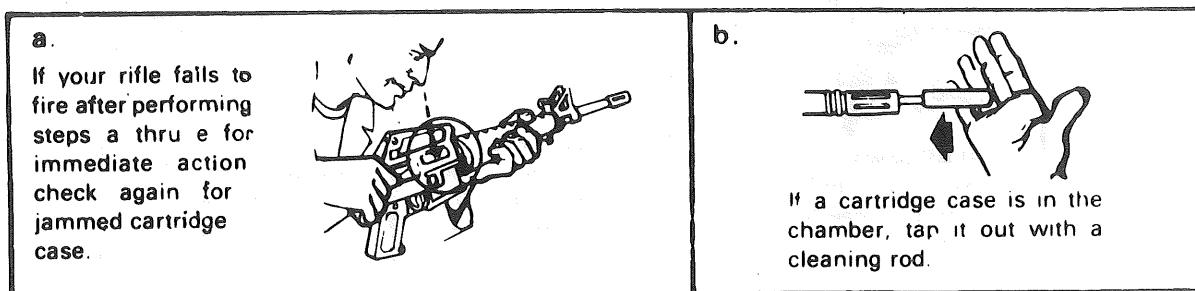


FIGURE 1-4

- c. IF YOUR RIFLE STILL FAILS TO FIRE, CHECK TROUBLESHOOTING IN TM 9-1005-249-10, pages 48 through 54.

**WARNING:** If you hear a "POP" or feel less RECOIL during firing, immediately CEASE FIRE, remove the magazine (1), lock the bolt to the rear (2), and place the selector level on the "SAFE" position (3). Inspect the bore, or insert a cleaning rod into the bore to insure there is not a round lodged in it (4).

DO NOT APPLY IMMEDIATE ACTION.

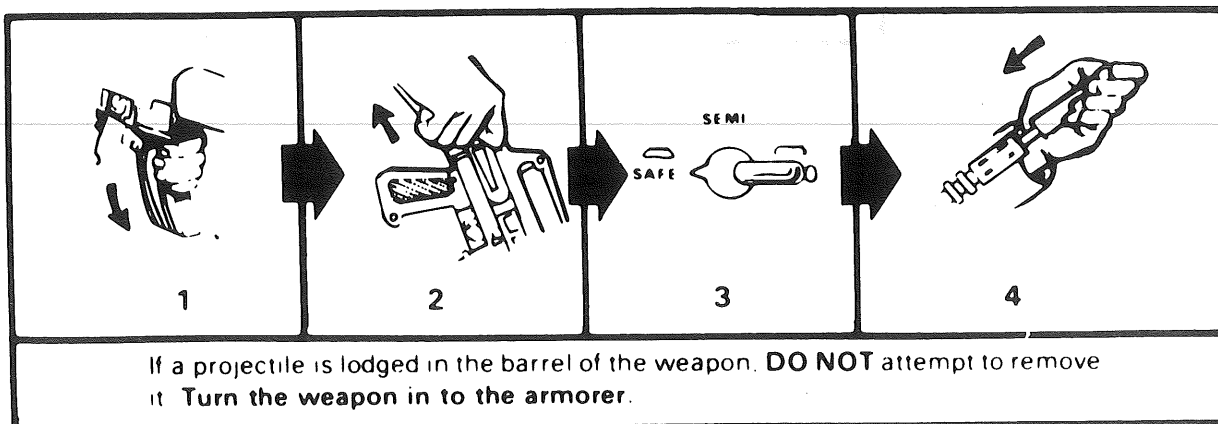


FIGURE 1-5

5. CLEARING THE RIFLE.

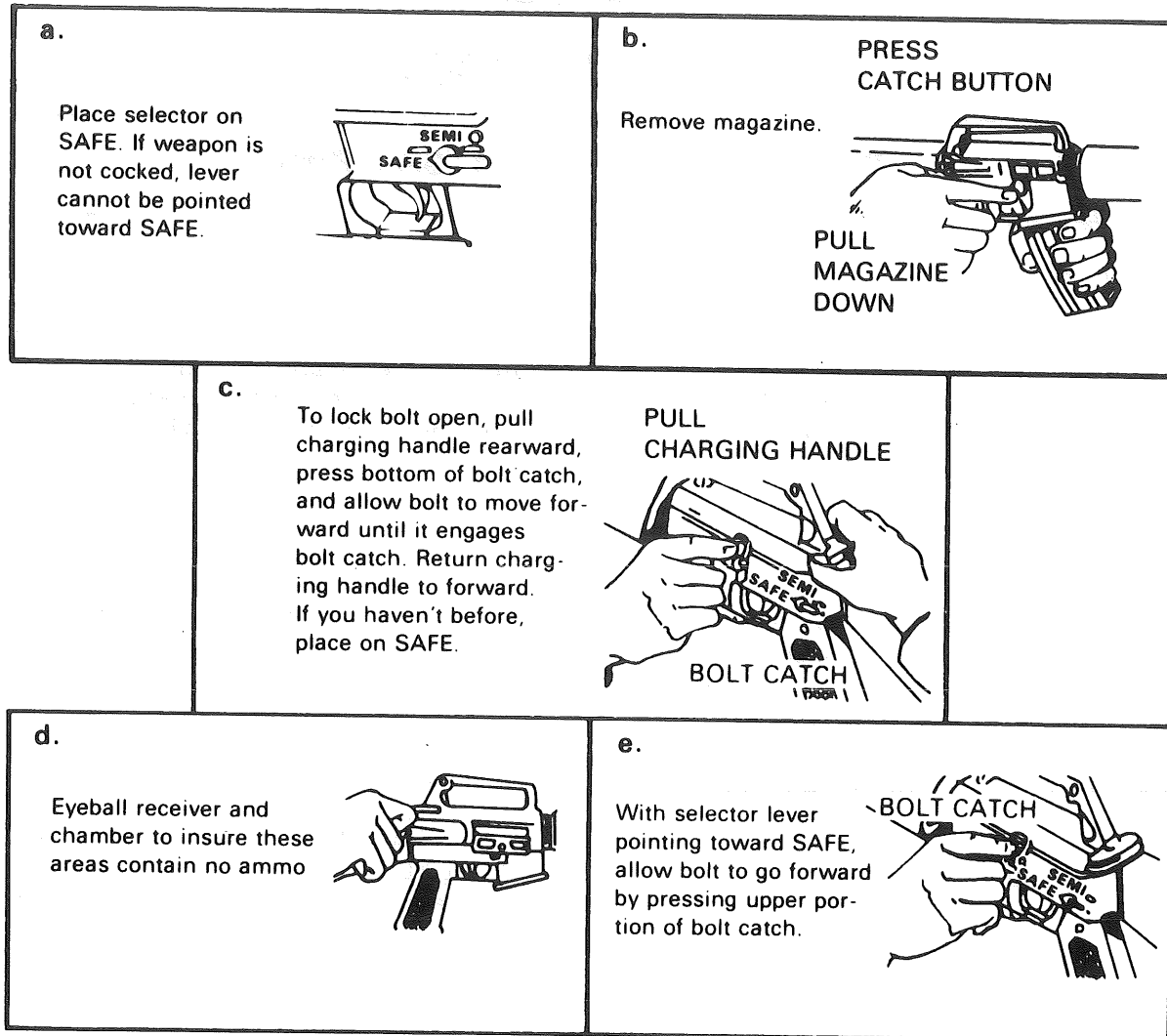


FIGURE 1-6

REFERENCES

TM 9-1005-249-10, Operator's Manual: M16A1 Rifle.

TEC Lesson 939-071-0009-F, Loading and Unloading the M16A1 Rifle.

TEC Lesson 939-071-0012-F, Preventing and Correcting Common Malfunctions.

# TASK

## 071-311-2004

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### Battlesight Zero an M16A1 Rifle

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#### CONDITIONS

On a 25-meter firing range, given an M16A1 rifle equipped with either the standard M16A1 sights or the low light level sight system (LLLSS), 18 rounds of 5.56-mm ammunition, battlesight zero target, sandbag for support, and a rifle shot group analysis card: semiautomatic fire with M16A1 and M14 rifles (C 21-1-4, Mar 74).

#### STANDARDS

Place the center of a three-round shot group at the X - 2.4 centimeters below the Canadian bull's-eye, and have the shot group touch or fall within a 5.2-centimeter-diameter circle centered on the X.

#### PERFORMANCE MEASURES

1. Sights. The M16A1 rifle has two adjustable sights. Elevation adjustments are made on the front sight and windage adjustments are made on the rear sight. The rifle comes equipped with either the standard sight system or LLLSS.

a. The Standard Sight System.

(1) The rear sight has two parts:

(a) An aperture marked "L" for ranges beyond 300 meters and an unmarked aperture for ranges from 0 to 300 meters.

(b) A windage drum for windage adjustments.

(2) The front sight consists of a rotating sight post with a spring-loaded detent.

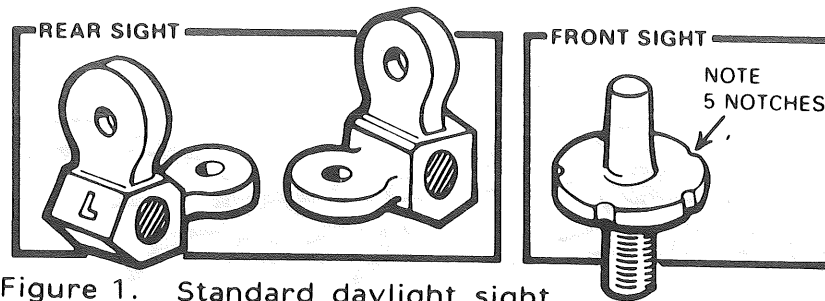


Figure 1. Standard daylight sight.

b. The Low Light Level Sight System.

NOTE: Not every rifle will have this sight.

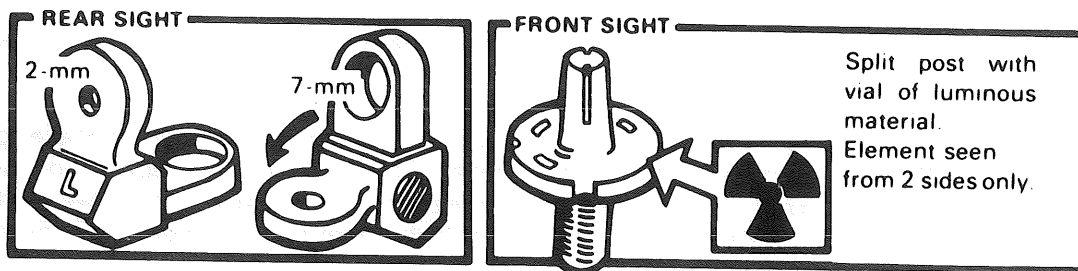


Figure 2. Low light level sight system.

- (1) The rear sight in this system also has two parts:
  - (a) A 2-mm aperture marked "L" which is used for zero and ranges to 460 meters under normal conditions. The other aperture (7-mm) is larger than the standard sight and is used for night and limited visibility firing.
  - (b) A windage drum for windage adjustments (same as standard system).
- (2) The front sight has only four notches (clicks) of elevation (the standard system has five). This permits the firer to adjust the sight so he can see the luminous part through the rear sight.

**CAUTION:** The front sight post contains a small glass vial of radioactive promethium 147. Take care not to bump, abuse, tamper with, or alter the post in any manner. DO NOT blacken or soot-up the front sight.



2. Sight Adjustment (low light and standard).

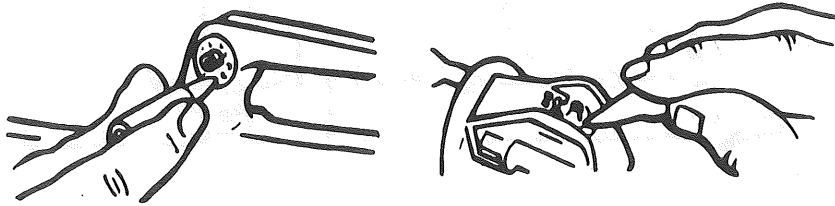


Figure 3. Sight adjustment.

- a. Rear Sight. To adjust windage, depress detent and rotate drum to desired direction. To move point of impact to right, turn drum clockwise in direction of arrow and letter R. To move left, move drum counterclockwise. Each graduation (notch) moves the point of impact of bullet as indicated in chart.
- b. Front Sight. To adjust elevation, depress detent, rotate post. To raise strike of bullet, rotate post in the direction of arrow marked up. Reverse the direction of rotation to lower strike of bullet. Each graduation (notch) moves the point of impact of bullet as indicated in chart.

IMPACT		DISTANCE
STANDARD	LOW LIGHT LEVEL	
0.7cm (17/62in)	0.9cm (23/64in)	25 meters
2.8cm (1-3/32in)	3.5cm (1-3/4in)	100 meters
5.6cm (2-13/64in)	7.0cm (2-3/4in)	200 meters

3. Battlesight Zeroing.

- a. Sight Picture. In aiming, the firer is concerned with correctly pointing his rifle so the bullet will hit the target when he fires. To do this, he must have the rear sight, the front sight post, and the target or aiming point in their proper relationship--known as sight picture. A correct sight picture is obtained when the sights are perfectly aligned and the aiming point (target) is in the correct relationship to the front sight post (fig 4b). Sight picture includes two basic elements: sight alignment and placement of the aiming point.

- b. **Sight Alignment.** To obtain correct sight alignment, the sights are aligned as shown in figure 4a. Notice that the top center of the front sight post is exactly in the center of the rear sight aperture. If an imaginary horizontal line were drawn through the center of the rear sight aperture, the top of the front sight post would touch this line. If an imaginary vertical line were drawn through the center of the rear sight aperture, the line would bisect the front sight post. The firer insures that he has perfect sight alignment by concentrating his attention and focusing his eye on the front sight post through the indistinct or fuzzy appearing rear sight aperture. By doing this, any errors in sight alignment can be easily detected and corrected.
- c. **Placement of the Aiming Point.** The aiming point (target on which the firer has aligned his rifle sights) is correctly placed when it is centered on and appears to touch the top of the front sight post (fig 4c). If the aiming point is correctly positioned, an imaginary vertical line drawn through the center of the front sight post will appear to split the front sight post in half.
- d. **Battlesight Zero Target.** The standard 25-meter target (fig 5) is used when determining the battlesight zero for the M16A1 rifle. Vertical and horizontal lines are printed on the target, forming 1.4-centimeter squares. One click of elevation or windage will move the strike of the bullet 0.7 centimeters at a range of 25 meters. Thus, on the 25-meter target, two clicks of elevation or windage will move the strike of the bullet one square.

NOTE: The LLLSS has only four clicks of elevation, but it is adjusted the same as the standard sight. The difference in sight movement per click is not critical during firing.



Figure 4. Correct sight picture.

Figure 5. 25 meter target.

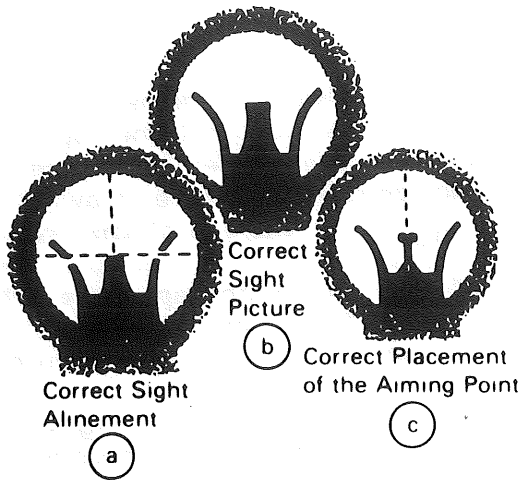
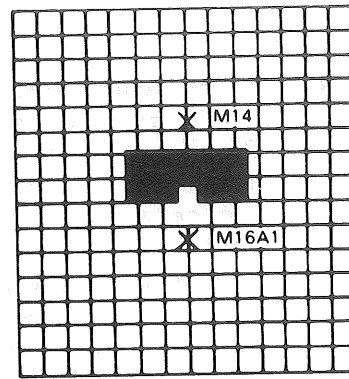


Figure 4. Correct sight picture.



NOTE TWO CLICKS OF ELEVATION OR WINDAGE WILL MOVE THE STRIKE OF THE BULLET ONE SQUARE ON THIS TARGET

Figure 5. 25 meter target.

- e. Determining the Battlesight Zero. The 250-meter battlesight zero is determined by firing a series of three-round shot groups at the 25-meter target. The firer aims at the distinctive aiming point at the bottom center of the black rectangle (base of the white cutaway portion) and adjusts his sights until the center of this acceptable shot group is located 5.2 centimeters directly below the aiming point (fig 6) on or around the X.

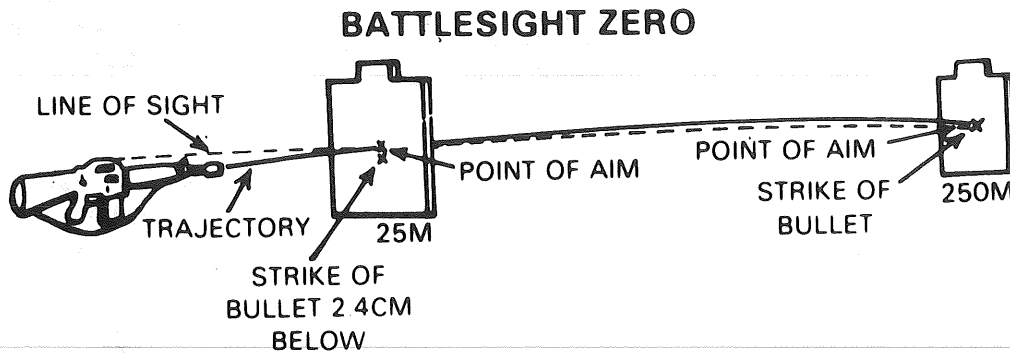
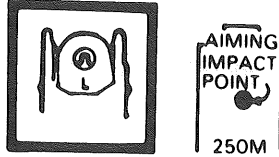


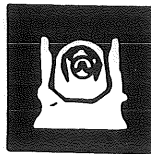
Figure 6. Determining the battlesight zero.

NOTE: To battlesight zero, adjust your sights so you can hit an aiming point at 250 meters. Zeroing can also be done on a 25-meter range by adjusting the sights so that the bullet will strike 2.4 centimeters below the point of aim. If your M16A1 has an LLLSS and you can't see the vial after zeroing, turn front sight post one click down for use during periods of limited visibility.

4. Using Low Light Level (Promethium) Sight System.
- a. During daylight firing, use aperture marked L. Effective range is 250 meters (original battlesight zero).



- b. At night and in limited visibility, use unmarked (7-mm) aperture. Obtain good sight picture using daylight procedure. After target detection, obtain good sight alignment by centering top of luminous portion of front sight post within 7-mm aperture on target and fire. Under certain light conditions, front sight post can be seen, but you can't determine whether you are looking through, above, or to the side of rear sight aperture. Practice positioning stock against shoulder and looking through rear aperture.



#### REFERENCES

FM 23-9, M16A1 Rifle and Rifle Marksmanship, Jun 74.

TM 9-1005-249-10, Operator's Manual: M16A1 Rifle, Apr 77.

M16A1 Rifle Marksmanship Training Program of Instruction.

C 21-1-4, Rifle Shot Group Analysis Card: Semiautomatic, Automatic Fire--M14, M16A1 Rifles.

# TASK

## 071-311-2007

### Qualify With the M16A1 Rifle

**CONDITIONS**

Situation 1: Daylight Firing. On a standard record firing range, given a zeroed M16A1 rifle equipped with either the standard M16A1 rifle sights or the promethium sights, 4 magazines of 10 rounds each, a record fire scorecard, and the requirement to fire record fire for qualification.

Situation 2: Night Firing. On a standard night fire record range, given a zeroed M16A1 rifle equipped with either the standard M16A1 rifle sights or the LLLSS sights, 3 magazines of 3 rounds each for practice firing and 80 rounds for record fire, and the requirement to fire night record fire for qualification.

**STANDARDS**

Situation 1: Attain a MINIMUM SCORE of 17 hits out of a possible 40 exposures.

Situation 2: Attain a MINIMUM SCORE of 20 hits out of a possible 40 exposures.

**SQT ADMINISTRATION REQUIREMENTS**

SQT credit will be awarded as follows:

Arms Qualification/Evaluation	SQT Units
Unqualified (NO GO)	0
Marksman (GO)	1
Sharpshooter (GO)	1
Expert (GO)	1
Nonobserved	Neither count for nor against total SQT score.

The night-firing portion of arms qualification will not be included in the performance certification component of the SQT.

### QUALIFICATION SCORES AND RATINGS:

	STANDARD RECORD	KNOWN DISTANCE	COURSE "C"
Possible	40	500	42
Expert	28-40	420-500	31 and above
Sharpshooter	24-27	360-419	24-30 inclusive
Marksman	17-23	300-359	11-23 inclusive
Unqualified	16 and below	299 and below	10 and below

NOTE: FM 23-9 superseded FM 23-71; however, pre-mobilization readiness proficiency "C" courses prescribed for use by reserve components were inadvertently omitted from 23-9 as was change 1 to FM 23-71 (Feb 68) which added appendix I for those units which have only known-distance facilities. These courses of fire may be used unless superseded by subsequent instructions. The following conditions and standards are to be used by units that DO NOT have a standard record fire range.

### CONDITIONS

Situation 3: During daylight on a known-distance range (as described in para 5 of appendix I, FM 23-71, change 1), given a zeroed M16A1 rifle, 50 rounds of caliber 5.56-mm ammunition (5 magazines of 10 rounds each to engage each target with 10 rounds), a requirement to fire, Record Firing, Known Distance (total rounds 100) as outlined in para 16d, appendix I of FM 23-71.

Situation 4: During daylight on a 1,000-inch range, given a zeroed M16A1 rifle, 42 rounds of caliber 5.56-mm ammunition, a requirement to fire standard course "C" for record fire as outlined in appendix D of FM 23-71.

STANDARDS

Situation 3: Fire Known-Distance Record Firing Table as outlined in para 16, appendix I of FM 23-71 (change 1) and achieve a minimum score of 300.

Situation 4: Fire Record Fire Course "C" as outlined in appendix D of FM 23-71 and achieve a minimum score of 11.

**WARNING**

**DANGEROUS PROCEDURES**

- Be sure the cam pin is installed in the bolt group. If it isn't, your rifle can still fire, but it could possibly explode, causing you harm.
- DO NOT exchange or switch bolt assemblies from one M16A1 to another . . . . It could cause damage to both you and the rifle.
- If your rifle stops firing with a live round in the chamber of a hot barrel, remove the round fast. However, during training, if you cannot remove it within 10 seconds, wait 15 minutes with the rifle pointing in a safe direction. This way you won't get hurt by a possible ammo cook-off, which could happen 10 seconds after contact with a hot chamber.
- Use only authorized ammo that is manufactured to US specs.
- If your bolt fails to unlock and you try to free it by banging the butt stock on the ground, keep yourself clear of the muzzle.
- If there's water in the barrel, don't fire the rifle. It could explode.
- If a noticeable difference in sound or recoil is experienced, STOP FIRING. Either condition could indicate an incomplete propellant burn and a bullet still in the bore. Retract bolt slowly and remove fired cartridge case. Clear weapon and check for unburned powder grains in the receiver or bore and for a bullet in the bore. Remove unburned propellant or bullet from bore before resuming firing, or barrel could explode. If bullet is lodged in bore, turn in rifle to direct support maintenance.

REFERENCES

FM 23-9, w/C1, M16A1 Rifle and Rifle Marksmanship, Jun 74.

TM 9-1005-249-10, Operator's Manual, M16A1 Rifle, Apr 77.

M16A1 Rifle Marksmanship Training Program of Instruction, Apr 77.

**TASK****071-327-0201**

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**Maintain an Appropriate Level of  
Physical Fitness (Male Only)**

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**CONDITIONS**

You will be tested to measure your physical fitness. If you are assigned to a combat or combat support unit, you will be given the Advanced Physical Fitness Test. If you are assigned to a combat service support unit or a TDA organization, you will be given the Staff and Specialist Physical Fitness Test. This test will be in daylight at a site established for the physical fitness test appropriate to your unit.

**STANDARDS**

You must demonstrate, once every 6 months, that you can meet or exceed the minimum level of physical fitness required of each member of your unit in accordance with the standards contained in AR 600-9 by:

1. Exceeding the minimum standard score of 60 points on each test event with a total score of 300 or more points on the Advanced Physical Fitness Test if you are under the age of 40 and are assigned to a combat or combat support unit.
2. Exceeding the minimum standard total score of 300 or more points on the Staff and Specialist Physical Fitness Test if you are under the age of 40 and are assigned to a combat service support or TDA unit.

**PERFORMANCE MEASURES**

1. Complete the five events of the Advanced Physical Fitness Test (APFT) listed below, as outlined in FM 21-20.
  - a. Inverted crawl



- b. Run, dodge, and jump
  - c. Horizontal ladder
  - d. Bent-leg situps
  - e. Two-mile run
2. Personnel over the age of 40 may elect not to take the APFT. If they elect to take it, they must complete the test once they have begun the first event or else they will receive a NO GO for the entire test.
3. Complete the five events of the Staff and Specialist Physical Fitness Test listed below, as outlined in FM 21-20.
- a. Push-ups
  - b. Run, dodge, and jump
  - c. Horizontal ladder
  - d. Bent-leg sit-ups
  - e. One-mile run

**SQT REQUIREMENTS**

1. Failure to meet the standards for either test will result in an evaluation of NO GO. Personnel with profiles, who cannot complete all five events of either test, will be scored as nonobserved on the performance certification portion of the SQT.
2. SQT credit will be awarded as follows:

<u>EVALUATION</u>	<u>SQT POINTS</u>
NO GO	0
GO	1
NONOBSERVED	Neither counts for nor against total SQT score

REFERENCES

AR 600-9, Army Physical Fitness and Weight Control Program, Nov 76.

FM 21-20, w/C3, Physical Readiness Training, Mar 73.

# TASK

## 071-327-0210

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### Maintain an Appropriate Level of Physical Fitness (Female Only)

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#### CONDITIONS

You will be tested to measure your physical fitness. If you are assigned to a combat or combat support unit, you will be given the Advanced Physical Fitness Test. If you are assigned to a combat service support unit or a TDA organization, you will be given the Staff and Specialist Physical Fitness Test. This test will be conducted during daylight at a test site established for the Physical Fitness Test appropriate to your unit.

#### STANDARDS

You must demonstrate, once every 6 months, that you can meet or exceed the minimum level of physical fitness required of each member of your unit in accordance with the standards contained in AR 600-9 by:

1. Exceeding the minimum standard score of 60 points each test event with a total score of 300 or more points on the Advanced Physical Fitness Test if you are under the age of 40 and are assigned to a combat support unit.
2. Exceeding the minimum standard total score of 300 or more points on the Staff and Specialist Physical Fitness Test if you are under the age of 40 and are assigned to a combat service support or TDA unit.

#### PERFORMANCE MEASURES

1. Complete the five events of the Advanced Physical Fitness Test listed below as outlined in FM 35-20.
  - a. Shuttle run
  - b. Modified push-ups

- c. Run, dodge, and jump
  - d. Modified sit-ups
  - e. One-mile run
2. Personnel over the age of 40 may elect not to take the APFT. Personnel over the age of 40 that elect to take the APFT must complete the test once they have begun the first event or receive a NO GO for the entire test.
  3. Complete the five events of the Staff and Specialist Physical Fitness Test listed below as outlined in FM 35-20.
    - a. Shuttle run
    - b. Modified push-ups
    - c. Run, dodge, and jump
    - d. Modified sit-ups
    - e. Stationary run

#### SQT REQUIREMENTS

1. Failure to meet the standards for either test will result in an evaluation of NO GO. Personnel with profiles, who cannot complete all five events of either test, will be scored as non-observed on the performance certification portion of the SQT.
2. SQT credit will be awarded as follows:

<u>EVALUATION</u>	<u>SQT POINTS</u>
NO GO	0
GO	1
NONOBSERVED	Neither counts for nor against total SQT score

#### REFERENCES

- AR 600-9, Army Physical Fitness and Weight Control Program, Nov 76.
- FM 35-20, Physical Fitness Training for Women, Feb 75, w/C1.

# TASK

## 071-331-0801

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### Use Challenge and Password

---

#### CONDITIONS

Given current challenge and password and a defensive position with designated sector of fire. Soldier will be told that enemy and friendly personnel may enter his sector and that he is to allow friendly personnel to pass only if they respond with correct password and to detain or capture other personnel as he is able.

#### STANDARDS

Soldier will:

1. Detect and halt personnel in his sector.
2. Challenge them with correct challenge.
  - a. If given correct password, allow personnel to pass.
  - b. If not given correct password, attempt to detain or capture personnel as he is able.

#### PERFORMANCE MEASURES

If one person desires to pass:

1. Upon seeing or hearing someone approach your position, and before he gets close enough to pose a threat, command him to "Halt!" Use a clear voice, just loud enough to be heard.
2. When the stranger halts, keep him covered and without exposing your position, ask "Who is there?" Again, use a clear voice but just loud enough to be heard so the enemy won't overhear if he's nearby.

3. When the stranger identifies himself, such as "Private Willard, Messenger," you order him to "Advance to be recognized."
4. Maintain your concealed position and keep the stranger covered with your weapon. When the stranger gets within 2 or 3 meters of you, again order him to "Halt!"
5. Issue the challenge in a soft voice and wait for the stranger to reply with the correct password. Hearing the correct password, give permission to pass if you have no other reason for doubt. If doubt still exists, demand further identification or ask a question only a friendly person would be able to answer.

If a group desires to pass:

6. The procedure and precautions for a group are almost the same as for one person. Seeing or hearing a group approach, before they are close enough to pose a threat, order them to "Halt!"
7. The leader of the group should identify the group, such as "Friendly Patrol." Since you don't want the whole group to advance on you at once, order "Advance one man to be recognized."
8. When the leader has come forward to be recognized, give him the challenge and get the password in reply.
9. Once you're satisfied that the leader is friendly, have the rest of the patrol advance one by one and let the leader identify each person.
10. Persons not able to give the proper password or identify themselves to your satisfaction are disarmed and detained. Then notify your immediate superior.

## REFERENCES

FM 21-75, Combat Training of the Individual Soldier and Patrolling, Jul 67, w/C1.

FM 22-6, Guard Duty, Sep 71, w/C1 (chap 9, pp 9-1 and 9-2; app F, pp F-1 thru F-4).

TEC Lesson 935-071-1029-F, Counterintelligence.

# TASK

## 081-831-1001

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### Perform Mouth-to-Mouth Resuscitation

---

#### CONDITIONS

Given a soldier who is apparently unconscious and not breathing.

#### STANDARDS

Check for breathing and consciousness. If not breathing or conscious, start resuscitation immediately and continue as long as there is a pulse, until the soldier breathes on his own, until relieved by medically trained personnel, or until too exhausted to continue.

#### PERFORMANCE MEASURES

1. Shake the soldier's shoulder and shout, "Are you o.k.?" If soldier answers, resuscitation is not needed.
2. If the soldier does not answer, call for help in order to have assistance.
3. Roll soldier on his back.
4. Kneel near the soldier's shoulders.
5. Tilt the soldier's forehead back and lift his neck as shown in figure 1. This should open the airway.
6. Pinch the soldier's nose closed as shown in figure 1.
7. Check for breathing by placing your ear near his mouth while looking at his chest. You can then see if the chest rises and falls, and feel or hear his breathing. If soldier is breathing, then mouth-to-mouth resuscitation is not necessary.

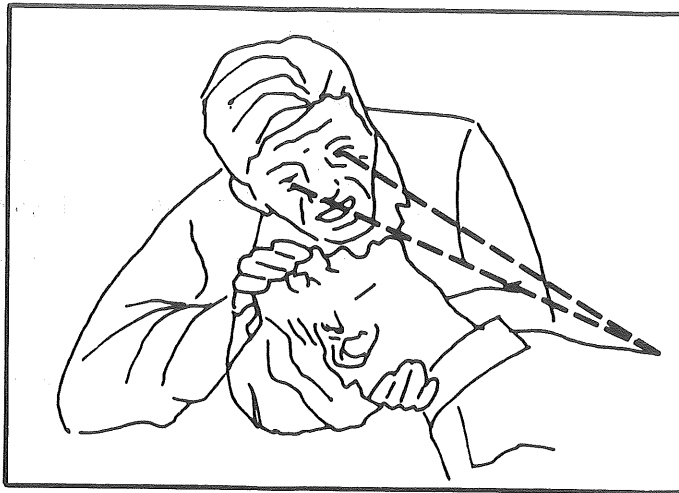


Figure 1.

8. If the soldier is not breathing, place your mouth completely over the soldier's mouth to make an air-tight seal while continuing to hold the nose closed.
9. Blow four full, quick breaths, not allowing the soldier to completely exhale between breaths.

**CAUTION:** If the soldier's chest does not rise, or you feel strong resistance to your first breath, the soldier's airway may be clogged. You should then do the following steps:

- a. First raise the soldier's neck more and again try four, forceful, quick breaths.
  - b. If airway still seems clogged, look in the mouth and take out any false teeth, foreign matter, or pull out his tongue (if he swallowed it). Again try four, forceful, quick breaths.
  - c. If airway still seems clogged, do the Heimlich Maneuver (Task 081-831-1003). The clog must be cleared.
10. After the fourth breath, release the nose.
  11. Immediately check the soldier's neck for a pulse. The pulse should be found in the soft area between the Adam's Apple and the large muscle on the side of the neck (fig 2).

**NOTE:** If pulse is found, continue resuscitation only. If pulse is not found, you will have to do CPR (see steps 12 through 19, Task 081-831-1002).





Figure 2

12. Blow breaths into the soldier about once every 5 seconds (12 times a minute), checking to see that his chest rises with each breath.

NOTE: Let the soldier's chest fall after each breath.

13. Check the soldier's pulse once a minute (as in step 11) or every 12 breaths.

CAUTION: If soldier's stomach begins to bulge, do not try to deflate the bulge as this may cause vomiting. If the soldier does vomit, turn his head to the side to drain the vomit from his mouth.

14. Continue resuscitation (steps 11 and 12 above) until:
  - a. the soldier breathes on his own, or
  - b. you are relieved by medically trained personnel, or
  - c. the soldier's pulse stops and you must also do CPR (steps 12 through 19 of CPR, Task 081-831-1002), or
  - d. you are exhausted and can no longer continue.

#### REFERENCES

None.

**TASK****081-831-1004****Apply First Aid Measures to Stop Bleeding****CONDITIONS**

Given a soldier with a bleeding wound.

**STANDARDS**

Stop or control the bleeding in accordance with the performance measures.

**PERFORMANCE MEASURES**

1. Stop bleeding using pressure.
  - a. Check to make sure the soldier is breathing.

**NOTE:** If he is not breathing or does not have a heartbeat, open the airway and restore breathing and heartbeat as explained in task 081-831-1002, Perform Cardiopulmonary Resuscitation.

- b. Apply a first aid dressing according to the instructions on the dressing package (fig 1).

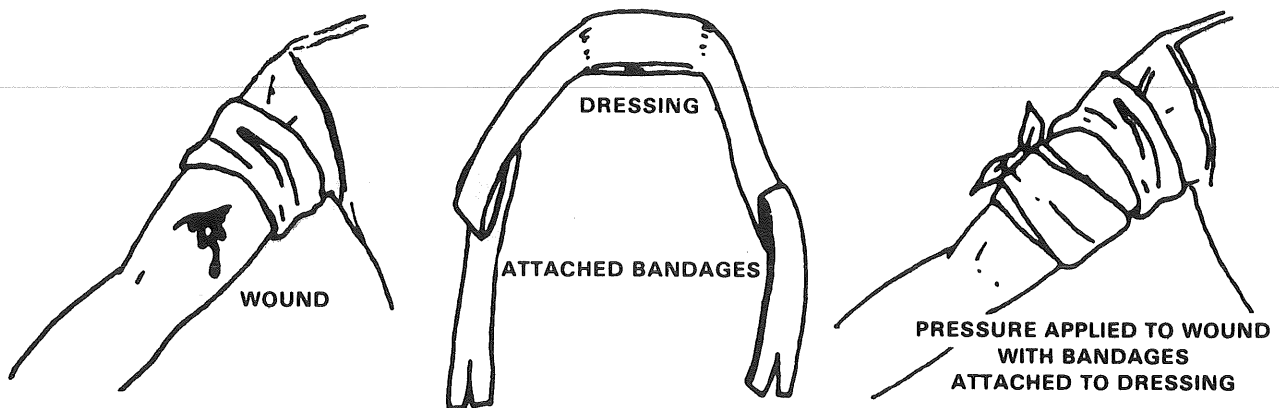


Figure 1. Application of first-aid dressing.

NOTE: Raising the injured limb above the level of the heart will help to control the bleeding. Use the soldier's helmet, pack, or other object to keep the injured limb elevated.

NOTE: You may need to press hard on the first aid dressing with your hand to help control the bleeding. You may have to press for 5 to 10 minutes to allow a clot to form (fig 2).

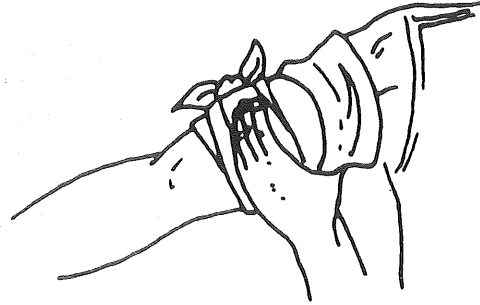


Figure 2. Pressing hand on dressing to help control bleeding.

c. If the bleeding does not stop:

- (1) Put additional pressure on the wound by placing a thick wad of padding (socks, handkerchief, etc.) on top of the first aid dressing at the location of the wound (fig 3).

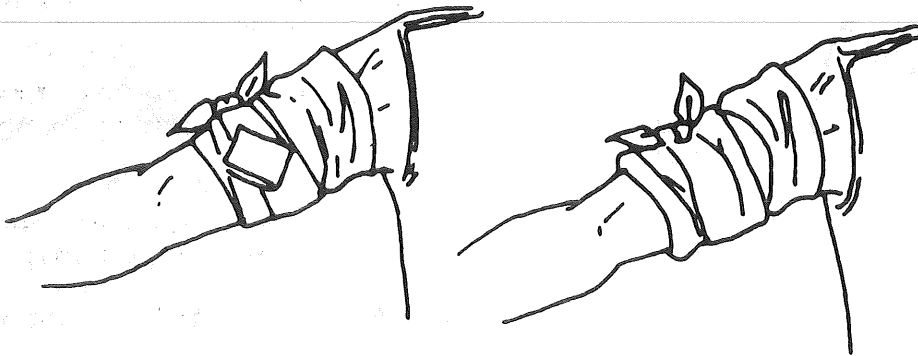


Figure 3. Padding placed on dressing for pressure.

- (2) Tie this wad firmly in place using a strip of cloth or other material.

NOTE: Continue to use hand pressure and elevation.

NOTE: The use of pressure as described in step 1, above, will control the bleeding from most wounds.

## 2. Stop bleeding using a tourniquet.

CAUTION: A tourniquet is the most extreme method of stopping bleeding. The use of a tourniquet can cause severe damage to blood vessels and nerves and can even cause the loss of an arm or leg. The only time you should ever apply a tourniquet is when an arm or leg has been cut off or when there is very heavy bleeding which cannot be stopped by the pressure methods described above.

- a. Place the tourniquet. The tourniquet must be applied between the wound and the heart. The object is to stop bleeding and save as much of the arm or leg as possible.

- (1) If an arm or leg has been cut off below the elbow or below the knee:

Place the tourniquet above the elbow joint or knee joint to get good bleeding control and to keep the tourniquet from slipping off.

- (2) If the arm or leg has been cut off above the elbow or the knee: Place the tourniquet as close as you can to the wound and still be able to get a firm hold on the arm or leg so that the tourniquet will not slip off.

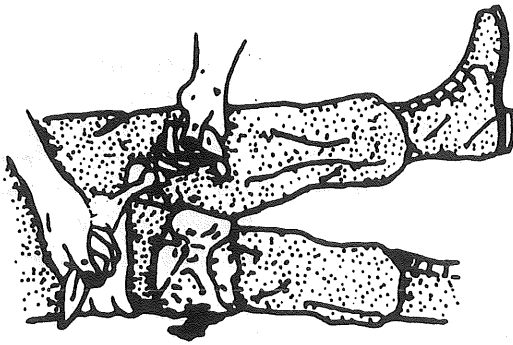
CAUTION: If only part of a hand or foot has been cut off, you should stop the bleeding using the pressure methods.

- (3) If a wound is bleeding very heavily and you have not been able to stop the bleeding using the pressure methods:

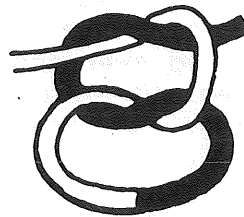
Place the tourniquet as close as you can to the edge of the wound.

b. Tighten the tourniquet.

(1) Tie the tourniquet, using a square knot as shown in figure 4.



MAKE A LOOP  
AROUND THE LIMB  
TIE WITH SQUARE  
KNOT.



SQUARE KNOT

Figure 4. Tying tourniquet.

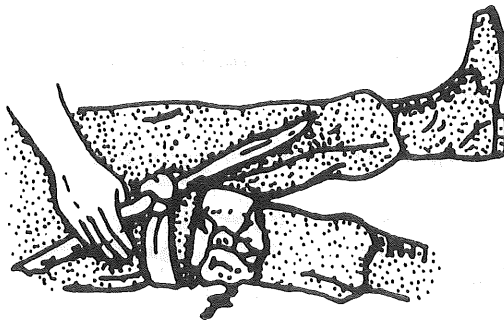
(2) Place a rigid object, such as a stick, between the wound and the tourniquet, as shown in figure 5.

PASS A STICK,  
SCABBARD, OR  
BAYONET UNDER  
THE LOOP.



Figure 5. Placing stick in tourniquet.

- (3) Twist the stick to tighten the tourniquet just enough to stop the bleeding as shown in figure 6.



**BIND FREE END  
OF STICK TO  
LIMB TO KEEP  
TOURNIQUET  
FROM UNWINDING.**

Figure 6. Twisting stick to tighten tourniquet.

- c. Check the soldier's pulse at the wrist or ankle of the injured arm or leg. If you cannot feel the pulse, the tourniquet is tight enough.
- d. Tie the tourniquet to the injured arm or leg as shown in figure 7.



**TIGHTEN TOURNIQUET  
JUST ENOUGH TO  
STOP ARTERIAL  
BLEEDING.**

Figure 7. Stick tied to leg to prevent unwinding.

**CAUTION:** The tourniquet must be tied to keep it from slipping or unwinding.

- e. Mark on the soldier's forehead, if possible: a T and the time the tourniquet was applied.
- f. Get the soldier to medical help as soon as possible.
- g. Keep the soldier from chilling or overheating, depending on the weather. If you must cover him, leave the tourniquet uncovered so it can be easily seen.

**CAUTION:** DO NOT LOOSEN THE TOURNIQUET AFTER IT HAS BEEN APPLIED.

**REFERENCES**

FM 21-11, First Aid for Soldiers, chap 4, pp 29 thru 35, Jun 76.

**TASK****081-831-1005**

---

**Give First Aid to Prevent Shock**

---

**CONDITIONS**

Given an injured soldier who may be showing signs of shock.

**STANDARDS**

Give first aid to prevent shock in accordance with performance measures.

**NOTE:** Shock as the result of an injury is usually shock caused by loss of blood. If a soldier appears to have a minor injury but is in shock, he either lost a lot of blood before you saw him or he has internal bleeding from another injury.

**PERFORMANCE MEASURES**

1. Identify signs of shock.
  - a. The soldier who is in the early stages of shock may be:
    - (1) Restless
    - (2) Thirsty
    - (3) Sweaty, but have cool skin
    - (4) Pale
    - (5) Showing signs of a rapid pulse
  - b. Soldiers in a more severe stage of shock may:
    - (1) Have a rapid pulse



- (2) Have lost a large amount of blood
  - (3) Be breathing with short fast breaths or gasps
  - (4) Have bluish skin, especially around the mouth
  - (5) Be unconscious with deep slow breathing
2. Insure the soldier can breathe and has a heartbeat (pulse). You may have to:
    - a. Clear the soldier's airway (task 081-831-1001).
    - b. Lay the soldier with head turned to the side to drain any fluid in his airway.
    - c. Give the soldier cardiopulmonary resuscitation (CPR) (task 081-831-1002).
  3. Stop bleeding (task 081-831-1004).
  4. Lay the soldier on his back with feet raised 12 inches higher than his head.
  5. Splint fractures (task 081-831-1006).
  6. Prevent chilling or overheating, depending on the weather.
  7. Keep the injured soldier calm by:
    - a. Being calm yourself
    - b. Being gentle yet firm in your actions.
    - c. Not volunteering any information about his injury
  8. Give the soldier water unless he has a stomach, neck or head wound.

#### REFERENCES

FM 21-11, First Aid for Soldiers, pg 36 thru 39, paragraph 5-1 thru 5-8, Jun 76.

**TASK****081-831-1011**

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**Give First Aid to a Nerve Agent Casualty**

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**CONDITIONS**

Given a soldier who may have been exposed to a nerve agent. Equipment required: Two nerve agent antidote injectors (combo pen), M13 decontamination kit and an M258 decontamination kit.

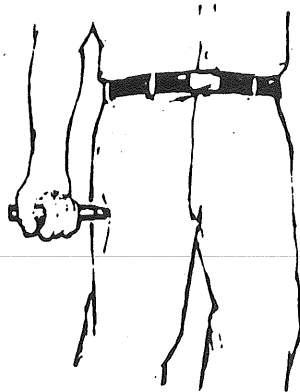
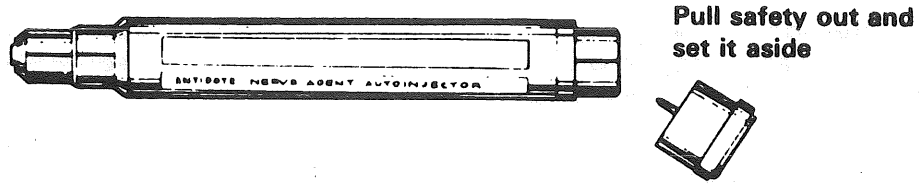
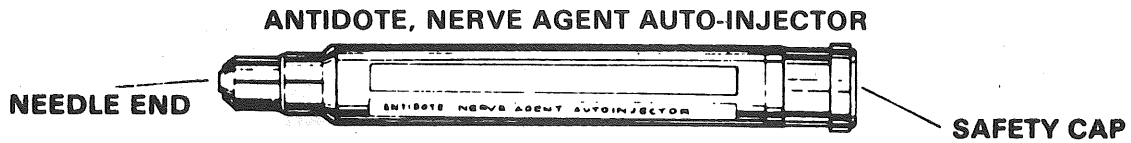
**STANDARDS**

Recognize nerve agent symptoms, give nerve agent antidote and decontaminate the soldier, his clothing, and his equipment in accordance with the sequence of performance measures.

**PERFORMANCE MEASURES**

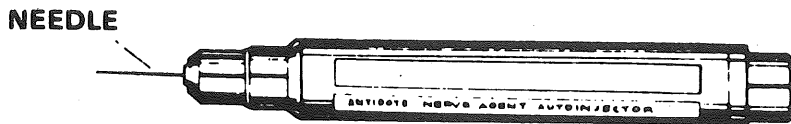
1. Recognize nerve agent symptoms. These symptoms must appear in an individual who was well before and gets worse within a very few minutes. Symptoms of nerve agent follow:
  - a. Difficulty in breathing with tightness in chest.
  - b. Pinpointing of eye pupils.
  - c. Excessive running nose.
  - d. Excessive saliva and drooling.
  - e. Jerking and twitching muscles, staggering.
  - f. Headache, dizziness.
  - g. Nausea, cramps.

- 2. Give nerve agent antidote.
  - a. Remove two combo pens from soldier's mask carrier.
  - b. Remove safety cap from one combo pen; place needle end against injured soldier's outer thigh, press hard and hold for 10 seconds (fig 1).



**Hold device by labelled part and push black end against thigh.**

**Device will 'click' when activated.**



**APPEARANCE OF ACTIVATED INJECTOR**

Figure 1. Antidote, nerve agent auto-injector.

- (2) Move the soldier to a cool area, remove his clothes and pour cold water over him while fanning his body.
- (3) Get the soldier to medical help as soon as you can and keep pouring water on him and fanning him.
4. Give him cool salt water to drink (see step 1b) if he is conscious and not sick to his stomach.

#### REFERENCES

FM 21-11, First Aid for Soldiers, pg 88, para 9-8, Jun 76.

# TASK

## 113-571-1003

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### Establish, Enter or Leave a Radio Net

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#### CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. You will be provided with a CEOI, ACP 124(C), and ACP 125(D). Supervision and assistance will be available.

#### STANDARDS

Task standard has been met when you have established, entered, or left a radio net in accordance with performance measures 1 through 3.

#### PERFORMANCE MEASURES

1. Establish a radio net. (Refer to ACP 124(C), chap 1, sec I, para 101 thru 110, pp 1-1 thru 1-5, and ACP 125(D), chap 3, para 301 thru 321, pp 3-1 thru 3-25.)
  - a. Extract appropriate call signs, suffixes, and frequency from the CEOI.
  - b. Prepare and operate the appropriate radio set.
  - c. Identify the net structure and determine the answering sequence, and make the appropriate response to the individual stations (fig 1).

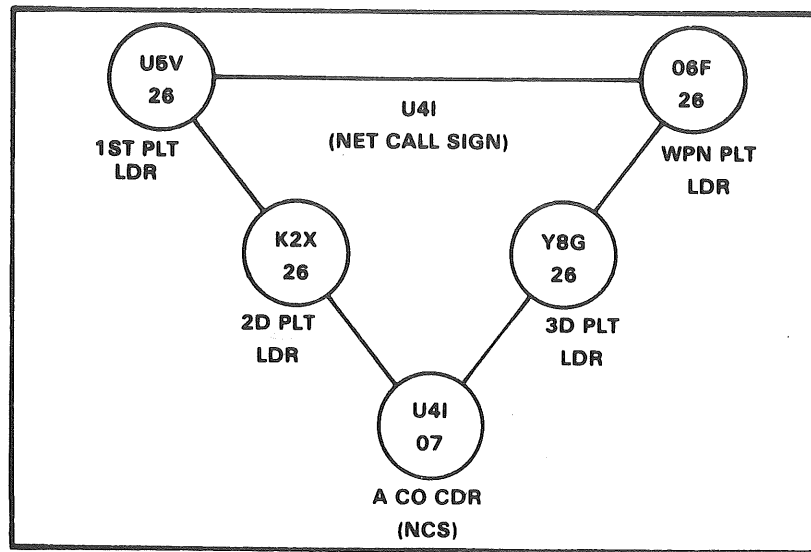


Figure 1. Simple Radio Net Diagram.

2. Enter a radio net. (Refer to ACP 124(C), chap 1, sec I, para 101 thru 110, pp 1-1 thru 1-5; ACP 125(D), chap 1, para 101 thru 110, pp 1-1 thru 1-6.)
  - a. Upon direction of the NCS and when no confusion will result, call signs other than the net call sign may be abbreviated by omitting their first two characters.
  - b. Authenticate when challenged by the NCS.
  - c. If you fail to answer your call sign in sequence, wait for the NCS to call your station individually.
  - d. If you are unable to communicate with the NCS due to faulty equipment, wrong codes, unsuitable location, etc., you must render a report to the NCS as soon as possible by means other than radio.
  - e. To enter a radio net in which you do not normally operate, you should refer to task 113-573-8001, performance measure 4.

3. To leave a radio net. (Refer to ACP 124(C), chap 3, sec I thru III, para 301 thru 321, pp 3-1 thru 3-10.)
  - a. Request permission to leave the net from the NCS.
  - b. Inform the NCS of the reason you are leaving the net.
  - c. Authenticate upon direction of the NCS prior to leaving the net.

REFERENCES

ACP 124(C), w/C1 and 2, Communication Instructions Radiotelegraph Procedures, Jul 69 (U).

ACP 125(D), Communication Instructions Radiotelephone Procedures, Jul 70, w/US Suppl-2, Radiotelephone Procedures for the Conduct of Artillery and Naval Gunfire, Sep 64 (U).

Army Correspondence Course, SSO 470, The CEOI.

**TASK****113-571-1005**

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**Send or Receive a Radiotelephone Message**

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**CONDITIONS**

This task is performed under all weather conditions in a field or a garrison location and may be performed while wearing your individual M17 or M17A1 Field Protective Mask. Your team chief or immediate supervisor will provide you with a CEOI, ACP 125(D), paper, pencil, a distant radiotelephone station with which to communicate, a five-word encoded message, and an operational radiotelephone.

**STANDARDS**

Task standard has been met when you have sent or received the five-word message over radiotelephone according to performance measures 1 through 3 below and ACP 125(D).

**PERFORMANCE MEASURES**

1. Establish communications with the distant radiotelephone station. (Refer to CEOI and ACP 125(D), para 302, pp 3-1 and 3-2 of C1.)
  - a. Determine your call sign and the distant radio station's call sign from your extract copy of the CEOI.
  - b. Determine the operating frequency of the net to be entered from your extract copy of the CEOI.
  - c. If operating in a directed net, perform the following. (Refer to ACP 125(D), para 305, pp 3-4 thru 3-6.)
    - (1) Contact the NCS (A1D28) and request permission to enter the net.



- (2) Authenticate as required by the NCS.
  - (3) Tell the NCS you have messages. Designate to whom the messages go and the level of precedence for each.
- d. If operating in a free net, perform the following. (Refer to ACP 125(D), para 304 thru 308, pp 3-4 thru 3-8 of C1.)
- (1) Listen carefully to insure that no other stations are using the net.
  - (2) Key your radio set and call the distant station with whom you wish to communicate.
  - (3) When the distant station answers, advise the operator of the number of messages and the level of precedence for each message.
  - (4) Authenticate as required by the distant station.
2. Transmit your message. (Refer to fig 1 and ACP 125(D), para 307 thru 309, pp 3-8 thru 3-10 of C1 and ORIGINAL.)
- a. Advise the distant station that you are ready to transmit your message.  
  
EXAMPLE: DELTA TWO CHARLIE WUN WUN (THIS IS) ROMEO WUN HOTEL WUN WUN - ROUTINE - OVER
  - b. Wait for the distant station to reply that he is ready to copy the message.  
  
EXAMPLE: ROMEO WUN HOTEL WUN WUN (THIS IS) DELTA TWO CHARLIE WUN WUN - ROGER - OVER
  - c. Transmit the message in the format prescribed in ACP 125(D), paragraphs 208 through 219, pages 2-3 through 2-9 of C1, C2, and ORIGINAL.

## EXAMPLE:

DELTA TWO CHARLIE WUN WUN (THIS IS) ROMEO WUN  
HOTEL WUN WUN

MESSAGE FOLLOWS

MESSAGE NUMBER WUN

TIME ZERO WUN ZERO ZERO ZERO WUN ALFA JULY  
SEVEN EIGHT

FROM ROMEO WUN HOTEL WUN WUN

TO DELTA TWO CHARLIE WUN WUN

GROUP FIFE

BREAK

ALFA DELTA BRAVO LIMA DELTA ECHO ECHO ECHO  
HOTEL MIKE NOVEMBER ROMEO DELTA OSCAR  
NOVEMBER

BREAK

AUTHENTICATION IS LIMA LIMA (sent only as required)

OVER

- 
- d. Obtain an acknowledgement of the message from the distant radio station along with a receipt time.

## EXAMPLE:

ROMEO WUN HOTEL WUN WUN (THIS IS) DELTA TWO  
CHARLIE WUN WUN - ROGER MESSAGE NUMBER WUN -  
TIME - ZERO WUN ZERO ZERO WUN ZERO JULY SEVEN  
EIGHT - OUT

TRANSMITTING STATION:  
RECEIVING STATION:  
SAMPLE MESSAGE:  
DATE TIME GROUP:

R1H11  
D2C11  
ADB LDE EEH MNR DON  
010001A JULY 78

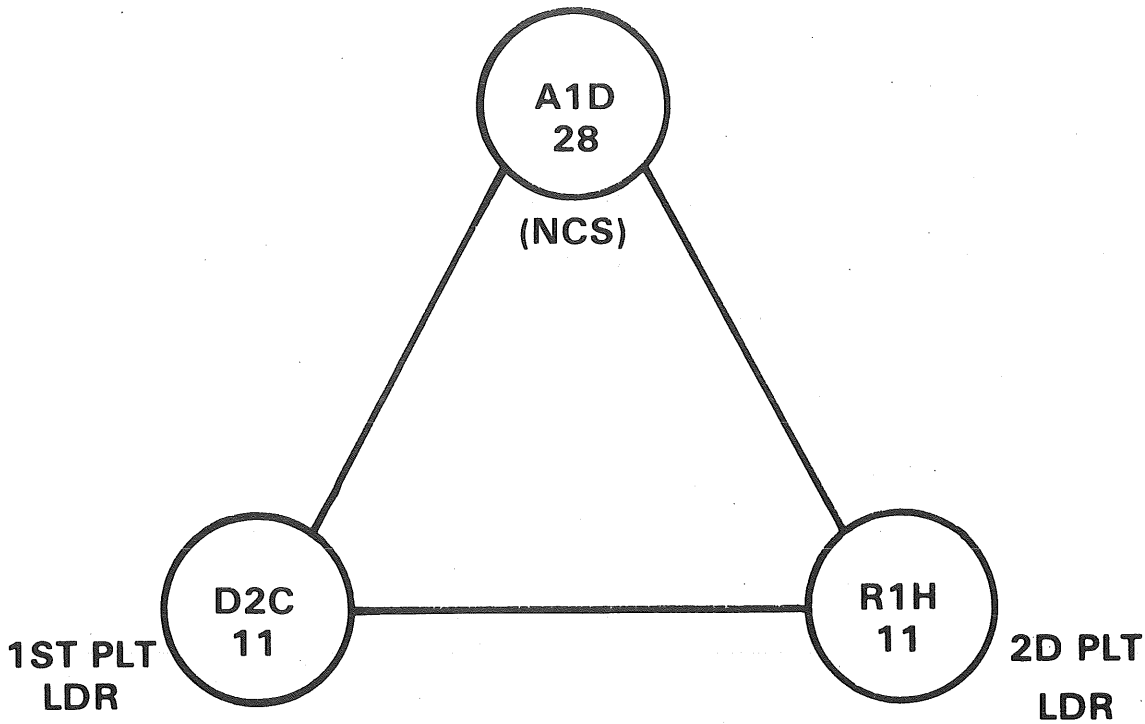


Figure 1. Simple Net Diagram With Five-Word Encoded Message.

3. Receive a radiotelephone message. (Refer to ACP 125(D), para 307 thru 309, pp 3-8 thru 3-10 of C1 and ORIGINAL.)
  - a. Reverse the procedures in performance measure 2 above.
  - b. Insure that you copy the message as it is sent and that you place it in proper format before delivery.

- c. Insure that you are using the correct decode set to decode the message by referring to your CEOI.
- d. Request repetitions of the message according to ACP 125(D), paragraph 311, pages 3-12 through 3-15.

## REFERENCES

Communications-Electronics Operation Instructions (CEOI).

ACP 125(D), Communication Instructions Radiotelephone Procedures, Jul 70, w/US Suppl-2, Radiotelephone Procedures for the Conduct of Artillery and Naval Gunfire, Sep 64 (U).

TEC Lesson 936-061-0108-F, RTP, Part 1: Initiating and Responding to Radio Calls.

TEC Lesson 936-061-0109-F, RTP, Part 2: Writing Down Messages Received by Radio.

TEC Lesson 936-061-0110-F, RTP, Part 3: Responding to Messages.

TEC Lesson 936-061-0111-F, RTP, Part 4: Preparing Messages to be Sent.

TEC Lesson 936-061-0112-F, RTP, Part 5: Sending and Receiving Messages.

TEC Lesson 936-061-0113-F, RTP, Part 6: Enter, Leave Radio Net, Authenticate.

TEC Lesson 936-061-0114-F, RTP, Part 7: Practice and Self-Evaluation.

# TASK

## 113-573-1002

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### Prepare a Message for Transmission in 16-Line Format

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#### CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. Your team chief will provide you with: ACP 124(C), ACP 125(D), ACP 126(B), and DA Form 173 (Joint Message Form) as required. Supervision and assistance will normally be available.

#### STANDARDS

Task standard has been met when you have prepared a given message for transmission in the proper 16-line message format according to performance measures 1 and 2, and figure 1 below.

#### PERFORMANCE MEASURES

1. Prepare a given message in 16-line format for radiotelegraph, radiotelephone, and radio teletypewriter transmission. (Refer to fig 1; ACP 124(C), chap 1, sec II, para 112, pp 1-7 thru 1-9; ACP 125(D), chap 2, para 208 thru 219, pp 2-3 thru 2-9; and ACP 126(B), chap 1, sec II thru IV, para 103 thru 112, pp 1-3 thru 1-7.)
2. Insure correct 16 line message format has been used for mode of transmission. (Refer to fig 1; ACP 124(C), chap 1, sec II, para 111, pp 1-6; ACP 125(D), chap 2, para 207, p 2-2; and ACP 126(B), chap 2, sec IV, para 111, p 1-7.)
  - a. Messages handled by radiotelegraph will be prepared for transmission in either PLAINDRESS, ABBREVIATED PLAINDRESS or CODRESS form, except when Commercial or IACO procedure is authorized.

Army Correspondence Course SSO 450, Basic Communications Principles.

TEC Lesson 201-113-4553-A, Authentication.

TEC Lesson 201-113-4554-E/A, Opening a Net.

TEC Lesson 936-061-0111-F, Preparing Messages to be Sent, Part IV.

TEC Lesson 936-061-0112-F, Sending and Receiving Messages, Part V.

# TASK

## 113-573-4001

### Encode and Decode Messages Using KTC-600D Tactical Operations Code

**CONDITIONS**

This task is performed under all weather conditions in a field or a garrison location. You will be provided with a sample message, paper, pencil, and a KTC-600D Tactical Operations Code and with the set and time period you are to use. Supervision and assistance will be available.

**STANDARDS**

Task standard has been met when you have encoded and decoded a sample message using Tactical Operations Code KTC-600D according to performance measures 1 and 2 below.

**PERFORMANCE MEASURES**

1. Encode message. (Refer to CEOI and KTC-600D Tactical Operations Code.)
  - a. Each set of the operations code is effective for a given time period, not to exceed 48 hours. Time of change will be directed in the CEOI (could be days of the month or any given operation).
  - b. To encode, after writing out your message in plaintext, turn to the set used on that day. (See fig 1. On the 5th day of the month or operation, you would use set 3.)

EXAMPLE ONLY			
SET	EFFECTIVE DAYS (of the month or operation as directed by the CEOI)	SET	EFFECTIVE DAYS (of the month or operation as directed by the CEOI)
1	_____ 1 and 2	3	_____ 5 and 6
2	_____ 3 and 4	4	_____ 7 and 8

Figure 1. Sample Set Page for KTC-600D.

- c. The encode portion of the operations code is made up of words and phrases, commonly used in tactical operations, which are arranged in alphabetical order as in a dictionary. To the left of each word or phrase is a three-letter code group which is the code for that word or phrase.
- d. Perform the following procedures to encode words or phrases.
- (1) Find the word or phrase to be encoded.
  - (2) Identify the three-letter code group located to the left of that word or phrase.
  - (3) Write the three letter code group on a separate sheet of paper.
  - (4) Repeat this procedure until the whole message is recorded as shown in figure 2.

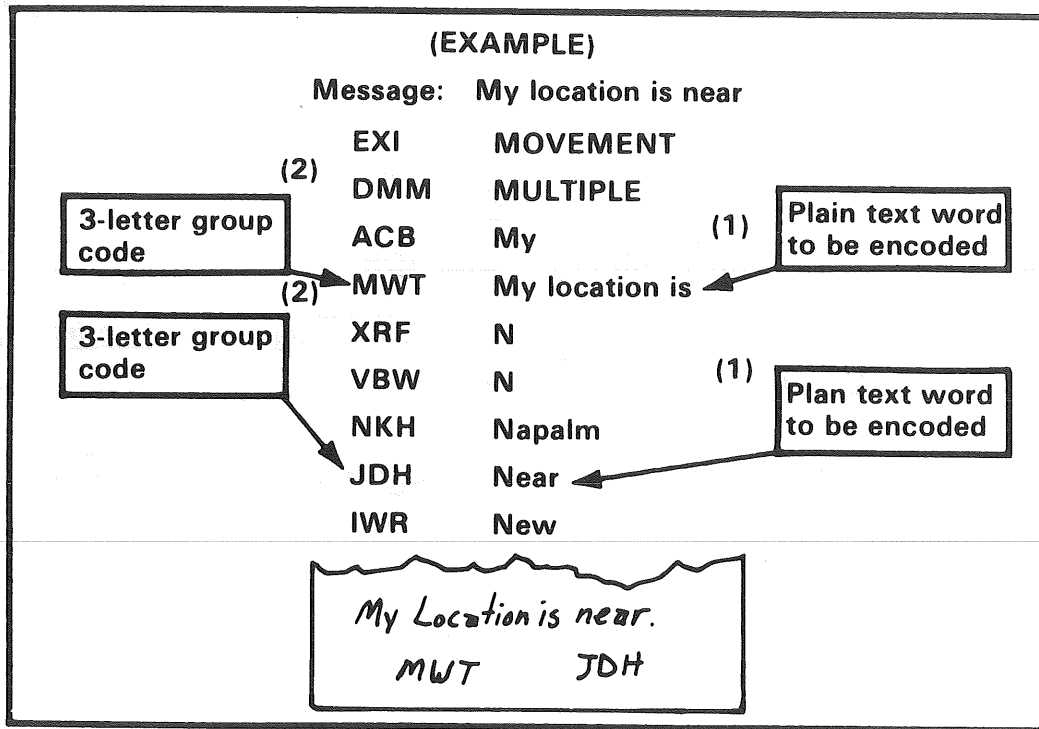


Figure 2. Sample Encode Page of KTC-600D.



2. Decode a received message. (Refer to CEOI and KTC-600D Tactical Operations Code.)
  - a. After receiving and writing down an encoded message, check the CEOI and turn to the code set in effect for that day.
  - b. The decode portion of the operations code is made up of a column of three-letter code groups arranged in alphabetical order (AAO, ABL, ABY, etc.) with a word or phrase located to the right of each.
  - c. To decode a received message, find the code group and write the word or phrase on a separate sheet of paper as shown in figure 3.

NOTE: You can save time when encoding or decoding a message by going in alphabetical order. (When encoding, look up all words/phrases starting with A, then B, etc. When decoding, look up all groups beginning with A, then B, etc.)

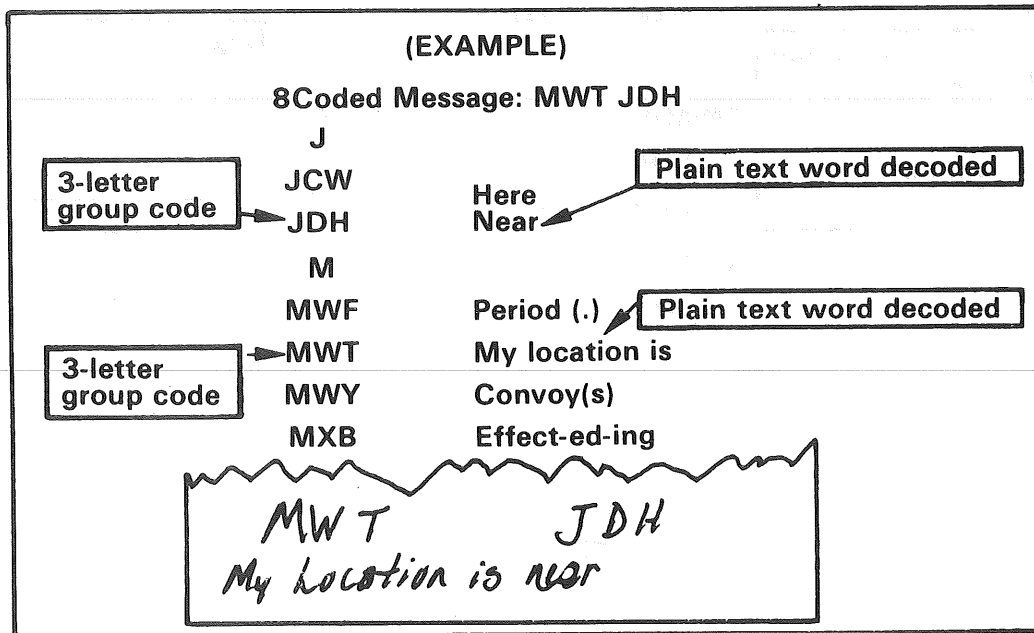


Figure 3. Sample Decode Page of KTC-600D.

**REFERENCES**

**CEOI**

**KTC-600D Tactical Operations Code.**

**TASK****113-573-4002**

---

**Use KAL-61B with KTC-1400 Numerical Code to  
Authenticate Transmissions and Encrypt/Decrypt  
Numbers and Grid Zone Letters**

---

**CONDITIONS**

This task is performed under all weather conditions in a field or a garrison location. You will be provided with a CEOI, KAL-61B, KTC-1400 Numerical Code, paper, and pencil as required. Supervision and assistance will be available.

**STANDARDS**

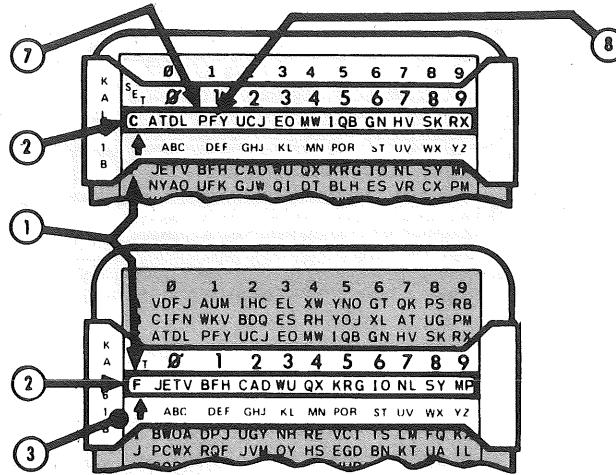
Task standard has been met when you have authenticated required transmission and encrypted/decrypted numbers and grid zone letters by use of the KAL-61B and KTC-1400 Numerical Code according to performance measures 1 through 7.

**PERFORMANCE MEASURES**

1. Set up for encrypting. (Refer to fig 1 and CEOI Item for Numerical Cipher Authentication System.)
  - a. Randomly select any two letters (except Z) for message "SET INDICATOR" (SI). EXAMPLE: CP.
  - b. Find the first letter "C" of the SI in the LINE INDICATOR COLUMN (1).
  - c. Find the second letter "P" of the SI in the line indicated by the first letter. Letter to the right of the second SI letter is the SET LETTER (8).

NOTE: If the second SI letter is the last letter in the line, then the first letter in the same line will be the SET LETTER.

- d. Find SET LETTER "F" in LINE INDICATOR COLUMN.
- e. Position READER GUIDE over line indicated by SET LETTER "F." Device is now ready for encrypting.



KAL 61 set up for encrypting.

- 1. Line Indicator Column
- 2. Set Letter/First Letter of Set Indicator
- 3. Reader Guide
- 4. Set Letter
- 5. Second Letter of Set Indicator
- 6. Set Letter
- 7. Second Letter of Set Indicator
- 8. Set Letter

Figure 1. KAL-61B with KTC-1400 Numerical Code.

- 2. Encrypt numbers. (Refer to fig 2 and CEOI Item for Numerical Cipher Authentication System.)

(Refer to fig 2 and CEOI Item for Numerical Cipher Authentication System.)

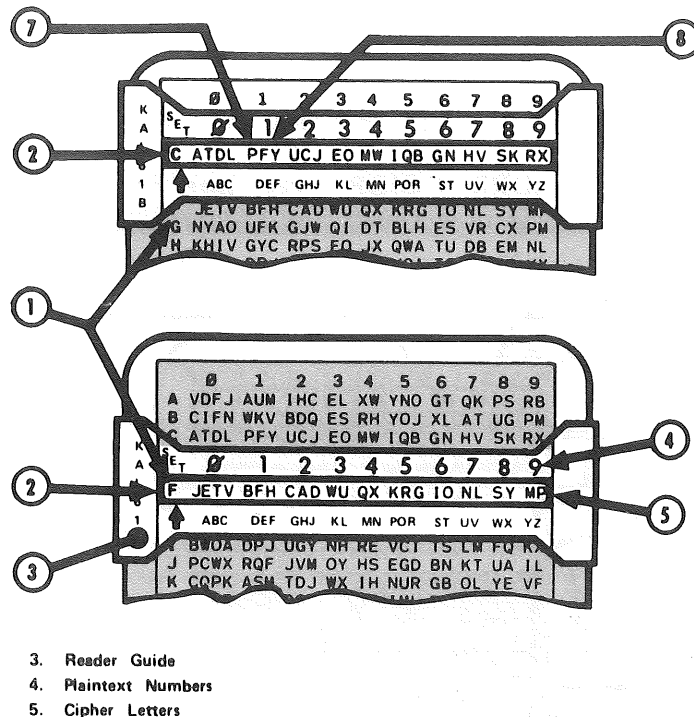


Figure 2. KAL-61B with KTC-1400 Numerical Code.

- a. Find number to be encrypted in PLAINTEXT NUMBERS (4) on READER GUIDE (3). EXAMPLE: 572938.
- b. Substitute for each number one of the CIPHER LETTERS (5) grouped in the set line immediately below the number to be encrypted. Continue to substitute letters from the same set line until all numbers for that group are encrypted. EXAMPLE: RNAMEUS is one possibility. By using variants, others are possible.

NOTE: Numbers will be encrypted one at a time in the same order they appear in the message. A different cipher letter will be used for repeated numbers. If there are more than 15 numbers to be encrypted in the same message, one SET INDICATOR will be used for the first 15 numbers, and a different SET INDICATOR will be used for each succeeding group of 1 to 15 numbers. This must be done because the encrypting of more than 15 numbers in the same SET INDICATOR can seriously weaken the security of the system.

3. Encrypt grid zone letters. (Refer to fig 3 and CEOI Item for Numerical Cipher Authentication.)

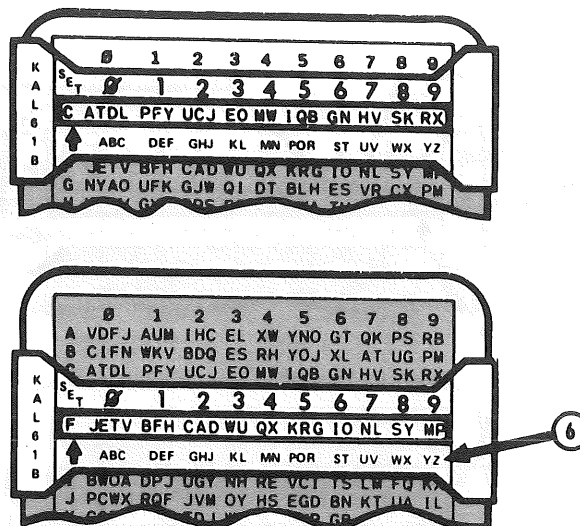


Figure 3. KAL-61B with KTC-1400 Numerical Code.

- Find the first grid zone letter to be encrypted in PLAINTEXT LETTERS (6). EXAMPLE: N.
- Substitute for that letter the cipher letter located in set line directly above the letter to be encrypted. EXAMPLE X.
- Find the second grid zone letter to be encrypted in PLAINTEXT LETTERS (6). EXAMPLE: R.
- Substitute for the second letter the cipher letter located in set line directly above the letter to be encrypted. EXAMPLE: G. The same set line will be used to encrypt both the grid zone letters and coordinates.

NOTE: Grid zone letters will be included in messages when they are necessary to the understanding of such messages. NO OTHER LETTERS WILL BE ENCRYPTED. If necessary to preclude misunderstanding, a statement may be made that grid zone letters are included in the message.

4. Complete encryption of grid zone letters and coordinates. (Refer to fig 4 and CEOI Item for Numerical Cipher Authentication.)

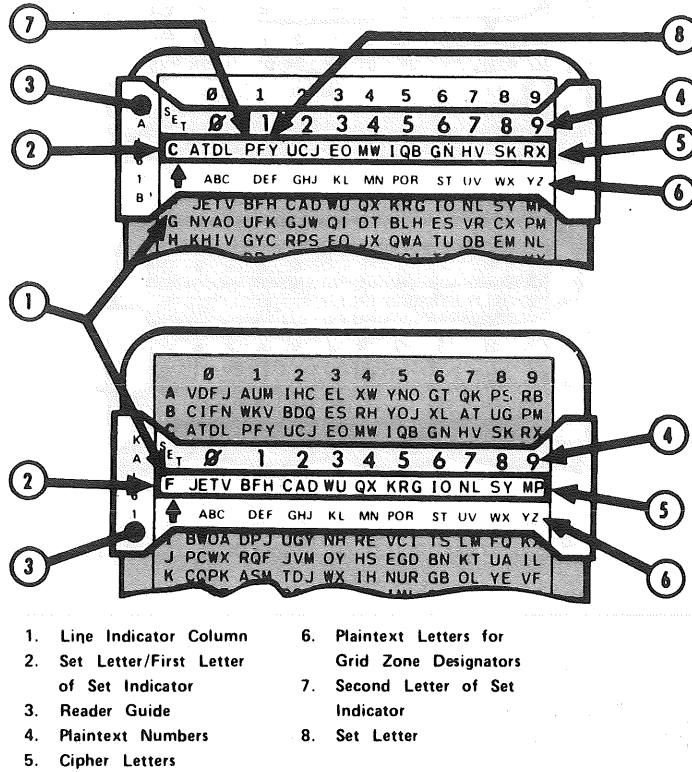
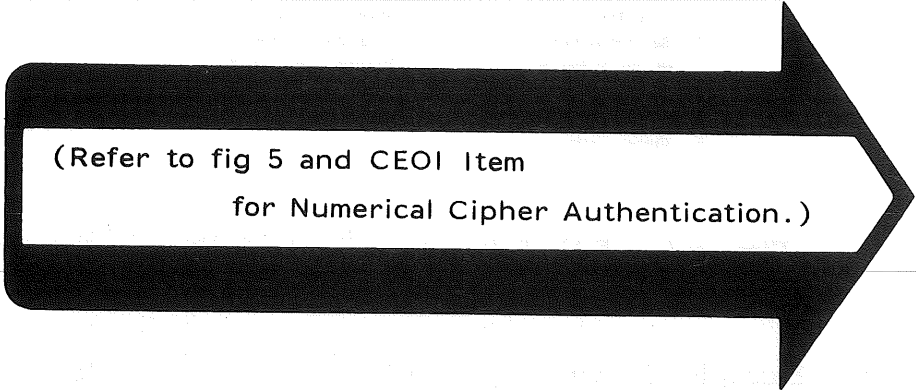


Figure 4. KAL-61B with KTC-1400 Numerical Code.

- a. This system is designed to be used with plaintext. Therefore, the arrangement and transmission of messages using this system will include both encrypted portions and plaintext portions. The encrypted portions of your message will be arranged as follows:

- (1) The first two letters will be the SET INDICATOR letters. (NEVER TRANSMIT THE SET LETTERS.) EXAMPLE: CP. (This is transmitted as "I SET CHARLIE PAPA.")

- (2) If grid zone letters are included, the third and fourth letters of your transmission will be encrypted grid zone letters. EXAMPLE: XG. (This is transmitted as "XRAY GOLF.")
  - (3) The remaining letters (including the third and fourth if grid zone letters are not included) will be encrypted numbers. EXAMPLE: RNAMEUS. (This is transmitted as "ROMEO NOVEMBER ALFA MIKE UNIFORM SIERRA.")
- b. An encrypted, six-digit location which includes grid zone letters will consist of 10 letters, including the SET INDICATOR which is always the first 2 letters. The entire encrypted location would be transmitted as "I SET CHARLIE PAPA (Pause) XRAY GOLF ROMEO NOVEMBER ALFA MIKE UNIFORM SIERRA."
5. Decrypt grid zone letters and numbers. (Refer to fig 5 and CEOI Item for Numerical Cipher Authentication.)



(Refer to fig 5 and CEOI Item  
for Numerical Cipher Authentication.)



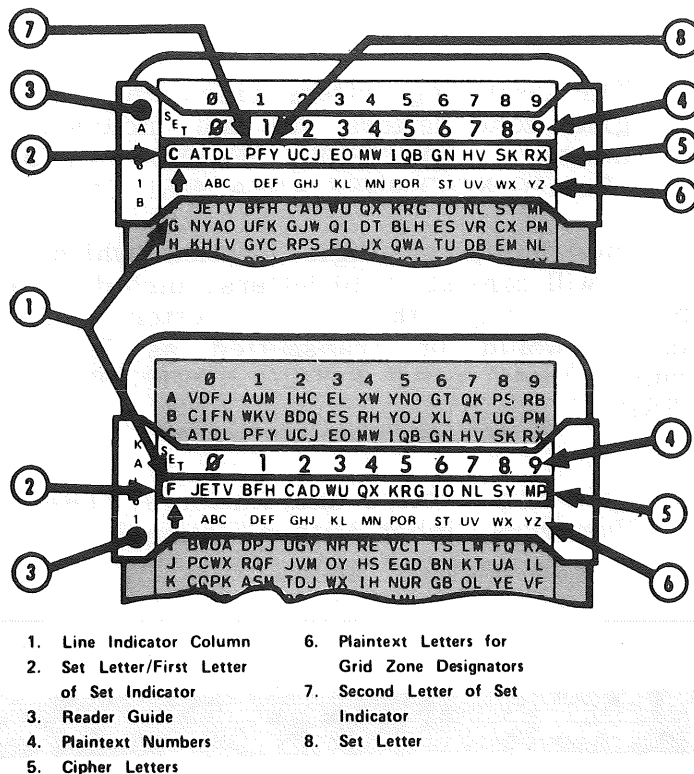


Figure 5. KAL-61B with KTC-1400 Numerical Code.

- a. Example of encrypted location: CP XG RNAMUS.
- b. Find the SET LETTER "F" using the SET INDICATOR "CP" as described in performance measure 1.
- c. Decipher the message beginning with the third letter "X" by substituting plaintext letters/numbers on the READER GUIDE (3) for the cipher letters.

6. Authenticate (challenge and reply). (Refer to fig 6 and CEOI Item for Numerical Cipher Authentication.)

	0	1	2	3	4	5	6	7	8	9	
A	VDFJ	AUM	IHC	EL	XW	YNO	GT	QK	PS	RB	
B	CIFN	WKV	BDQ	ES	RH	YOJ	XL	AT	UG	PM	
C	QSXJ	CFY	OGD	RT	UA	VIN	KH	EM	WP	LB	
D	IOBS	JKQ	FEG	DP	MN	XWL	CH	TA	VU	RY	
E	KLPA	MJX	QDY	CH	GW	VFE	BT	RN	UI	OS	
F	VUCI	EPA	NXY	TH	BQ	OGJ	LK	WR	FM	DS	
G	NYAO	UFK	GJW	QI	DT	BLH	ES	VR	CX	PM	
H	KHIV	GYC	RPS	FO	JX	QWATU	DB	EM	NL		
I	BWOA	DPJ	UGY	NH	RE	VCI	TS	LM	FQ	KX	
J	PCWX	RQF	JVM	OY	HS	EGD	BN	KT	UA	IL	
K	CQPK	ASM	TDJ	WX	IH	NUR	GB	OL	YE	VF	
L	BWRF	JPC	QON	AV	HG	IML	DU	SK	YX	ET	
M	HQIA	XLC	FVB	SK	OJ	MUDRW	YN	GE	TP		
N	CWQF	KJS	XHP	AE	TN	UGC	VL	MD	RI	OB	
O	NWFD	QBS	RJX	PH	YT	ICM	OG	AV	LU	KE	
P	PAFT	NSC	DGR	QM	WX	HKI	OE	YJ	UB	LV	
Q	SNGD	JTP	WYI	CR	BE	UOV	MX	FH	QK	LA	
R	AMRH	NJG	QUY	SE	IO	KDL	PV	XC	WB	FT	
S	YWGS	VXE	IDC	KQ	OA	TPH	BU	JR	ML	NF	
T	BCDL	FOR	AUT	NV	GW	SXK	PI	ME	HQ	JY	
U	RMQD	WVS	JYX	TG	UL	FEK	PB	OA	NH	IC	
V	BOKA	HXG	SLC	PD	JT	EFQ	IV	WM	RN	UY	
W	ASLW	YVD	TRO	BE	CI	PFX	HG	MN	JQ	KU	
X	DLTV	NEQ	PAS	XB	OC	MHJ	KW	RF	IG	YU	
Y	XSIC	YGP	NFW	HE	KL	JAR	VO	QD	TM	BU	
DAY 17										KTC 1400	A
CLASSIFICATION MARKING											

Figure 6. Authentication Page Day 17 of KTC-1400.

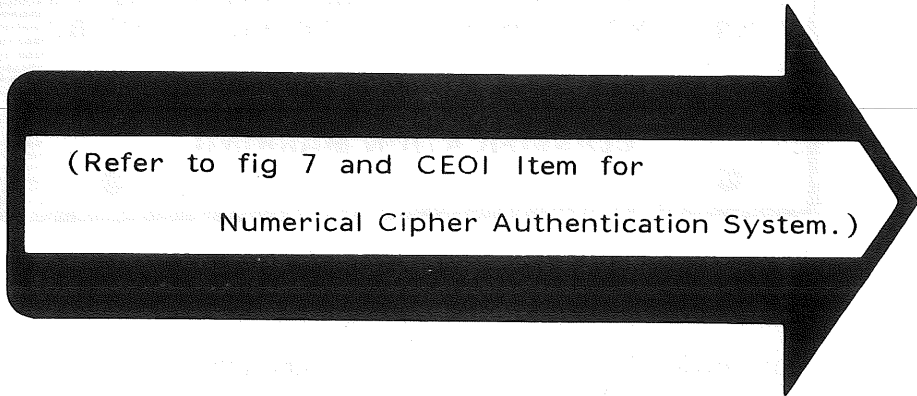
- a. Authentication will be best accomplished by moving the reader guide completely out of the way or else positioning it so as not to obscure the reply line.
- b. Select any two letters (except Z) at random for challenge. EXAMPLE: KV.

- c. Find the first letter "K" of challenge in LINE INDICATOR COLUMN.
- d. Find the second letter "V" of challenge in the line indicated by the first letter. The correct reply is the cipher letter directly under the second letter "V" of the challenge.

NOTE 1: If the first letter of the challenge is "Y" indicating the last line of the table, the reply should be taken from the "A" line and will be the letter in the same position as the second letter of the challenge in the "Y" line. If the challenged party does not answer/reply within 5 seconds, but does reply correctly, challenge that party again using a different challenge.

NOTE 2: The called party will make the first challenge. Both the person making the challenge and the person being challenged must find the correct reply. The party making the call may then counter-challenge the called party using a different challenge.

- 7. Transmission authentication. (Refer to fig 7 and CEOI Item for Numerical Cipher Authentication System.)



**(PROTECTIVE MARKING)**  
**INSERT THIS EDGE FIRST IN KAL 62**

**INSTRUCTIONS FOR INSERTING CIPHER TABLE IN KAL 62**

1. Place KAL 62 on a flat surface in front of you with the base down and rotate the cylinder until you can read the word "PUSH".
2. Rotate reader guide away from you so that it is out of the way.
3. With this instruction side of the cipher table face up, depress the cylinder at "PUSH" and insert the upper edge into the cylinder as far as the dotted line.
4. Using the right-hand knob, rotate the cylinder toward you (counterclockwise) so that cipher values are exposed.
5. Depress cylinder at "PUSH" and insert opposite edge into the same slot until paper fits snugly.
6. Adjust paper slightly to the right or left so that all letters on a line show through the reader guide as indicated in NAO 3.

**INSTRUCTIONS FOR INSERTING CIPHER TABLE IN KAL 61**

1. Unfasten flap at the bottom of device and bend back out of the way.
2. Slide the cipher table face up under the lips at the top and sides of the device.
3. Before refastening the flap, adjust cipher table so that the two register marks (⊗) at the bottom of the table will align precisely with the snaps when the flap is fastened.

**TRANSMISSION AUTHENTICATION TABLE**

Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	10	
HB	TH	AA	GO	II	OI	LP	YD	HF	VA	
YK	PG	SD	RC	IH	LC	PP	RM	YN	YW	
UF	PW	LX	QU	EM	LJ	EC	WO	FI	EB	
QC	GS	JO	VQ	LA	LI	KO	BW	TB	BS	
YX	AC	OC	FR	XH	FX	RH	KG	DU	ZB	
MH	GR	JY	CV	BK	CI	PF	ON	UY	IQ	
ZQ	XW	JH	IU	FW	OT	YP	DD	CA	CM	
WX	EG	EK	CK	AZ	JE	JS	CQ	EQ	DG	
SN	XT	JA	GF	YH	SZ	LW	BR	LK	HK	
YM	DZ	KS	XQ	DJ	EF	DP	JX	XX	TQ	
DAY 17							KTC 1400			A

Figure 7. Transmission Authentication Table of KTC-1400.

- a. One hundred Transmission Authentication digraphs have been provided in this system.
- b. Digraphs are to be used in cases where authentication is required and it is not possible or desirable that the receiving station reply.

## SKILL LEVEL 1

- c. The Transmission Authentication Table consists of 10 numbered columns containing 10 digraphs each. Columns have been numbered to make the assignment of Transmission Authentication digraphs easier.
- d. Numbered columns should be assigned by the Controlling Authority to selected communications nets within his cryptonet.
- e. AUTHENTICATION DIGRAPHS WITHIN THE NUMBERED COLUMNS SHOULD BE USED ONLY ONCE AND ONLY WITHIN THE CONTROLLING AUTHORITY'S NET.
- f. When it becomes necessary to use Transmission Authentication, the first or next unused digraph in the assigned column will be used.

NOTE: NEVER SELF-AUTHENTICATE using the KTC-1400. If self-authentication is required, use one of the two-letter digraphs found in the Transmission Authentication Table assigned to your unit.

## REFERENCES

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CEOI.

**TASK****113-573-6001**

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**Recognize Electronic Countermeasures (ECM) and  
Implement Electronic Counter-Countermeasures  
(ECCM)**

---

**CONDITIONS**

This task is performed in a tactical or nontactical situation under all weather conditions, and may be performed in an NBC environment. Given a requirement and--

1. Radio set.
2. Applicable operator's TM.
3. CEOI extract.

Supervision is normally available.

**STANDARDS**

Task standard has been met when you have determined that EW is directed at your station, and you have employed ECCM for continued operation according to performance measures 1 through 4 below.

---

**PERFORMANCE MEASURES**

1. Determine if ECM is being employed.
  - a. Accidental or unintentional interference. (Refer to FM 32-30, chap 2, p 2-2.)
    - (1) Friendly units on the same frequency.
    - (2) Faulty components or circuits in the radio set.
    - (3) Bad weather conditions.

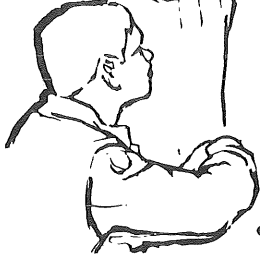
- (4) Poor insulators on high power electric lines.
  - (5) Nearby generator.
  - (6) Ignition noise from nearby vehicles.
- b. Intentional interference. (Refer to FM 32-30, chap 6, p 6-1.)
- (1) Meaconing - the process of altering navigational signals so that aircraft and ships do not arrive at the intended target or destination.
  - (2) Intrusion - the entrance of false information into friendly signal paths so that operators react to the enemy's tactical advantage.
    - (a) Imitative communications deception. (Refer to FM 32-30, chap 3, p 3-8.) Friendly communications networks are entered using call signs, radio procedures, and instructions to cause friendly forces to react for a tactical disadvantage.
    - (b) Nuisance intrusion. (Refer to FM 32-30, chap 3, p 3-10.) Friendly communications networks are entered in a preplanned effort to disrupt or at least confuse both voice and hard copy transmissions. Plaintext messages, random texts resembling cipher, or combinations of texts and headings taken from previous transmissions are received.
  - (3) Jamming - a signal transmitted for the purpose of jamming electronic emitters. The signal may be varied in amplitude, frequency, or pulse by an almost unlimited variety of modulating signals. Jamming is subtle enough that operators will often not know they are being jammed.
    - (a) Spot jamming - deliberate interference on a specific frequency or channel.
    - (b) Barrage jamming - simultaneous jamming of all receivers within the bandwidth of the jammer.

- (4) Interference - any electrical or electronic noise or clutter whose source cannot be quickly and positively identified.
2. Initiate operator's procedures. (Refer to FM 24-1, app H, p H-1; FM 32-30, chap 2, pp 2-2 and 2-3.)
    - a. Check the equipment ground to insure that the interference is not caused by a buildup of static electricity.
    - b. Disconnect the antenna.
      - (1) If the noise persists, the problem is within the radio receiver.
      - (2) If the noise diminishes, then the noise is being received.
    - c. Identify the type of noise.
      - (1) Generator set operating nearby, check the grounding and line connections.
      - (2) Atmospheric conditions.
        - (a) Lightning.
        - (b) Hot wind blowing in desert or arid areas.
      - (3) Vehicle engine (gasoline, not diesel) running nearby, check the generator/alternator connections and spark plug wire shielding.
    - d. Move the receiver, or re-orient the antenna, if possible, and listen or look for variations in the strength of the disturbance.
    - e. Tune the receiver a few kilohertz above or below the normal frequency. If such detuning causes the intensity of the interfering signal to drop sharply, it can be assumed that the interference is the result of spot jamming.

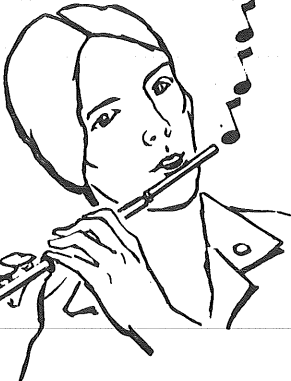


3. Identify jamming signals. (Refer to FM 32-30, chap 2, pp 2-3 thru 2-6.)

NOTE: The word description of the different types of jamming signals have been asterisked (\*) if that particular type of jamming signal can be unintentional.



\*a



\*b

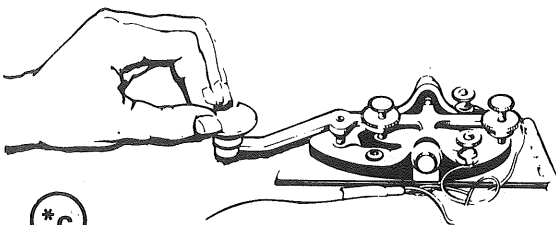
### TYPES OF JAMMING SIGNALS

\*a. Babbled voice. This signal is composed of mixed voices engaged in simultaneous conversations, preferably in the same language, with voice characteristics similar to those found in the victims communications net.

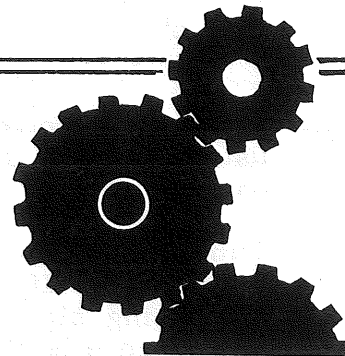
\*b. Tone. This signal is a single frequency of constant tone. It is used to jam manually-keyed Morse code, voice, and radio carrier circuits.

\*c. Random-keyed Morse code. This signal is produced by keying a Morse signal at random and mixing the keyed signal with spark noise. It is effective against voice and Morse code communications.

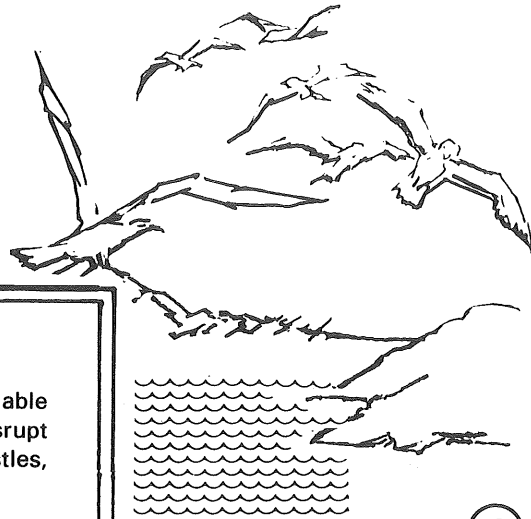
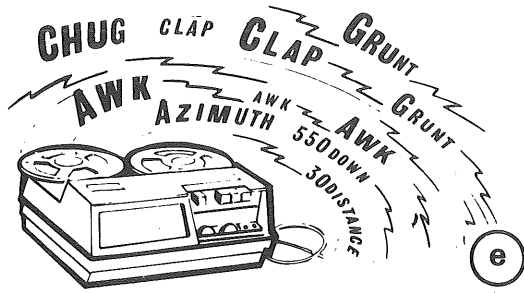
\*d. Pulse. This signal resembles the monotonous rumble of rotating machinery. Pulse jamming signals produce a nuisance effect on voice communications circuits.



\*c



\*d



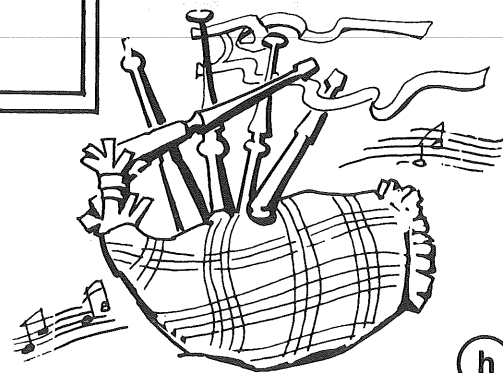
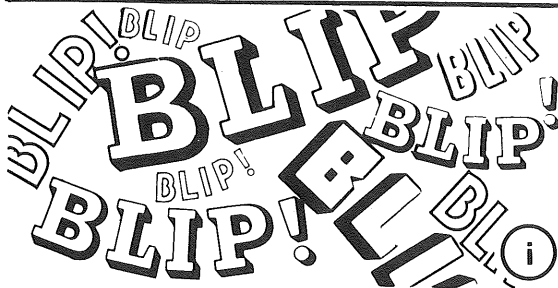
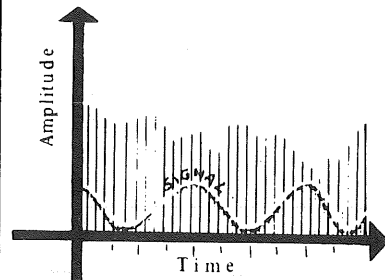
e. Recorded sounds. Any audible sound, especially of a variable nature, that can be used to distract operators and disrupt communications circuits. Music, screams, applause, whistles, machinery noise, and laughter are examples.

f. Gulls. The gull signal is generated by a quick rise and slow fall of a variable audio frequency and is similar to the cry of a sea gull. It produces a nuisance effect on voice circuits.

g. Random noise. This is synthetic radio noise which is random in amplitude and frequency. It is similar to the normal background noise and can be used to degrade all types of signals.

h. Stepped Tones. These are tones transmitted in increasing pitch, producing an audible effect similar to the sound of bagpipes. Stepped tones are normally used against single-channel AM and FM voice circuits.

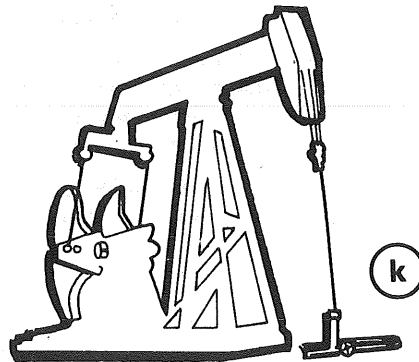
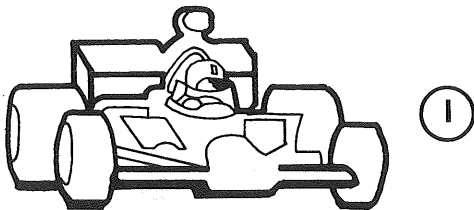
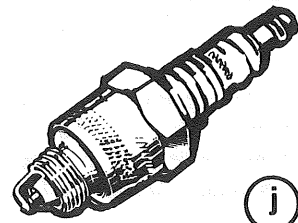
i. Random Pulse. Pulses of varying amplitude, duration, and rate are generated and transmitted to disrupt teletypewriter, radar, and all types of data transmission systems.



j. Spark. This signal is easily produced and is one of the most effective for jamming. Bursts are of short duration and high intensity, repeated at a rapid rate. The time required for receiver circuitry and the human ear to recover after each spark burst makes this signal effective in disrupting all types of radio communications.

k. Wobbler. The wobbler signal is a single frequency varied by a low and slowly varying tone. The result is a howling sound which causes a nuisance effect on voice communications.

l. Rotary. The rotary signal is produced by a low-pitched, slowly varying audio frequency, resulting in grunting sounds. It is used against voice communications.



4. Employ antijamming measures. (Refer to FM 24-1, app H, p H-1.)

NOTE: Antijamming measures have been designed to allow radio operators to work effectively through intentional interference. Regardless of the nature of the interfering signal, radio operators will not reveal in the clear the possibility or success of enemy jamming.

a. When jamming is suspected, the following antijamming measures will be taken:

- (1) Remain calm.
- (2) Continue to operate.
- (3) Do not admit to being jammed and observe radio discipline at all times.
- (4) Adjust the fine tuning, gain (or volume) control, bandwidth (or volume) control, bandwidth selector, crystal filter, and other controls peculiar to the equipment being used.
- (5) Increase transmitter power.
- (6) Re-orient or resite the antenna; or change antenna polarization.
- (7) Reduce transmission speed.

b. If antijamming measures are unsuccessful, the operator should contact the C-E officer and request a spare frequency.

c. Prepare and submit a report of the incident promptly, regardless of whether or not the radio operator is successful in working through the interference.

#### REFERENCES

FM 24-1 (HTF), Combat Communications, (How to Fight), Sep 76.

FM 32-30, Electronic Warfare, Tactics of Defense, Aug 76.

# TASK

## 113-573-7001

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### Prepare an Interference (MIJI) Report

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#### CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. You will be provided with your station's CEOI, KAL-61B, Numerical Code KTC-1400, paper and pencil. Supervision and assistance will normally be available.

#### STANDARDS

Task standard has been met when you have completed preparation of the interference (MIJI) report according to performance measure 1.

#### PERFORMANCE MEASURES

1. Prepare the interference/MIJI Report.
  - a. Refer to figure 1 for Interference/MIJI Report format.
  - b. The report will contain the following information and will be prepared using the brevity list provided below. For security, these brevity list numbers must be encrypted in the numerical/authentication system (KAL 61B with KTC 1400 Numerical Code).

(1) Item 1G - Victim designation and call sign:

- (a) Give the NCS the last letter of your call sign and your suffix.
- (b) This line need not be encrypted.



See Figure 1. Sample Interference/  
MIJI Report Format.

(PROTECTIVE MARKING)		
KTV 600 Series	MIJI REPORT	110
ITEM 1G - Victim designation and call sign: _____		
Item 2 - Type incident (circle one): MEACONING INTRUSION - JAMMING - INTERFERENCE.		
ITEM 3 - Operator's name and function: _____		
ITEM 5 - Nomenclature of equipment affected: _____		
ITEM 7 - Date/time (Z)/coordinates MIJI began: _____		
ITEM 11B - Frequency or channel affected: _____		
ITEM 12D - Type emission or audio characteristics of MIJI: _____		
ITEM 15 - MIJI effectiveness: _____		
ITEM 39 - Summarization - Effects of MIJI, ECCM action, and any other comments: _____		
MIJI REPORTS	15 of 15	110

113-573-7001

Figure 1. Sample Interference/MIJI Report format.

(2) Item 2 - Incident:

1. Meaconing
2. Intrusion
3. Jamming
4. Interference

(3) Item 3 - Operator's name and function.

(4) Item 5 - Nomenclature of equipment affected.

(5) Item 7 - Date/time (Z) coordinates MIJI began.

NOTE: Encrypt the station's grid coordinates. Grid zone letters need not be included and should only be included when they are necessary to clarify the location. If you include them, you must note the fact, or they may be confused with the encrypted coordinates.

(6) Item 11B - Frequency or channel affected.

NOTE: Encrypt the frequency (in MHz) or the channel affected.

(7) Item 12D - Type of emission or audio characteristics of MIJI:

5. Randomly keyed CW/RATT
6. Keyed CW
7. Stepped tones (bagpipes)
8. Modulated tone
9. Random noise/static
10. Gulls
11. Pulse
12. Wobbler
13. Unidentified voice, chatter, traffic or music
14. Friendly call sign, chatter, and/or traffic

(8) Item 15 - MIJI effectiveness: Using the scale 00/100, encrypt the estimated percentage of copy lost or the percentage of time radar/NAVAID was ineffective.

(9) Item 39 - Summarization - Effects of MIJI, ECCM action and any other comments.

- c. In Item 39 include any additional information that might help C-E and intelligence officials to evaluate the MIJI. The type of mission, prevailing weather condition, how the affected frequency was being used, flight plan of the aircraft, and the duration of the MIJI, are examples of useful information. This portion may be a narrative explaining exactly what did happen.
- d. Items 3 and 39 may be omitted when the report is transmitted electrically. However, a full written report should be forwarded to the C-E officer within 24 hours of the encrypted report.

#### REFERENCES

FM 24-16, Communications Electronics: Operations, Orders, Records, and Reports, Apr 78.

CEOI.



# TASK

## 113-573-8005

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### Use an Automated CEOI

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#### CONDITIONS

This task is performed under all weather conditions in a field or garrison location. You will be provided with:

1. Automated CEOI (including command/staff package and appropriate extracts.)
2. Scratch paper.
3. Pencil.

Supervision and assistance will be available.

#### STANDARDS

Task standard has been met when, in 5 minutes, you have used the Automated CEOI to determine your call sign, operating frequency, suffix item number identifier, and have entered a net in which you do not normally operate, in accordance with performance measures 1 through 5.

#### PERFORMANCE MEASURES

1. Determine call signs. (Refer to fig 1 and 2.)
  - a. Find the call signs for a given unit/element (e.g. A CO, 1st PLT, 1-24 IN BN). Turn to the index, read down the left-hand column until you find the unit (major HQ) that you are looking for (1-24 IN BN). After you have found the unit, look in the right-hand column, under Item Number heading, to find the correct item number (fig 1). Select the appropriate CEOI extract and turn to that page (fig 2).

- b. Determine the correct time period (fig 2). Using time period (01), look under the left-hand column to find the unit's call sign. After you have found the call sign for the unit (call sign for A CO, 1-24 IN BN is Z4G), find the suffix by reading down the column on the right-hand side of the page where you will find a limited listing of suffixes. Find the PLT/SCT PLT; located to the right is the two-digit suffix for 1 PLT SCT/PLT. You now have the five-character call sign for the A CO, 1st PLT 1-24 IN BN (Z4G10).

NOTE: The CEOI Extract for a particular unit, within a command, contains only a limited listing of suffixes. To find the complete listing you must use the command/staff package, portion of the CEOI.

(PROTECTIVE MARKING)		
KSV 614 Series	INDEX	1
ITEM		ITEM NO
1-24 IN BN .....		7B
2-24 IN BN .....		7C
2ND BDE .....		8
2-14 AR BN .....		8A
1-44 IN BN .....		8B
2-44 IN BN .....		8C
3RD BDE .....		9
3-14 AR BN .....		9A
1-64 IN BN .....		9B
2-64 IN BN .....		9C
DIVARTY .....		10
1-74 FA BN .....		10A
2-74 FA BN .....		10B
3-74 FA BN .....		10C
3-264 FA BN .....		10D
DISCOM .....		11
14TH MED BN .....		11A
33RD S&T BN .....		11B
714TH MAINT BN .....		11C
2-14 CAV SQDN .....		12
D/2-14 CAV SQDN .....		12A
2-54 ADA BN .....		13
INDEX	2 of 5	1

Figure 1. Sample CEOI Extract Page KSV 614 Series.

(PROTECTIVE MARKING)

KSV 614 A		TIME PERIOD			
1-24 IN BN EXTRACT		01			7B
1-24 IN BN	A1H	44.20	CMD	COMMANDER	37
HHC/1-24 IN	L7M	36.30	A/L	XO	26
A/1-24 IN	Z4G	52.05	CMD	S1	59
1/A/1-24		51.40		S2	65
2/A/1-24		50.20		S3	89
3/A/1-24		51.20		S4/SUP SGT	45
WPNS/A/1-24		50.05		MTR OFF/SGT	29
B/1-24 IN	V8W	31.55	CMD	C-E O/COMM CH	25
1/B/1-24		50.10		MED OFF/MEDIC	95
2/B/1-24		51.00		FO 1	75
3/B/1-24		49.00		FO 2	39
WPNS/B/1-24		34.55		FO 3	27
C/1-24 IN	B3J	50.05	CMD	1 PLT/SCT PLT	10
1/C/1-24		50.00		2 PLT/GSR SEC	08
2/C/1-24		51.70		3 PLT/AD SEC	16
3/C/1-24		49.00		WPNS PLT	44
WPNS/C/1-24		54.05		MORT PLT/SEC	98
CSC/1-24 IN	U3Q	51.25	CMD	AT PLT	63
AD/CSC/1-24		42.45		ALO	51
AT/CSC/1-24		33.20		TOC/CP	77
SCT/CSC/1-24		47.40		FDC	69
MORT/CSC/1-24		37.25		RTO/DVR	F
GSR/CSC/1-24		31.05		PLT/SEC/TM LDR	H
1-24 AJ/ALTN 1		70.05		PLT/SEC/TM SGT	O
1-24 AJ/ALTN 2		39.00		TM/SQD/SEC 1	B
1 BDE	V4Y	51.05	CMD	TM/SQD/SEC 2	C
1 BDE RETRANS	D6X	60.35	RTS	TM/SQD/SEC 3	M
MEDEVAC	W5X	32.75	PRI	TM/SQD/SEC 4	K
		53.55	ALT	SIGN	HITS
				C/SIGN	YEAR
1-24 IN BN EXTRACT					7B

Figure 2. Sample CEOI Extract Page KSV 614 Series.

2. Determine operating frequency.

NOTE: Frequencies are assigned to each radio net according to command/echelon.

- a. Select the appropriate CEOI and extract.
- b. To find the frequency for a given unit/element (for example: A CO, 1st PLT 1-24 IN BN), turn to the index of the CEOI and find the item number of the major organization you wish to communicate with (i.e., 1-24 IN BN). After finding the unit, look to the right for the item number (fig 1). Select the CEOI extract for the unit, turn to the correct page, for the given time period (01), the frequency for A CO, 1st PLT, 1-24 IN BN is 51.40 MHz.

3. Determine ITEM NUMBER IDENTIFIERS.

- a. Unknown station call signs can be identified by use of ITEM NUMBER IDENTIFIER.

- b. Each station should know the two-letter identifier for its own net for each time period. To find your ITEM NUMBER IDENTIFIER, follow these steps.

STEP 1: Go to the index of your CEOI (fig 3) and find the ITEM NUMBER IDENTIFIER and the page where it is located in the CEOI.

STEP 2: Turn to the correct page for identifiers in your CEOI (fig 4a) and read down the appropriate time period column until you find your CEOI item number. Then follow that line to the far left column of two-letter identifiers. This is your item number identifier for that time period. You will use this identifier when entering a net in which you do not normally communicate. When you enter such a net, you will be asked by the NCS to identify your station by referring to the item number identifier. Send this two-letter identifier. This provides the NCS of the other net with your CEOI item number, and by referring to that item, the NCS can readily identify your station.

(PROTECTIVE MARKING)		
KSV 614 Series		1
ITEM	INDEX	ITEM NO
CALL SIGN SPARES AND FREQUENCY SPARES 27-52 (FM) .....		22A
CALL SIGN SPARES AND FREQUENCY SPARES 53-78 (FM) .....		22B
CALL SIGN SPARES AND FREQUENCY SPARES (VHF) .....		22C
CALL SIGN SPARES AND FREQUENCY SPARES (UHF) .....		22D
CALL SIGN SPARES AND FREQUENCY SPARES (HF) .....		22E
ITEM NUMBER IDENTIFIERS .....		23
PYROTECHNIC AND SMOKE SIGNALS .....		24
SIGNS AND COUNTERSIGNS .....		25
<b>NOTE: THE FOLLOWING ITEMS ARE CONTAINED IN KAV 600 SER SUP AND MUST BE ATTACHED TO KSV 614 TO FORM A COMPLETE CEOI.</b>		
INDEX .....		101
GENERAL INSTRUCTIONS .....		102
RC-292 ANTENNA INSTRUCTIONS .....		103
SOUND SIGNALS .....		104
INDEX	4 of 5	1

Figure 3. Sample CEOI Extract Page KSV 614 Series.

(PROTECTIVE MARKING)

KSV 614 A 23

ITEM NUMBER IDENTIFIERS

	01	02	03	04	05	06	07	08	09	10
AA	6B	8C	6	6B	4A	21	9C	3A	9	19
AB	9B	7	8	11C	19	12A	17	10C	3B	9A
AC	4	6D	3C	22B	17	16G	22E	16H	8A	15
AD	16J	22E	9C	8C	11B	16B	8A	16G	9B	12A
AE	16D	8A	8C	5A	7A	22C	3E	11B	9A	13A
AF	22D	4A	3B	3E	13A	16J	18	8A	5	16C
AG	11C	22C	22B	17	6D	15	13A	5	10C	22B
AH	7A	16I	6C	9	12A	22	7	22B	8B	13
AI	10C	6B	17	6D	16E	6	15	4A	13	7
AJ	16B	3	7C	22D	7	8A	11	3G	22A	8C
AK	3F	3G	6D	22	10D	7	10C	10D	3G	16J
AL	16F	10D	12A	4	16D	16F	10A	8B	6D	16B
AM	9	10A	10B	16E	9	16I	22C	15	3E	22E
AN	16C	3E	19	7B	16F	9A	6A	12A	16D	6A
AO	8A	9B	10C	16J	6	7C	11B	3D	10B	22D
AP	16H	5A	6A	6A	11	16A	7B	5A	8C	10B
AQ	22	9	3F	3F	3F	14	11C	7B	9C	9C
AR	5A	10C	16	20	22A	6D	3F	16I	6A	10
AS	11	6A	11	5	11A	10C	3G	3B	6B	8B
AT	3D	8	5A	16F	5A	3G	8B	6D	20	17
AU	3	7C	11A	7	10B	10A	4A	17	10D	6
AV	16	3B	16D	22C	16	3C	16G	22E	3C	16A
AW	12	22	7B	11A	4	16D	16	16E	16E	18
AX	12A	6C	7A	12A	3B	7A	16B	8C	10A	14
AY	3C	16C	9	9B	13	9C	4	19	7C	11
AZ	10B	8B	16H	3B	14	12	16D	9B	22B	16H

ITEM NUMBER IDENTIFIERS 1 OF 3 23

Figure 4a. Sample CEOI Page KSV 614 Series.

(PROTECTIVE MARKING)

KSV 614 A 23

ITEM NUMBER IDENTIFIERS

	01	02	03	04	05	06	07	08	09	10
CA	9C	14	11B	10	16G	10B	11A	21	16G	3D
CB	16A	16J	13A	9C	7B	5A	22B	9C	12	4A
CC	16E	22D	16C	8B	9B	6A	21	3F	22E	3
CD	3B	22B	16E	7A	8B	7B	13	16B	11C	9B
CE	10	16	15	16D	16	13	3A	7C	21	12
CF	8C	16A	16F	22E	3	4A	16A	6B	12A	7B
CG	9A	13	9B	16I	22B	3B	6D	6A	10	10A
CH	22B	16G	5	16G	22	6C	10	16A	16C	11B
CI	13	3F	3A	19	16B	8C	5A	16D	16	9
CJ	7B	22A	11C	4A	10C	22B	8	6	4	16G
CK	3E	3A	16G	3A	6B	22E	6	8	6	4
CL	8	6	21	13A	16J	8	16C	3E	4A	16I
CM	19	16D	22C	16A	9C	16E	16E	13A	22C	3F
CN	21	11A	20	8A	20	3	16I	22	11A	22A

ITEM NUMBER IDENTIFIERS 3 OF 3 23

Figure 4b. Sample CEOI Page KSV 614 Series.

4. Enter a net in which you do not normally operate.
  - a. When entering a net in which you do not normally operate, use the following procedures:

SITUATION: You are the driver/radio operator (suffix F, fig 5c) for the CDR, B CO, 1-24 IN BN, with a requirement to enter the 1-44 IN BN CMD net and send a message to the CDR, CO B, a net in which your commander does not normally communicate. (Time period is 01.) The 1-44 IN BN call sign is K7086 (fig 6 and fig 5b) and your CDR is V8W37 (fig 2 and fig 5a). The call sign for CDR, CO B is M2T37.

STEP 1: Go to the index of your CEOI (fig 1 and 3), find the item and item number identifier page, turn to that page (fig 4b), and determine your two-letter identifier (CJ).

STEP 2: Determine the operating frequency of the NCS of the 1-44 IN BN as described in performance measure 2 and call the NCS station:

EXAMPLE: K I L O S E V E N O S C A R E I G H T S I X ( T H I S I S )  
V I C T O R E I G H T W H I S K E Y T H R E E S E V E N F O X T R O T - R E -  
F E R T O C H A R L I E J U L I E T T - I H A V E T R A F F I C F O R M I K E  
T W O T A N G O T H R E E S E V E N - R E Q U E S T P E R M I S S I O N T O  
E N T E R N E T - O V E R

STEP 3: The NCS will require you to authenticate prior to giving you permission to enter the net. Refer to Task 113-573-4002 for correct explanation of authentication procedures. After permission is granted to enter the net, contact the station for which you have traffic, and send your message.

- b. Upon completion of your message, advise the NCS that you are leaving his net. You may or may not be required to authenticate your departure.

5. Determine identification of an unknown station. To determine the identification of an unknown station, by use of item number identifiers, use the following procedure:

**SITUATION:** You have just received a call from an unknown station. The individual identified the station by using the call sign of C4A91 and stated that his item number identifier is AJ. It is time period (02) and the individual authenticated correctly when you challenged the station. To find out who the individual is, perform the following steps:

**STEP 1:** Go to your CEOI index (fig 3) and locate the page of ITEM NUMBER IDENTIFIERS. Turn to that page (fig 4a), then, look down the left-hand column until you find the two-letter item number identifier (AJ), follow this column across to time period 02, this will give you the correct CEOI item number of the unknown unit (3).

**STEP 2:** Turn to the CEOI item number page for the station calling (3) (fig 6). Look under the correct time period (02) for the first three characters of the unknown call sign (G4A). You find this then to be the 214 SIG BN.

**STEP 3:** To determine who in the 214 SIG BN is calling you, look at the last two characters of the call sign (91). Go to the CEOI item for SUFFIXES, time period 02 (fig 5a), read down the correct time period column until you find the last two characters. You can now determine the identity of the unknown station to be S2 of the 214 SIG BN.



**Figures 5a thru 5c and 6. Sample CEOI**

(PROTECTIVE MARKING)

KSV 614 A	SUFFIXES	2
	01 02 03 04 05 06 07 08 09 10	
COMMANDER	37 08 72 04 54 06 24 88 30 12	
COFS/XO	26 40 08 03 96 92 31 70 13 05	
SGS	56 21 71 79 77 27 42 30 18 22	
G1/S1	50 27 11 36 02 55 12 03 04 03	
G2/S2	65 01 39 55 81 01 46 32 70 19	
G2/S2 AIR	72 43 53 40 06 30 06 40 45 10	
G3/S3	80 83 68 90 52 08 08 04 00 82	
G3/S3 AIR	58 32 83 88 20 77 21 34 02 31	
G3/S3 OPS	76 05 00 64 87 82 55 74 47 84	
G4/S4/SUP SGT	45 48 46 44 51 67 33 75 85 74	
G5/S5	24 15 15 07 80 43 78 21 44 90	
C-E OFF/COMM CH	25 00 45 26 65 09 71 51 73 81	
PLT/SEC/TM/FLT LDR	43 38 58 68 05 98 08 57 79 68	
PLT/SEC/TM SGT	74 52 92 43 43 12 40 80 11 02	
1 PLT/SCT PLT	10 65 10 73 70 09 11 55 15 03	
2 PLT/GSR SEC	08 51 76 74 26 02 67 77 00 92	
3 PLT/AD SEC	16 08 32 80 89 58 38 78 49 17	
WPNS/SVC PLT	44 16 07 42 61 48 65 71 20 01	
MORT PLT/SEC	08 30 77 78 36 78 82 50 21 80	
AT PLT/SEC	63 94 13 20 67 80 88 44 65 97	
TOC/CP/AADCP	77 85 37 07 09 37 70 26 42 36	
ADC (M)	04 87 34 50 56 03 01 65 33 68	
ADC (S)	46 10 03 63 80 76 50 68 84 04	
AG	80 17 95 37 34 23 14 07 31 40	
ACFT/FO/SCT/TACP 1	75 46 09 92 63 88 87 01 54 71	
ACFT/FO/SCT/TACP 2	39 69 63 12 29 72 48 61 16 05	
ACFT/FO/SCT/TACP 3	27 24 51 87 35 00 08 83 77 25	
ACFT/FO/SCT/TACP 4	18 19 35 59 49 87 48 07 57 77	
ACFT/FO/SCT/TACP 5	78 45 73 08 03 14 04 82 60 00	
ACFT/FO/SCT/TACP 6	08 01 08 58 47 08 57 38 46 35	
SUFFIXES	1 OF 4	2

Figure 5a. Sample CEOI Page KSV 614 Series.

(PROTECTIVE MARKING)

KSV 614 A	SUFFIXES	2
	01 02 03 04 05 06 07 08 09 10	
LN OFF 1	38 00 59 03 84 47 47 09 46 44	
LN OFF 2	05 12 06 71 86 36 29 87 89 18	
LN OFF 3	40 33 62 53 38 93 05 45 53 80	
LN OFF 4	03 11 44 67 31 10 34 81 87 09	
MAINT OFF	84 58 01 10 25 97 58 35 22 91	
MATERIEL OFF	23 34 04 52 79 05 77 12 76 75	
MET/SWO	85 59 57 65 53 81 76 13 68 23	
NAICO	15 06 24 34 30 86 72 66 99 33	
NCS	86 63 80 04 08 42 94 04 26 72	
PROVOST MARSHAL/PMO	50 67 52 41 39 21 07 42 35 76	
RADAR	22 54 20 46 22 33 86 20 92 48	
RECOVERY VEH	67 20 40 76 03 61 74 11 88 21	
RETRANS/RWI STA	61 61 27 06 28 59 17 60 10 73	
SAFETY OFF	55 80 85 75 69 96 92 15 14 37	
SIGSEC	21 02 16 51 75 13 75 48 36 53	
SP WPNS OFF	82 77 91 38 92 04 52 39 23 57	
SURG/MED OFF/MEDIC	95 37 03 48 45 11 23 50 19 88	
SURVEY OFF	42 14 43 82 17 44 95 90 02 14	
TARGET ACQ OFF	13 36 18 16 55 57 69 22 24 58	
TM/SQD/SEC 1	71 28 21 31 04 29 10 36 41 38	
TM/SQD/SEC 2	12 04 20 08 14 83 15 24 34 27	
TM/SQD/SEC 3	47 80 69 32 48 06 43 97 60 06	
TM/SQD/SEC 4	17 86 75 61 15 71 82 70 98 11	
TM/SQD/SEC 5	79 53 97 62 71 40 44 10 50 52	
TRANS/MTR OFF/SGT	29 30 54 60 18 49 56 31 75 56	
SPARE 1	70 13 86 00 85 89 06 72 63 62	
SPARE 2	99 76 06 11 09 17 26 05 72 28	
SPARE 3	33 05 00 84 40 46 89 52 78 60	
SPARE 4	91 61 31 18 62 62 09 23 25 32	
SPARE 5	10 07 64 09 19 84 35 03 48 04	
SUFFIXES	3 OF 4	2

Figure 5b. Sample CEOI Page KSV 614 Series.



**(PROTECTIVE MARKING)**

KSV 614 A	SUFFIXES	2
	01 02 03 04 05 06 07 08 09 10	
SPARE 6	02 08 14 21 33 34 63 18 52 45	
SPARE 7	48 49 65 95 90 56 03 06 32 08	
SPARE 8	62 31 81 66 98 28 64 02 28 30	
SPARE 9	28 04 55 35 01 95 41 63 56 00	
SPARE 10	07 90 70 87 78 24 83 91 93 46	
SPARE 11	88 18 02 58 74 50 45 53 86 16	
SPARE 12	30 35 42 69 83 51 90 28 03 29	
SPARE 13	20 64 30 20 70 73 50 84 01 26	
SPARE 14	54 55 17 14 11 38 27 62 58 15	
-----EXPANDERS-----		
ALTERNATE/COPILOT	R A M C G J I O E M	
DEPUTY/STAFF ASST	G N N J J D C Q C R A	
FIRE CON TM/REAR	P I B M E R T N R P	
FORWARD	S F P E T H H R A Q N	
JR AIDE/2ND/ENL ASST	J K D L B A Q F J T	
MAIN	N O E D A I P A G I T	
PLT/SEC/TM LDR/OIC	H L C T D G N P G Q O	
PLT/SEC/TM SGT/NCOIC	O T Q B C N N P K S G	
RTO/DVR/PILOT	F B R Q K E F C T I	
SR AIDE/1ST/OFF ASST	E S S R H M F C T I	
TM/SQD/SEC/DET/TK 1	B M H G O F D J L C	
TM/SQD/SEC/DET/TK 2	C H K O P L L R E N	
TM/SQD/SEC/DET/TK 3	M R O F F B R J E P E	
TM/SQD/SEC/DET/TK 4	K C T I R S S B H J	
TM/SQD/SEC/DET/TK 5	T J J S I P O S G D D	
TM/SQD/SEC/DET/TK 6	Q Q G P N O O S B S	
TM/SQD/SEC/DET/TK 7	I E I K Q T B H M H	
TM/SQD/SEC/DET/TK 8	A G F N M C L L K F	
SPARE 1	L D P A A L K E I O	
SPARE 2	L P L H S Q K I T	
SUFFIXES	4 OF 4	2

Figure 5c. Sample CEOI Page KSV 614 Series.

**(PROTECTIVE MARKING)**

KSV 614 A	CALL SIGNS					3
QUICK REF MAJOR SUBOR ELMS & CBT BNS	01	02	03	04	05	
14 DIV	K0P	D4J	N3D	Y2E	L5D	
1 BDE	V4Y	M8R	Z4S	H1S	X2E	
2 BDE	X8A	Z6N	K2J	K7H	V9A	
3 BDE	V8K	B1P	V8Q	K8W	R4I	
DIVARTY	C9L	X0V	E4H	S2B	A0H	
DISCOM	T8I	Q0Q	U4F	V6R	R1V	
1-14 AR BN	R4S	B8W	A7G	H4I	D8L	
2-14 AR BN	X3W	Z0S	L6P	H2M	S4K	
3-14 AR BN	X4R	R7X	T1B	I9F	C1Y	
1-74 FA BN	D2U	E1F	W4W	A8Q	A6P	
2-74 FA BN	S0D	Z0T	W0M	Z8X	H1X	
3-74 FA BN	T0X	S5D	Q2Y	P8A	S2R	
3-264 FA BN	G2G	L3G	J7I	Q9L	Q0Q	
1-24 IN BN	A1H	N8L	V8R	W4T	X2S	
2-24 IN BN	Q0F	M7I	Z2C	A3K	G1M	
1-44 IN BN	K7O	Z6K	D5N	G7C	N8F	
2-44 IN BN	Z6Z	H6H	M4V	K2U	M0N	
1-64 IN BN	J5N	X9E	R5U	L1Z	Y2W	
2-64 IN BN	V5E	C8U	R2T	D8N	G7U	
2-14 CAV SQDN	N0C	C8Y	N0L	E7O	F5O	
2-64 ADA BN	Y7B	M2B	U7E	J2G	V1C	
24 EN BN	D6J	S1Z	D8X	D4Y	B0T	
214 SIG BN	P4V	G4A	K7Z	B0P	R8B	
143 CAB	J5T	L6C	R5O	M3V	D4Z	
314 CEWI BN	J3Q	P8O	M4A	U2J	G2G	
MEDEVAC	W6X	L6U	D6L	X0S	Z7X	
34 MP CO	S8M	Y4M	T8K	U4D	R0J	
QUICK REF MAJOR SUBOR ELMS & CBT BNS						3

Figure 6. Sample CEOI Page KSV 614 Series.

REFERENCES

None.

**TASK****551-721-1007**

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**Perform Before-Operation Maintenance**

---

**CONDITIONS**

Task will normally be performed in a field condition or in garrison by all vehicle operators without direct supervision or assistance and under all weather conditions. Necessary items of equipment are: vehicle, applicable vehicle technical manual (TM), BII (basic issue items), DA Form 2404, logbook, and pen or pencil.

**STANDARDS**

You must perform before-operation maintenance in accordance with applicable vehicle TM. You must inspect the vehicle and record all faults not correctable within the operator's level of maintenance on DA Form 2404 within 45 minutes. This time does not include time spent on correcting faults found.

**PERFORMANCE MEASURES**

1. Check general condition of vehicle exterior.
2. Check tires for damage and inflate, as necessary.
3. Check for fuel, oil, and water leaks.
4. Drain fuel filters.
5. Check fuel tanks for contamination, fuel level, and strainer in filter necks.
6. Check surge tank/radiator for coolant level.
7. Check engine oil level.

## SKILL LEVEL 1

8. Check engine components.
9. Check battery fluid level, condition of box, clamps, and hold down frame.
10. Clean light lenses, reflectors, and check operation.
11. Insure all appropriate publications are with vehicle and are up-to-date.
12. Check horn for proper operation.
13. Check engine idle speed and listen for unusual noises.
14. Check operation of instruments.
15. Check clutch for minimum and maximum free travel.
16. Check steering for unusual free play and binding.
17. Check power steering reservoir oil level.
18. Check service and handbrakes for proper free travel and adjustments.
19. Check transmission and transfer selector levers action.
20. Check winch for proper oil level, condition of cable, hook and shear pin.
21. Check fifth wheel mounting, operation of locking plunger lever, plunger, and coupling jaws.

## REFERENCES

FM 21-305, Manual for the Wheeled Vehicle Driver, C1, C2, 15 Apr 75, chap 2.

TM 9-2320-209-10, Operator's Manual for 2½-Ton, 6 x 6, W/W, M44 Series Chassis, Truck, 8 Feb 65.

TM 9-2320-211-10, Operator's Manual for Truck, Chassis: 5-Ton, 6 x 6, M39, 30 Nov 77.

TM 9-2320-218-10, Operator's Manual for Truck, Utility: ¼-Ton, 10 Aug 78.

TM 9-2320-260-10, Operator's Manual for Truck: 5-Ton, 6 x 6, M809 Series (Diesel): Truck, 30 Nov 77.

TM 38-750, The Army Maintenance Management System (TAMMS), w/C1 thru 3, 15 May 78, chap 3.

TF 55-4247, Truck, Utility, ¼-Ton M151A2-Characteristics and Handling.

# TASK

## 551-721-1008

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### Perform During-Operation Maintenance

---

#### CONDITIONS

Task will normally be performed in a field condition or in garrison by all vehicle operators without direct supervision or assistance and under all weather conditions. Necessary items of equipment are: vehicle, applicable vehicle TM, BII (basic issue items), DA Form 2404, logbook, and pen or pencil.

#### STANDARDS

You must check any unusual noise, vibration, or instrument reading, and correct all deficient items that are within the operator's level of maintenance and record all others on DA Form 2404.

#### PERFORMANCE MEASURES

1. Check instruments for normal engine operation.
2. Check clutch for drag, noise, chatter, grab, slippage, and clashing of gears.
3. Check steering for unusual free play, binding, wander or shimmy.
4. Check brakes for braking effect, feel, side pull, noise, and chatter.
5. Check transmission for unusual noise, vibration, stiffness, or tendency to slip out of gear.
6. Check winch for proper operation.
7. Check vehicle components; check for unusual noises in cab, body, wheels, exhaust system, powertrain and attachments. Tighten any loose assembly or mounting bolts.
8. Check engine oil and coolant level at halts. Add oil or coolant if necessary.

9. Check tires at halts for penetrating objects, objects between duals, and loss of air. Remove penetrating objects, objects between duals, add air, and tighten lug nuts if necessary.

#### REFERENCES

- FM 21-305, Manual for the Wheeled Vehicle Driver, C1, C2, 15 Apr 75, chap 2.
- TM 9-2320-209-10, Operator's Manual for 2½-Ton, 6 x 6, w/w, M44 Series Chassis, Truck, 8 Feb 65.
- TM 9-2320-211-10, Operator's Manual for Truck, Chassis: 5-Ton, 6 x 6, M39, 30 Nov 77.
- TM 9-2320-218-10, Operator's Manual for Truck, Utility: ¼-Ton, 10 Aug 78.
- TM 9-2320-260-10, Operator's Manual for Truck: 5-Ton, 6 x 6, M809 Series (Diesel): Truck, 30 Nov 77.
- TM 38-750, The Army Maintenance Management System (TAMMS), w/C1 thru 3, 15 May 78, chap 3.

# TASK

## 551-721-1009

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### Perform After-Operation Maintenance

---

#### CONDITIONS

Task will normally be performed in a field condition or in garrison by all vehicle operators without direct supervision or assistance and under all weather conditions. Necessary items of equipment are: vehicle, applicable vehicle TM, BII (basic issue items), DA Form 2404, logbook, and pen or pencil.

#### STANDARDS

You must correct all deficient items that are within operator's level of maintenance, and record all others on DA Form 2404.

#### PERFORMANCE MEASURES

1. Visually check general condition of vehicle.
2. Remove all penetrating objects from tires, gage tires and correct if required.
3. Visually check under vehicle for coolant, engine oil, fuel, gear oil, or brake fluid leaks.
4. Visually check fuel tanks for contamination and fuel level. Insure fuel strainer in filler necks is clean. Drain and/or fill as required.
5. Check coolant level in surge tank radiator; fill as required. Check hoses.
6. Check engine oil for contamination and level. Drain and/or fill as required.
7. Check belts, lines, covers, connections, and linkage for apparent damage. Check alternator and starter for mounting condition and secureness of wires and cables.
8. Insure that all manuals, lubrication orders, and forms are with vehicle. Insure that logbook entries are correct and up-to-date.
9. Check operation of handbrake to insure that it can be applied and released. Check handbrake level for adjustment; adjust as required.

10. Check for excessive heat in vehicle assemblies.
11. Drain air reservoirs.
12. Clean vehicle, fill fuel tank, stow and secure equipment, lubricate as required.

#### REFERENCES

FM 21-305, Manual for the Wheeled Vehicle Driver, C1, C2, 15 Apr 75, chap 2.

TM 9-2320-209-10, Operator's Manual for 2½-Ton, 6 x 6, W/W, M44 Series Chassis, Truck, 8 Feb 65.

TM 9-2320-211-210, Operator's Manual for Truck, Chassis: 5-Ton, 6 x 6, M39, 30 Nov 77.

TM 9-2320-218-10, Operator's Manual for Truck, Utility: ¼-Ton, 10 Aug 78.

TM 9-2320-260-10, Operator's Manual for Truck: 5-Ton, 6 x 6, M809 Series (Diesel): Truck, 30 Nov 77.

TM 38-750, The Army Maintenance Management System (TAMMS), w/C1 thru 3, 15 May 78, chap 3.



# TASK

## 551-721-1011

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### Drive Vehicle with Manual Transmission

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#### CONDITIONS

Task will normally be performed in a field condition or in garrison by all vehicle operators without direct supervision or assistance and under all weather conditions. Necessary item of equipment is a vehicle.

#### STANDARDS

You must operate vehicle in accordance with local traffic regulations, rules of the road, and safety factors outlined in the unit SOP. Vehicle must start moving and continue to move through all gears with a smooth fluid motion.

#### PERFORMANCE MEASURES

1. Start engine.
2. Warm engine to proper operating temperature.
3. Depress clutch pedal.
4. Shift into low gear (always when starting vehicle to move).
5. Check inside/outside rearview mirrors.
6. Check blind spots and give signals.
7. Release clutch pedal, pausing when it takes hold.
8. Recheck mirrors for traffic.
9. Release parking brake.
10. Release clutch pedal.
11. Depress accelerator.
12. If moving forward, continue to smoothly shift up using clutch and gearshift until last gear is engaged as appropriate.

#### REFERENCES

FM 21-305, Manual for the Wheeled Vehicle Driver, 15 Apr 75, C1 and 2, Chap 4.

**TASK****551-721-1012**

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**Park Vehicle Parallel**

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**CONDITIONS**

Task will normally be performed in a field condition or in garrison by all vehicle operators without direct supervision or assistance and under all weather conditions. Necessary item of equipment is a vehicle.

**STANDARDS**

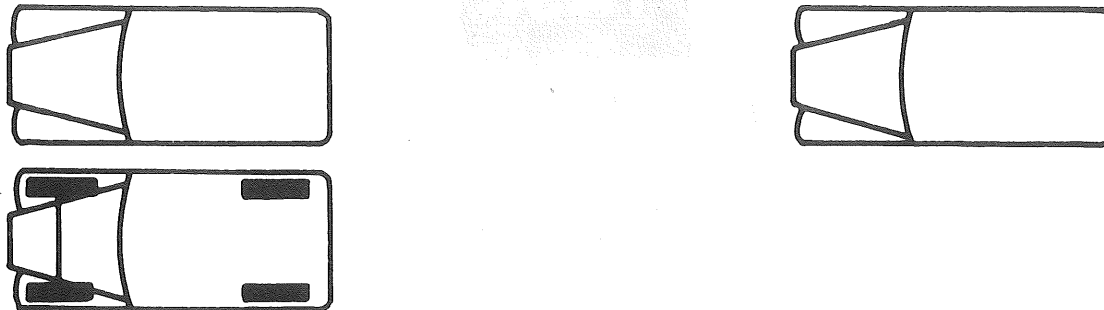
You must park vehicle so that front and rear wheels are an equal distance from the curb and no more than a foot from the curb.

**PERFORMANCE MEASURES**

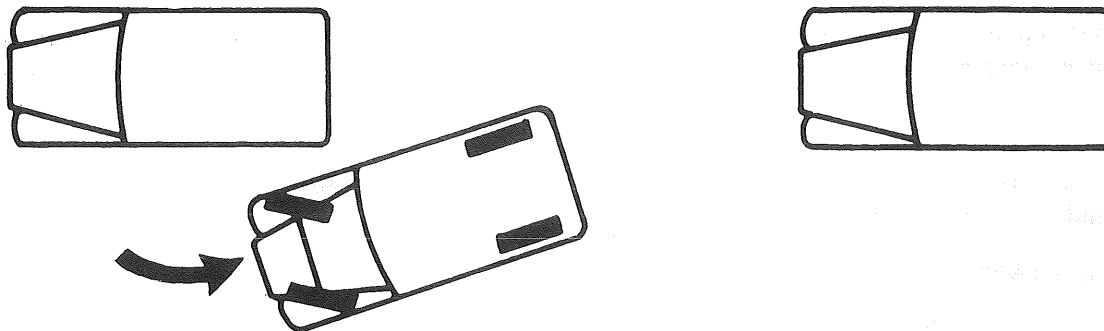
1. Select a large enough space.
2. Give hand signal for stopping.
3. Pull vehicle alongside vehicle in the space ahead of your intended space.
4. Back vehicle slowly.
5. Turn steering wheel to the right.
6. Back vehicle until about 45° angle to the curb.
7. Straighten front wheels.

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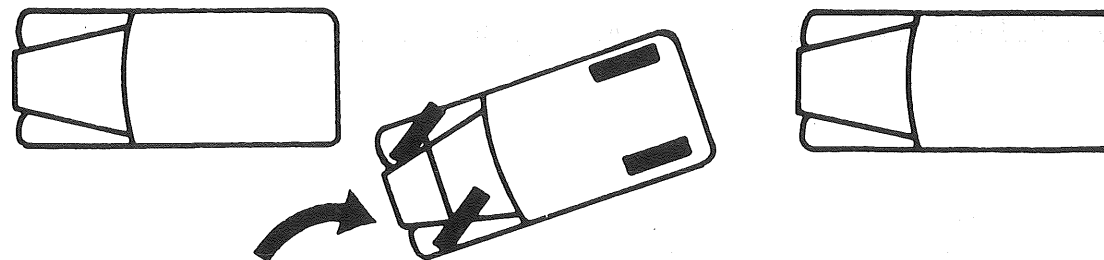
8. Turn steering wheel hard to the left.
9. Back slowly into the space.
10. Divide space equally.
11. Turn off engine.
12. Set handbrake.
13. Place transmission shifting lever in reverse gear/automatic transmission to park.
14. Fasten locking devices.



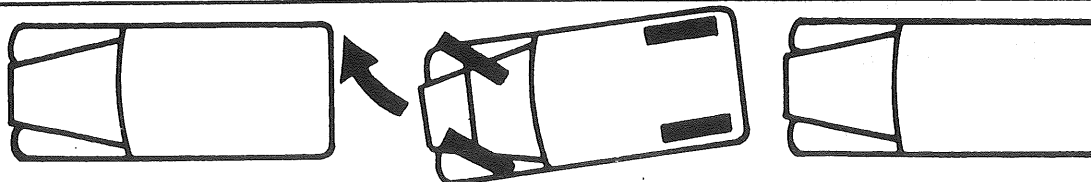
(a) LINE UP WITH CAR AHEAD.



(b) TURN WHEEL SHARPLY TO RIGHT.



(c) TURN WHEEL SHARPLY LEFT WHILE BACKING.



(d) FINAL ALINEMENT.

Parking parallel to a curb.

REFERENCES

FM 21-305, Manual for the Wheeled Vehicle Driver, 15 Apr 75, C1 and 2, Chap 7.

**TASK****551-721-1015**

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**Drive Vehicle Off Road**

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**CONDITIONS**

Task will normally be performed in a field condition through varying terrain, without direct supervision or assistance and under all weather conditions. Necessary items of equipment are a vehicle and basic issue items (BII).

**STANDARDS**

You must operate vehicle in a safe manner without damage to the vehicle and without getting stuck.

**PERFORMANCE MEASURES**

1. Negotiate vehicle through ditches.
2. Negotiate vehicle through gullies and ravines.
3. Negotiate vehicle through woods and rocky terrain.
4. Negotiate vehicle through streams (fording).
5. Negotiate vehicle through mud and swamps.

**REFERENCES**

FM 21-305, Manual for the Wheeled Vehicle Driver, 15 Apr 75, C1 and 2, chap 20.

# TASK

## 551-721-1016

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### Drive Vehicle in Motor March or Convoy

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#### CONDITIONS

Task will normally be performed in a field condition or in garrison, under the control of a convoy commander, and under all weather conditions, day or night. Necessary items of equipment are a vehicle and flashlight.

#### STANDARDS

Vehicle must be operated in accordance with specific instructions issued by convoy commander. You must be able to receive and relay hand signals.

#### PERFORMANCE MEASURES

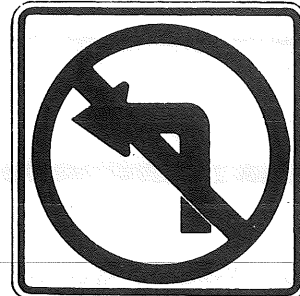
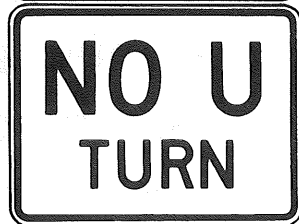
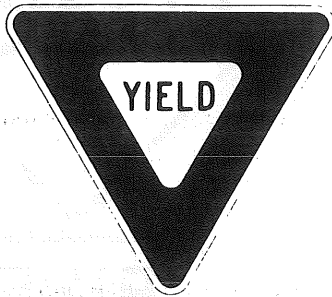
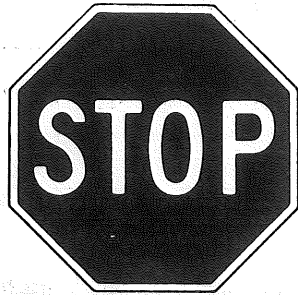
1. Utilize the speedometer multiplier as prescribed by the convoy commander in order to maintain proper vehicle interval unless designated by civil authorities.
2. Receive and relay signals used in convoy operations both day and night.
3. Recognize and obey highway warning and regulatory signs.

#### REFERENCES

FM 21-305, Manual for the Wheeled Vehicle Driver, 15 Apr 75, C1 and 2, chap 1.

FM 55-31, Army Motor Transport Units, 1 Jun 72, app K.

# REGULATORY SIGNS



International traffic signs

## REGULATORY SIGNS



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THE TWO SIGNS SHOWN HERE WILL APPEAR WHERE BICYCLES ARE RESTRICTED FROM ROADWAYS AND WHERE SEPARATE PATHS FOR BICYCLES ARE PROVIDED. A GUIDE SIGN, WITH THE BICYCLE SYMBOL, IS ALSO BEING USED TO DIRECT BICYCLISTS TO PERMISSIBLE ROUTES.

International traffic signs

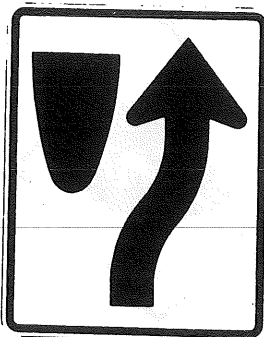
# REGULATORY SIGNS



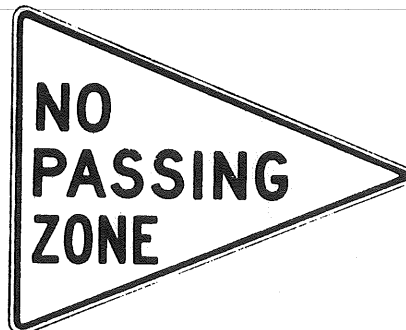
**NO RIGHT  
TURN**



**NO  
TRUCKS**



**KEEP  
RIGHT**



International traffic signs



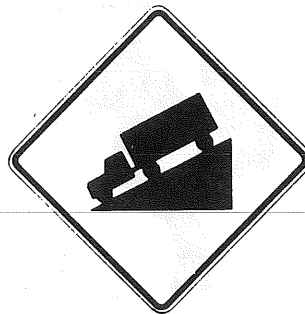
# WARNING SIGNS



SCHOOL CROSSING

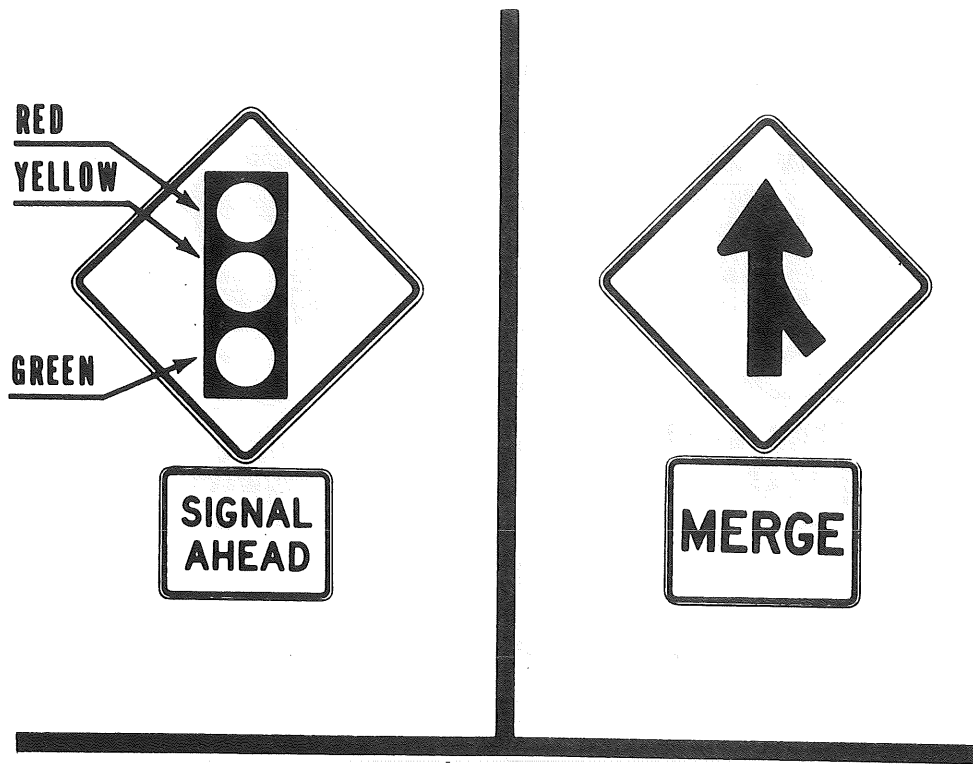


PEDESTRIAN CROSSING



International traffic signs

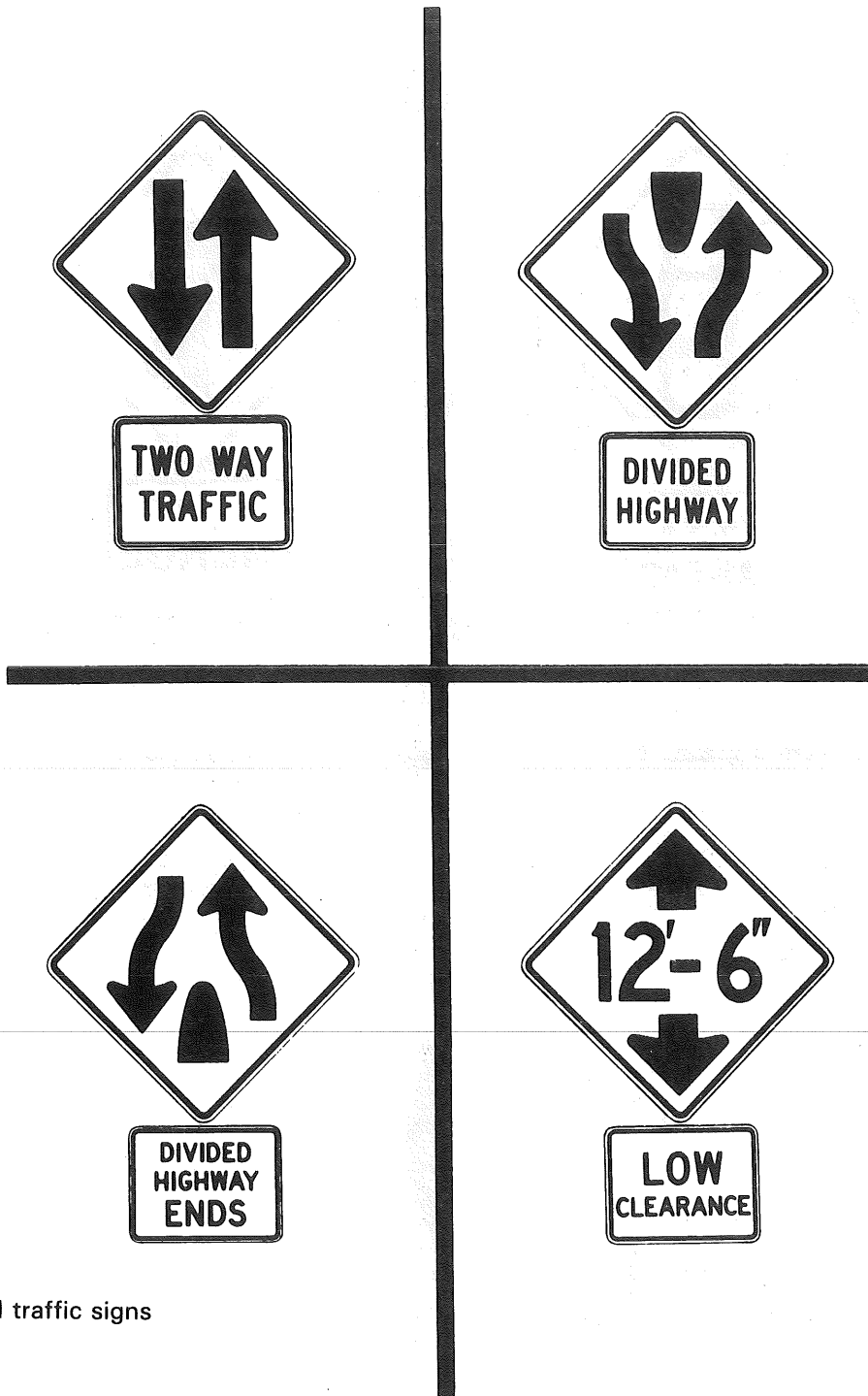
# WARNING SIGNS



International traffic signs

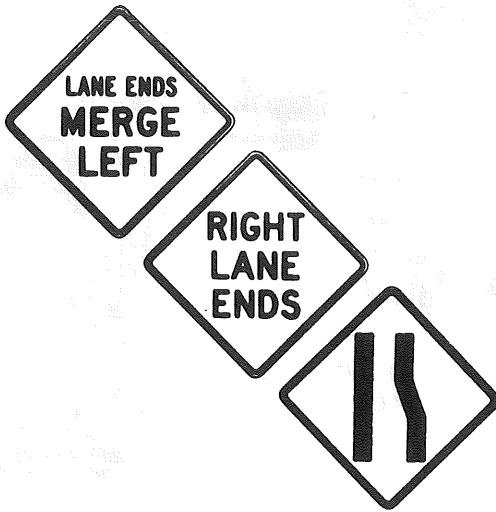
SCHOOL

# WARNING SIGNS

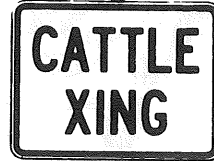


International traffic signs

# WARNING SIGNS



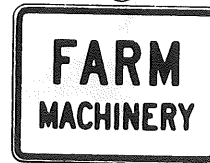
RIGHT LANE ENDS



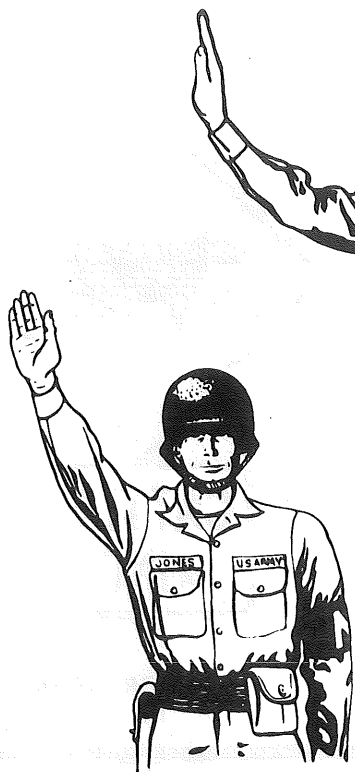
CATTLE CROSSING



DEER CROSSING



International traffic signs



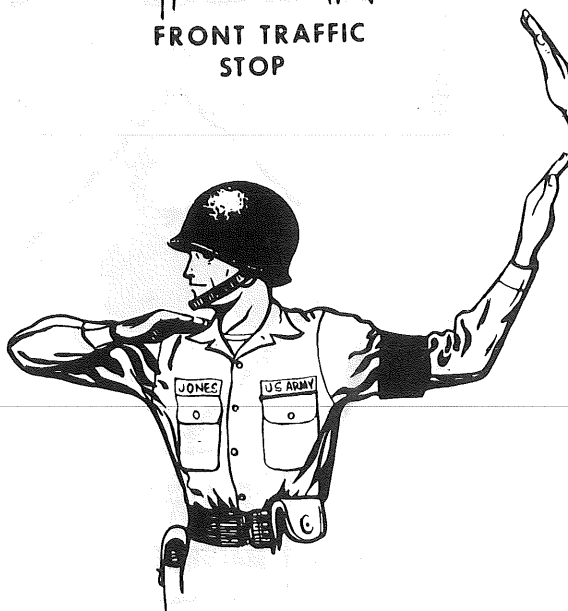
FRONT TRAFFIC STOP



LEFT AND RIGHT TRAFFIC STOP



REAR TRAFFIC STOP

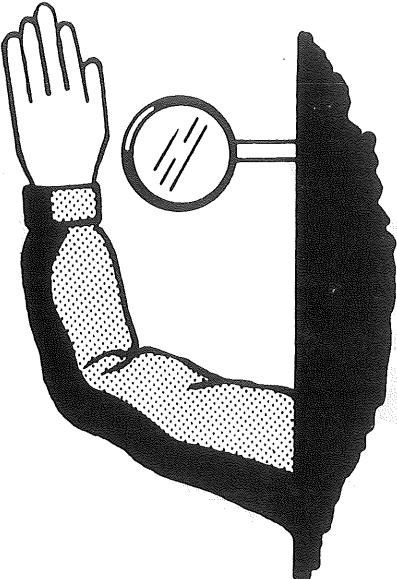


TRAFFIC FROM RIGHT GO

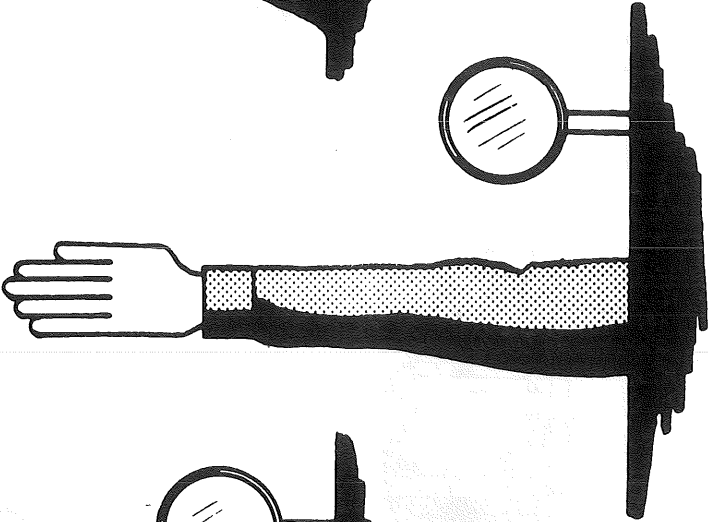


TRAFFIC FROM LEFT GO

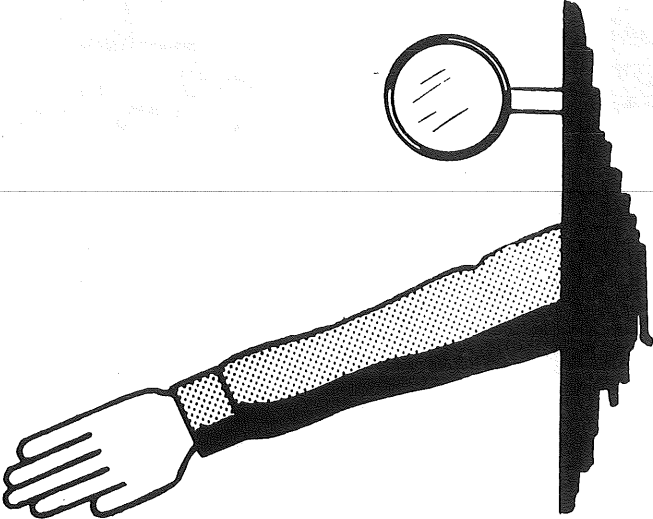
Signals given by traffic control personnel



RIGHT  
TURN



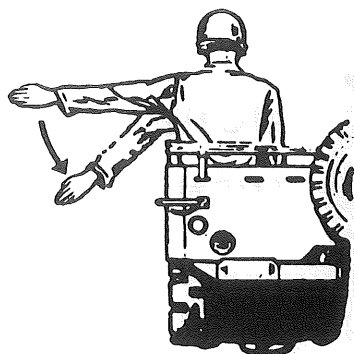
LEFT  
TURN



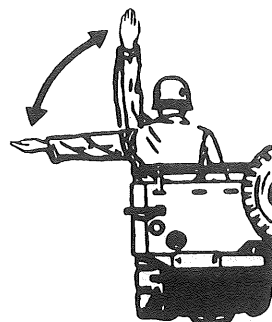
STOP  
OR  
SLOW

Driver hand signals

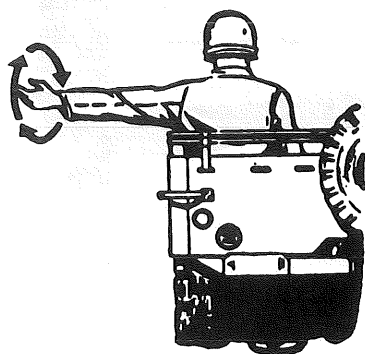
SKILL LEVEL 1



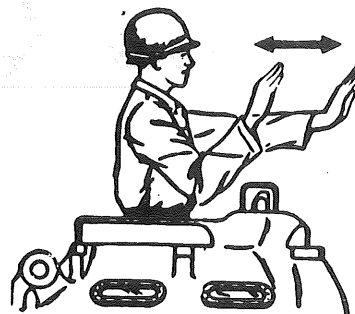
1. Open up (extend distance between vehicles.) Extend left arm horizontally to the side, palm to the front, then move arm downward to an angle  $45^{\circ}$  below horizontal. Repeat several times.



2. Close up. Extend the left arm sideward to the horizontal, palm up, and raise it to the vertical. Repeat several times.



3. Pass and keep going. Extend left arm horizontally to the side, palm to the front, and describe large circles to the front by rotating arm clockwise from the elbow.



4. Move in reverse. Face the unit being signaled and raise hand to shoulder level in front of the body, palm to the front; extend arm forward to the full extent in a pushing motion, keeping the palm to the front.

Convoy signals given from a vehicle



A. ATTENTION



B. ASSEMBLE



C. READY



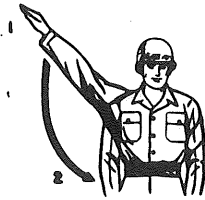
D. FORWARD; OR TO THE REAR (VEHICLES OR INDIVIDUALS TURN SIMULTANEOUSLY)



COLUMN



E. MOUNT



F. DISMOUNT



G. START ENGINE(S); OR PREPARE TO MOVE



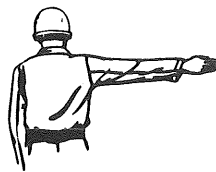
H. STOP ENGINE(S)



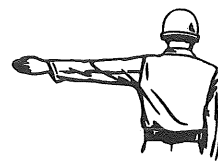
I. INCREASE SPEED; OR DOUBLE TIME; OR RUSH



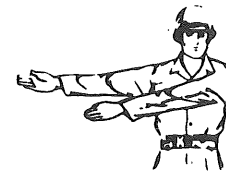
J. DECREASE SPEED (VEHICLES)



K. RIGHT TURN; OR COLUMN LEFT



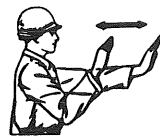
L. LEFT TURN; OR COLUMN LEFT



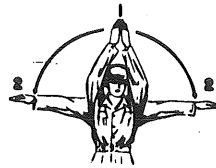
BY THE RIGHT (LEFT) FLANK



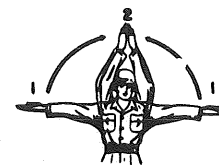
M. MOVE AHEAD OR JOIN ME; OR FOLLOW ME



N. MOVE IN REVERSE



O. EXTEND (FROM TURRET, GROUND, OR OPEN VEHICLE)



P. CLOSE UP (FROM TURRET, GROUND OR OPEN VEHICLE)



Q. HALT; OR STOP



R. CLOSE UP AND STOP



S. DISREGARD PREVIOUS COMMAND; OR AS YOU WERE



T. VEHICLE OUT OF ACTION

Day motor march hand and arm signals



# TASK

## 551-721-1017

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### Utilize Vehicle Camouflage and Concealment

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#### CONDITIONS

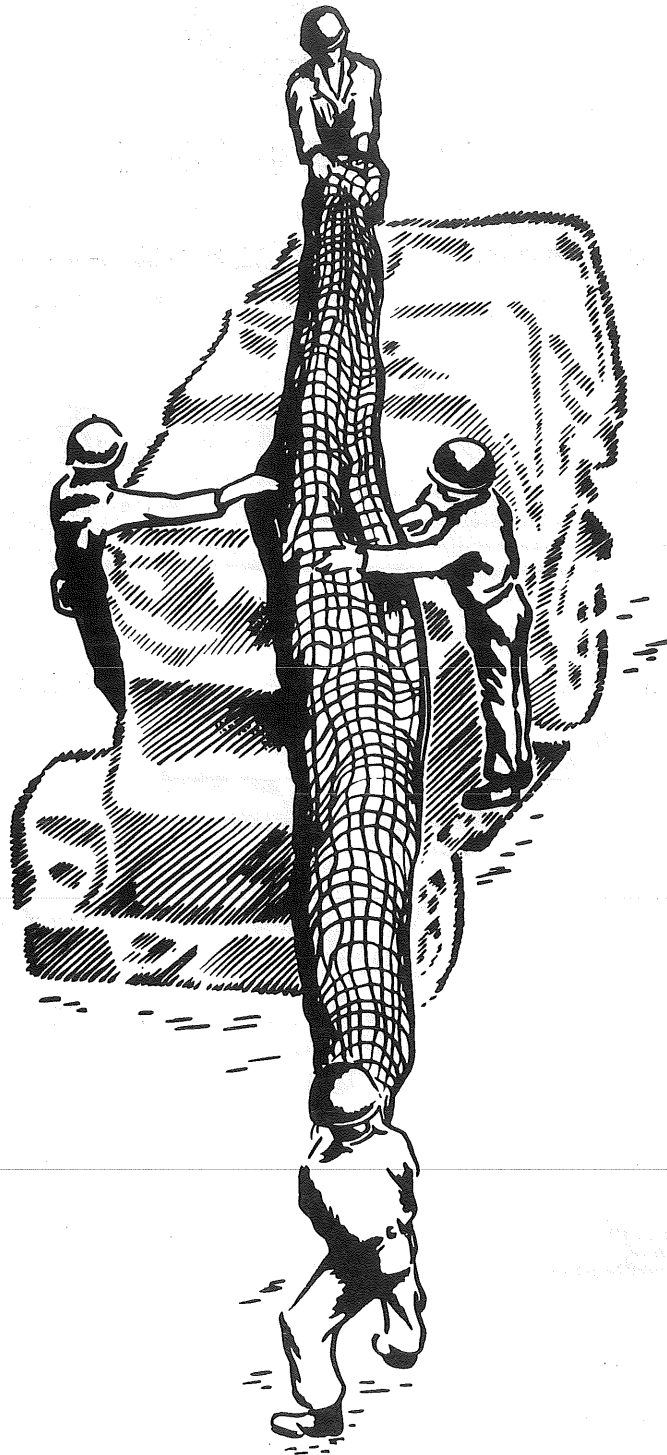
Task will normally be performed in a field condition under the supervision of a squad leader/platoon sergeant and with assistance from at least three individuals. It may be performed under all weather conditions, day or night. Necessary items of equipment are: vehicle, drape net, basic issue items (BII), burlap, and shelter halves.

#### STANDARDS

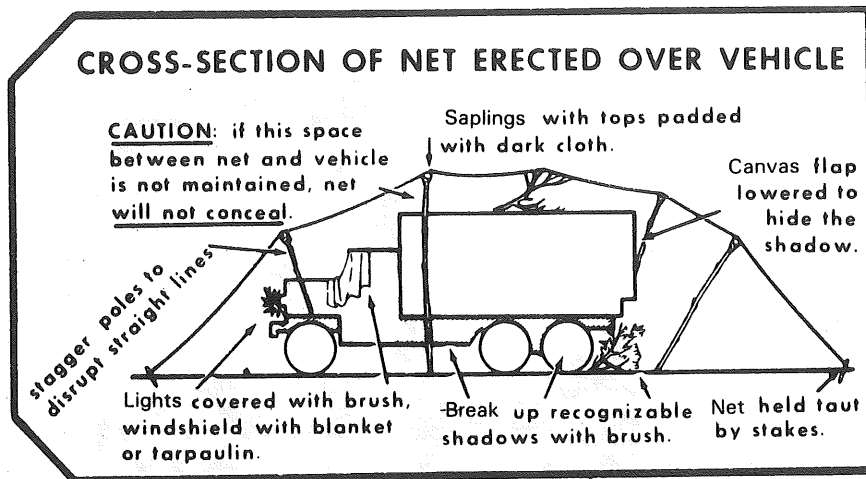
You must camouflage the vehicle to avoid detection from air/ground, using the procedures listed below.

#### PERFORMANCE MEASURES

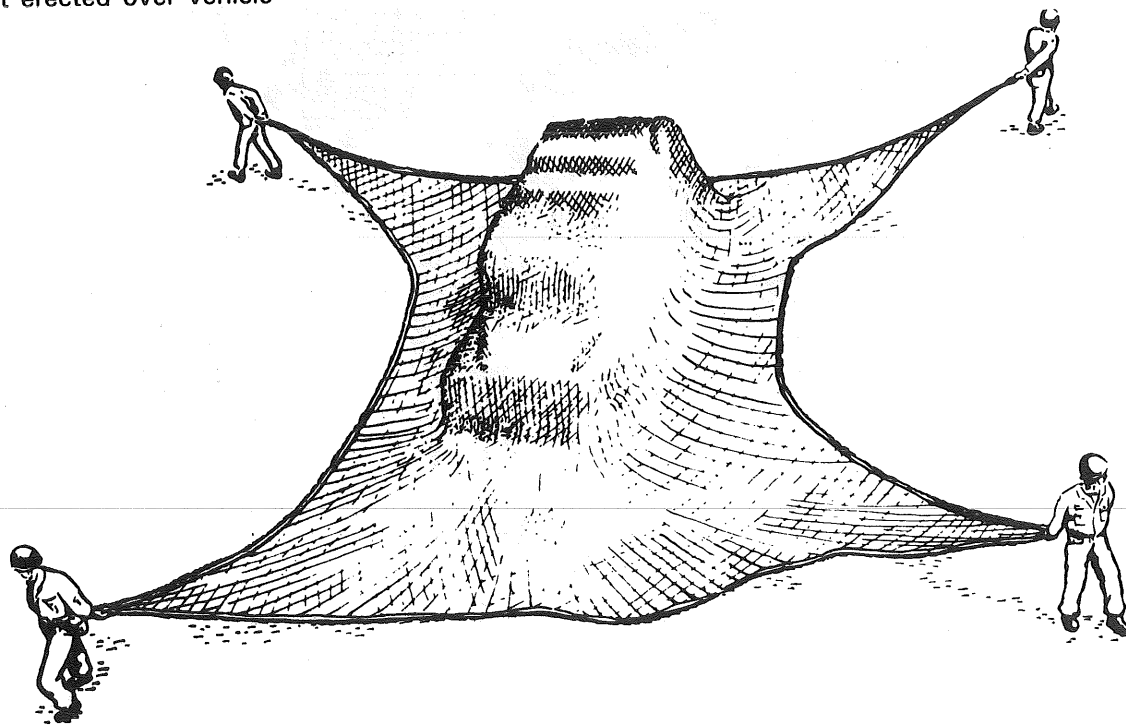
1. Place vehicle under natural vegetation.
2. Cover all vehicle parts that are likely to cast a reflection with natural or artificial material.
3. Assure color and texture blend with the surrounding area.
4. Brush and cover tracks of vehicles.
5. Avoid all visible movement when under enemy observation.
6. Utilize drape net for camouflage and concealment of vehicles as depicted in the following illustrations.



Drape net position diagonally over vehicle

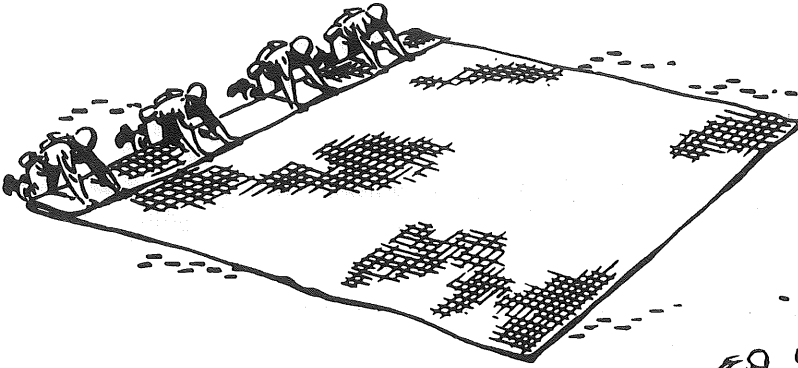


Net erected over vehicle

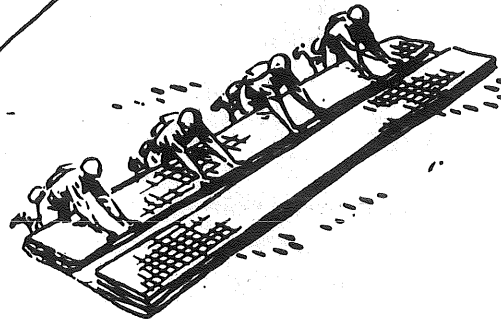


Placing and driving intermediate stakes along the edges of the drape net

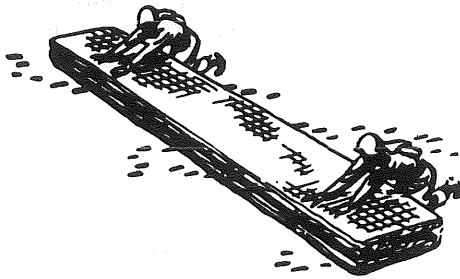
Step 1



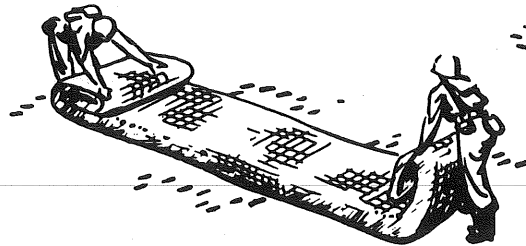
Step 2



Step 3



Step 4



Step 5



Net folding procedure

REFERENCES

FM 21-305, Manual for the Wheeled Vehicle Driver, 15 Apr 75, C1 and 2, Chap 26.

# TASK

## 551-721-1018

---

### Drive Vehicle Under Blackout Conditions

---

#### CONDITIONS

Task will normally be performed in a field condition without direct supervision or assistance, and under all weather conditions at night. Necessary item of equipment is a vehicle.

#### STANDARDS

You must move from one location to another under blackout conditions without causing damage to vehicle, injury to personnel, or without being detected by following the procedures listed below.

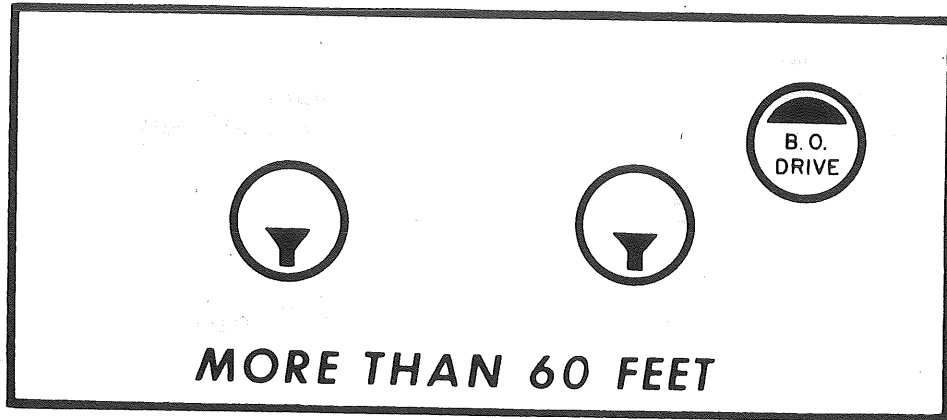
#### PERFORMANCE MEASURES

1. Insure blackout lights are operational.
2. Lower windshield.
3. Drive at reduced speed.
4. Observe the rear blackout lights of the vehicles ahead to maintain proper intervals (60 to 180 feet).

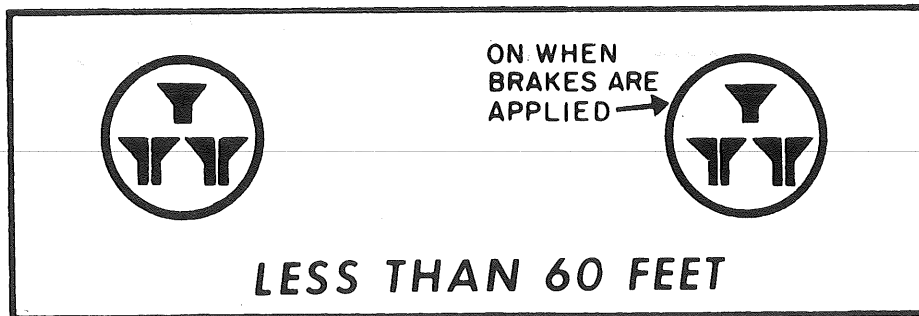
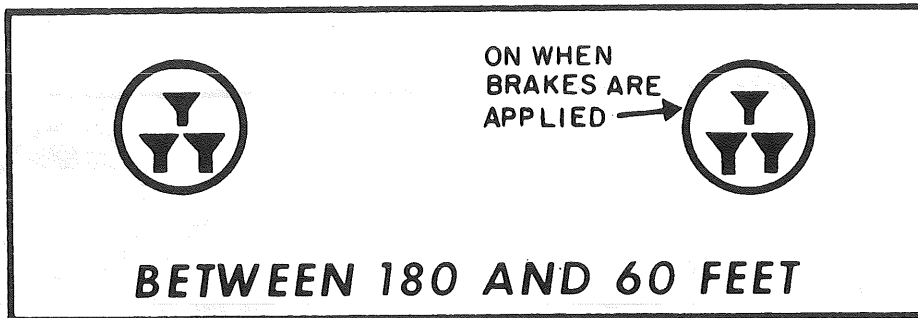
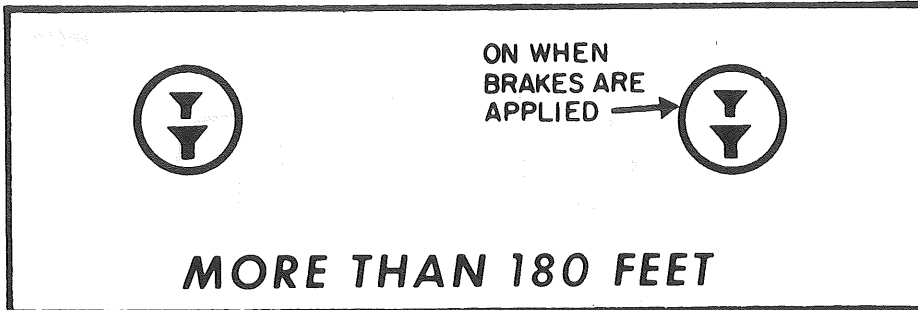
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#### REFERENCES

FM 21-305, Manual for the Wheeled Vehicle Driver, 15 Apr 75, C1 and 2, chap 26.



Front blackout marker lights



Rear blackout marker lights

**TASK****551-721-1020**

---

**Utilize Proper Defense Procedures  
When Ambushed or Attacked**

---

**CONDITIONS**

Task will be performed in a tactical field condition without direct supervision or assistance and under all weather conditions, day or night. Necessary items of equipment are a vehicle and a weapon.

**STANDARDS**

You must take immediate action in response to the given situation, following the applicable steps below.

**PERFORMANCE MEASURES**

1. Maintain movement.
2. Attempt to drive out of the "kill zone."
3. If your vehicle becomes disabled, dismount and get on another vehicle still operating.
4. If unable to mount another vehicle, take cover and return fire on enemy.
5. If you have not entered the "kill zone," dismount and take up defensive position.
6. Comply with all instructions as directed by your supervisors.
7. Identify passive defense measures against attack or ambush.

**REFERENCES**

FM 21-305, Manual for the Wheeled Vehicle Driver, 15 Apr 75, C1 and 2, Chap 26.

TM 55-311, Motor Convoy Security in Stability Operations, 19 Aug 70, Chap 4.

TF 55-4303, The Hardened Vehicle Concept in Convoy Defense, 1972.



# TASK

## 551-721-1021

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### Take Passive Defense Measures Against Air Attacks

---

#### CONDITIONS

Task will normally be performed in a tactical field condition or in garrison without direct supervision or assistance. It may be performed under all weather conditions, day or night. Necessary items of equipment are: vehicle, basic issue items (BII), blankets, burlap, and shelter half.

#### STANDARDS

You must be able to successfully avoid detection of position from the air.

#### PERFORMANCE MEASURES

1. Place vehicle under natural vegetation.
2. Cover all vehicle parts that are likely to cast a reflection with natural or artificial material.
3. Assure color and texture blend with the surrounding area.
4. Brush and cover tracks of vehicles.
5. Avoid all visible movement when under enemy observation.

#### REFERENCES

FM 21-305, Manual for the Wheeled Vehicle Driver, 15 Apr 75, C1 and 2, Chap 26.

FM 55-31, Army Motor Transport Units, 1 Jun 72, app H.

**TASK****551-721-1028**

---

**Perform Vehicle Self-Recovery Using Winch**

---

**CONDITIONS**

Task will normally be performed in a field condition without direct supervision or assistance and under all weather conditions. Necessary items of equipment are: vehicle with winch, tow chain, snatch block, and suitable anchor.

**STANDARDS**

You must recover vehicle without causing damage to the vehicle or injury to personnel, using the following procedures.

**PERFORMANCE MEASURES**

1. Select or construct anchor.
  2. Attach snatch block to anchor with vehicle tow chain.
  3. Run winch cable through snatch block back.
  4. Place transmission shifting lever in neutral.
  5. Place transfer case in neutral.
  6. Start vehicle.
- 
7. Place power takeoff lever in low or high range.
  8. Take up cable slack gradually.
  9. Pull truck forward with its winch until vehicle is free.

**REFERENCES**

FM 20-22, Vehicle Recovery Operations, 30 Jul 70.

FM 21-305, Manual for the Wheeled Vehicle Driver, 15 Apr 75, C1 and 2, Chap 22.

TF 55-2348, The Motor Vehicle Driver--Traction Aids and the Winch, 1957.

# TASK

## 551-721-1029

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### Prepare Vehicle for Movement/Shipment

---

#### CONDITIONS

Task will normally be performed in a field condition or in garrison under general supervision of a squad leader/platoon sergeant and under all weather conditions. Necessary items of equipment are: vehicle, banding equipment, plywood, and basic issue items (BII).

#### STANDARDS

Procedures listed below must be completed in sequence.

#### PERFORMANCE MEASURES

1. Perform operator's maintenance.
2. Reduce vehicle's configuration in accordance with TM 55-310, chap 10.
3. Secure cargo and equipment on vehicle in accordance with TM 55-450-15.
4. Load vehicle on transporting source in accordance with TM 55-450-15.
5. Secure vehicle on transporting source.

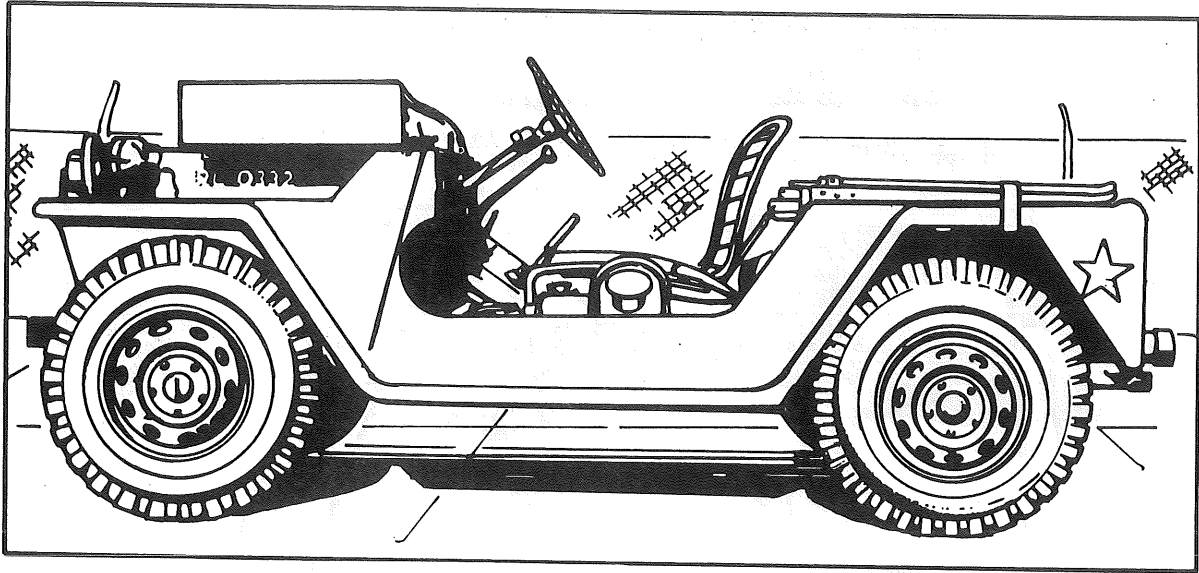
#### REFERENCES

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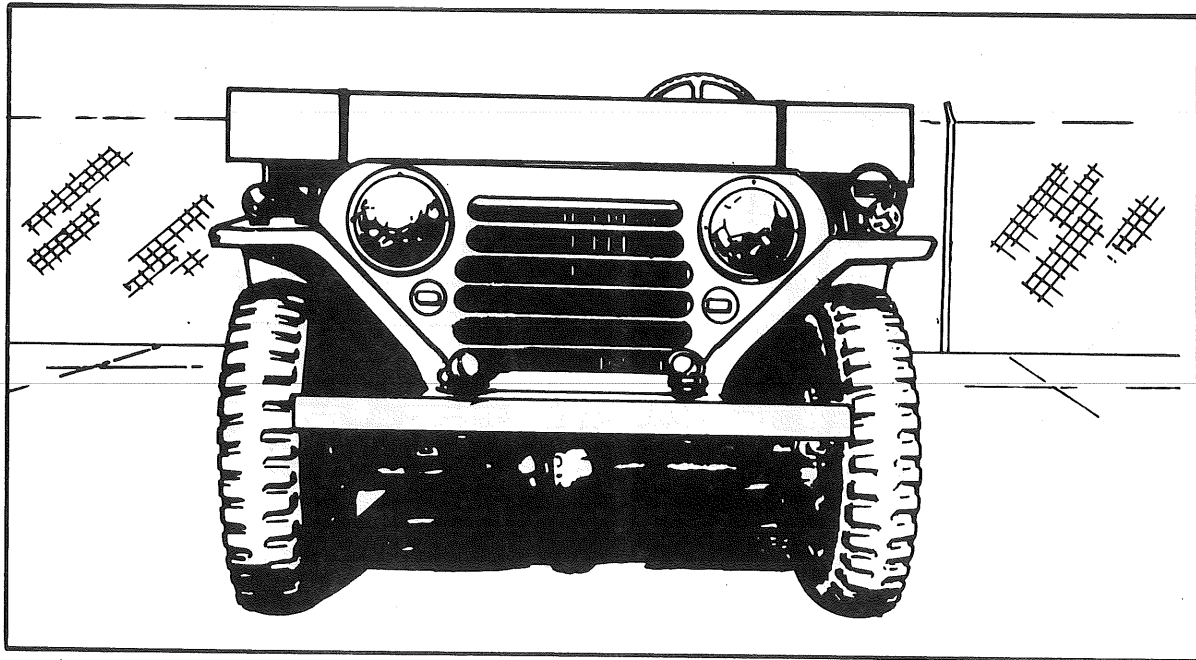
FM 55-15, Transportation Reference Data, 23 Feb 68, C1 thru 3.

TM 55-310, Motor Transport Operations, 14 Feb 69, C1 and 2, chap 10.

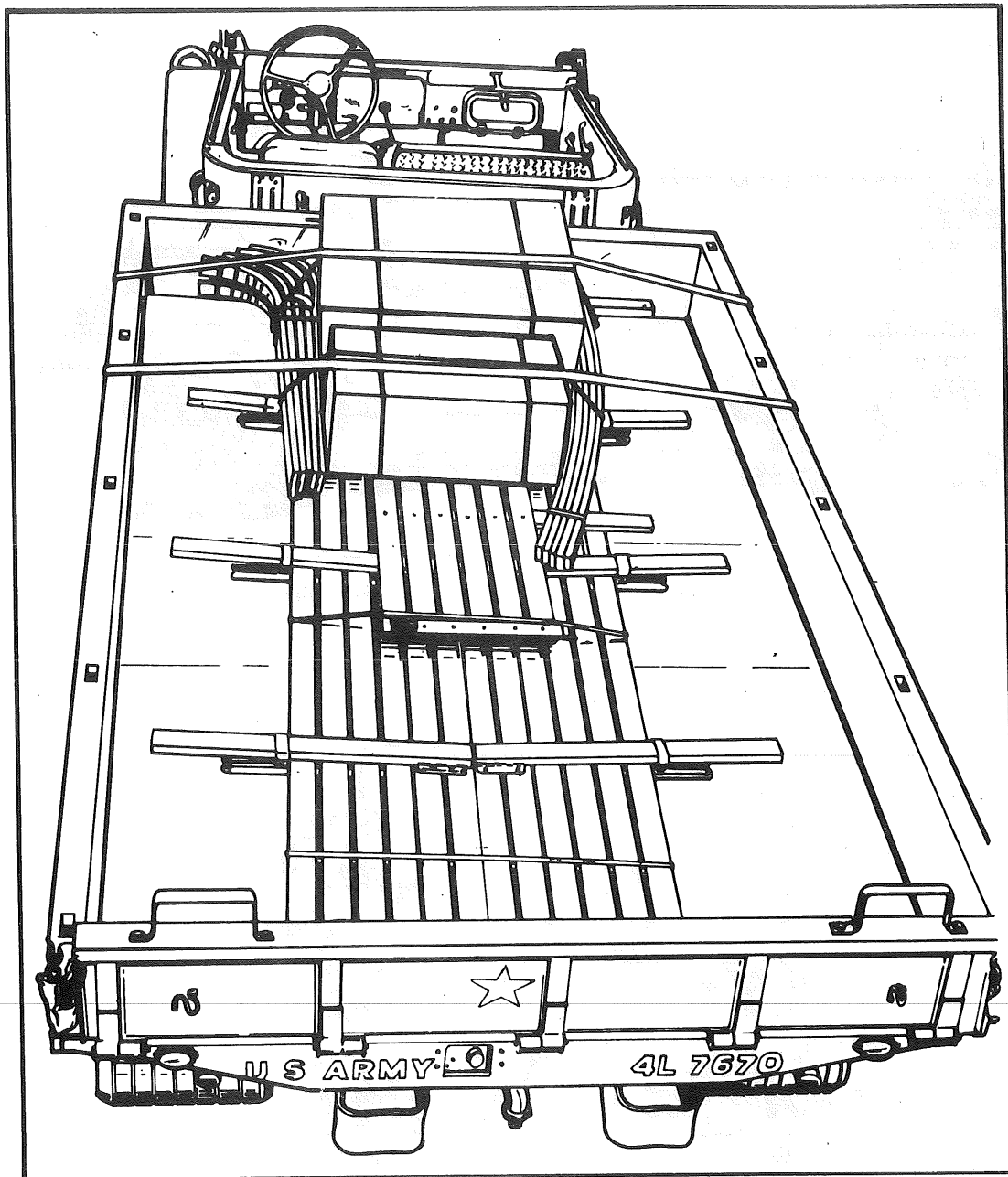
TM 55-450-15, Air Movement of Troops and Equipment (Nontactical), 4 Jun 71.



Truck, 1/4-ton, marked and equipment secured for shipment (side view).



Truck, 1/4-ton, marked and equipment secured for shipment (front view).



Truck, 2 1/2-ton, with equipment secured for shipment (rear view).

**TASK****551-721-1030**

---

**Fill Out SF 91 (Operator's Report of Motor Vehicle Accident)**

---

**CONDITIONS**

Task will normally be performed in a field condition or in garrison by all operators involved in a motor vehicle accident. Task may be performed without supervision or assistance under all weather conditions. Necessary items of equipment are: SF 91 and pen or pencil.

**STANDARDS**

You must complete all required portions of SF 91, utilizing steps below. All entries must be legible and detailed to give a clear picture of exactly what happened.

**PERFORMANCE MEASURES**

The following information is to be entered in appropriate sections on SF 91:

1. Department or agency.
2. Name and location of organization.
3. Operator involved in accident.
4. Time and place of accident.
5. Your vehicle.

---

6. Other vehicle and property involved in accident.
7. Persons injured.
8. Occupants in your vehicle.
9. Occupants in other vehicle.

10. Witnesses and police.
11. The accident.
12. Events after accident.
13. Other vehicle and property.
14. Diagram of how accident happened.
15. Operator's statement of accident and use of safety equipment.
16. Signature of operator.
17. Date SF 91 prepared.

**REFERENCES**

FM 21-305, Manual for the Wheeled Vehicle Driver, C1, C2, 15 Apr 75, chap 19.

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THIS FORM TO BE FILLED OUT BY THE GOVERNMENT OPERATOR AT THE TIME AND AT THE SCENE OF THE ACCIDENT, INsofar AS POSSIBLE.		OPERATOR'S REPORT OF MOTOR-VEHICLE ACCIDENT		
DEPARTMENT OR AGENCY <b>DEPARTMENT OF THE ARMY</b>				
NAME AND LOCATION OF ORGANIZATION TO WHICH YOU ARE ASSIGNED <b>12TH TRANSPORTATION COMPANY (MDM TRK), APO46</b>				
I OPERATOR	PLEASE PRINT FULL NAME (Last, First Middle Initial) <b>BOWMAN, JOHN R.</b>	AGE <b>21</b>	RANK, RATING, OR TITLE <b>E3</b>	
	SERVICE NUMBER OR SOCIAL SECURITY NUMBER <b>SSN 219-02-7504</b>	OPERATOR'S GOV. PERMIT NUMBER <b>USA-17-74</b>		
	HOME ADDRESS (Street, city, State, ZIP Code) <b>213 PENNIMAN RD, WILLIAMSBURG VA 23185</b>	TELEPHONE (Home) <b>220-0071</b>		
II TIME AND PLACE	DATE AND DAY OF WEEK OF ACCIDENT <b>1 APRIL 1975 MONDAY</b>	TIME <b>1045 HRS</b>	HOURS ON DUTY PRIOR TO ACCIDENT <b>3</b>	
	PLACE OF ACCIDENT (If accident in city, street and number, and State: If outside city limits, indicate mileage to nearest city or other landmark) <b>1 MILE SOUTH OF PANZER KASERNE AT JUNCTION OF RT 14 AND ROMER STR</b>			
	FROM WHAT PLACE TO WHAT PLACE WERE YOU BOUND <b>PANZER KASERNE TO PATCH BARRACKS</b>			
	FOR WHAT PURPOSE <b>SUPPLY RUN</b>			
III YOUR VEHICLE	MAKE <b>M35A1, 2 1/2-TON 6X6</b>	TYPE <b>CARGO</b>	REGISTRATION NUMBER OR OTHER IDENTIFICATION <b>4C3282</b>	
	PARTS OF VEHICLE DAMAGED (Describe) <b>LEFT REAR TIRE CUT</b>		OPERATOR'S ESTIMATED AMOUNT OF DAMAGE <b>\$ 65.</b>	
	IF THIS IS A BACKING ACCIDENT, WAS GUIDE AVAILABLE? <input type="checkbox"/> YES <input type="checkbox"/> NO IF AVAILABLE, WAS GUIDE USED? <input type="checkbox"/> YES <input type="checkbox"/> NO <b>N/A</b>			
IV OTHER VEHICLE AND PROPERTY (For additional vehicles see page 1)	MAKE <b>FORD</b>	TYPE <b>4-DR SEDAN</b>	YEAR <b>1975</b>	
	OPERATOR'S STATE PERMIT NUMBER <b>NY897963-USAREUR 0920Z</b>	VEHICLE LICENSE NUMBER, AND STATE <b>S-4434 (USAREUR)</b>		
	OPERATED BY (Name) <b>SP5 WILLIAM R. ESTER</b>	VEHICLE OWNED BY <b>WILLIAM R. ESTER</b>		
	OPERATOR'S HOME ADDRESS (Street, city, State, ZIP Code) <b>APT 8A5 BOEBLINGEN, GER APO46</b>	OWNER'S ADDRESS (Street, city, State, ZIP Code) <b>APT 8A5 BOEBLINGEN, GER APO46</b>		
	PARTS OF VEHICLE DAMAGED (Describe) <b>LEFT FRONT FENDER AND BUMPER LEFT FRONT HEADLIGHT BROKEN</b>		OPERATOR'S ESTIMATED AMOUNT OF DAMAGE <b>\$ 220.</b>	
	OTHER VEHICLE OR PROPERTY DAMAGED (Describe) <b>NONE</b>			

Standard Form 91  
Revised Nov 76

(91-107)

GENERAL SERVICES ADMINISTRATION  
FPMR 101-11.8

Example of Operator's Report of Motor Vehicle Accident



	NAMES	HOME ADDRESSES
V PERSONS INJURED	NONE	
VI OCCUPANTS IN YOUR VEHICLE	SFC LARRY V. WILLIAMS	12 <sup>TH</sup> TRANSPORTATION CO, APO 46
VII OCCUPANTS IN OTHER VEHICLE	NONE	
VIII WITNESSES AND POLICE	NONE	
	POLICE OFFICER PFC JACK L. BROWN	BADGE NO. MP
IX THE ACCIDENT	YOUR VEHICLE	OTHER VEHICLE
	DIRECTION OF TRAVEL SOUTH ON ROMER STR	DIRECTION OF TRAVEL EAST ON RT 14 TURNING INTO ROMER STR
	SIDE OF STREET OR HIGHWAY RIGHT	SIDE OF STREET OR HIGHWAY RIGHT CENTER
	APPROXIMATE SPEED (Miles per hour) STOPPED	APPROXIMATE SPEED (Miles per hour) 15 MPH
	CONDITION OF ROADWAY (Wet or dry, icy, etc.) WET	
	WEATHER (Clear, foggy, rain, snow, etc.) RAIN	TYPE OF ROADWAY (Concrete, macadam, etc.) STONE BLOCKS
	OTHER INFORMATION (Indicate stop signs, traffic lights, obstructions, etc.) STOP SIGN LOCATED ON ROMER STR AS INDICATED BY "X"	

Example of Operator's Report of Motor Vehicle Accident

I	IF MEDICAL AID RENDERED, STATE BY WHOM <b>NONE</b>	WHERE WAS INJURY TAKEN	
	CONDITION OF OTHER DRIVER <b>GOOD</b>		
	IF OTHER DRIVER OR PERSONS INJURED MADE STATEMENTS AS TO CAUSE OF ACCIDENT AND EXTENT OF PERSONAL OR PROPERTY DAMAGE, RELATE CONVERSATION AND NAMES AND ADDRESSES OF OTHERS HEARING SUCH STATEMENTS  <b>OTHER DRIVER MADE NO COMMENT ABOUT THE ACCIDENT EXCEPT TO SAY HE WAS INSURED BY THE ROCK INSURANCE COMPANY OF NEWPORT NEWS, VA.</b>		
II	MAKE	TYPE	YEAR
	OPERATOR'S STATE PERMIT NUMBER	VEHICLE LICENSE NUMBER	
	OPERATED BY	OWNED BY	
	ADDRESS (Home)	OWNER'S ADDRESS (Business)	
	PARTS OF VEHICLE DAMAGED (Describe)		
	OTHER PROPERTY DAMAGED (Describe) <b>NONE</b>		
<p><b>XII. INDICATE BY DIAGRAM BELOW WHAT HAPPENED:</b></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>1. Number Federal vehicle as 1—other vehicle as 2—additional vehicle as 3, and show direction of travel by arrow (Example → [1] [2] ←)</p> <p>2. Use solid line to show path before accident Broken line after accident</p> </div> <div style="width: 45%;"> <p>3. Show pedestrian by → ○</p> <p>4. Show railroad by ++++++</p> <p>5. Give names or numbers of streets or highways</p> <p>6. Indicate north by arrow in this circle</p> </div> </div>			

Example of Operator's Report of Motor Vehicle Accident

TELL IN YOUR OWN WAY HOW ACCIDENT HAPPENED

XIII  
OPERATOR'S STATEMENT OF ACCIDENT AND USE OF SAFETY EQUIPMENT

I WAS DRIVING SOUTH ON ROMER STR.,  
I STOPPED AT THE INTERSECTION OF  
RT 14 TO CHECK TRAFFIC. WHILE STILL  
HALTED I SAW A SEDAN APPROACHING  
FROM MY RIGHT ON RT 14. JUST BEFORE  
REACHING ROMER STR. THE SEDAN  
DRIVER GAVE A SIGNAL THAT HE WAS  
GOING TO TURN RIGHT INTO ROMER STR.  
AS HE MADE HIS TURN, HIS CAR SLIDE  
TO THE LEFT AND STRUCK THE LEFT  
REAR TIRE OF MY TRUCK

WAS VEHICLE EQUIPPED WITH SEAT BELTS?  YES  NO

IF YES, WERE THEY IN USE AT TIME OF ACCIDENT?  YES  NO

SIGNATURE OF OPERATOR

*John. P. Bowman*

*1 April 1975*

HAVE YOU ANSWERED ALL QUESTIONS AS COMPLETELY AS POSSIBLE?

Example of Operator's Report of Motor Vehicle Accident

**TASK****551-721-1031**

---

**Fill Out DD Form 518 (Accident Identification Card)**

---

**CONDITIONS**

Task will normally be performed in a field condition or garrison by all vehicle operators involved in an accident. Task may be performed under all weather conditions without supervision or assistance. Necessary items of equipment are: DD Form 518 and pen or pencil.

**STANDARDS**

You must complete all required portions of DD Form 518, utilizing steps listed below. All entries must be legible.

**PERFORMANCE MEASURES**

The following information is to be entered in appropriate blocks on DD Form 518.

1. Date of accident.
2. Make and type of vehicle.
3. Registration number.
4. Driver's name.
5. Social security number.
6. Grade.
7. Organization.

**REFERENCES**

FM 21-305, Manual for the Wheeled Vehicle Driver, C1, C2, 15 Apr 75, chap 19.

## ACCIDENT-IDENTIFICATION CARD

Any correspondence regarding accident should be addressed to:

COMMANDING GENERAL  
Ft Eustis, Virginia

### MAKE REFERENCE TO

DATE OF ACCIDENT

27 AUGUST, 1976

MAKE AND TYPE OF VEHICLE

2½ Ton 6X6 Cargo

REGISTRATION NO.

4C 3282

DRIVER (*Last name—first name—initial*)

BEVANS, BILLY J.

SERVICE NO.

SSN 211-01-0186

GRADE

PFC

ORGANIZATION

112th Trans Co

16-64501-1 GPO

**DD** FORM 518  
1 MAY 51

REPLACES WD AGO  
FORM 614, WHICH  
MAY BE USED.

Example of Accident Identification Card

**TASK****113-587-1001**

---

**Install Radio Set AN/PRC-77 or AN/PRC-25**

---

**CONDITIONS**

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. Radio Set AN/PRC-77(25).
2. TM 11-5820-667-12.
3. Handset H-189/GR.
4. Battery Dry BA-4386/PRC-25.

Supervision and assistance will be available.

**STANDARDS**

This task has been performed correctly when, in 3 minutes, the battery has been installed in the battery box and radio without causing damage to the battery or radio, the antenna is erected, handset is connected and the radio set is ready to be aligned and operated in accordance with performance measures 1 through 4.

**PERFORMANCE MEASURES**

1. Insert battery. (Refer to fig 1 and TM 11-5820-667-12, chap 2, para 2-4, p 2-2.)
  - a. Do not install Battery BA-4386 until you are certain air vent in battery box is operational. With valve depressed, air should pass from outside, and when valve is closed, air should not flow. Be sure to tighten the pressure test screw and the pressure relief valve prior to installing battery.

**SKILL LEVEL 1**

- b. When you place battery in battery box, DO NOT BREAK floating connector.
- c. Replace battery box and close latches.

**CAUTION:** Remove the battery when the equipment is not in use for more than 1 day.

- 2. Erect Antenna AT-892/PRC-25. Do not remove plastic locking device on threads of connector. (Refer to TM 11-5820-667-12, chap 2, para 2-6a, p 2-5.)
- 3. Erect Antenna AT-271A/PRC. (Refer to TM 11-5820-667-12, chap 2, para 2-6b, p 2-5.)

**WARNING:** When you install this antenna, be certain you have a clear overhead to avoid contact with electrical wires.

- 4. Attach Handset H-189/GR to either audio connector on radio.

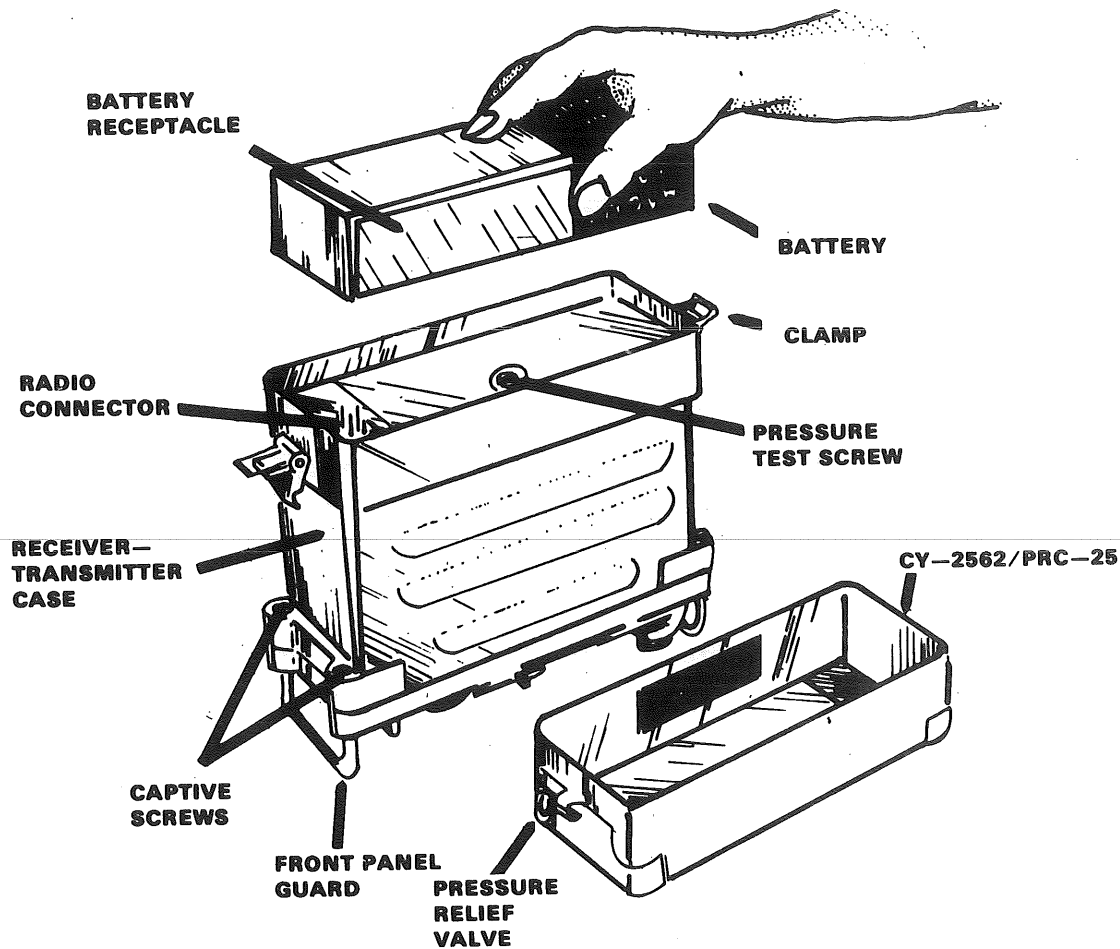


Figure 1. Installing Battery in Receiver-Transmitter.

REFERENCES

TM 11-5820-667-12, w/C1 thru 7, Operator's and Organizational Maintenance Manual: Radio Set AN/PRC-77 (Including Receiver-Transmitter, Radio RT-841/PRC-77), Jun 67.

TEC Lesson 201-113-4501-F, Preparation of Radio Set AN/PRC-77 for Operation, Part I, Installation.

Army Correspondence Course SS9 735 Operation of Radio Set AN/PRC-77 (SOJT).



# TASK

## 113-587-2001

---

### Operate Radio Set AN/PRC-77 or AN/PRC-25

---

#### CONDITIONS

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. Radio Set AN/PRC-77 or AN/PRC-25.
2. TM 11-5820-667-12 or TM 11-5820-398-12.
3. CEOI.

Supervision and assistance will be available.

#### STANDARDS

This task has been performed correctly when, in 3 minutes, the radio set has been aligned in accordance with the requirements in figure 1, and the radio set has been placed into and taken out of operation in accordance with performance measures 1 through 3.

#### PERFORMANCE MEASURES

1. Determine operating frequency from current CEOI.
2. Set frequency using megahertz (MHz) and kilohertz (kHz) tuning control knobs. (Refer to fig 1 and TM 11-5820-667-12, chap 3, para 3-2, pp 3-1 thru 3-4.)
3. Perform stopping procedures. (Refer to fig 1 and TM 11-5820-667-12, chap 3, para 3-5, p 3-5.)

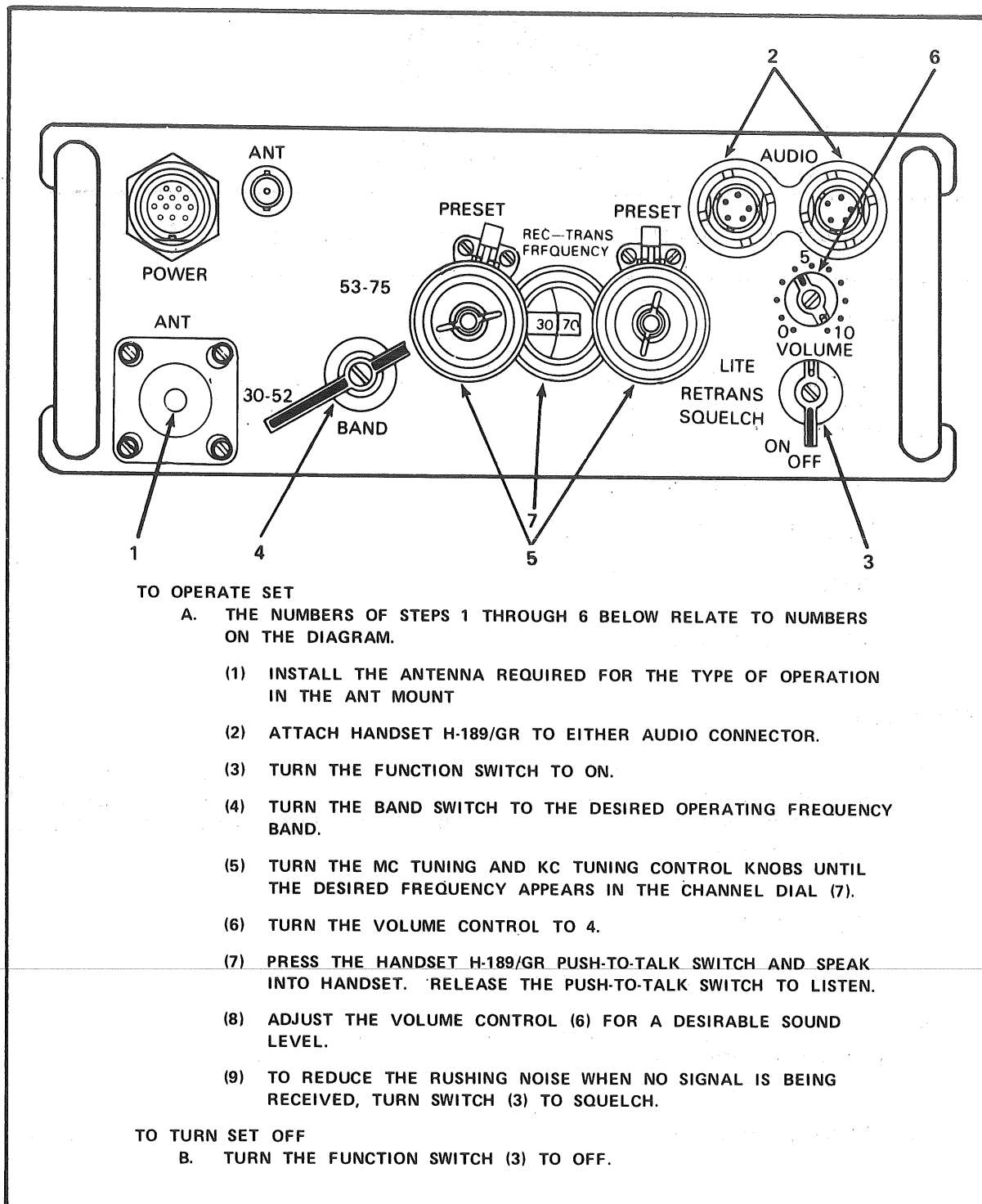


Figure 1. Condensed Operating Instructions for Radio Set AN/PRC-77.

## SKILL LEVEL 1

### REFERENCES

TM 11-5820-398-12, w/C1 thru 5, Operator's and Organizational Maintenance Manual (Including Repair parts and Special Tool Lists): Radio Set, AN/PRC-25 (Including Receiver-Transmitter, Radio, RT-505/PRC-25), Nov 65.

TM 11-5820-667-12, w/C1 thru 7, Operator's and Organizational Maintenance Manual: Radio Set AN/PRC-77 (Including Receiver-Transmitter, Radio RT-841/PRC-77), Jun 67.

TEC Lesson 201-113-4502-F, Preparation of Radio Set AN/PRC-77 for Operation, Part II, Operational Checks.

TEC Lesson 201-113-4503-F, Preparation of Radio Set AN/PRC-77 for Operation, Part III, PRE-SETS.

TEC Lesson 201-113-4545-A, Maintain Circuit Log and Operator's Number Sheet.

TEC Lesson 201-113-4550-E/A, Radiotelegraph Procedure, Part I, Calling and Answering.

TEC Lesson 201-113-4551-E/A, Radiotelegraph Procedure, Part II, Calling and Answering.

TEC Lesson 201-113-4552-E/A, Radiotelegraph Procedure, Establishing a Net.

TEC Lesson 201-113-4553-E/A, Radiotelegraph Procedure, Authentication.

TEC Lesson 201-113-4554-E/A, Radiotelegraph Procedure, Opening a Net.

TEC Lesson 201-113-4555-E/A, Radiotelegraph Procedure, Free and Directed Net.

TEC Lesson 201-113-4556-E/A, Radiotelegraph Procedure, Message Format, Part I.

TEC Lesson 201-113-4557-E/A, Radiotelegraph Procedure, Message Format, Part II.

Army Correspondence Course SSO 470, The CEOI.

Army Correspondence Course SS9 735, Operation of Radio Set AN/PRC-77 (SOJT).

**TASK****113-587-3001**

---

**Perform Operator's Preventive Maintenance on Radio Set AN/PRC-77 or AN/PRC-25**

---

**CONDITIONS**

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Your supervisor will provide you with:

1. AN/PRC-77 or AN/PRC-25.
2. Lint-free cloth.
3. Cleaning compound.
4. Battery BA-4386/U.
5. Equipment Inspection and Maintenance Worksheet (DA Form 2404).

Supervision and assistance are available.

**STANDARDS**

You must perform operator's preventive maintenance on Radio Set AN/PRC-77 or AN/PRC-25 and complete DA Form 2404 with no errors in accordance with performance measures 1 through 3 within 10 minutes.

**WARNING 1:** Remove battery when radio set is not to be used for one or more days.

**WARNING 2:** The fumes of Trichloroethane are toxic. Provide ventilation when used. Do not use near open flames, exposure converts the fumes to a highly toxic and dangerous gas.

**PERFORMANCE MEASURES**

1. Perform operator's daily preventive maintenance checks and services. (TM 11-5820-667-12, chap 4, para 4-4, p 4-2.)

- a. Check to see that the equipment is complete.
  - b. Remove dust, dirt, and moisture from channel window and equipment surface.
  - c. Check all controls.
  - d. Inspect battery for leakage, corrosion, and swelling.
  - e. Perform the steps in the operational checklist.
2. Perform operator's weekly preventive maintenance checks and services. (TM 11-5820-667-12, chap 4, para 4-5, p 4-2.)
    - a. Inspect the handset cord.
    - b. Inspect canvas.
    - c. Inspect antennas.
    - d. Inspect gasket on Battery Box CY-2562/PRC-25 for damage.
  3. Complete DA Form 2404. (TM 38-750, chap 3, para 3-4, p 3-4.)
    - a. Record faults that you, as an operator, cannot correct.
    - b. Submit completed DA Form 2404 to your team chief.

REFERENCES

TM 11-5820-667-12, w/C1 thru 7, Operator's and Organizational Maintenance Manual: Radio Set AN/PRC-77 (Including Receiver-Transmitter, Radio RT-841/PRC-77, Jun 67.

TM 38-750, w/C1 thru 3, The Army Maintenance Management System (TAMMS), May 78.

**TASK****113-587-1002**

---

**Install Radio Set AN/VRC-12**

---

**CONDITIONS**

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. Receiver-Transmitter RT-246/VRC.
2. Receiver R-442/VRC.
3. Antenna AS-1729/VRC.
4. Vehicle with mounts, antenna, and matching unit installed.
5. TM 11-5820-401-12.

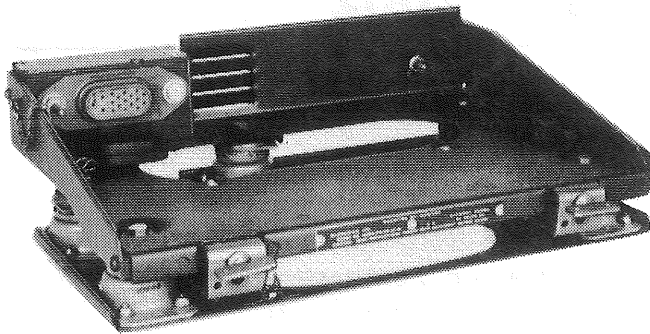
Supervision and assistance will be available.

**STANDARDS**

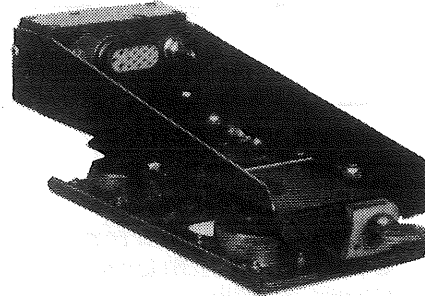
This task has been performed correctly when, in 10 minutes, the components of the radio are installed in their mounts without causing damage to the components or mounts, the antennas are erected, all cable connections are made and the radio is ready to be aligned and operated according to performance measures 1 through 7.

**PERFORMANCE MEASURES**

1. Insure POWER switches of Receiver-Transmitter RT-246/VRC and Receiver R-442/VRC are in the OFF position. (Refer to TM 11-5820-401-12, chap 2, sec II, para 2-5b, p 2-3.)
2. Clean surface of Mount MT-1029/VRC and MT-1898/VRC and remove electrical connector covers from radio receptacles. (Refer to fig 1, and TM 11-5820-401-12, chap 2, sec II, para 2-5a(6), para 2-6a, pp 2-3 and 2-4.)



A. MOUNTING MT-1029/VRC  
(FOR RECEIVER-TRANSMITTERS).

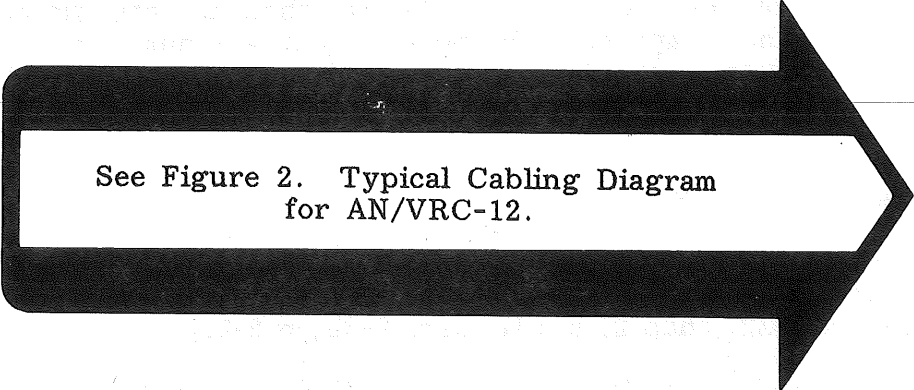


B. MOUNTING MT-1898/VRC  
(FOR R-442(\*)/VRC).

113-587-1002

Figure 1. Mountings MT-1029/VRC and MT-1898/VRC.

3. Check cabling of Radio Set AN/VRC-12. (Refer to fig 2, and TM 11-5820-401-12, chap 2, sec II, p 2-28, fig 2-20.)
  - a. Insure all cables are present.
  - b. Cable radio set major components.



AN VRC-12

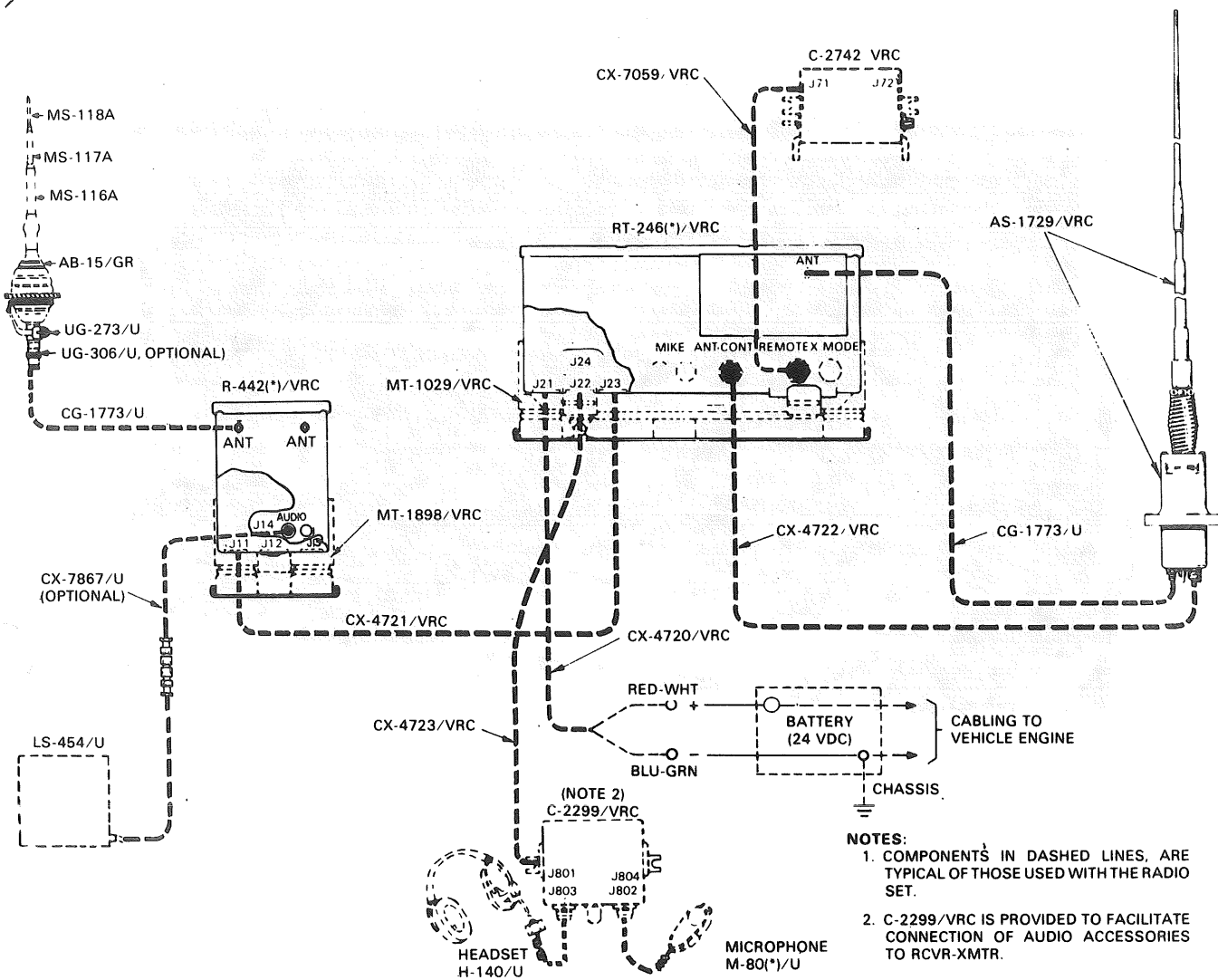


Figure 2. Typical Cabling Diagram for AN/VRC-12.

4. Insure RETRANS switch of Control, Radio Set C-2299/VRC is in the OFF position. (Refer to fig 2, and TM 11-5820-401-12, chap 3, sec II, para 3-12, pp 3-13 and 3-14.)



5. Insert receiver-transmitter and receiver into mounts. (Refer to figs 3 and 4, and TM 11-5820-401-12, chap 2, sec II, para 2-5b (1), 2-6a(1), pp 2-3 and 2-4.)

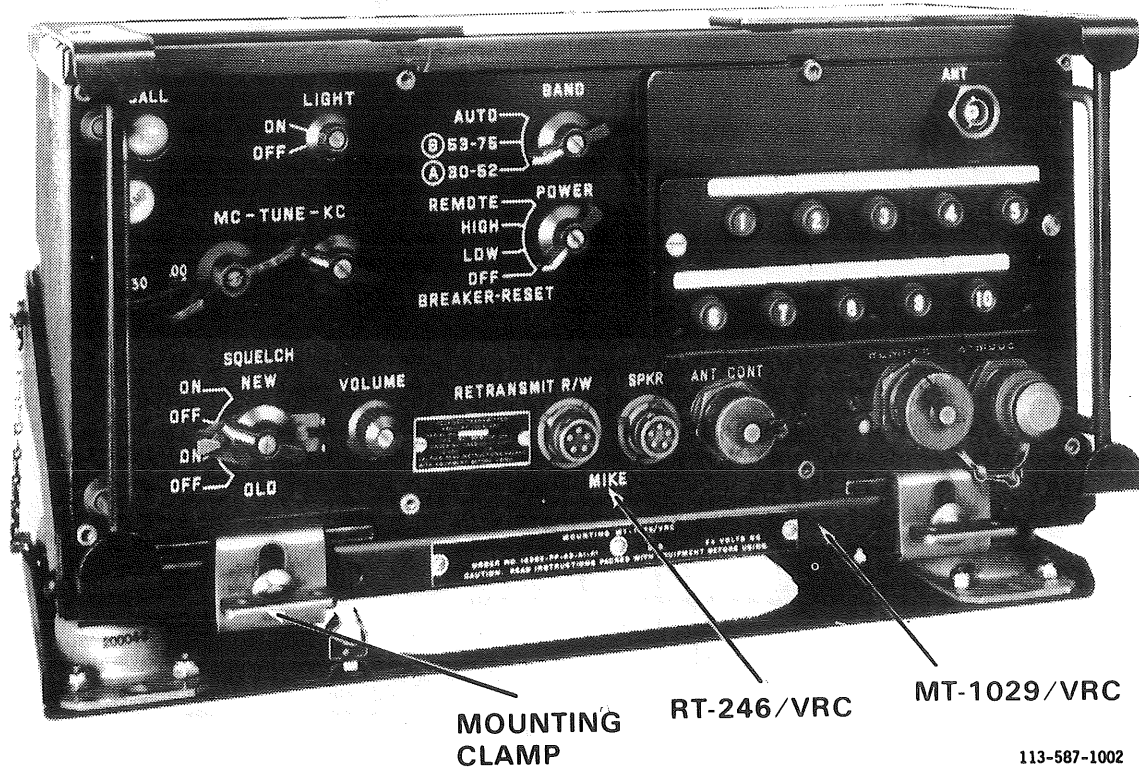


Figure 3. Receiver-Transmitter, Radio RT-246/VRC  
Installed on Mounting MT-1029/VRC.

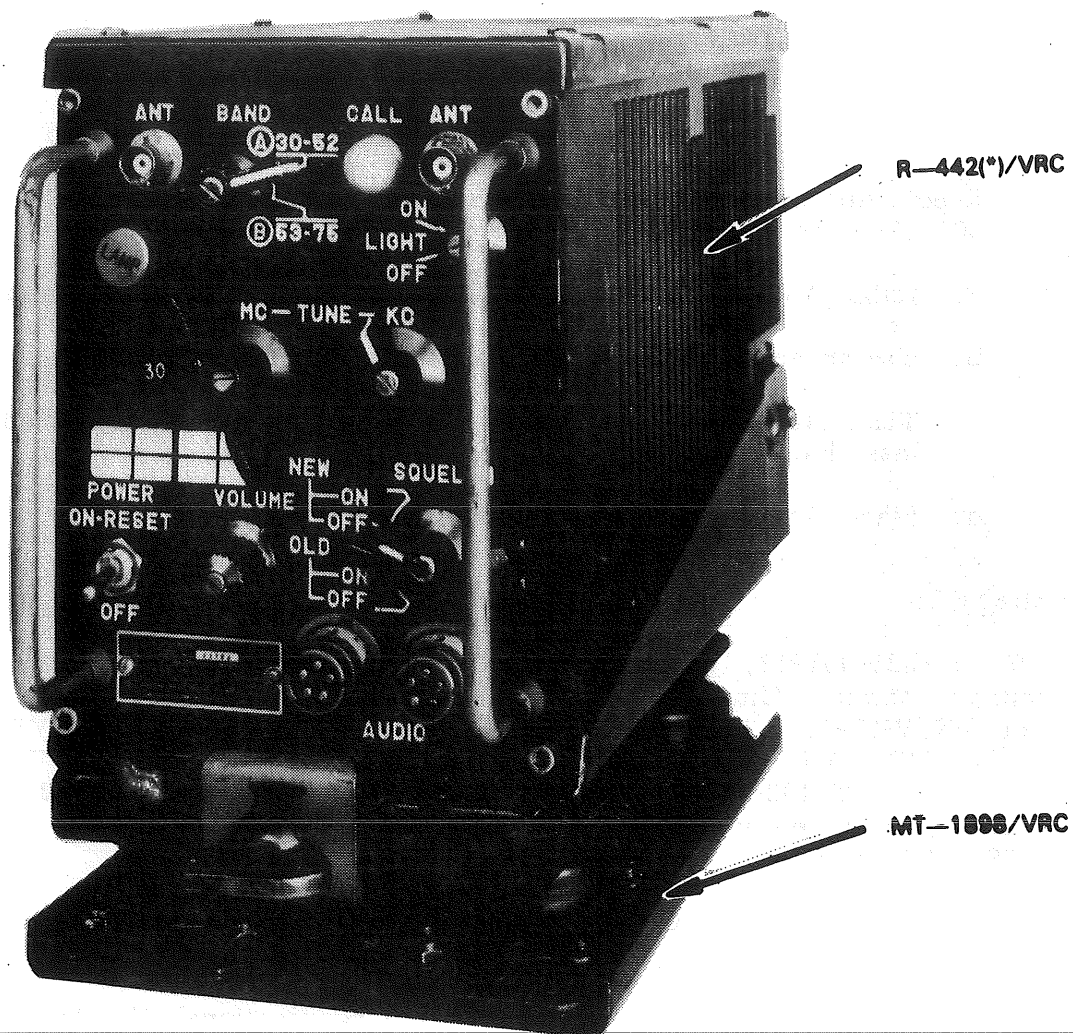


Figure 4. Receiver R-442(\*)/VRC, Installed on Mounting MT-1898/VRC.

- a. Tighten MOUNTING CLAMPS of MT-1029/VRC.
  - b. Tighten MOUNTING CLAMP of MT-1848/VRC.
6. Complete cabling of audio accessories. (Refer to fig 2, and TM 11-5820-401-12, chap 2, sec II, para 2-5b(2) thru (7), para 2-6a (2) thru (4), pp 2-3 and 2-4.)

7. Erect Antenna AS-1729/VRC. (Refer to fig 2, and TM 11-5820-401-12, chap 2, sec II, para 2-7, pp 2-5 thru 2-8.)
  - a. Cable Antenna AS-1729/VRC and auxiliary receiver antenna.
  - b. Use antenna tie-down assemblies to secure antennas.
  - c. Tie antenna down so that personnel are not endangered (not less than 9 feet vertical height).
  - d. Place antenna tip caps on antennas.

#### REFERENCES

TM 11-5820-401-12, w/C1 thru 3, Operator's and Organizational Maintenance Manual (Including Repair Parts and Special Tool List): Radio Set AN/VRC-12, AN/VRC-43, AN/VRC-44, AN/VRC-45, AN/VRC-46, AN/VRC-47, AN/VRC-48, AN/VRC-49, AN/VRC-54, and AN/VRC-55; Mounting RT-1029/VRC and MT-1898/VRC; Antenna AT-912/VRC; Control, Frequency Selector C-2742/VRC and Control, Radio Set C-2299/VRC, Sep 72.

Army Correspondence Course SSO 712, Organizational Maintenance of Radio Set AN/VRC-12.

Army Correspondence Course SS9 712, Organizational Maintenance of Radio Set AN/VRC-12 (SOJT).

TC 11-4, Handbook for AN/VRC-12 Series of Radio Set, Apr 77.

TC 11-6, Grounding Techniques, Sep 76.

# TASK

## 113-587-1004

### Install Radio Set AN/VRC-46

#### CONDITIONS

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. Radio Set AN/VRC-46.
2. Antenna AS-1729/VRC or Antenna AT-912/VRC.
3. M151 1/4-Ton Series Truck with mounts and matching unit installed.
4. TM 11-5820-401-12.

Supervision and assistance will be available.

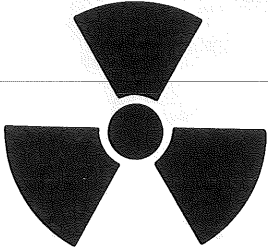
<p><b>WARNING</b></p> <p><b>RADIATION HAZARD</b></p>  <p><b>RADIOACTIVE MATERIAL</b></p> <p><b>CONTROLLED DISPOSAL REQUIRED</b></p> <p><b>ACCOUNTABILITY NOT REQUIRED</b></p>	Ammeter	Ra 226	0.59uCi	6625-00-569-0213	
	Audio level meter	Ra 226	0.69uCi	6625-00-669-0769	
	EEVC	Electron Tube	OA2WA	5960-00-503-4880	
	CBS Hytron	U 238	0.1uCi		
	Rattheon	Ni 63	0.5uCi		
		Co 60	0.2uCi		
		Electron Tube	5670	5960-00-188-6584	
	RCA	Th 232	0.07uCi		
	<p><b>Radiation Hazard Information:</b> The following radiation hazard information must be read and understood by all personnel before operating or repairing the AN/VRC-12, -43, -44, -45, -46, -47, -49 -54, and -55. Hazardous radioactive materials are present in the above listed components of the T-195A, B/GRC and the AN/VRC-24A. The components are potentially hazardous when broken. See qualified medical personnel and the local Radiological Protection Officer (RPO) immediately, if you are exposed to or cut by broken components. First aid instructions are contained in TB 43-0116, TB 43-0122, and AR 755-15.</p> <p><b>NEVER</b> place radioactive components in your pocket.</p> <p>Use extreme care <b>NOT</b> to break radioactive components while handling them.</p> <p><b>NEVER</b> remove radioactive components from cartons until you are ready to use them.</p>				
	<p>If any of these components are broken, notify the local RPO immediately. The RPO will survey the immediate area for radiological contamination and will supervise the removal of broken components.</p> <p>The above listed radioactive components will not be repaired or disassembled.</p> <p>Disposal of broken, unserviceable, or unwanted radioactive components will be accomplished in accordance with the instructions in AR 755-15.</p>				

Figure 1. Radiation Warning Hazard Label.

STANDARDS

This task has been performed correctly when, in 5 minutes, the radio is installed in its mount without causing damage to the radio or mount, the antenna is erected, all cable connections are made, and the radio set is ready to be aligned and operated in accordance with performance measures 1 through 6.

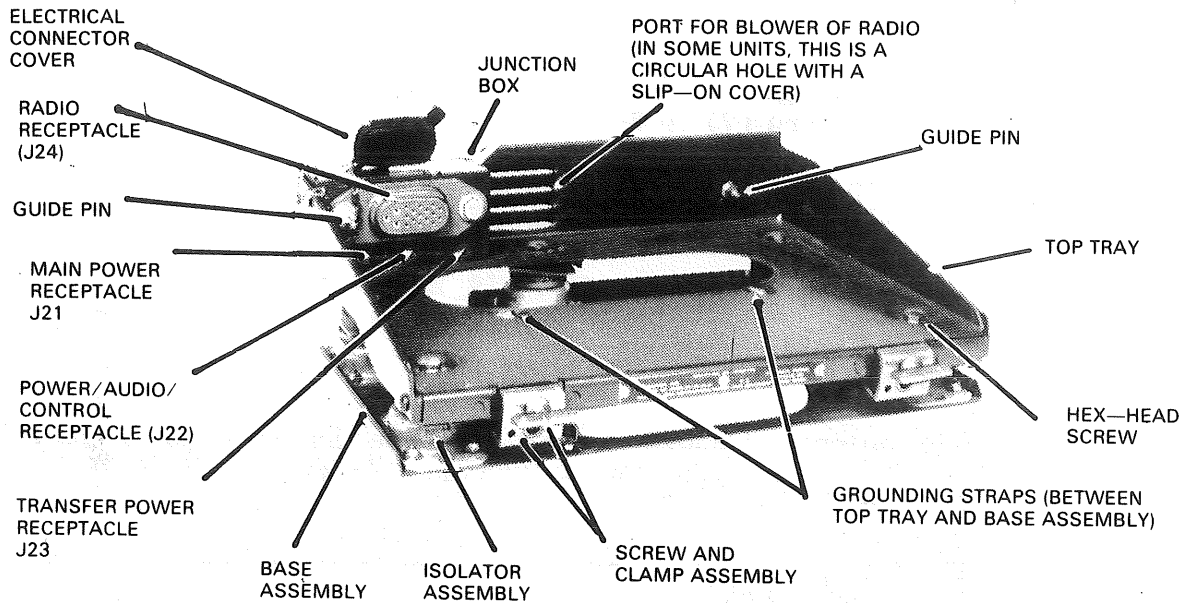
PERFORMANCE MEASURES

1. Insure POWER switch on receiver-transmitter is OFF. (Refer to fig 2 and TM 11-5820-401-12, chap 2, sec 2, para 2-5, p 2-3.)



Figure 2. Receiver-Transmitter, Radio RT-524/VRC.

2. Clean surface of Mount MT-1029/VRC, and remove electrical connector cover from radio receptacle. (Refer to fig 3 and TM 11-5820-401-12, chap 2, sec II, para 2-5a(6), p 2-3.)



113-587-1004

Figure 3. Mounting MT-1029/VRC, Parts Identification.

3. Insert receiver-transmitter into MT-1029/VRC. (Refer to TM 11-5820-401-12, chap 2, sec II, para 2-5b(1), p 2-3.)

**WARNING:** The receiver-transmitters weigh over 50 pounds. Use extreme care when handling them to protect yourself from injury or to protect the equipment from damage. Never lift or carry the receiver-transmitter by one handle.

4. Tighten MT-1029/VRC clamps to keep radio from falling out during mobile operation. (Refer to TM 11-5820-401-12, chap 2, sec II, para 2-5b(1), p 2-3.)
5. Complete cabling. (Refer to TM 11-5820-401-12, chap 2, sec II, para 2-5b(2) thru (7), p 2-3.)
6. Erect Antenna AS-1729/VRC or AT-912/VRC. (Refer to TM 11-5820-401-12, chap 2, sec II, para 2-7, pp 2-5 thru 2-8.)

NOTE: Apply a little graphite grease to the threads of the antenna sections. This insures easy removal and prevents the sections from seizing if they are rarely removed.

- a. Use antenna tiedown assembly to secure antenna to forward part and above the top of vehicle. (Refer to TM 11-5820-401-12, chap 2, para 2-7c.)
- b. Tie it so that personnel are not endangered (not less than 9 feet vertical height).
- c. Place antenna tip cap on antenna.

#### REFERENCES

TM 11-5820-401-12, w/C1 thru 3, Operator's and Organizational Maintenance Manual (Including Repair Parts and Special Tools List): Radio Sets AN/VRC-12, AN/VRC-43, AN/VRC-44, AN/VRC-45, AN/VRC-46, AN/VRC-47, AN/VRC-48, AN/VRC-49, AN/VRC-54, and AN/VRC-55; Mounting MT-1029/VRC and Mounting MT-1898/VRC; Antenna AT-912/VRC; Control Frequency Selector C-2742/VRC and Control, Radio Set C-2299/VRC, Sep 72.

Army Correspondence Course SSO 712, Organizational Maintenance of Radio Set AN/VRC-12.

Army Correspondence Course SS9 712, Organizational Maintenance of Radio Set AN/VRC-12 (SOJT).

TC 11-4, Handbook for AN/VRC-12 Series of Radio Set, Apr 77.

TC 11-6, Grounding Techniques, Sep 76.

**TASK****113-587-1005**

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**Install Radio Set AN/VRC-49**

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**CONDITIONS**

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment.  
Given --

1. AN/VRC-49.
2. Vehicle with mounting facilities installed.
3. CEOI Extract.
4. Initiated DA Form 2404.

Supervision is normally available.

**STANDARDS**

Task standard has been met when the AN/VRC-49 has been correctly mounted, connected, and an operational test made in accordance with performance measures 1 through 5 within 15 minutes.

**PERFORMANCE MEASURES**

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**CAUTION:** Before installing the radio in, or removing it from the radio mount, turn off the radio POWER switches in the system.

**WARNING:** The receiver-transmitters are compact and heavy (over 50 pounds). Use care in handling them to protect personnel from serious injury and the equipment from damage.



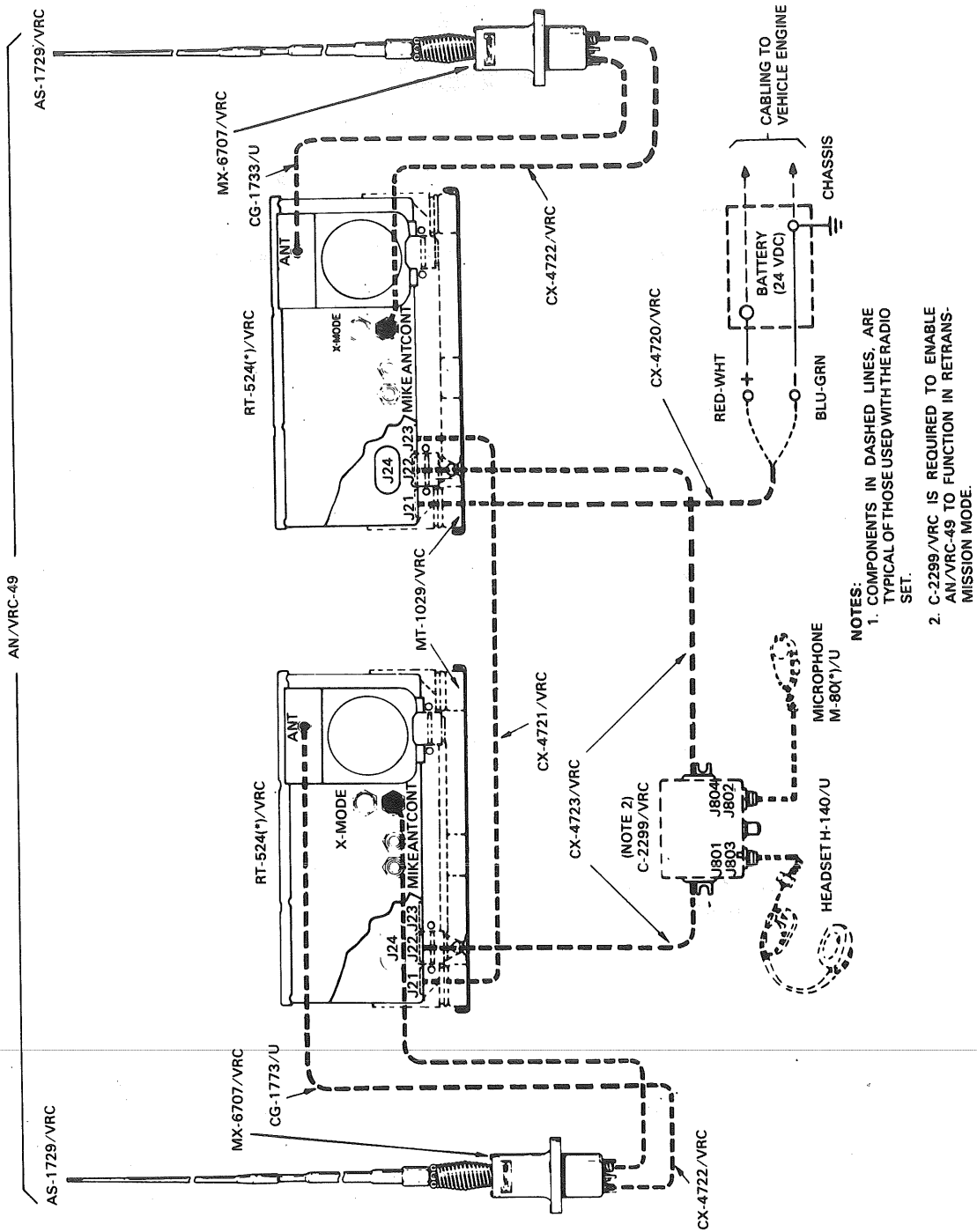


Figure 1. Typical Cabling Diagram for AN/VRC-49

CAUTION 1: Do not lay the receiver-transmitter on the back. This may damage the blower assembly. Lay it on one side.

CAUTION 2: When pulling a receiver-transmitter from the MT-1029/VRC, grasp both guards (or handles) to pull the unit from the radio mount, and continue to use both hands to lift and carry the unit. NEVER CARRY OR LIFT THE RECEIVER-TRANSMITTER BY ONLY ONE OF THE GUARDS (OR HANDLES).

1. Mount each receiver-transmitter. (Refer to TM 11-5820-401-10-1, chap 2, sec III, step 1, p 53; or TM 11-5820-401-10-2, chap 2, sec III, step 1, p 73.)
  - a. Insure mount is clean.
  - b. Remove receptacle cover and insure that the chain is not caught between guide pin and receptacle.
  - c. Insure that grounding straps are securely connected between the top tray and mount base.
  - d. Insure vent port is free of obstructions.

CAUTION: On early model R-T mounts, a special vent cover is provided. This vent cover must be installed when the set is in operation.
  - e. Lift and position R-T on mount and carefully push it back to seat the plug in the mount receptacle.
  - f. Tighten mount clamps to lock R-T on mount.
  - g. Install a safety wire between the mount clamps.
2. Assemble and connect each antenna. (Refer to TM 11-5820-401-10-1, chap 2, sec III, step 4, p 54; step 7, p 56; or TM 11-5820-401-10-2, chap 2, sec III, step 4, p 74; step 5, p 77.)

CAUTION: Insure that a ground strap is firmly connected between the MX-6707/VRC (compact antenna matching unit) and a ground point on the vehicle.

- a. Screw the top antenna section fully into the bottom section.

CAUTION: Apply graphite grease to the threads of the antenna sections to make removal easier. This also helps prevent rusting together if they are not separated for a long time.

- b. Screw the assembled antenna sections onto the top of the spring mount of the matching unit. (The "O" ring should be slightly compressed.)

NOTE: Connect a length of safety wire between the bottom antenna section and the spring mount of the MX-6707/VRC (compact antenna matching unit).

- c. Connect the antenna control cable (CX-4722/ VRC) between the ANT CONT connector of the receiver-transmitter and the control cable (large) connector of the matching unit.

CAUTION: Insure that the male end of the cable is connected to the receiver-transmitter.

- d. Connect the antenna (RF) cable (CG-1773A/U) between the ANT connector at the receiver-transmitter and the small (BNC) connector of the matching unit.

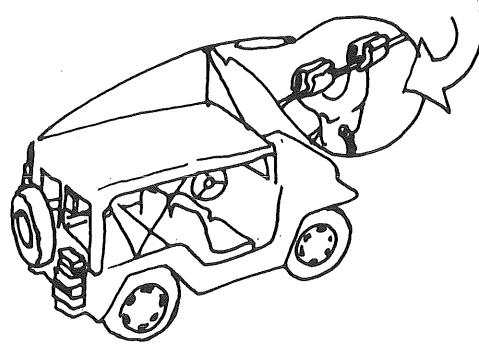
- e. Insure that the cables are routed in such a manner that the cables are not endangered by the movement of equipment or personnel. (Refer to TM 11-5820-401-12, chap 2, sec II, para 2-5b(4), p 2-3.)

- f. Tie down antennas. (Refer to TM 11-5820-401-10-1, chap 2, sec III, step 5, p 55; or TM 11-5820-401-10-2, chap 2, sec III, step 7, p 80.)

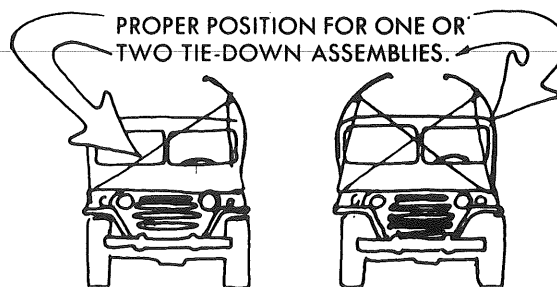
CAUTION 1: Insure that the antenna tip cap is in place on the tip of the upper antenna section.

CAUTION 2: Do not use the tie-down that is supplied with some vehicles if the clamp will not release if the antenna hits something.

- (1) Clip the V-shaped clamp to the middle of the upper antenna section.
- (2) Do not put the antenna beneath the clamp; it cannot spring out of this position.



- (3) Insure that the clamp does not cut into the fiberglass on the antenna elements.
- (4) Pull the antennas to approximately 60 degrees above the ground level and tie to the vehicle.



PROPER POSITION FOR ONE OR TWO TIE-DOWN ASSEMBLIES.

**CAUTION**

When pulling the antenna down, make sure that the tip is above any pedestrian and that it will not swing beyond the side of the vehicle.

CAUTION 1: When pulling the antenna down, make sure that the tip is above any pedestrian and that it will not swing beyond the side of the vehicle.

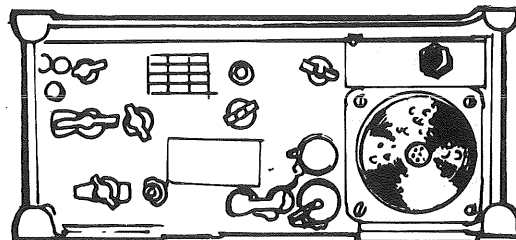
CAUTION 2: Do not cross the antennas during tie-down.

3. Set receiver-transmitter switches and controls. (Refer to TM 11-5820-401-10-1, chap 2, sec III, step 2, p 64; or TM 11-5820-401-10-2, chap 2, sec III, step 5, p 102.)

CAUTION 1: If possible, operate the radio set with the engine running. The engine speed should be high enough to indicate the battery is charging while the radio is keyed.

CAUTION 2: DO NOT START VEHICLE WHILE RADIO IS ON.

NOTE: Insure that RETRANS switch of control C-2299/VRC is at OFF.



- a. Set POWER switches to LOW.
- b. Set BAND switches to band of operating frequency(cies).

- c. Set SQUELCH switches to authorized (CEOI) position.
  - d. Set MC - TUNE - KC controls to authorized operating frequency(cies).
  - e. Set SPEAKER switches to ON.
4. Set up control C-2299/VRC. (Refer to TM 11-5820-401-10-1, chap 2, sec III, step 7, pp 69 and 70; or TM 11-5820-401-10-2, chap 2, sec III, step 12, pp 108 and 109.)
- a. Connect microphone to the right audio connector.
  - b. Set RAD TRANS switch to 1. (Push-to-talk switch should key the left receiver-transmitter.)
  - c. Set RAD TRANS switch to 2. (Push-to-talk switch should key the right receiver-transmitter.)
  - d. Establish communications with two stations, one on each receiver-transmitter.
  - e. Direct station 1 to transmit to station 2.
  - f. Set RETRANS switch to ON.
  - g. Signal from station 1 causes set 2 to key.
  - h. Signal from station 2 causes set 1 to key.
  - i. Set RETRANS switch to OFF.
5. Update DA Form 2404. (Refer to TM 38-750, chap 3, para 3-4, pp 3-7 thru 3-12.) (Task 113-623-3028.)
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#### REFERENCES

TM 11-5820-401-10-1, w/C1, Operator's Manual Radio Sets: AN/VRC-12, AN/VRC-43, AN/VRC-44, AN/VRC-45, AN/VRC-46, AN/VRC-47, AN/VRC-48, AN/VRC-49 (Used without INTERCOM Systems), Aug 77.

TM 11-5820-401-10-2, Operator's Manual Radio Sets: AN/VRC-12, AN/VRC-43, AN/VRC-44, AN/VRC-45, AN/VRC-46, AN/VRC-47, AN/VRC-48, AN/VRC-49 (Used with INTERCOM Systems), Dec 77.

TM 11-5820-401-12, w/C1 thru 3, Operator's and Organizational Maintenance Manual (Including Repair Parts and Special Tools List): Radio Sets AN/VRC-12 (5820-00-223-7412), AN/VRC-43 (5820-00-223-7415), AN/VRC-44 (5820-00-223-7417), AN/VRC-45 (5820-00-223-7418), AN/VRC-46 (5820-00-223-7433), AN/VRC-47 (5820-00-223-7434), AN/VRC-48 (5820-00-223-7435), AN/VRC-49 (5820-00-223-7437), AN/VRC-54 (5820-00-223-7567), and AN/VRC-55 (5820-00-402-2265); Mounting MT-1029/VRC (5820-00-893-1323) and Mounting MT-1898/VRC (5820-00-893-1324); Antenna AT-912/VRC (5820-00-897-6357); Control, Frequency Selector C-2742/VRC (5820-00-892-3343) and Control, Radio Set C-2299/VRC (5820-00-892-3340), Sep 72.

**TASK****113-587-2005**

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**Operate Radio Set AN/VRC-49**

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**CONDITIONS**

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. AN/VRC-49 installed and operational in a vehicle.
2. CEOI Extract.

Supervision is normally available.

**STANDARDS**

Task standard has been met when the radio set has been prepared and operated in the retransmission mode in accordance with performance measures 1 through 3 within 15 minutes.

**PERFORMANCE MEASURES**

**CAUTION: TURN OFF RADIO BEFORE STARTING VEHICLE.**

1. Set receiver-transmitter switches and controls. (Refer to TM 11-5820-401-10-1, chap 2, sec III, step 2, p 64; or TM 11-5820-401-10-2, chap 2, sec III, step 5, p 102.)

**NOTE:** Insure RETRANS switch of C-2299/VRC is at OFF.

- a. Set POWER switches to LOW.
- b. Set BAND switches to bands of authorized operating frequencies.



- c. Set SQUELCH switches to ON (according to CEOI).  

NOTE: The system will not retransmit with the SQUELCH switches at OFF.
  - d. Set MC-TUNE-KC controls to authorized frequencies.
  - e. Set SPEAKER switches to ON.
2. Establish communications. (Refer to TM 11-5820-401-10-1, chap 2, sec III, step 7, pp 69 and 70; or TM 11-5820-401-10-2, chap 2, sec III, step 12, pp 108 and 109.)
- a. Connect microphone to the right audio receptacle of control C-2299/VRC.
  - b. Connect speaker (LS-454/U) to the left audio receptacle of control C-2299/VRC.
  - c. Set RAD TRANS switch to 2 and establish communications with distant station operating on frequency 2.
  - d. Set RAD TRANS switch to 1 and establish communications with distant station operating on frequency 1.
3. Operate retransmission station. (Refer to TM 11-5820-401-10-1, chap 2, sec III, step 7, pp 69 and 70; or TM 11-5820-401-10-2, chap 2, sec III, step 12, pp 108 and 109.)
- a. Direct distant station 1 to establish communications with distant station 2.
  - b. Set RETRANS switch to ON.

---

NOTE: The microphone will not key the radios from the C-2299/VRC when the RETRANS switch is ON.

- c. Monitor retransmission operations over speaker (LS-454/U).

NOTE: The system will not retransmit with the SQUELCH switches at OFF.

- d. Set RETRANS switch to OFF when retransmission operations are completed.

## REFERENCES

ACP 125 (D) Communications Instructions Radiotelephone Procedure, Jul 70, w/US Suppl-2, Radiotelephone Procedures for the Conduct of Artillery and Naval Gunfire, Sep 64 (U).

TM 11-5820-401-10-1, w/C1, Operator's Manual Radio Sets: AN/VRC-12, AN/VRC-43, AN/VRC-44, AN/VRC-45, AN/VRC-46, AN/VRC-47, AN/VRC-48, AN/VRC-49, (USED WITHOUT INTERCOM SYSTEMS), Aug 77.

TM 11-5820-401-10-2, w/C1, Operator's Manual Radio Sets: AN/VRC-12, AN/VRC-43, AN/VRC-44, AN/VRC-45, AN/VRC-46, AN/VRC-47, AN/VRC-48, AN/VRC-49, (USED WITH INTERCOM SYSTEMS), Dec 77.

# TASK

## 113-587-3002

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### Perform Operator's Preventive Maintenance Checks and Services on Radio Set AN/VRC-49

---

#### CONDITIONS

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. AN/VRC-49.
2. Vehicle with mounting facilities installed.
3. Clean, lint-free cloth and brush.
4. Trichloroethane.
5. Initiated DA Form 2404.
6. TM 11-5820-401-10-1 or TM 11-5820-401-10-2.

Supervision is normally available.

#### STANDARDS

Task standard has been met when the preventive maintenance checks and services have been performed in accordance with performance measures 1 through 5 within 20 minutes (30 minutes if the installation includes an intercom system).

#### PERFORMANCE MEASURES

1. Perform routine checks. (Refer to TM 11-5820-401-10-1, chap 2, sec II, pp 38 and 39; or TM 11-5820-401-10-2, chap 2, sec II, pp 52 and 53.)

NOTE: Routine checks are not listed as PMCS checks. They are things that you should do anytime you see they must be done.

a. Cleaning, dusting, washing.

NOTE: The cleaning operations should be performed once a day. If the equipment is not used daily, the cleaning operations must be performed before operation after any extended shutdown, or once a week while the equipment is kept in standby condition.

WARNING: The fumes of TRICHLOROETHANE are toxic. Provide thorough ventilation whenever it is used; avoid prolonged or repeated breathing of vapor. Do not use near an open flame or hot surface; trichloroethane is nonflammable but heat converts the fumes to a highly toxic phosgene gas which, if inhaled could result in serious injury or death. Prolonged or repeated skin contact with trichloroethane can cause skin inflammation. When necessary, use gloves, sleeves, and aprons which the solvent cannot penetrate.

- (1) Remove dust or loose dirt with a clean soft cloth or brush.
- (2) Remove grease, fungus, and ground in dirt with a clean cloth dampened (not wet) with trichloroethane.

---

CAUTION: DO NOT use water under pressure; DO NOT use trichloroethane; DO NOT paint; Matching Unit Base MX-6707/VRC. Use only clear water to clean the plastic body. Trichloroethane and other cleaning solvents attack the plastic, causing it to be porous.

- (3) Clean the dial windows, plastic lenses, and other plastic items with a clean soft cloth. If it is difficult to remove any dirt, dampen the cloth with water; mild soap may be used to make the cleaning more effective.

CAUTION: If the equipment is washed using a water hose, do not direct the water directly at the front panels and cable connectors. Wipe the equipment after using the water hose.

- b. Checking for frayed or damaged cables.
  - (1) At connectors.
  - (2) Where the cables form unprotected bends.
  - (3) Where cables are exposed to possible damage by personnel or cargo.
- c. Checking for loose nuts, bolts, or other mounting hardware.

NOTE 1: The PROCEDURES column in your PMCS chart instructs you to "CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY". Carefully follow these instructions and if tools are needed, or the chart instructions tell you, get organizational maintenance to do the necessary work.

NOTE 2: If your equipment must be in operation all the time, check and service those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

NOTE 3: Use the ITEM NO. column of your PMCS table to get the numbers for the TM ITEM NO. column on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) when you fill out the form.

- 2. Perform Operator's Daily Preventive Maintenance Checks and Services. (Refer to PMCS Table.) (Refer to TM 11-5820-401-10-1, chap 2, sec II, table 2-1, pp 40 thru 51; or TM 11-5820-401-10-2, chap 2, sec II, table 2-1, pp 54 thru 71.)
  - a. Perform BEFORE OPERATION checks to be sure your equipment is ready to go.

- (1) Items to be checked on all installations: 1, 3-7, 9-11, 13, and 22.
  - (2) Additional items to be checked on installations with INTERCOM systems: 23-31, 33-36.
  - b. Perform DURING OPERATION checks to help you spot small troubles before they become big problems. Items to be checked on all installations: 3, 4, 15, and 16.
  - c. Perform AFTER OPERATION checks to help keep your equipment in top shape. Items to be checked on all installations: 1, 3, and 4.
3. Perform Operator's Weekly Preventive Maintenance Checks and Services. (Refer to PMCS Table). (Refer to TM 11-5820-401-10-1, chap 2, sec II, table 2-1, pp 40 thru 51; or TM 11-5820-401-10-2, chap 2, sec II, table 2-1, pp 54 thru 71.)

NOTE: Operator's daily PMCS are performed in conjunction with the weekly checks and services.

Items to be checked on all installations: 1, 3-7, 9, 10, 15, 16, and 22.

Additional items to be checked on installations with INTERCOM systems: 23-31, 33-36.

- 
4. ~~Perform Operator's Monthly Preventive Maintenance Checks and Services. (Refer to PMCS Table.) (Refer to TM 11-5820-401-10-1, chap 2, sec II, table 2-1, pp 40 thru 51; or TM 11-5820-401-10-2, chap 2, sec II, table 2-1, pp 54 thru 71.)~~

NOTE 1: Operator's monthly PMCS can be performed in conjunction with Daily and/or Weekly PMCS.

NOTE 2: Item 8 should be performed more often if you are operating during the rainy season.

NOTE 3: Item 20 should be performed more often if you are operating in a dusty area. Items to be checked on all installations: 2, 8, 12, 14, and 19-20.

5. Update DA Form 2404.

REFERENCES

TM 11-5820-401-10-1, w/C1, Operator's Manual, Radio Sets: AN/VRC-12, AN/VRC-43, AN/VRC-44, AN/VRC-45, AN/VRC-46, AN/VRC-47, AN/VRC-48, AN/VRC-49, (used without INTERCOM systems), Aug 77.

TM 11-5820-401-10-2, w/C1, Operator's Manual, Radio Sets: AN/VRC-12, AN/VRC-43, AN/VRC-44, AN/VRC-45, AN/VRC-46, AN/VRC-47, AN/VRC-48, AN/VRC-49, (used with INTERCOM systems), Dec 77.

TM 38-750, w/C1 thru 3, The Army Maintenance Management System (TAMMS), May 78.

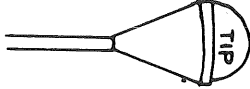

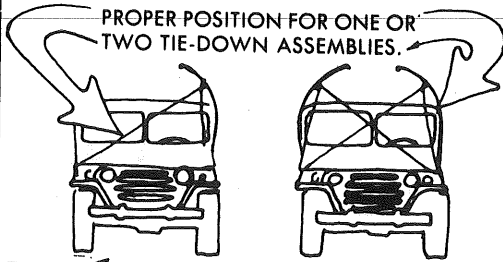
TABLE 2-1 PREVENTIVE MAINTENANCE CHECKS AND SERVICES

NOTE: THE CHECKS IN THE "INTERVAL" COLUMN ARE TO BE PERFORMED IN THE ORDER LISTED.

B—BEFORE OPERATION  
D—DURING OPERATION

A—AFTER OPERATION  
W—WEEKLY

M—MONTHLY

ITEM NO.	INTERVAL					ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	FOR READINESS REPORTING EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M			
1	*		*	*		All Antenna Systems	<p>WARNING</p> <p>DO NOT TRANSMIT ON THE RADIO WHILE HANDLING THE ANTENNA.</p> <p>Check to see that elements are not split. Replace defective elements.</p>	<p>Antenna cannot be used while vehicle is in motion.</p>
						Elements		
2				*	Element Threads	Clean and lubricate threads.		
3	*	*	*	*	Tip	<p>Check to see that the tip cap is in place on the top section.</p> 		
4	*	*	*	*	Tie-down	<p>Check to see that the tie-down assembly is adjusted to properly hold down the antenna.</p> <p>PROPER POSITIONING PERMITS SAFE RELEASE IF ANTENNA HITS SOMETHING.</p>  <p>PROPER POSITION FOR ONE OR TWO TIE-DOWN ASSEMBLIES.</p>  <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>CAUTION</b></p> <p>When pulling the antenna down, make sure that the tip is above any pedestrian and that it will not swing beyond the side of the vehicle.</p> </div>		



SKILL LEVEL 1

TABLE 2-1 PMCS (continued)

ITEM NO.	INTERVAL					ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	FOR READINESS REPORTING EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M			
5	*			*		Cable Connections	<p>ALL CABLE CONNECTOR PINS ARE STRAIGHT.</p> <p>All cable connectors are properly keyed in their antenna base receptacle.</p> <p>All connectors are firmly in place.</p> <p>When installing connectors</p>	Thin connector (on cable CG-1773/U) cannot be connected to antenna base.
6	*			*		Compact Antenna Ground Strap	<p>Ground strap is securely connected</p>	
7	*			*		Safety Wire	<p>Safety wire is securely installed between bottom of antenna element and base.</p>	
* 8					*	Water Drain	<p>Drain all water trapped inside the mount.</p>	

\* DO THIS STEP MORE OFTEN IF YOU ARE OPERATING DURING THE RAINY SEASON.

TABLE 2-1 PMCS (continued)


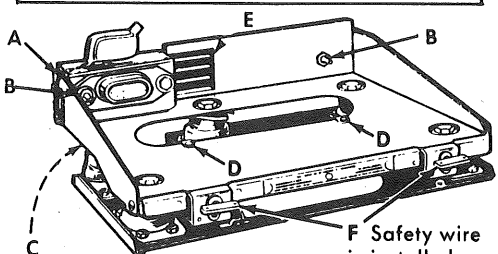
ITEM NO.	INTERVAL					ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	FOR READINESS REPORTING EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M			
9	*				*	Matching Unit	<p>Check to see that it securely bolted.</p> <p>Check for cracks caused by overtightening.</p> <p>Check for softening caused by painting or solvents or trichloroethane.</p> <p>Clean with clear water and a rag.</p>  <p><b>CAUTION: DO NOT USE WATER UNDER PRESSURE, DO NOT USE TRICHLOROETHANE, AND DO NOT PAINT.</b></p>	
10	*				*	All R-T and AUX Receiver Mounts.	<p>Before installing an AUX receiver or R-T on its mount, make sure that:</p> <p>A Receptacle cover is removed and chain is not caught between guide pin and receptacle.</p> <p>B Both mount guide pins are straight.</p> <p>C Unused underside receptacles are covered.</p> <p>D Grounding straps are securely connected between top tray and mount base.</p> <p>E Vent port area is free of obstructions.</p> <p><b>CAUTION</b> ON EARLY MODEL R-T MOUNTS, A SPECIAL VENT COVER IS PROVIDED. THIS VENT COVER MUST BE INSTALLED WHEN SET IS IN OPERATION.</p>  <p>F Safety wire is installed between mount clamps.</p>	R-T cannot be securely clamped in its mount.

TABLE 2-1 PMCS (continued)

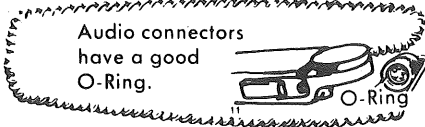
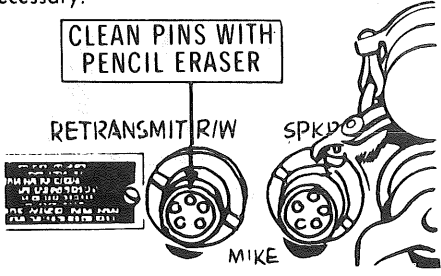
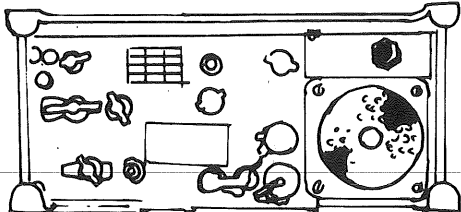
ITEM NO.	INTERVAL					ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	FOR READINESS REPORTING EQUIPMENT IS NOT READY/AVAILABLE IF:	
	B	D	A	W	M				
11	*	<u>Audio Accessories</u>							
		O-Rings	 <p>Audio connectors have a good O-Ring.</p>						
		Lubrication	O-Ring has a light coat of silicon grease. Use MIL-M-8660.						
		Moisture Barriers	If used, moisture barriers are in place.						
12				*					
13	*								
14				*					
15	*	*	Receiver-Transmitter Basic Operation				<p>CLEAN PINS WITH PENCIL ERASER</p> 	<p>With audio accessories connected to the front panel and R-T turned on and tuned to the assigned frequency:</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>WARNING</b> DO NOT START VEHICLE WHILE RADIO IS ON. START VEHICLE BEFORE TURNING ON THE RADIO.</p> </div>  <p>"KEY THE RADIO" and talk to the distant radio station.</p> <p>During transmission, you should hear: sidetone and the blower running.</p> <p>During reception, you should hear the distant station.</p> <p>Set-up the desired SQUELCH operation with the distant station, and verify CALL lamp operation.</p>	<p>Distant station cannot hear you or you cannot hear sidetone or the blower running.</p> <p>You cannot hear the distant station.</p>

TABLE 2-1 PMCS (continued)

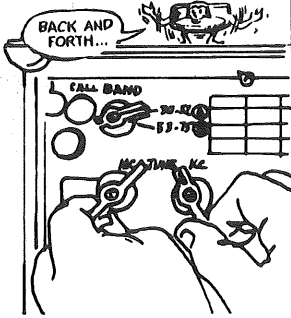
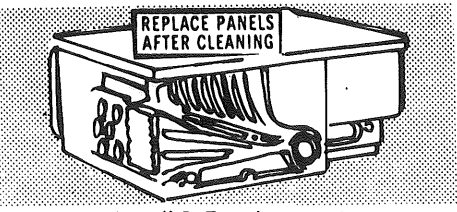
ITEM NO.	INTERVAL					ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	FOR READINESS REPORTING EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M			
16	*		*			R-T Operation with Radio Relay Box	<p>With audio accessories connected to the RELAY box,</p> <p>communicate with the distant station.</p> <p>During transmission, you should hear sidetone and the blower running.</p> <p>During reception, you should hear the distant station.</p> <p>During a retransmission hook-up, both terminals should communicate through your radio set.</p>	<p>Distant station cannot hear you or you cannot hear sidetone or the blower running.</p> <p>You cannot hear the distant station.</p> <p>Retransmission is not satisfactory in both directions.</p>
19					*	R-T Tuner Contacts	<p>To prevent corrosion build-up on the tuner contacts, turn the tuner knobs back and forth several times.</p> <p>If you have an AUX receiver, do the same to its tuner knobs.</p> 	
*20					*	<u>Receiver-Transmitter Cooling</u>	<p>With help from organizational maintenance: Remove the R-T from its mount.</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p><b>CAUTION</b> MAKE SURE POWER TO RADIO IS TURNED OFF</p> </div> <p>Lay the R-T on one side.</p> <p>Remove the back and side panels from the heat exchanger.</p> <p>Carefully clean both the vanes and squirrel cage fins (a toothbrush is OK).</p>  <p>Install R-T on its mount.</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p><b>CAUTION</b> MAKE SURE R-T PLUG PINS ARE NOT BENT OR MISSING</p> </div>	
<p>* DO THIS STEP MORE OFTEN IF YOU ARE OPERATING IN A DUSTY AREA.</p>								

TABLE 2-1 PMCS (continued)

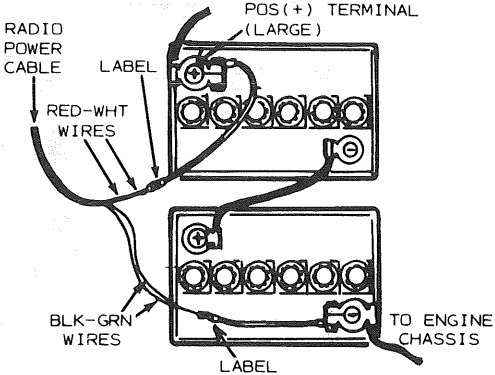
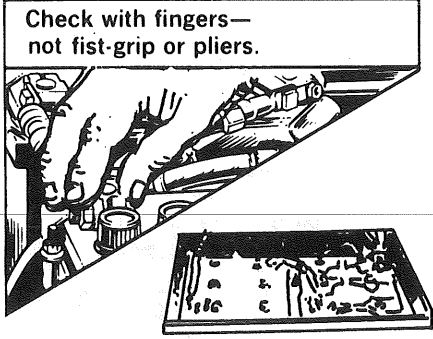
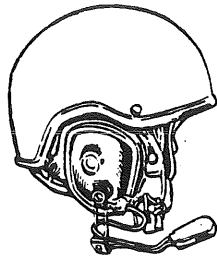
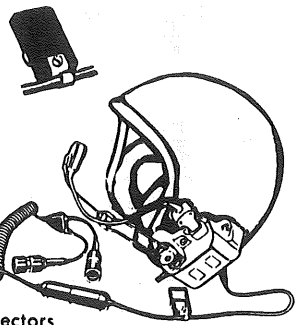
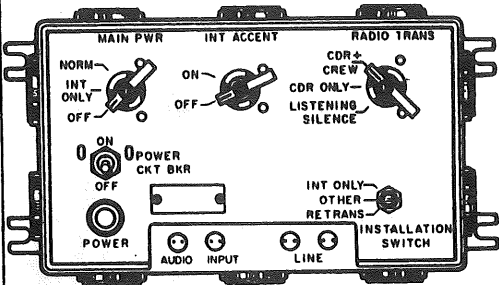
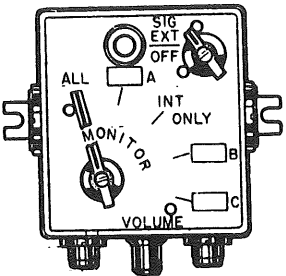
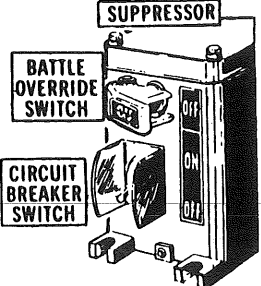
ITEM NO.	INTERVAL					ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	FOR READINESS REPORT- ING EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M			
21	*					<u>AUX Receiver Operation</u>	<p>With AUX receiver turned on and tuned to the assigned frequency, have the distant radio station transmit to you.</p> <p>During reception, you should hear the distant station.</p> <p>Set-up the desired SQUELCH type of operation and verify CALL lamp operation.</p>	You cannot hear the distant station.
22	*					<u>Vehicle Battery Compartment</u>	<p>Check to see that the:</p> <ul style="list-style-type: none"> <li>Battery terminals are not corroded.</li> <li>Radio power cable lugs are securely connected to the battery.</li> <li>Radio power cable leads are tagged.</li> </ul>  <p><b>Check with fingers— not fist-grip or pliers.</b></p> 	Radio power cable lugs cannot be securely connected.

TABLE 2-I PMCS (CONTINUED)

ITEM NO.	INTERVAL					ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	FOR READINESS REPORTING EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M			
23	*			*		CVC Helmet Shell	Cracked, rubber edging, loose, rivets loose.	
24	*			*		Clothing Clip	Check for proper spring tension.	
25	*			*		Mike Boom Adjusting Knob	Missing, can't be tightened.	
26	*			*		Bail-out Connector and Cord	Cord pinched, connectors separate smoothly.	
27	*			*		Guide Boom	Bent, ball joint sticking or loose, frame or cord twisted.	
28	*			*		Switch	Check operation.	
29	*			*		Sweatband	Missing, torn.	
30	*			*		Liner	Cloth torn. Foam or rubber parts hardened or missing.	
<b>NOTE</b>								
Wash with warm water and suds and dry carefully.								
<b>CAUTION</b>								
BE CAREFUL NOT TO WET THE EARPHONE-MICROPHONE SET.								



ITEM NO.	INTERVAL					ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	FOR READINESS REPORTING EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M			
31						<p><b>MAIN JUNCTION BOX-AMPLIFIER (AM-1780/VRC)</b></p> <p>Operation</p>	<p><b>NOTE:</b> The procedures below that require you to check for proper operation of all controls and indicators include checking every mode of RADIO and INTERCOM operation possible with your authorized equipment and accessories.</p>  <p>Check all controls and indicators for proper operation (including operation with an outside telephone).</p>	Intercom is not possible between crewmembers.
						<p><b>DRIVER'S CONTROL BOX (C-2297/VRC)</b></p> 		
						<p><b>SUPPRESSOR, ELECTRICAL TRANSIENT (MX-7778/GRC)</b></p> 		
34	*				*	Circuit Breaker	Check for smooth operation.	
35	*				*	BATTLE OVERRIDE switch	WITH RADIO TURNED OFF, check for smooth operation.	
36	*				*	Normal Operation	Check operation with equipment operating. <b>CAUTION:</b> Do not break radio silence if it is in effect.	SUPPRESSOR operates in an unsatisfactory manner (prevents communications).

**TASK****113-587-2003**

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**Operate Radio Set AN/VRC-46 (AN/VRC-12 Series)**

---

**CONDITIONS**

This task is performed under all weather conditions in a field or a garrison location and may be performed in an NBC environment. You will have another station to establish communication with and will be provided with TM 11-5820-401-10-1, a CEOI. An operational AN/VRC-46 will also be provided. Supervision and assistance will be available.

**STANDARDS**

This task has been performed correctly when, in 3 minutes, the radio set has been aligned according to performance measure 2, and the radio set has been placed into and taken out of operation in according to performance measures 1 through 3.

**PERFORMANCE MEASURES**

1. Determine operating frequency from current edition of CEOI.

**WARNING:** Do not permit vehicular whip antenna to touch high power lines or other sources of electricity injury or death could result.

2. Align receiver-transmitter. (Refer to TM 11-5820-401-10-1, chap 2, sec III, para 31 and 32, pp 63 and 64.)

**CAUTION:** Do not turn radio on until vehicle is started, or damage may occur to the set.

- a. Set POWER switch to LOW.
- b. Set LIGHT switch to ON.



- c. Set SQUELCH switch to desired mode of operation.
- d. Set BAND switch to position of operating frequency.
- e. Turn MHz control to desired frequency.
- f. Turn kHz control to desired frequency.

NOTE: If you have trouble locking in the frequency, give control knobs a little wiggle to help seat them.

- g. Set SPEAKER switch to ON.
  - h. Connect handset to AUDIO ACCESSORY connector.
3. Perform stopping procedures. (Refer to TM 11-5820-401-10-1, chap 2, sec III, para 5, p 67.)
- a. Turn switches to OFF position before you stop your vehicle motor.
  - b. Clear your assigned frequency from the receiver-transmitter.

#### REFERENCES

TM 11-5820-401-10-1, w/C1, Operator's Manual, Repair Sets: AN/VRC-12, AN/VRC-43, AN/VRC-44, AN/VRC-45, AN/VRC-46, AN/VRC-47, AN/VRC-48, AN/VRC-49, (used without intercom systems), Aug 77.

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Army Correspondence Course SSO 712, Organizational Maintenance of Radio Set AN/VRC-12.

Army Correspondence Course SS9 712, Organizational Maintenance of Radio Set AN/VRC-12 (SOJT).

TC 11-4, Handbook for AN/VRC-12 Series of Radio Sets, Apr 77.

TC 11-6, Grounding Techniques, Sep 76.

CEOI.

**TASK****113-587-2004**

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**Troubleshoot AN/VRC-46 (AN/VRC-12 Series)**

---

**CONDITIONS**

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. Radio Set AN/VRC-46.
2. TM 11-5820-401-12.
3. TM 38-750.
4. DA Form 2404.

Supervision and assistance will be available.

**STANDARDS**

This task has been performed correctly when any discovered faults are corrected in accordance with performance measure 2, and those faults that you, as an operator, cannot correct are recorded on DA Form 2404 and reported to your immediate supervisor according to performance measures 1 through 3.

---

**PERFORMANCE MEASURES**

1. Conduct troubleshooting procedures by visual inspection procedures. (Refer to TM 11-5820-401-12, chap 4, sec II, para 4-4, pp 4-5 and 4-6.)
  - a. Power failure.
    - (1) Insure radio set is seated in mount.
    - (2) Check power cable connections to battery.

## SKILL LEVEL 1

### b. Radio communication failure.

- (1) Check assigned frequency.
  - (2) Check whip antenna for completeness, tightness and clearance.
  - (3) Insure antenna cable is connected and connectors are tight.
  - (4) If you are using squelch operation, set SQUELCH switch to OFF.
2. If you fail to locate problem through visual inspection, conduct troubleshooting procedures as described in TM 11-5820-401-12, chap 4, sec II, para 4-5a thru e, pp 4-6 thru 4-9.
  3. If the corrective measures do not clear trouble, complete DA Form 2404 and turn it into your supervisor or support maintenance facility. (Refer to TM 38-750, chap 3, para 3-4c and d, pp 3-4 thru 3-8.)

## REFERENCES

TM 11-5820-401-12, w/C 1 thru 3, Operator's and Organizational Maintenance Manual (Including Repair Parts and Special Tools List): AN/VRC-12, AN/VRC-43, AN/VRC-44, AN/VRC-45, AN/VRC-46, AN/VRC-47, AN/VRC-48, AN/VRC-49, AN/VRC-54, and AN/VRC-55; Mounting RT-1029/VRC and MT-1898/VRC; Antenna AT-912/VRC; Control, Frequency Selector C-2742/VRC and Control, Radio Set C-2299/VRC, Sep 72.

TM 38-750, w/C 1 thru 3, The Army Maintenance Management System (TAMMS), May 78.

Army Correspondence Course SSO 712, Radio Set AN/VRC-12.

Army Correspondence Course SS9 712, Organizational Maintenance of Radio Set AN/VRC-12 (SOJT).

**TASK****113-587-1003**

---

**Install Radio Set AN/VRC-64**

---

**CONDITIONS**

This task is performed under all weather conditions in a field or garrison location. Your team chief will provide you with Radio Set AN/VRC-64, Antenna AS-1729/VRC or Antenna AT-912/VRC, Long Wire Antenna AT-984A/G, Antenna Tie Down Kit, an M151A2 Jeep with Mount, MT-1029/VRC and Antenna Matching Unit Base installed, a Generator Set 3 KW, 28 V dc, TM 11-5820-498-12, TM 5-6115-271-14, and power and radio cables necessary to install the radio set. Supervision and assistance will normally be available.

**STANDARDS**

This task has been performed correctly when, in 10 minutes, the components have been installed in their mounts without causing damage to the components or mounts, the antenna is erected, all cable connections made, and the radio is ready to be aligned and operated according to performance measures 1 through 7.

**PERFORMANCE MEASURES**

1. Insert Amplifier-Power Supply OA-3633/GRC or OA-3633A/GRC into Mount MT-1029/VRC. (Refer to TM 11-5820-498-12, chap 2, sec II, para 2-5d, p 2-5.)

**WARNING:** Do not permit man-pack or vehicular whip antennas to come in contact with high power lines or other sources of electricity; injury or death could result. Observe the requirements of TB SIG 291 which illustrates the dangers of permitting an antenna to contact other sources of power.

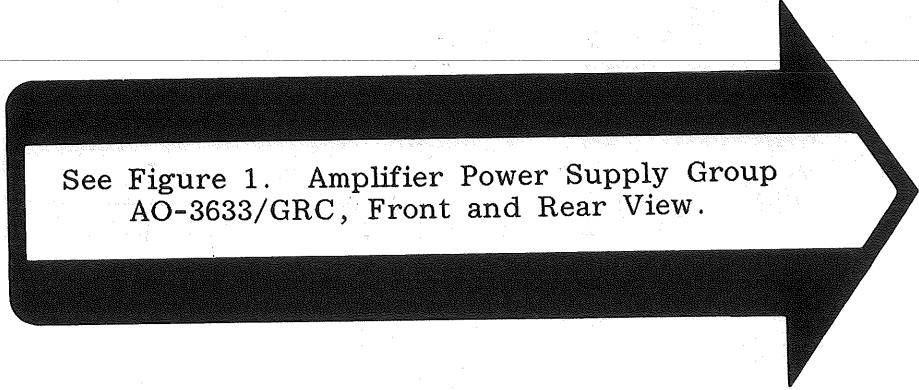
CAUTION 1: Remove the battery from the Battery Box CY-2562/ PRC-25 when the receiver-transmitter is installed in the vehicle.

CAUTION 2: Do not operate the radio within three MHz of the operating frequency of another radio that is less than 25 feet away. Mutual interference may occur.

CAUTION 3: Do not reverse the connections of the radio power cable leads at the vehicular battery. The proper color cable leads for each battery terminal are: Green and Black - Negative (-), Red and White - Positive (+). Damage to resistors and diodes in the AM-2060/ GRC or AM-2060A/GRC may result if leads are reversed at the battery terminals.

CAUTION 4: Do not start the vehicle engine, restart it, slave it, or stop it with the AM-2060/GRC or AM-2060A/GRC turned on. The AM-2060/GRC or AM-2060A/GRC POWER switch must be set to OFF. Install WARNING decals as instructed in SB 11-624.

- a. Refer to figure 1 for front and rear views of Amplifier-Power Supply OA-3633/GRC or OA-3633A/GRC.



See Figure 1. Amplifier Power Supply Group  
AO-3633/GRC, Front and Rear View.

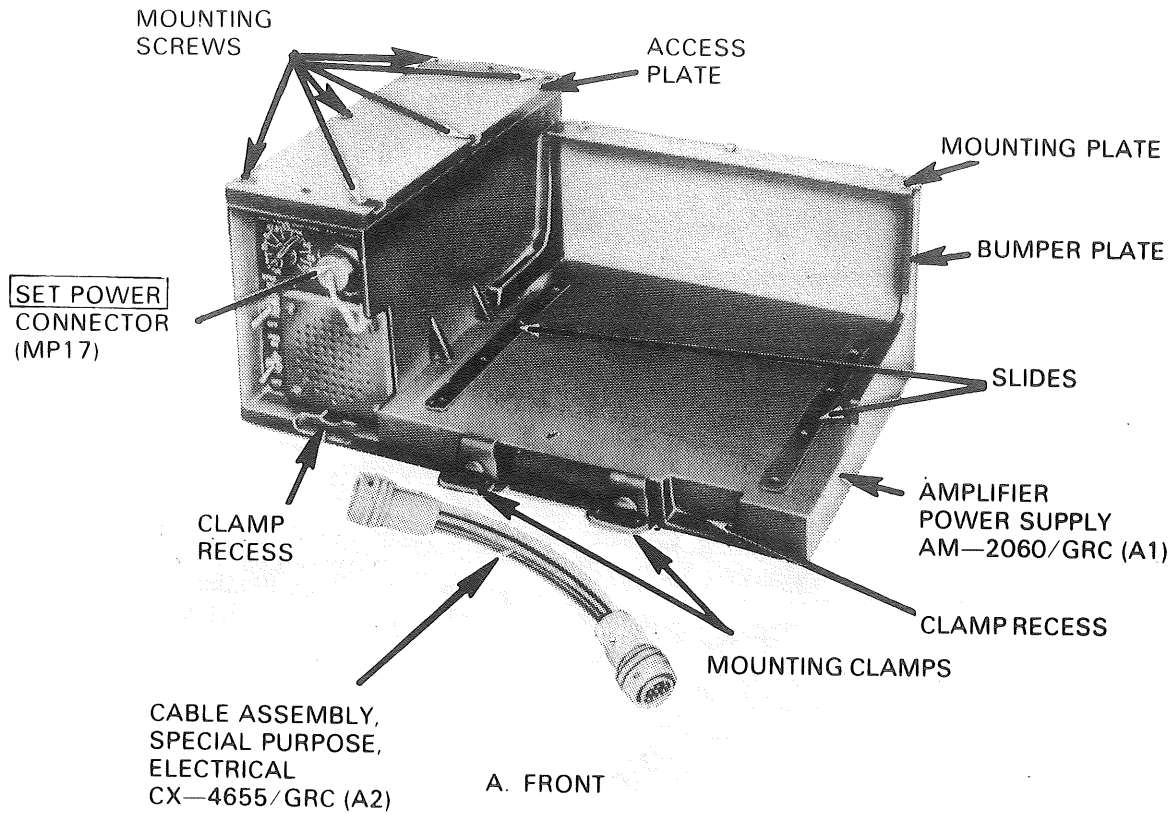


Figure 1a. Front View of Amplifier-Power Supply OA-3633/GRC or OA-3633A/GRC.

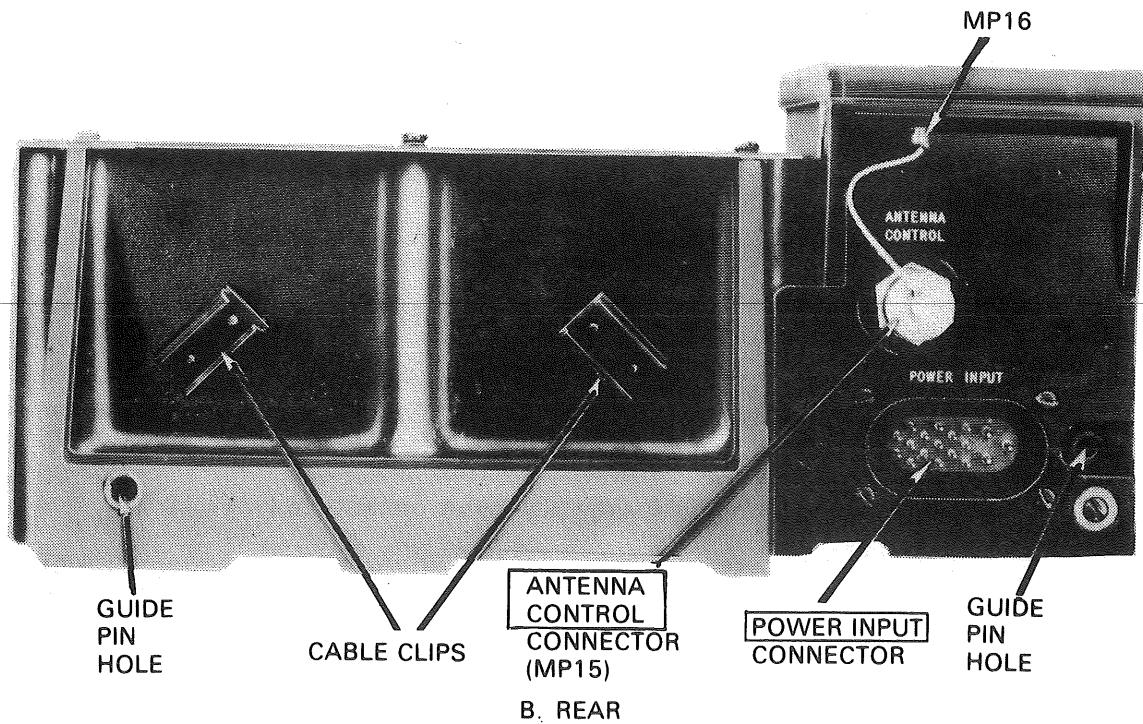


Figure 1b. Rear View of Amplifier-Power Supply OA-3633/GRC or OA-3633A/GRC.

- b. Loosen CLAMPS on Mount, MT-1029/VRC as shown in figure 2.

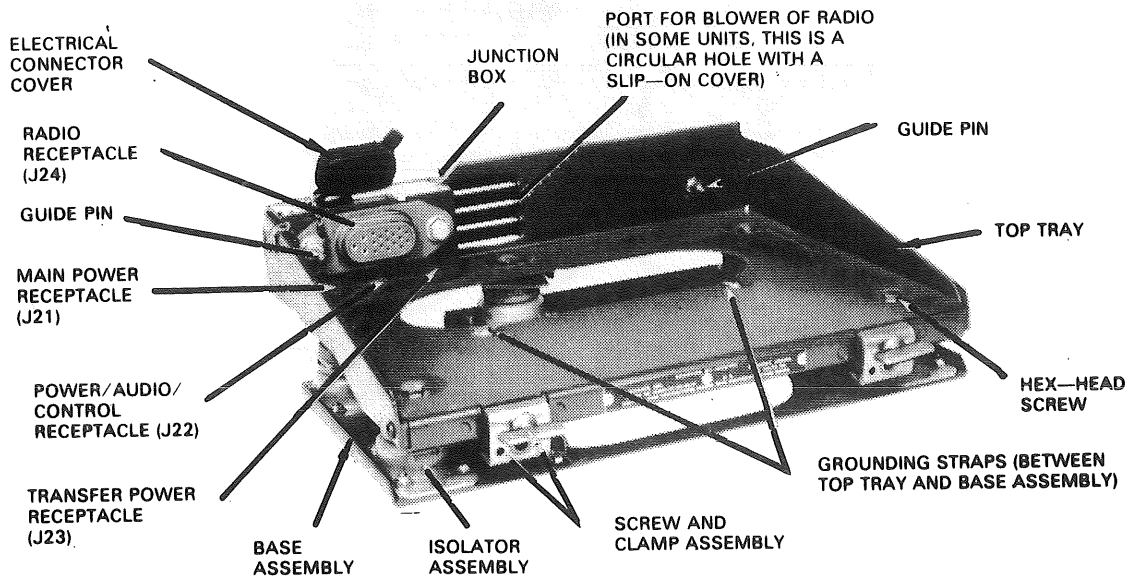


Figure 2. Mounting MT-1029/VRC.

- c. Place amplifier-power supply on the MT-1029/VDC.
- 
- d. Mate POWER INPUT CONNECTOR (fig 1) of the amplifier-power supply with the CONNECTOR (fig 2) on MT-1029/VRC JUNCTION BOX. Be sure that GUIDE PINS (fig 2) of MT-1029/VRC are aligned with GUIDE PIN HOLES (fig 1) of amplifier-power supply.
- e. Push amplifier-power supply back on MT-1029/VDC.
- f. Engages CLAMPS (fig 2) on MT-1029/VDC with CLAMP RECESSES (fig 1) of amplifier-power supply and tighten CLAMPS securely.

- g. Connect Cable Assembly, Special Purpose, Electrical CX-4722/VRC between the amplifier-power supply ANTENNA CONTROL connector and connector J-552 of Antenna Matching Unit MX-2799/VRC or connector J2 of Antenna Matching Unit MX-6707/VRC as shown in figure 3.

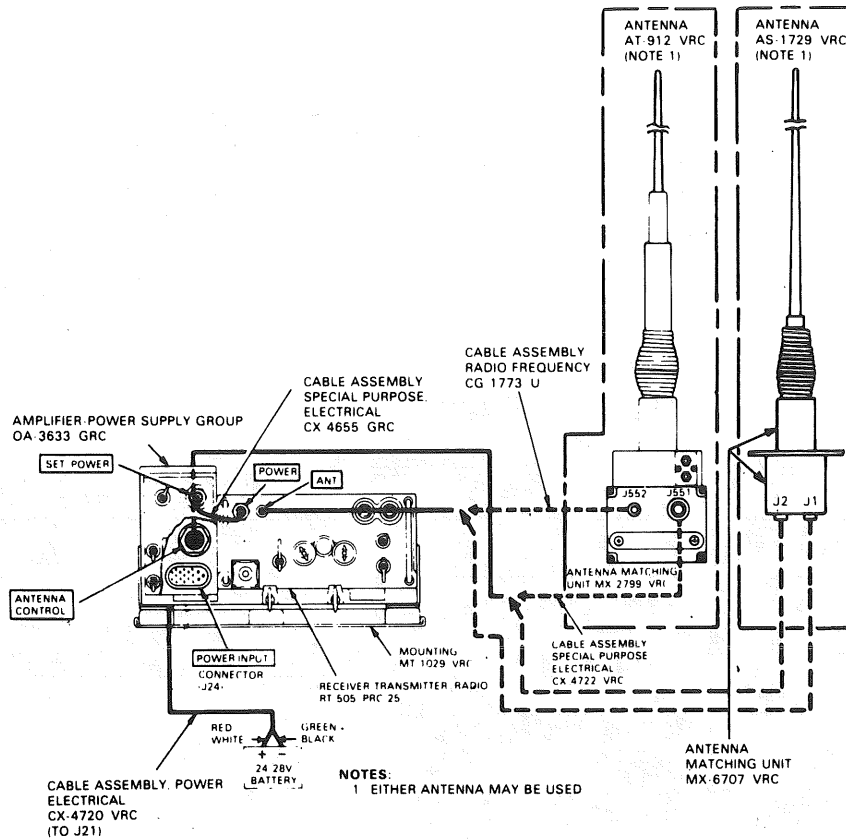


Figure 3. Cabling Diagram of Radio Set (Receiver-Transmitter OA-3633/GRC, and Antenna).

**CAUTION:** The ANTENNA CONTROL connector on the back of the amplifier-power supply is FEMALE and the one on the AT-912/VRC or AS-1729/VRC is MALE. Connect the corresponding mating end of Cable Assembly, Special Purpose, Electrical CX-4722/VRC accordingly.

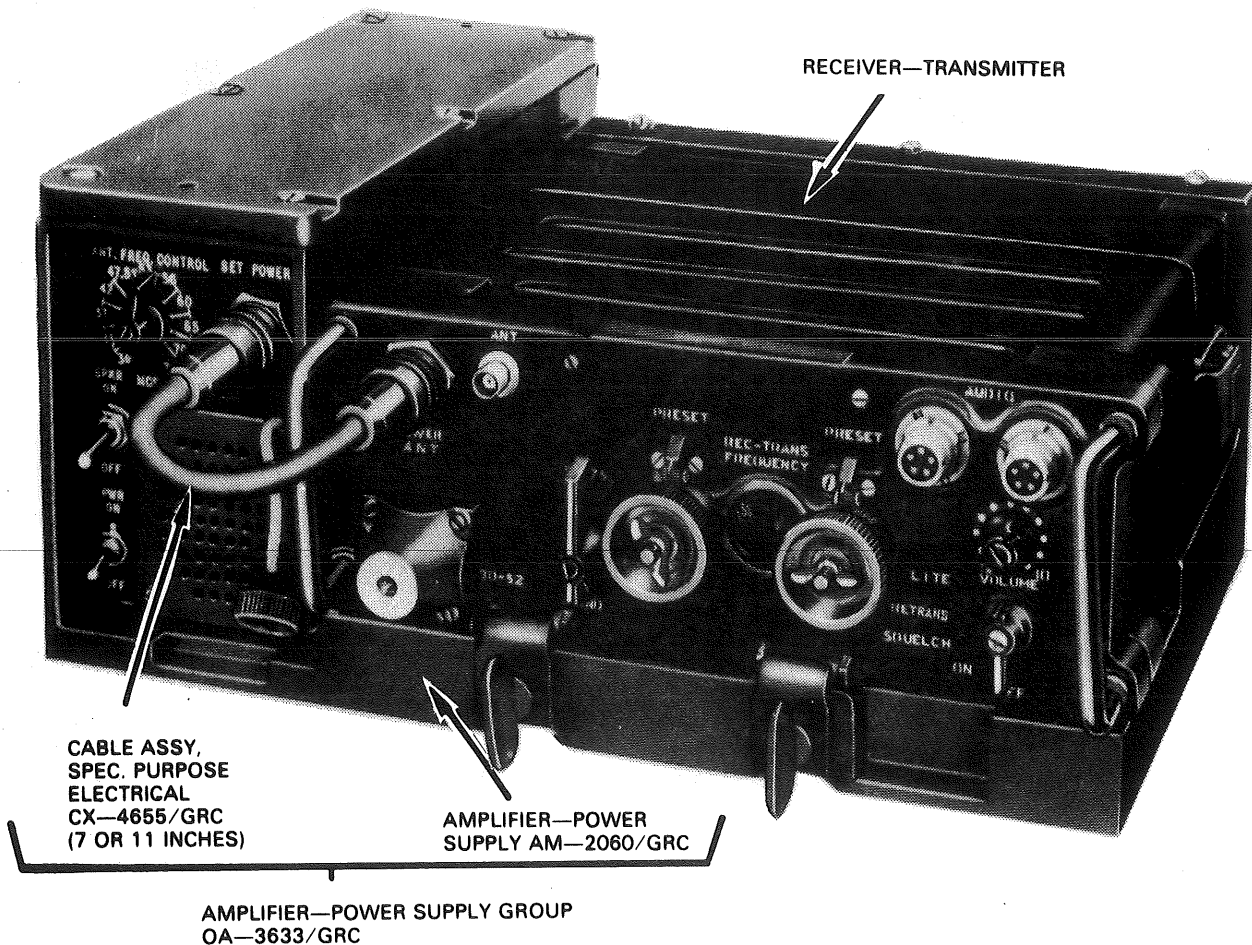


**SKILL LEVEL 1**

- h. Use caution when connecting the CX-4722/VRC connectors to the mating connectors. Improper mating damages the pins of the cable connector or the pins in the antenna matching units. First, line up the key in the receptacle with the slot in the cable connector. Then press in on the cable connector and turn the cable connector sleeve to lock the cable connector to the receptacle.
2. Insert receiver-transmitter into amplifier-power supply. (Refer to fig 4, and TM 11-5820-498-12, chap 2, sec II, para 2-5e, pp 2-5 and 2-6.)

**CAUTION:** Only if immediate man-pack operation is expected during the mission should a battery be left in the receiver-transmitter.

- a. Loosen the MOUNTING CLAMPS (fig 1) on the front of the amplifier-power supply. They will then drop slightly.



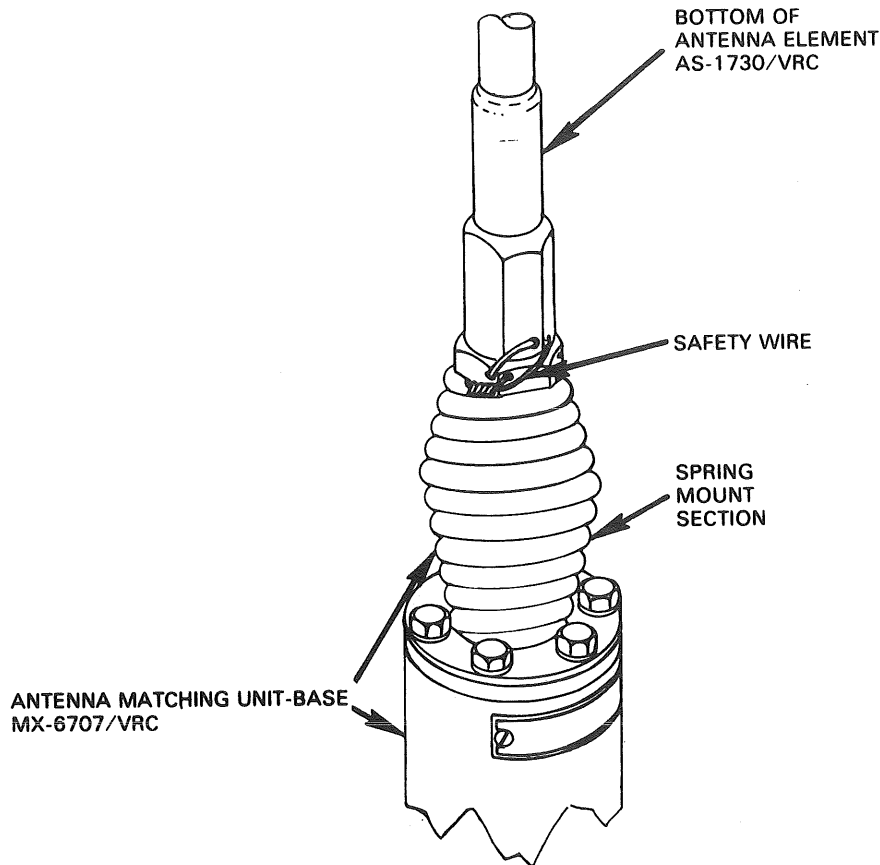
**Figure 4.** Amplifier-Power Supply OA-3633/GRC or OA-3633A/GRC with Receiver-Transmitter Installed.

- b. Slide the receiver-transmitter into the amplifier-power supply until bottom of the receiver-transmitter is flush with the BUMPER PLATE (fig 1) of the amplifier-power supply.
  - c. Raise the MOUNTING CLAMPS (fig 1) until they engage the lips on the panel of the receiver-transmitter then tighten the MOUNTING CLAMPS.
  - d. Remove the protective cap from POWER connector on front of receiver-transmitter (fig 3).
  - e. Connect Cable Assembly, Special Purpose, Electrical CX-4655/GRC between amplifier-power supply SET POWER connector and receiver-transmitter POWER connector as shown in figure 4.
  - f. Connect Cable Assembly, Radio Frequency CG-1773/U between receiver-transmitter ANT connector and connector J-551 of MX-2799/VRC or connector J1 of MX-6707/VRC as shown in figure 3.
3. Check siting of radio set. (Refer to TM 11-5820-498-12, chap 3, sec II, para 3-8, pp 3-6 and 3-7.)
    - a. Insure radio set is not located in a valley or depression.
    - b. Insure radio set is not located in a densely wooded area.
    - c. Insure radio set is not located near sources of electrical interference, such as power or telephone lines, radar sets, and field hospitals.
  4. Erect vehicular antenna and antenna tie-down kit. (Refer to TM 11-5820-498-12, chap 2, sec II, para 2-5f, p 2-6.)

NOTE: The vehicular whip antenna should always be in the upright position when transmitting to provide optimum radio communication range.

- a. Connect top and bottom sections of Antenna, AS-1729/VRC or AT-912/VRC.
- b. Attach assembled antenna to antenna matching unit.
  - (1) Insure that lower mast section of AT-912/VRC is tightly attached to the spring section of the antenna matching unit.

- (2) On AS-1729/VRC, insure that the safety wire is secured between the lower mast section and the spring section of the antenna matching unit as shown in figure 5.



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Figure 5. Tying Safety Wire Between AS-1730/VRC and MX-6707/VRC of AS-1729/VRC.

- c. Tie the antenna down using the antenna tie-down kit provided with the AT-912/VRC and AS-1729/VRC, whenever the antenna is not being used or you do not wish the antenna upright for any reason (especially to avoid contact with power lines).
- (1) Tie the rope to the front of the vehicle so that the antenna, when tied down, will rest centered over the hood and approximately 9 feet above the ground.

- (2) Insure antenna is placed in the MOBILE or STATIONARY position of the tie-down clamp as situation warrants.
  - (3) Install the antenna tip cap to the top section of the antenna.
5. Erect Antenna AT-984A/G (Long Wire). (Refer to TM 11-5820-498-12, chap 6, sec II, para 6-16, p 6-9.)
- a. Utilize Antenna Base Unit AB-591/PRC-25 to install the long wire antenna.
  - b. Insert the terminal lug located on one end of the long wire antenna under the AB-591/PRC-25 and tighten the AB-591/PRC-25 down into ANTENNA MOUNT of receiver-transmitter.
  - c. Tie cord attached to the antenna wire to a nearby support that is capable of supporting the wire when it is stretched to another support 150 feet away.
  - d. Unreel the antenna wire in the direction of the receiving station.

NOTE: Transmission and reception is off the end of the long wire antenna in the direction of the receiving station.

- e. Stretch antenna wire approximately 4 feet above the ground by securing the reel (which is provided with a tie cord for this purpose) to a building, tree, post or similar object.
- 
6. Connect dc power cable from Generator Set 3 KW, 28 V dc to vehicle battery terminals. (Refer to fig 6.)
- a. Insure amplifier-power supply and receiver-transmitter POWER controls are in OFF position.
  - b. Connect positive (+) lead of dc power cable to positive (+) battery terminal.
  - c. Connect negative (-) lead of dc power cable to negative (-) battery terminal.

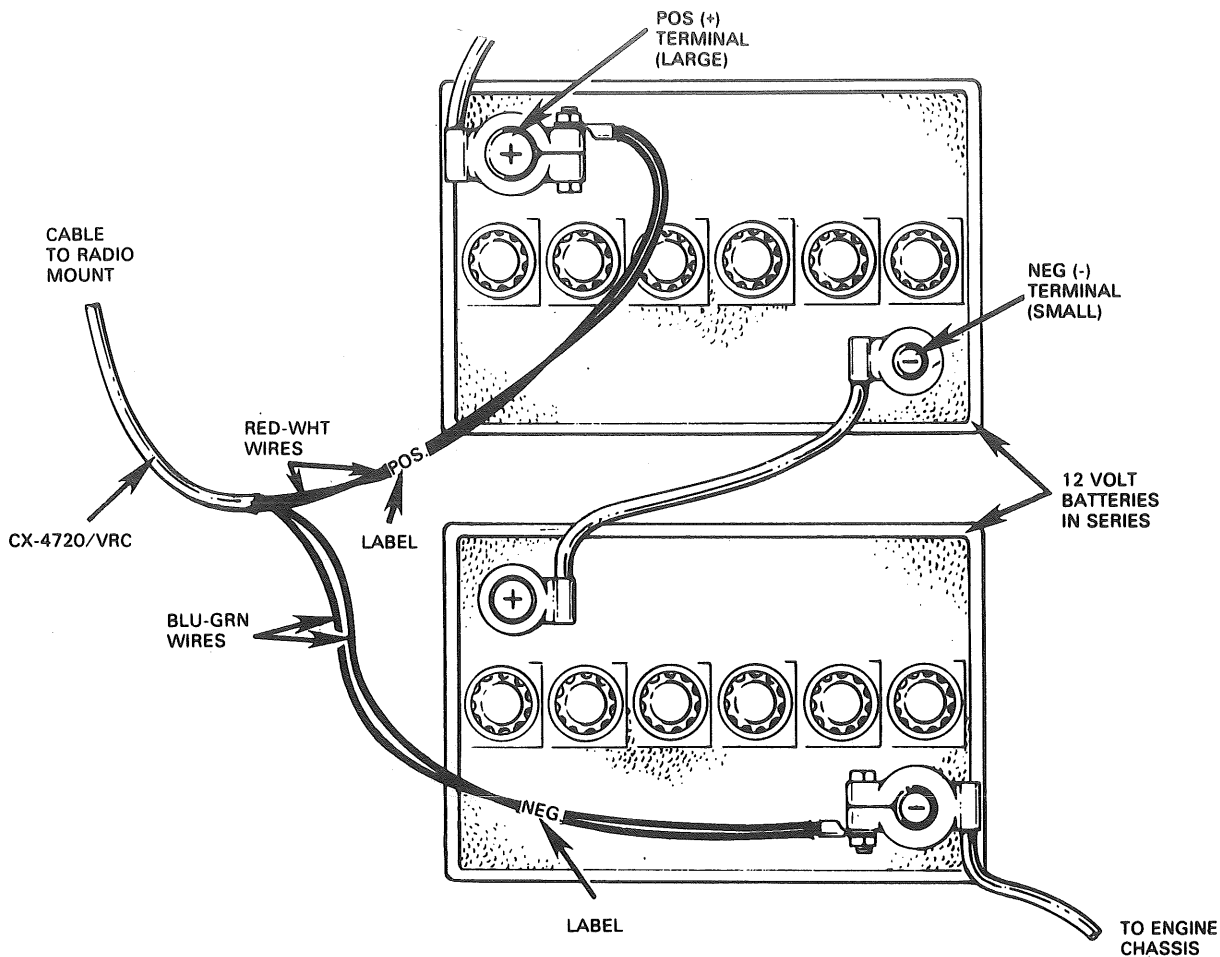


Figure 6. Connection of 28 V dc Power Cable.

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7. Insure all equipment is properly grounded in accordance with applicable TM's and TB SIG 291 prior to energizing equipment. (Refer to TM 11-5820-498-12, chap 2, sec II, WARNING, p 2-2.)

#### REFERENCES

TM 11-5820-498-12, w/C1 thru 8, Operator's and Organizational Maintenance Manual, Radio Sets AN/VRC-53, AN/VRC-64, AN/GRC-125 and AN/GRC-160 and Amplifier Power-Supply Groups OA-3633/GRC and OA-3633A/GRC, May 67.

TM 5-6115-271-14, w/C1, Operator/Crew, Organizational, Intermediate (Field), (Direct Support), and Depot Maintenance Manual: Generator Set, Gasoline Engine Driven, Skid Mounted, Tubular Frame, 3 KW, 3 Phase, AC 120/208 and 120/240 V, 28 V DC, Aug 76.

TB Sig 291, Safety Measures to be Observed When Installing and Using Whip Antennas, Field-type Masts and Towers, Antennas, and Metal Poles That are used With Communications, Radar, and Direction Finder Equipment, Jun 56.

SB 11-624, Warning Notice for Vehicles in Which Radios are Mounted, Mar 70.

# TASK

## 113-587-2002

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### Operate Radio Set AN/VRC-64

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#### CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. Your team chief will provide you with an installed Radio Set AN/VRC-64, current CEOI, SB-11-624, and TM 11-5820-498-12. Supervision and assistance will normally be available.

#### STANDARDS

This task has been performed correctly when, in 5 minutes, the radio set has been aligned according to performance measure 3, and the radio set has been placed into and taken out of operation according to performance measures 1 through 6.

#### PERFORMANCE MEASURES

1. Determine operating frequency from current CEOI.

**WARNING:** Do not permit vehicular whip antenna to touch high power lines or other sources of electricity; injury or death could result.

**CAUTION 1:** Insure battery is removed from Battery Box CY-2562/ PRC-25, for vehicular operation.

**CAUTION 2:** Do not key the receiver-transmitter while changing channels or the BAND switch. Module damage may occur or the frequency of the new channel may be incorrect.

**CAUTION 3:** Do not start, restart, slave, or stop the vehicle engine with the AM-2060/GRC turned ON. The AM-2060/GRC PWR switch must be set to OFF. Install WARNING decals as instructed in SB-11-624.

2. Conduct channel preset procedures. (Refer to TM 11-5820-498-12, chap 3, sec II, para 3-11, pp 3-8 and 3-9.)
3. Conduct alignment procedures for RT-841/PRC-77. (Refer to TM 11-5820-498-12, chap 3, sec II, para 3-13, pp 3-11, 3-13.)
  - a. Connect handset to one of the AUDIO connectors. (Refer to fig 1.)
  - b. Set FUNCTION switch to ON. (Refer to fig 1.)
  - c. Set BAND switch at 30-52 or 53-75, depending on frequency being used. (Refer to fig 1.)
  - d. Utilize preset or turn the MC tuning and KC tuning controls so that the desired frequency shows in the frequency window. (Refer to fig 1.)
  - e. Set VOLUME control at four and readjust for a desired sound level in the handset.

CAUTION: Do not force the VOLUME control past its stop.

4. Conduct alignment procedures for Amplifier-Power Supply Group OA-3633 or OA-3633A. (Refer to TM 11-5820-498-12, chap 3, sec II, para 3-14, pp 3-12, 3-13.)
  - a. Turn amplifier-power supply PWR switch to ON. (Refer to fig 1.)
  - b. Set amplifier-power supply SPKR switch to ON.
  - c. Adjust receiver-transmitter VOLUME control until background noise is heard.
5. Determine squelch setting for receiver-transmitter and align squelch control to appropriate setting as listed in CEOI.
6. Perform stopping procedures. Refer to TM 11-5820-498-12, chap 3, sec II, para 3-14k(1) and (2), pp 3-12, 3-13.)
  - a. Set the AM-2060/GRC PWR switch to OFF.
  - b. Turn the receiver-transmitter FUNCTION switch to OFF.

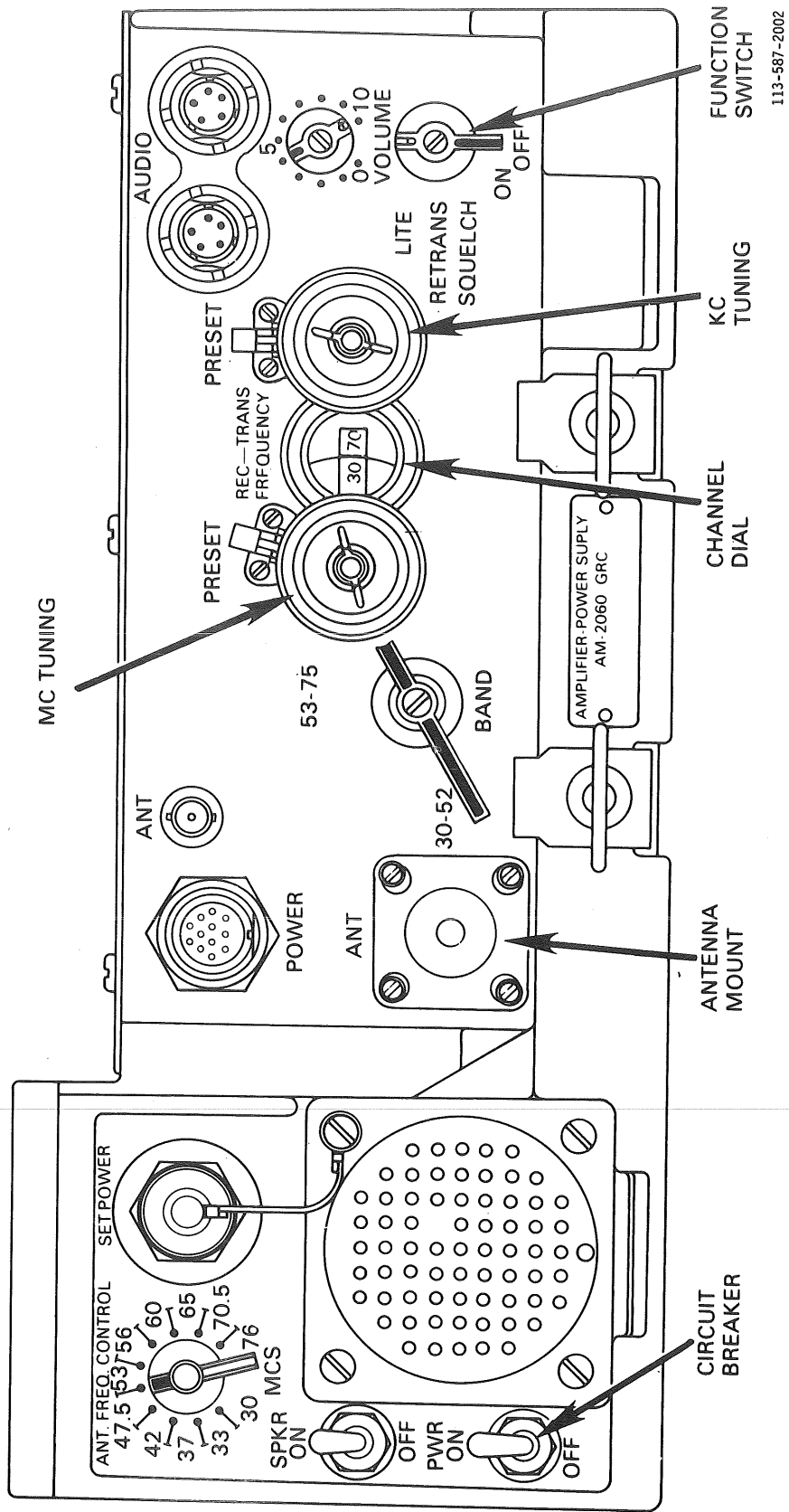


Figure 1. Amplifier-Power Supply and Receiver-Transmitter, Controls, Indicators, and Connectors.



REFERENCES

TM 11-5820-498-12, w/C1 thru 8, Operator's and Organizational Maintenance Manual, Radio Sets AN/VRC-53, AN/VRC-64, AN/GRC-125 and AN/ GRC-160 and Amplifier Power-Supply Groups OA-3633/GRC and OA-3633A/GRC, May 67.

TEC Lesson 201-113-4545-A, Maintain Circuit Log and Operator's Number Sheet.

TEC Lesson 201-113-4550-E/A, Radiotelegraph Procedure, Part 1, Calling and Answering.

TEC Lesson 201-113-4551-E/A, Radiotelegraph Procedure, Part 2, Calling and Answering.

TEC Lesson 201-113-4552-E/A, Radiotelegraph Procedure, Establishing a Net.

TEC Lesson 201-113-4553-E/A, Radiotelegraph Procedure, Authentication.

TEC Lesson 201-113-4554-E/A, Radiotelegraph Procedure, Opening a Net.

TEC Lesson 201-113-4555-E/A, Radiotelegraph Procedure, Free and Directed Net.

TEC Lesson 201-113-4556-E/A, Radiotelegraph Procedure, Message Format, Part 1.

TEC Lesson 201-113-4557-E/A, Radiotelegraph Procedure, Message Format, Part 2.

TC 32-11, How to Get Out of a Jam, Apr 75.

SB 11-624, Warning Notice for Vehicles in Which Radios are Mounted, Mar 70.

**TASK****113-596-1018****Install RC-292 Antenna****CONDITIONS**

This task is performed in a tactical or nontactical situation, under all weather conditions except electrical, wind, and ice storms, and may be performed in an NBC environment. Given a requirement and --

1. RC-292 Antenna.
2. Designated site for installation.
3. CEOI Extract.
4. Assistance for raising (total two personnel).

Supervision is normally available.

**STANDARDS**

Task standard has been met when the antenna site has been evaluated for natural and man-made hazards, tactical considerations, antenna assembled, and raised in accordance with performance measures 1 through 4 within 20 minutes.

**PERFORMANCE MEASURES**

**CAUTION: DO NOT INSTALL CLOSER THAN TWICE THE ERECTED HEIGHT TO POWER LINES.**

1. Evaluate installation site. (Refer to TB Sig 291, para 1b, p 1; para 3b(1), p 2; FM 24-18, chap 6, sec I, para 75-76, pp 72-75.)
  - a. Prior to installing or erecting any equipment, survey the area carefully for location of power lines, their height above ground level, and their proximity to the installation location (fig 1).

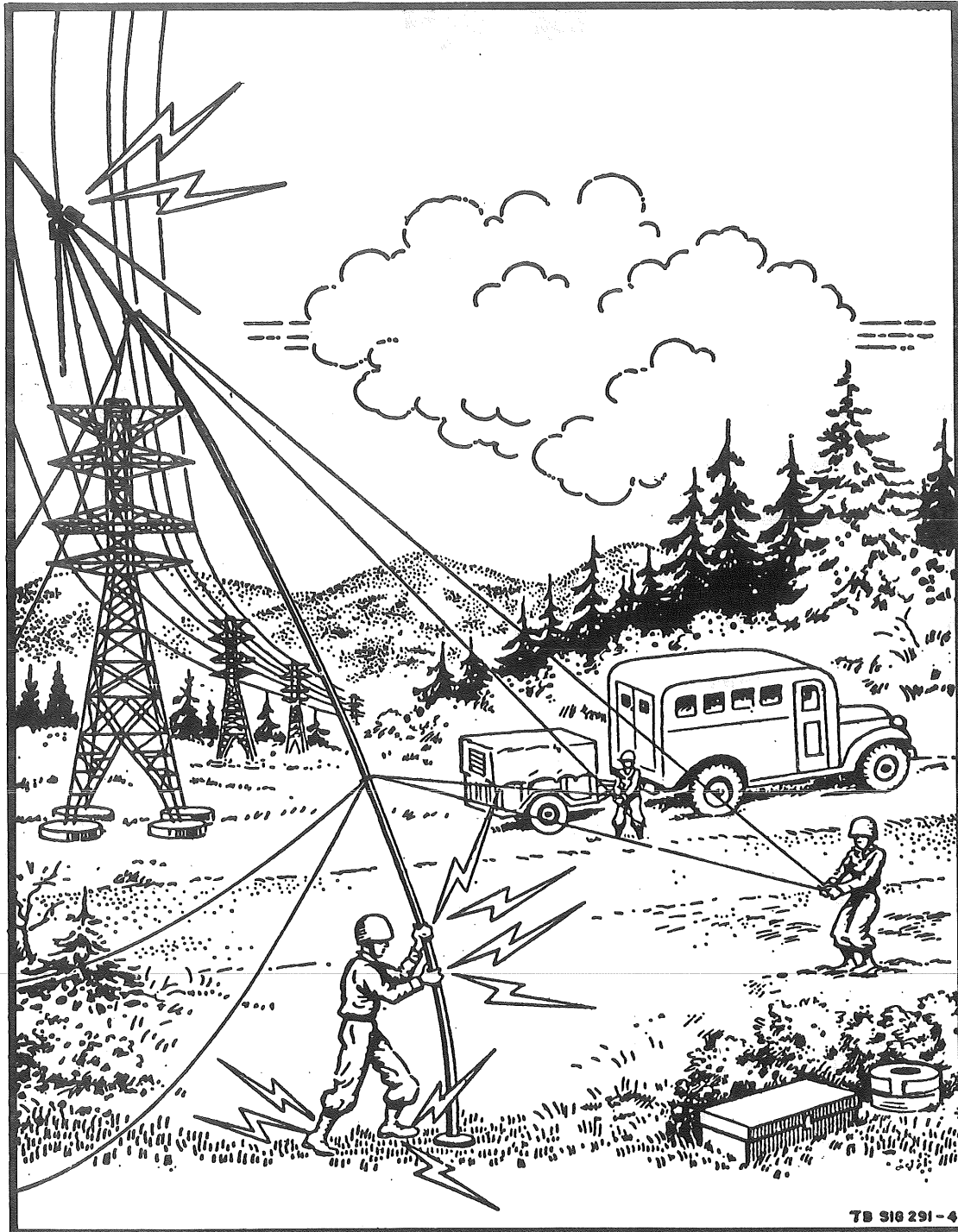


Figure 1. Antenna site with inadequate distance between power lines and antenna mast.

- b. A position beneath a steel bridge or in the vicinity of steel or reinforced concrete structures should not be selected due to high RF absorption.
  - c. Locations adjacent to heavily traveled roads and highways or generators can cause electrical interference.
  - d. The location should provide the best cover and concealment available consistent with good transmission and reception.
  - e. All positions should be properly camouflaged for protection against both aerial and ground observation. However, the antenna should not touch trees, brush, or camouflage material.
  - f. Open crests of hills and mountains must be avoided. A slightly defiladed position just behind the military crest gives better concealment and sometimes provides better transmission.
2. Lay out installation site (fig 2). (Refer to TM 11-5820-348-15, chap 2, sec II, para 2-4, 2-5a(1), p 2-3.)

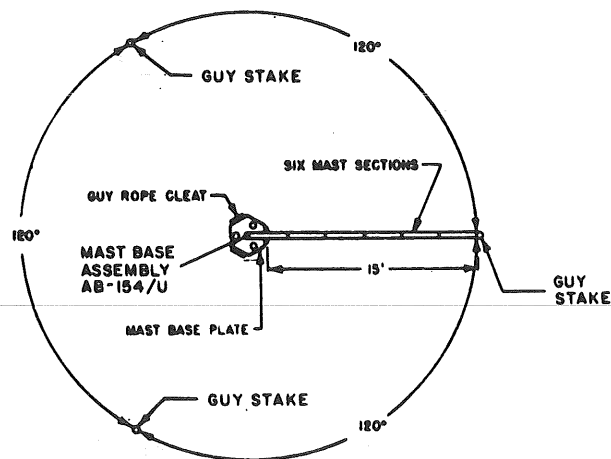


Figure 2. Positioning Guy Stakes.

## SKILL LEVEL 1

- a. Position the base plate at the point of installation, with the cleats up (fig 4).
- b. Drive the swivel stake (AB-154/U) through the center hole of the base plate with the hammer.
- c. Assemble six mast sections (AB-35/TRC-7) on the swivel stake.
- d. Drive three guy stakes, 15 feet from the centers of the cleats of the base plate (fig 2).
  - (1) Position the assembled mast sections over one base plate cleat.
  - (2) At the end of the mast sections, drive a stake at a 45-degree angle facing away from the mast.
  - (3) Move the mast sections to the other two cleats and repeat the process.
  - (4) Attach a guy strap to each of the guy stakes, using a cow hitch (fig 3).

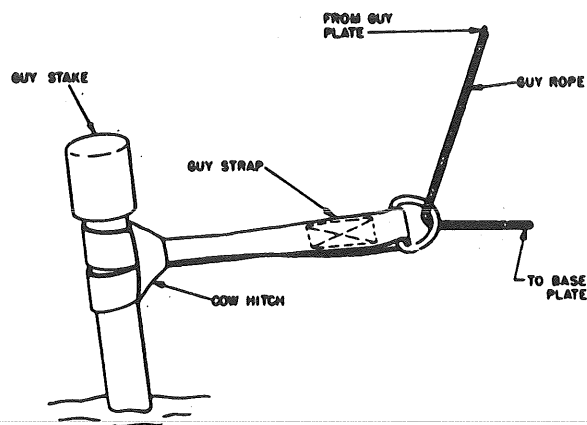


Figure 3. Attaching guy strap to guy stake.

3. Assemble the antenna. (Refer to TM 11-5820-348-15, chap 2, sec II, para 2-5, pp 2-3, 2-4; para 2-6a-e, pp 2-4, 2-5.)
  - a. Assemble mast.

- (1) Place a guy plate, cupped side toward the base, on the end of the six assembled mast sections.
- (2) Assemble five additional mast sections (AB-35/TRC-7) and join them to the six already assembled.
- (3) Place a second guy plate over the end of the eleventh mast section; add the final mast section (AB-35/TRC-7) to the assembly.
- (4) Pick up and position the assembled mast midway between two of the guy stakes.

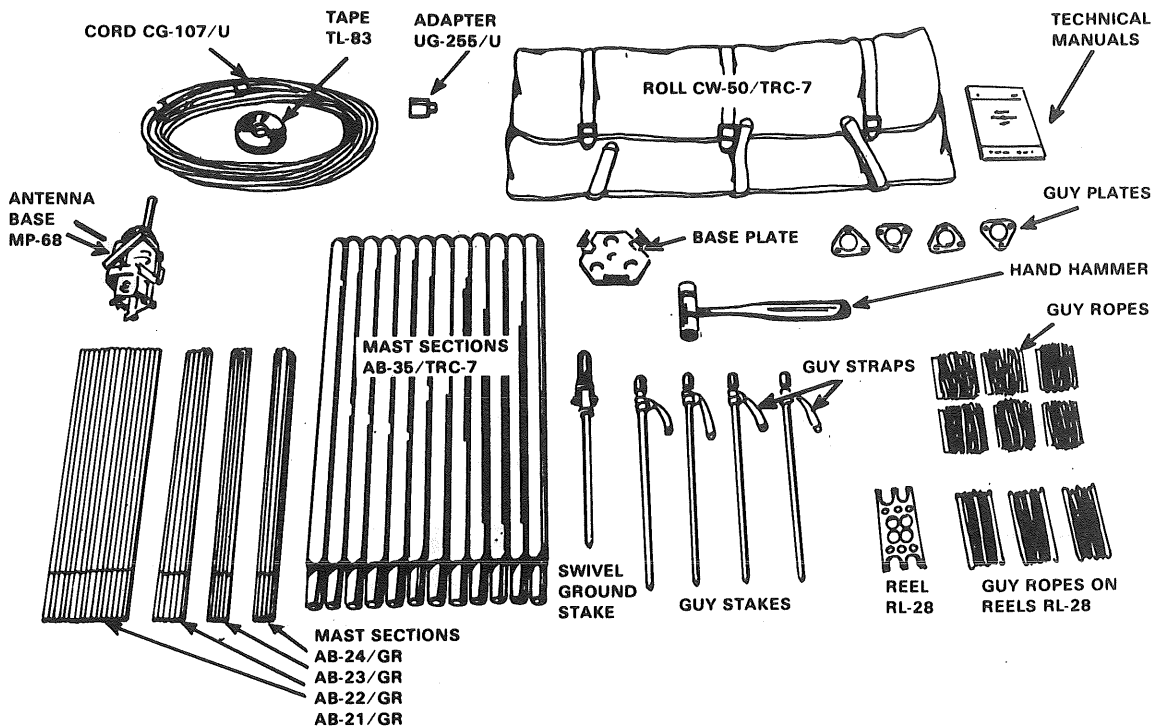


Figure 4. Antenna components.

b. Assemble antenna elements.

- (1) Determine elements required (fig 5).

NOTE: Assume an operating frequency of 42.95 MHz. On the chart, locate the frequency range that includes the operating frequency (36.5 to 50.5).

- (2) Assemble the vertical elements.

NOTE: On the chart, read across the frequency range to the first section. Three elements are required, (1) AB-22/GR; (1) AB-23/GR; (1) AB-24/GR.

- (a) Screw the antenna sections together.  
 (b) Screw the assembled elements into the top portion of the Antenna Base, MP-68.

- (3) Assemble the ground plane elements.

NOTE: Continue to read across the chart to the second section. Twelve ground plane elements are required; three sets of four elements: (1) AB-21/GR; (1) AB-22/GR; (1) AB-23/GR; (1) AB-24/GR.

- (a) Screw the three sets of elements together.  
 (b) Screw each of the assembled elements into the angled sockets on the lower portion of the Antenna Base, MP-68.

Radio Set or Receiver-Transmitter	Operating frequency (mc)	Number of antenna sections required	Type of sections used				Number of ground plane sections required	Type of ground plane sections			
			AB-21/GR	AB-22/GR	AB-23/GR	AB-24/GR		AB-21/GR	AB-22/GR	AB-23/GR	AB-24/GR
RT-66/GRC, AN/PRC-8	20 to 27.9	6	3	1	1	1	18	3	1	1	1
RT-67/GRC, AN/PRC-9	27 to 38.9	4	1	1	1	1	15	2	1	1	1
RT-68/GRC, AN/PRC-10	38 to 54.4	3	0	1	1	1	12	1	1	1	1
RT-246/VRC, RT-524/VRC, RT-505/PRC-25, RT-841/PRC-77	30 to 36.5	4	1	1	1	1	15	2	1	1	1
	36.5 to 50.5	3	0	1	1	1	12	1	1	1	1
	50.5 to 75.95	2	0	1		1	9	0	1	1	1

Figure 5. Antenna frequency chart.

- c. Mount Antenna Base.
- (1) Loosen the clamps and place the antenna base on the mast sections.
  - (2) Position the antenna on the ground so that two ground plane sections rest on the ground.
  - (3) Tighten the vise on the mast sections.
- d. Connect RF cable - CG-107A/U.
- (1) Screw one end into the L-shaped adapter (M-359) on the bottom of the antenna base.
  - (2) Tape the cable to the mast just below the antenna base. Leave a loop to relieve strain.
  - (3) Tape the cable to the mast every 5 feet.
- e. Connect guys.
- (1) Turn guy plates so that one hole is on top.
  - (2) Attach two guy ropes to the side holes (open side of snap hook pointing toward mast) of the lower guy plate.
  - (3) Pass the guys through the respective guy strap "D"-rings (fig 3) to the base plate cleat.
  - (4) Pass the free end of each guy through the center hole of the cleat. Tie a slip knot (fig 7) about 3 feet from the cleat, between the cleat and the guy stake.
  - (5) Pass the free end of the guy through the slip knot and back to the cleat.
  - (6) Pull the guy loosely-taut (not tight or stretched) and secure it with a hitch (fig 8).
  - (7) Snap the third guy rope in the upper hole of the guy plate and lay the guy along the mast toward the third guy stake.
  - (8) Attach the guys to the upper guy plate in the same manner.



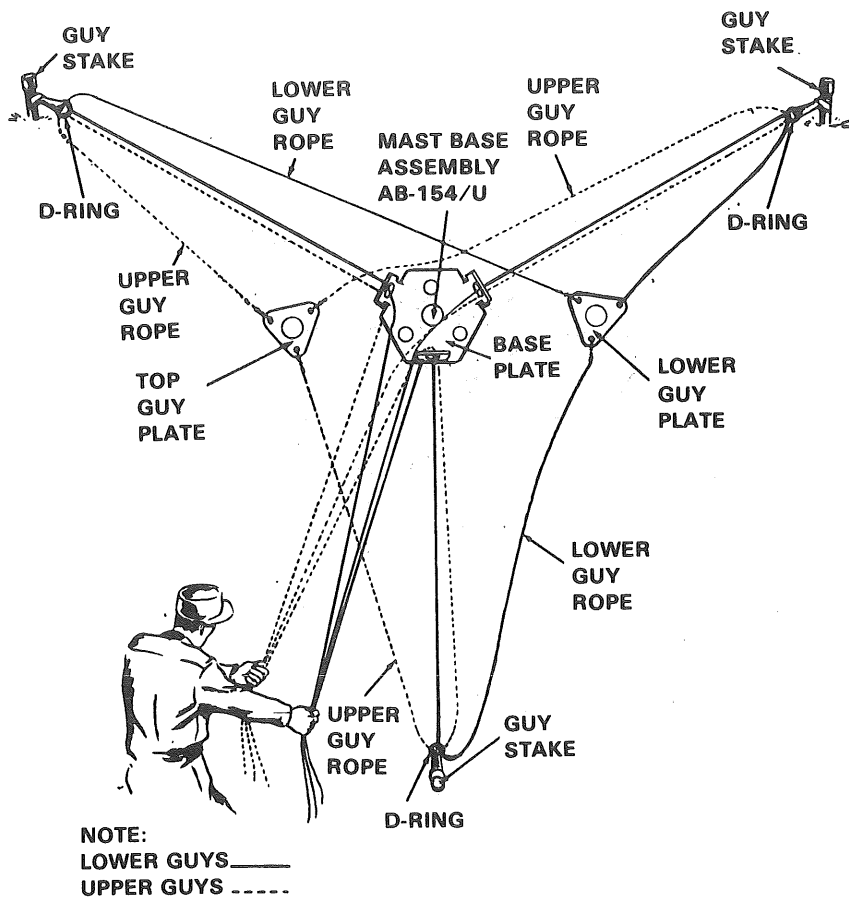


Figure 6. Base plate, guy plate and guy rope layout.

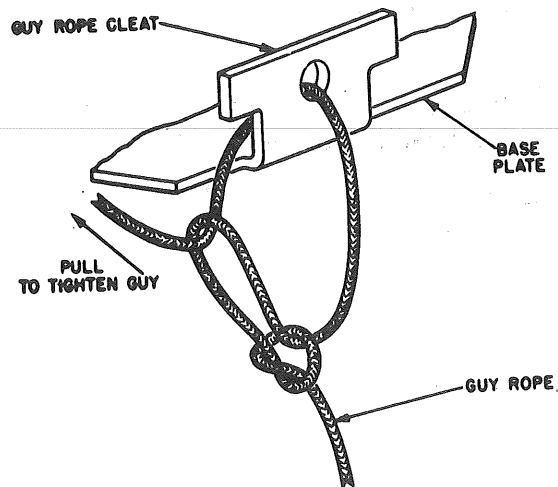


Figure 7. Slip knot for tightening guy rope.

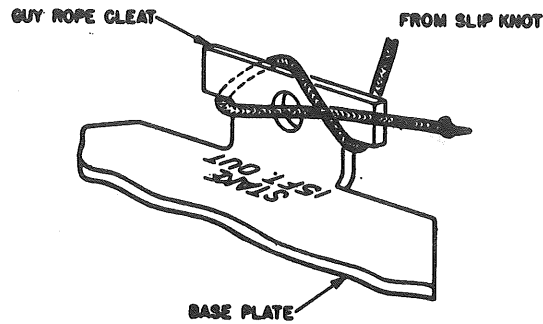


Figure 8. Hitch for securing end of guy rope.

4. Erect the antenna. (Refer to TM 11-5820-348-15, chap 2, sec II, para 2-6f, g, p 2-5.)

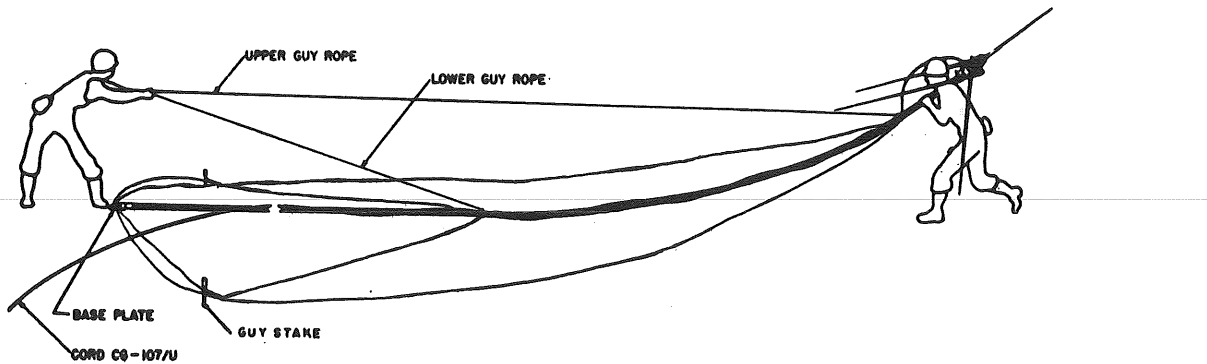


Figure 9. Erecting antenna with assistance.

a. Preparation.

- (1) Installer--near the swivel stake in line with the third guy stake, holding the free guys (fig 9).

(2) Assistant--at the top, holding the antenna base at shoulder height.

b. Raising.

(1) Installer--bow the top end by pulling the guy ropes tight, and walk backward pulling the mast slowly and firmly erect.

(2) Assistant--walk toward the base, pushing the mast upward.

c. Adjusting.

(1) Installer--hold the free guys taut, at the third guy stake.

(2) Assistant--adjust the remaining 4 guys to balance the antenna in the vertical position.

(3) Assistant--pass the ends of the free guys through the "D"-ring of the third guy strap and secure the third guy to the base plate cleat (figs 7 and 8).

REFERENCES

FM 24-18, Field Radio Techniques, Jul 65.

TB Sig 291, Safety Measures to be Observed When Installing and Using Whip Antennas, Field Type Masts, Towers, Antennas, and Metal Poles that are Used with Communication, Radar, and Direction Finder Equipment, Jun 56.

TM 11-5820-348-15, w/C2 thru 4, Organizational, Direct Support, General Support, and Depot Maintenance Manual: Antenna Equipment RC-292, May 66.

TEC Lesson 936-061-0100-F, Antenna RC-292: Inventory Parts.

TEC Lesson 936-061-0102-F, Antenna RC-292: Assembly and Erection without Base.

TEC Lesson 936-061-0103-F, Antenna RC-292: Assemble Antenna Elements, Erection, Dismantling.

TEC Lesson 936-061-0104-F, Antenna Group RC-292: Site Selection and Safety.

**TASK****113-596-3009**

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**Perform Operator's Preventive Maintenance Checks  
and Services on Antenna RC-292**

---

**CONDITIONS**

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. RC-292, Antenna.
2. Lint-free cloth and/or brush.
3. Trichloroethane.
4. Initiated DA Form 2404.
5. TM 11-5820-348-15.

Supervision is normally available.

**STANDARDS**

Task standard has been met when preventive maintenance on the antenna has been performed in accordance with performance measures 1 through 3 within 30 minutes.

**PERFORMANCE MEASURES**

**WARNING:** Shut down the transmitter before performing preventive maintenance checks and services.

1. Perform operator's daily preventive maintenance checks and services. (Refer to TM 11-5820-348-15, chap 3, para 3-4, p 3-1; para 3-5, p 3-2.)

NOTE: Operator's preventive maintenance checks and services are performed daily when installed and under the following special conditions:

1. Before the antenna is put into operation.
2. When the equipment is initially installed.
3. When the equipment is reinstalled after removal for any reason.
4. At least once a week if the equipment is maintained in standby condition.

**Operator's Daily Preventive Maintenance Checks and Services Chart**

Sequence No.	Item to be inspected	Procedure	References
1	Antenna -----	<i>Warning:</i> Shut down the transmitter before performing the following procedure. a. Check for completeness ----- b. See that the installation complies with operational requirements. c. Check for cleanliness. Remove any grease, dirt, corrosion, and fungus. d. See that all painted surfaces are free of bare spots, rust, and corrosion.	a. Appx II. b. Para 2-5 through 2-10. c. Para 3-7. d. Para 4-7.
2	Reels -----	Check the reels for rust, corrosion, bends, or damage that could impair serviceability.	Fig. 1-2.
3	Baseplate and guy plate.	Inspect the baseplate and guy plate to see if they are broken or bent.	Fig. 1-1 and 1-2.
4	Guy stakes -----	Check to see that the guy stakes are driven correctly into the earth, and that they are not under excessive strain or pull from the guy ropes.	Fig. 1-1.
5	Canvas items -----	Examine the guy straps and the canvas roll for fungus, mildew, tears, or fraying.	Fig. 1-2.

- b. Cleaning. (Refer to TM 11-5820-348-15, chap 3, para 3-7, p 3-2.)

**WARNING:** The fumes of TRICHOLOROETHANE are toxic. Provide thorough ventilation whenever it is used; avoid prolonged or repeated breathing of vapor. Do not use near an open flame or hot surface; trichloroethane is nonflammable but heat converts the fumes to a highly toxic phosgene gas, which, if inhaled, could result in serious injury or death. Prolonged or repeated skin contact with trichloroethane can cause skin inflammation. When necessary, use gloves, sleeves and aprons which the solvent cannot penetrate.

- (1) Remove dust or loose dirt with a clean, soft cloth or brush.
- (2) Remove grease, fungus, and ground-in dirt with a clean cloth dampened (not wet) with trichloroethane.

2. Perform operator's weekly preventive maintenance checks and services. (Refer to TM 11-5820-348-15, chap 3, para 3-6, p 3-2.)

NOTE: The weekly PMCS are performed in conjunction with a daily PMCS.

**Operator's Weekly Preventive Maintenance Checks and Services Chart**

Sequence No.	Item to be inspected	Procedure	References
1	Guy ropes -----	Inspect the guy ropes for damage such as cuts, frays, strain and observe their general appearance as for their serviceability.	Fig. 1-1.
2	Insulators -----	Check the insulators for cracks and the presence of soiling matter on the antenna base.	Fig. 1-3.
3	Cable assembly, radio frequency.	Inspect the cable assembly for damage to the insulation, such as cuts or breaks.	
4	Connector plug ----	Examine the connector plugs for cleanliness and effective contact with the receptacles.	
5	Installation -----	Inspect the antenna to see that it is properly assembled and erected.	Para 2-4 through 2-10.
6	Spare parts -----	Check all spare parts (organizational) to see that they are in good condition and properly stored. There should be no evidence of overstock, and all shortages must be on valid requisitions.	Appx II.

3. Update DA Form 2404.

**REFERENCES**

TM 11-5820-348-15, w/C2 thru 4, Organizational, Direct Support, General Support, and Depot Maintenance Manual: Antenna Equipment RC-292, May 66.

# TASK

## 113-601-1003

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### Install Generator Set 3 KW, 28 V DC

---

#### CONDITIONS

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. Generator Set 3 KW, 28 V DC.
2. TM 5-6115-271-14.
3. 5-pound sledge hammer.
4. Ground rod, or ground plate.
5. Ground strap.
6. 8-inch flat tip screwdriver.
7. 8-inch adjustable wrench.
8. Standard pliers.

Supervision and assistance will be available.

#### STANDARDS

This task has been performed correctly when the generator set has been sited, grounded, DC power cable connected, fuel supply determined and connected without causing damage equipment. Task is to be completed in 10 minutes in accordance with performance measures 1 thru 3.

#### PERFORMANCE MEASURES

1. Site Generator Set 3 KW, 28 V DC. (Refer to TM 5-6115-271-14, chap 4, sec I, para 4-2a, p 4-1.)
  - a. Insure generator set has adequate platform to prevent skids from sinking into soft ground or sand.
  - b. Insure generator set level does not exceed a tilt of 15 degrees in any direction.

- c. Insure drainage is provided for run-off of water from the generator set.

**WARNING:** If generator set is trailer mounted complete these steps:

1. Insure landing wheel and rear support leg are down.
  2. Remove front baffle.
  3. Roll canvas up and secure to top bows.
2. Ground Generator Set 3 KW, 28 V DC. (Refer to fig 1, and TM 5-6115-271-14, chap 4, sec I, para 4-2b, pp 4-1 and 4-2.)

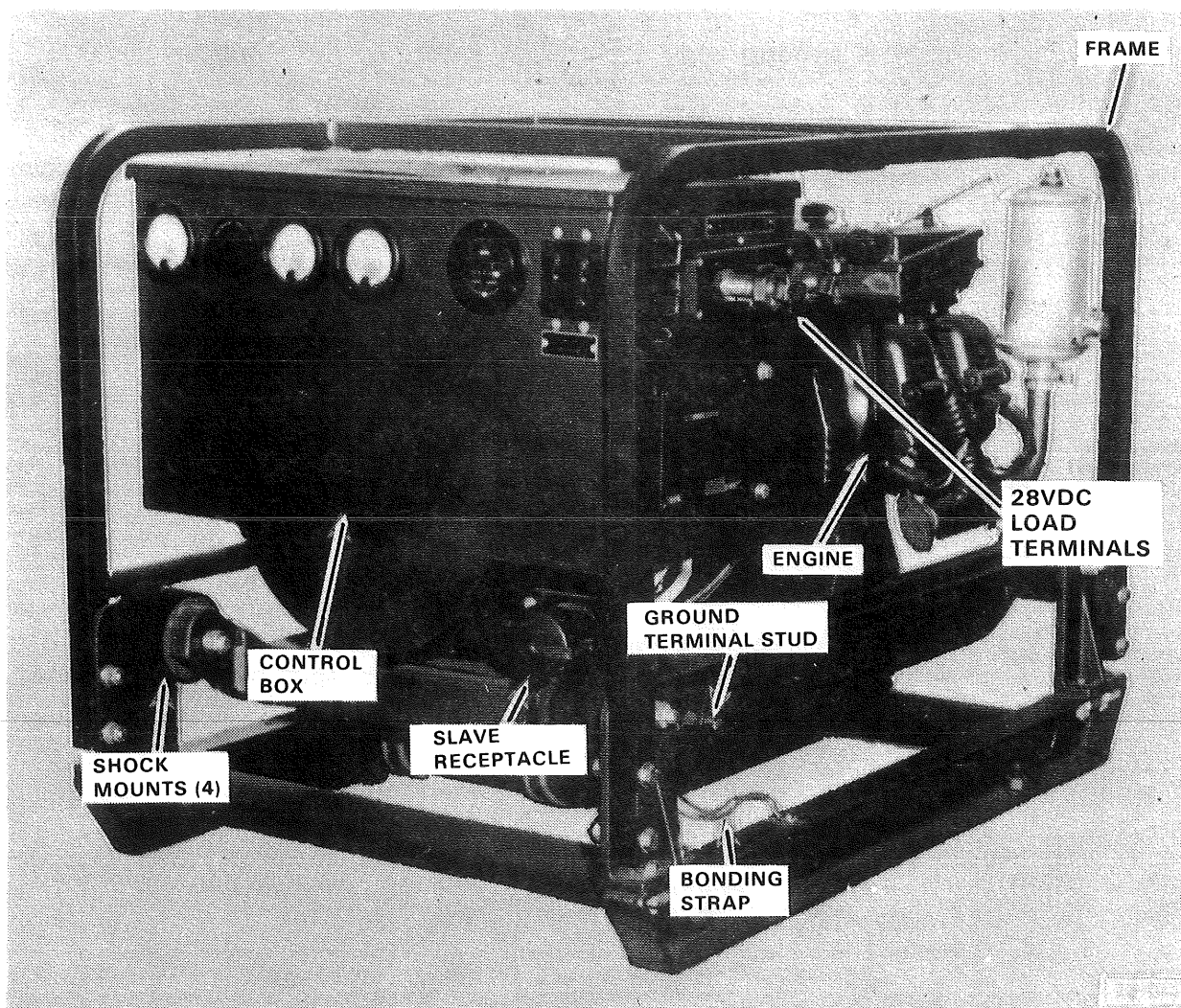


Figure 1. Generator Set 3 KW, 28 V DC.



- a. Select one of the following ground systems:
    - (1) An underground metallic water pipe system.
    - (2) A ground rod.
    - (3) A ground plate with a minimum area of 9 square feet.
  - b. Insure ground rod, if selected, is driven a minimum of 8 feet into the ground.
  - c. Insure ground plate, if selected, is buried a minimum of 4 feet in the ground.
  - d. Attach ground strap to GROUND TERMINAL STUD of generator set and ground connector of selected ground.
3. Connect dc power cable. (Refer to fig 1, and TM 5-6115-271-14, chap 4, sec I, para 4-2c(2), p 4-3.)
- a. Connect dc power cable to the 28 V DC LOAD TERMINALS of the generator set.
  - b. Insure + cable of power cord is connected to + terminal and - cable of power cord is connected to - terminal of generator set.

#### REFERENCES

TM 5-6115-271-14, w/C1, Operator/Crew Organizational, Intermediate (Field), (Direct and General Support) and Depot Maintenance Manual: Generator Set, Gasoline Engine Driven, Skid Mounted, Tubular Frame, 3 KW, 3 Phase, AC 120/208 and 120/240, 28 V DC, Aug 76

TC 11-6, Grounding Techniques, Sep 76.

# TASK

## 113-601-2005

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### Operate Generator Set, 3 KW, 28 V DC

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#### CONDITIONS

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. Generator Set 3 KW, 28 V DC.
2. TM 5-6115-271-14.
3. External 24/28 volt power source.
4. Auxiliary fuel supply.

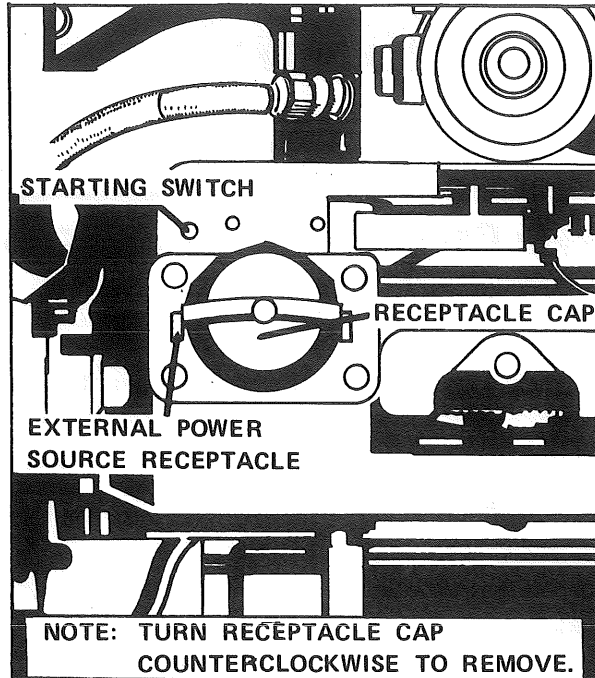
Supervision and assistance will be available.

#### STANDARDS

This task has been performed correctly when, in 10 minutes, the meters on the generator set conform to the requirements of figure 3 of this task, both electrically and manually, and the generator set has been placed into and taken out of operation according to performance measures 1 through 6.

#### PERFORMANCE MEASURES

1. Perform daily preventive maintenance checks and services before starting Generator Set 3 KW, 28 V dc. (Refer to TM 5-6115-271-14, chap 4, sec IV, para 4-9, 4-10, pp 4-12, 4-13, and table 4-1, p 4-13.)
2. Connect the auxiliary fuel line if an external fuel source is to be used. (Refer to TM 5-6115-271-14, chap 2, sec I, para 2-2b(1) (b), p 2-1.)
3. Electrically start Generator Set 3 KW, 28 V dc (when appropriate.) (Refer to fig 1 and 3, and TM 5-6115-271-14, chap 2, sec I, para 2-2b(1) and (2), p 2-1.)
  - a. Connect the 24/28-volt external power source to the EXTERNAL POWER SOURCE receptacle of the generator set.

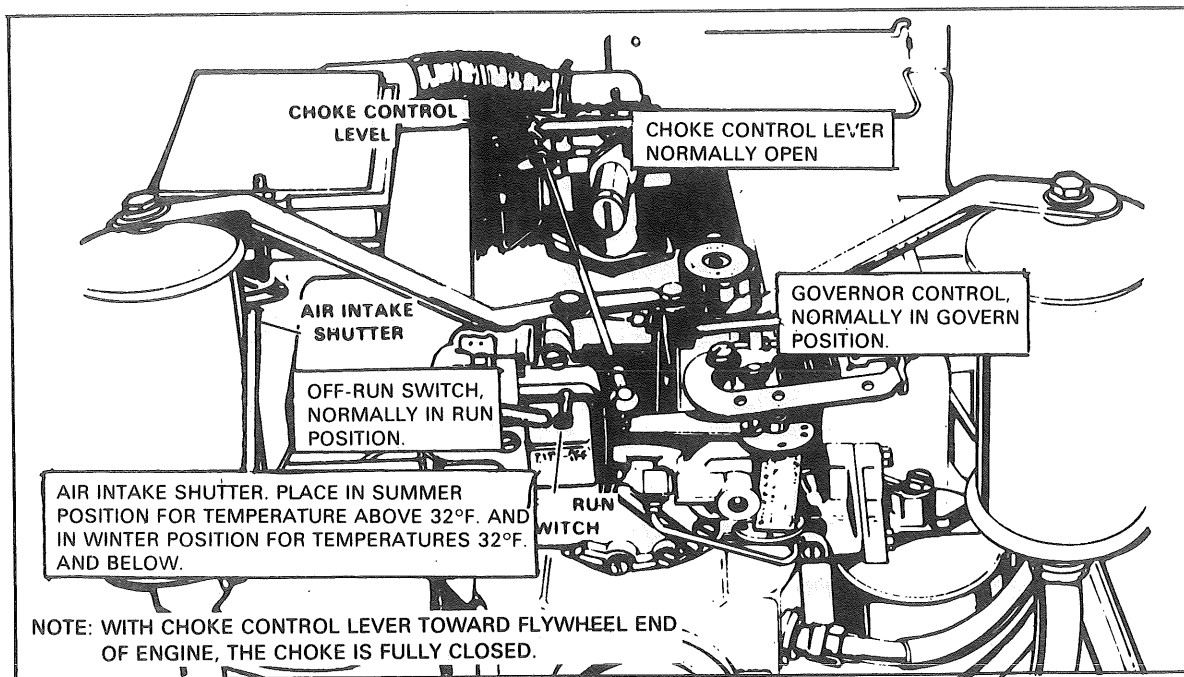


113-601-2005

Figure 1. External Power Source Receptacle.

- b. Turn VARIABLE RESISTOR knob fully counterclockwise.
- c. Insure circuit breaker is in the OFF position.
- d. Place the FUEL SELECTOR valve in SET TANK or AUX TANK depending on source of fuel supply.
- e. Place AIR INTAKE SHUTTER to WINTER position when temperature is 32 degrees Fahrenheit or lower and to the SUMMER position when temperature is 32 degrees Fahrenheit or above.
- f. Place GOVERNOR control in START AND IDLE position.
- g. Close choke with CHOKE CONTROL lever.
- h. Place OFF-RUN switch in RUN position.
- i. Hold STARTING switch in the START position a maximum of 15 seconds. If engine does not start, allow a cooling off period of 1-minute before attempting to restart.

- j. After engine has started, gradually open choke with CHOKE CONTROL lever as engine attains operating temperature.
4. Manually start Generator Set 3 KW, 28 V dc. (Refer to fig 2, and TM 5-6115-271-14, chap 2, sec I, para 2-2b(3), p 2-1.)
    - a. Turn VARIABLE RESISTOR knob fully counterclockwise.
    - b. Insure circuit breaker is in the OFF position.
    - c. Place FUEL SELECTOR valve in SET TANK or AUX TANK depending on source of fuel supply.
    - d. Place AIR INTAKE SHUTTER in SUMMER or WINTER position depending on temperature.
    - e. Place GOVERNOR CONTROL in START AND IDLE position.
    - f. Close choke with CHOKE CONTROL lever.
    - g. Place OFF-RUN switch in RUN position.
    - h. Wrap starter rope around pulley FLANGE and pull with a quick steady motion.
    - i. When engine starts, place the GOVERNOR control to the GOVERN position.
    - j. Gradually open choke with CHOKE CONTROL lever as engine attains operating temperature.



CHOKE CONTROL LEVER, AIR INTAKE SHUTTER, GOVERNOR CONTROL OFF-RUN SWITCH.

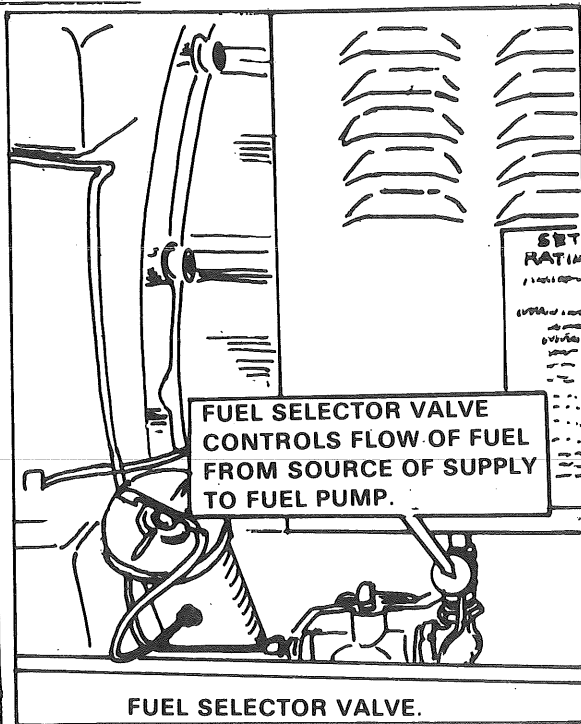
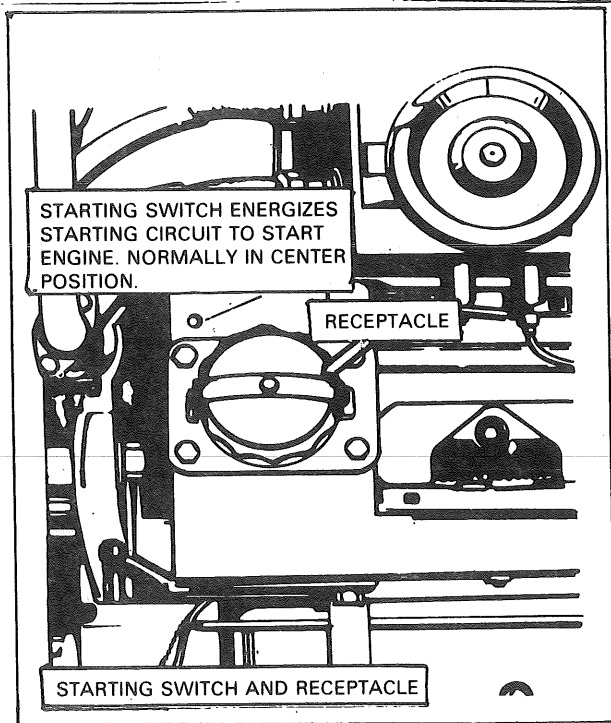


Figure 2. Engine Controls for Generator Set 3 KW.

CAUTION: Allow engine to warm up at rated RPM for 3-5 minutes before applying a load.

5. Perform operating procedures for Generator Set 3 KW, 28 V DC. (Refer to fig 1, and TM 5-6115-271-14, chap 2, sec I, para 2-2d, pp 2-1 thru 2-3.)

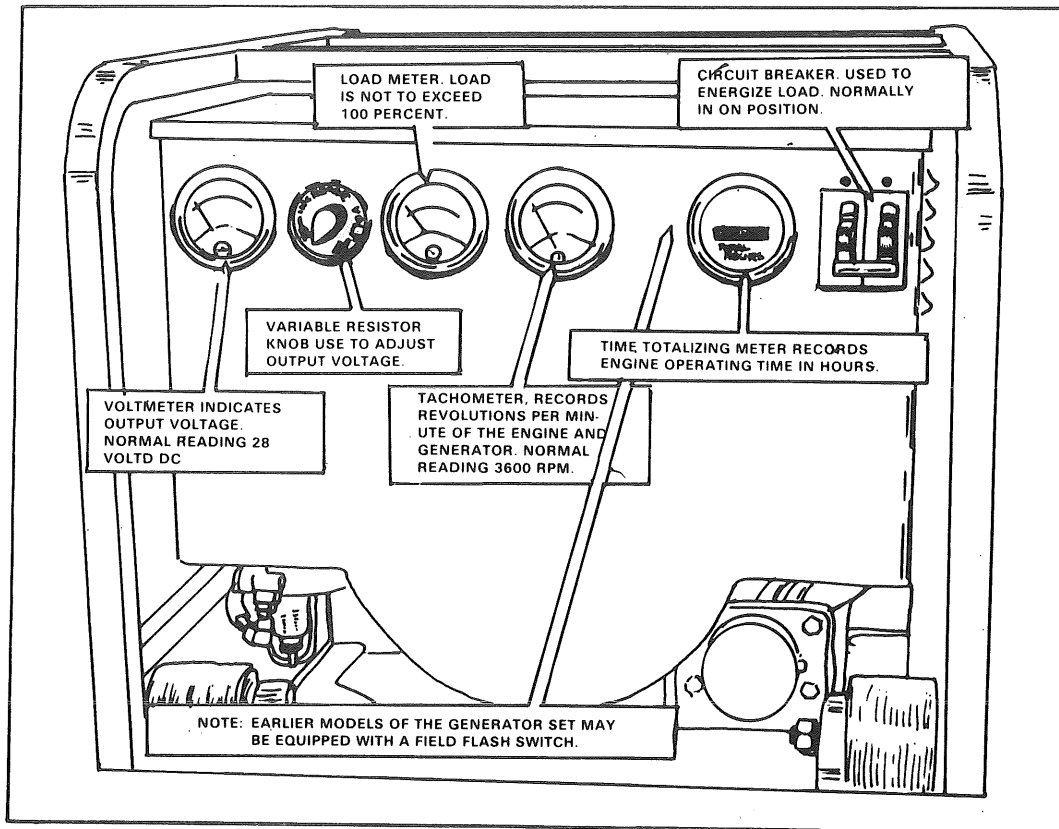


Figure 3. Controls and Instruments for a 3 KW Generator.

- a. Turn VARIABLE RESISTOR knob clockwise to increase voltage output, counterclockwise to decrease voltage output, and adjust to 28 volts MAXIMUM on the DC VOLTMETER.

NOTE: The FIELD FLASH switch is used to flash the generator fields only when voltage fails to build up automatically. Depress switch momentarily.

- b. Place circuit breaker in ON position.

## SKILL LEVEL 1

- c. If needed, readjust VARIABLE RESISTOR to 28 volts.
  - d. Inspect the TACHOMETER for correct RPM. If reading is above or below 3600 RPM, the GOVERNOR must be adjusted.
  - e. Inspect the LOAD METER, if more than 100% of full load current is indicated, reduce the load or report the condition to your supervisor.
6. Perform stopping procedures for Generator Set 3 KW, 28 V DC. (Refer to TM 5-6115-271-14, chap 2, sec I, para 2-2c, p 2-1, and fig 2-8, p 2-10.)
- a. Place circuit breaker in OFF position.
  - b. Turn VARIABLE RESISTOR knob fully counterclockwise.
  - c. Place GOVERNOR CONTROL in START AND IDLE position and allow engine to idle for 3-5 minutes.
  - d. Place OFF-RUN switch to the OFF position.
  - e. Place FUEL SELECTOR valve in the OFF position.

## REFERENCES

TM 5-6115-271-14, w/C1, Operator/Crew Organizational Intermediate (Field), (Direct and General Support) and Depot Maintenance Manual: Generator Set, Gasoline Engine Driven, Skid Mounted, Tubular Frame, 3 KW, 3 Phase, AC, 120/208 and 120/240 V, 28 V DC, Aug 76.

**TASK****113-609-1001**

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**Install and Operate Communications Security  
Equipment TSEC/KY-8**

---

**CONDITIONS**

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. Security Equipment TSEC/KY-8.
2. Radio Set.
3. TM 11-5810-224-10.
4. Cables.

Supervision and assistance will be available.

**STANDARDS**

This task has been performed correctly when, in 10 minutes, the security equipment has been installed in its mount without damage to the security equipment or its mount, all cable connections are made and the security equipment has passed and received secure traffic according to performance measures 1 or 2.

**PERFORMANCE MEASURES**

1. Install Security Equipment TSEC/KY-8 with Remote Control Unit (RCU). (Refer to TM 11-5810-224-10.)
  - a. Place TSEC/KY-8 in mount and secure locking levers.
  - b. Connect all cables.
  - c. Switch radio power OFF (when using RT-524/VRC or RT-246, switch power ON).



- d. Switch RCU power OFF.
- e. Switch RCU to CIPHER.
- f. Switch TSEC/KY-8 to REMOTE.
- g. Key the TSEC/KY-8. (CLASSIFIED)
- h. Switch RCU power ON.
- i. Perform TSEC/KY-8 alarm test (pause at each position, RED light should blink on and beeps should be heard).
- j. Press PUSH-TO-TALK, single BEEP should be heard.
- k. Begin SECURE transmission.
- l. For subsequent transmissions only steps (j) and (k) above apply.

NOTE: If constant series of BEEPS are heard or flashing RED light occurs during CIPHER transmissions, repeat entire first start. If problem reoccurs, switch to PLAIN voice and notify your supervisor or support maintenance facility.

- m. In an EMERGENCY, eliminate key according to local ZEROIZE procedures.
- 
2. Install TSEC/KY-8 (without remote control unit). (Refer to TM 11-5810-224-10.)
    - a. Place TSEC/KY-8 in mount and secure all locking levers.
    - b. Connect all cables.
    - c. Switch radio power OFF (when using RT-524/VRC or RT-246/VRC, switch power ON).
    - d. Switch TSEC/KY-8 power OFF.

- e. Switch TSEC/KY-8 to CIPHER.
- f. Switch TSEC/KY-8 to LOCAL.
- g. Key the TSEC/KY-8. (CLASSIFIED)
- h. Turn TSEC/KY-8 power ON.
- i. Perform TSEC/KY-8 alarm test. (Pause at each position, BEEPS should be heard and PLAIN (RED) light should flash.)
- j. Press PUSH-TO-TALK, get single BEEP.
- k. Begin secure transmission.
- l. For subsequent transmissions only steps j and k above apply.
- m. In an EMERGENCY, eliminate key according to local ZEROIZE procedures.

NOTE: If constant series of BEEPS are heard or flashing RED light occurs during any CIPHER transmission, repeat entire first start. If problem reoccurs, switch to PLAIN voice and notify your supervisor or support maintenance facility.

#### REFERENCES

TM 11-5810-224-10, Operator's Manual for Communications Security Equipment TSEC/KY-8, Aug 71.

# TASK

## 113-609-1002

---

### Install and Operate Speech Security Equipment TSEC/KY-38

---

#### CONDITIONS

This task will be performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. Radio Set.
2. Security Equipment TSEC/KY-38.
3. TM 11-5810-245-10.
4. Batteries.
5. Cables.

Supervision and assistance will be available.

#### STANDARDS

This task has been performed correctly when, in 10 minutes, the security equipment has been installed without causing damage to the security equipment or mount, all cable connections are made and the security equipment has passed and received secure traffic according to performance measures 1 through 3.

#### PERFORMANCE MEASURES

1. Install TSEC/KY-38 (first start). (Refer to TM 11-5810-245-10.)
  - a. Connect cable from POWER connector on radio to RADIO connector on TSEC/KY-38.

**CAUTION:** Insure that batteries are properly installed in TSEC/KY-38 and Radio Set AN/PRC-77.

- b. Connect handset cable to KY-38 AUDIO plug.
  - c. Key the KY-38 (classified).
2. Operate TSEC/KY-38. (Refer to TM 11-5810-245-10.)
- a. First start (daily).
    - (1) Turn radio set FUNCTION switch to ON.
    - (2) Switch KY-38 to CIPHER.
    - (3) Switch KY-38 DELAY to IN.
    - (4) Press handset PUSH-TO-TALK switch and wait for three rapid beeps then one lower pitched beep.
    - (5) Begin SECURE transmission.
  - b. Subsequent transmissions.
    - (1) Switch DELAY to OUT (unless operating with a retransmission station using HYL-3/TSEC).
    - (2) Press handset PUSH-TO-TALK switch and wait for one beep.
    - (3) Begin SECURE transmissions.

NOTE: If constant series of beeps are heard during any CIPHER transmission repeat entire first start. To clear the equipment in an emergency turn ZEROIZE switch clockwise (toward direction of arrow).

3. Follow these procedures to remedy minor problems. (Refer to TM 11-5810-245-10.)

## SYMPTOMS

## CORRECTIVE MEASURES

- |                                |  |
|--------------------------------|--|
| a. First indication of trouble | Clean cable connections with pencil eraser and repeat first start procedure. |
| b. No beeps or no steady tone  | Rotate batteries and repeat first start procedure.                           |

SYMPTOMS

CORRECTIVE MEASURES

- |                              |  |
|------------------------------|--|
| c. Dead handset              | Replace batteries and repeat first start procedure.                        |
| d. Steady tone               | Verify correct key setting, key equipment again, and repeat first start.   |
| e. Constant series of beeps. | Release PUSH-TO-TALK switch and try again.                                 |
| f. Still beeps.              | Verify key setting, key equipment again, and repeat first start procedure. |

NOTE: If problem cannot be solved by the above remedies, switch to PLAIN voice and notify your supervisor or support maintenance personnel.

REFERENCES

TM 11-5810-245-10, Operator's Manual for Communication Security Equipment TSEC/KY-38, Aug 71.

**TASK****113-609-1003**

---

**Install and Operate Communications Security  
Equipment HYL-3/TSEC**

---

**CONDITIONS**

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. Security Equipment HYL-3/TSEC.
2. Installed Radio Set AN/VRC-49.
3. TM 11-5810-247-10.
4. Cables.

Supervision and assistance will be available.

**STANDARDS**

This task has been performed correctly when, in 10 minutes, the security equipment has been installed in its mount without damage to the security equipment or its mount, all cable connections are made and the security equipment has passed and received secure traffic according to performance measures 1 through 4.

**PERFORMANCE MEASURES**

1. Install Security Equipment HYL-3/TSEC. (Refer to TM 11-5810-247-10.)
  - a. Place HYL-3/TSEC in mount and secure.
  - b. Connect Radio Set AN/VRC-49 to RT/1 and RT/2 connectors of HYL-3/TSEC with cables provided.

- c. Preset RT/1 frequency to same frequency as Distant Station 1, and RT/2 frequency to same frequency as Distant Station 2.
- d. For Radio Set AN/PRC-77 only, place radio FUNCTION switch to RETRANS.
- e. Set radio VOLUME controls to midrange and do not readjust during operation.
- f. Insure radio X-MODE switches are in the ON position.

NOTE: Setting of radio X-MODE switches should be accomplished prior to operation by support maintenance. The radio set should be clearly marked when set for X-MODE operation.

- g. Set HYL-3/TSEC POWER switch to ON.
2. Operate in retransmission mode. (Refer to TM 11-5810-247-10.)
- a. Set HYL-3/TSEC FUNCTION switch to RETRANS.
  - b. Connect handset to HANDSET connector of HYL-3/TSEC if monitoring is required. Adjust listening level using the VOLUME control of the HYL-3/TSEC.
  - c. If X-MODE monitoring is required, connect X-MODE equipment to the HYL-3/TSEC X-MODE connector, and connect handset to the X-MODE equipment. Adjust listening level using the X-MODE equipment VOLUME control.
3. Conduct break-in (plain) operations. (Refer to TM 11-5810-247-10.)

- a. Set FUNCTION switch of HYL-3/TSEC to XMIT-1 or XMIT-2 depending upon station to be contacted.

NOTE: Operator can contact selected stations only. Retransmission is not possible until HYL-3/TSEC FUNCTION switch is returned to the RETRANS position.

- b. With handset connected to HANDSET connector of HYL-3/TSEC, depress PUSH-TO-TALK switch and contact selected station.
- c. Adjust handset volume to a comfortable listening level with VOLUME control of HYL-3/TSEC.

4. Conduct break-in (X-MODE) operations. (Refer to TM 11-5810-247-10.)
  - a. Connect X-MODE equipment to X-MODE connector of HYL-3/TSEC.
  - b. Set controls of X-MODE equipment for X-MODE operation.
  - c. Set FUNCTION switch to XMT-1 or XMT-2 depending upon station to be contacted.
  - d. With the handset connected to the X-MODE equipment, depress the PUSH-TO-TALK switch and contact selected station.
  - e. Adjust handset volume to a comfortable listening level with VOLUME control of X-MODE equipment.

#### REFERENCES

TM 11-5810-247-10, Operator's Manual for Communication Security Equipment HYL-3/TSEC, Aug 71.



**TASK****113-609-2013**

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**Operate KY-57 in Cipher Text Mode**

---

**CONDITIONS**

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. This task is performed when a requirement exists to operate the TSEC/KY-57 in the cipher text mode. You will be provided with:

1. Installed AN/VRC-12 series radio or installed Radio Set AN/PRC-77, with TSEC/KY-57 installed.
2. Electronic transfer device KYK-13/TSEC with variables stored.
3. Unit CEOI.

**STANDARDS**

This task has been performed correctly when, within 10 minutes, the TSEC/KY-57 has been operated in the cipher mode, performance measures 1 through 4 have been completed, and a secure transmission has been made.

**PERFORMANCE MEASURES**

1. Prepare the TSEC/KY-57 for keying. (Refer to TM 11-5810-256-10-OP-2, TM 11-5810-256-OP-3, or TM 11-5810-256-OP-4.)
  - a. Connect the KYK-13 to the "FILL" connector of the KY-57.
  - b. Place the MODE switch on the KYK-13 to ON.
  - c. Place the FILL switch on the KYK-13 to position 1.
  - d. Place the POWER switch on the KY-57 to the ON position.

- e. Set the MODE switch on the KY-57 to "C" (cipher) position.
  - f. Clear the KY-57 alarm by depressing and releasing the PUSH-TO-TALK switch on the handset one time.
2. Key the TSEC/KY-57.
- a. Place the KY-57 MODE switch to LD (load).
  - b. Place the KY-57 FILL switch to position 1.
  - c. Depress and release the PUSH-TO-TALK switch on the handset.

NOTE: When a single beep is heard and a flash of the parity indicator light is observed on the KYK-13, the KY-57 contains one CNV (crypto net variable).

- d. Place the FILL switch on the KYK-13 to position 6.
- e. Place the FILL switch on the KY-57 to position 6.
- f. Depress and release the PUSH-TO-TALK switch on the handset.

NOTE 1: When a single beep is heard and a flash of the parity indicator light is observed on the KYK-13, the KY-57 contains one RKV (remote keying variable).

NOTE 2: To place CVNs in positions 2 through 5, repeat performance measure 2 for each position.

- 
3. Remove the KYK-13 from the KY-57.
- a. Place MODE switch on the KYK-13 to the OFF position.
  - b. Disconnect the KYK-13 from the KY-57.
4. Operate the KY-57.
- a. Place the MODE switch on the KY-57 to "C" (cipher).
  - b. Perform a parity check.

## SKILL LEVEL 1

- (1) With the FILL switch in position 6, depress the PUSH-TO-TALK switch, and listen for a single beep.
- (2) Place FILL switch in position 1, depress the PUSH-TO-TALK switch, and listen for a single beep.

NOTE: If a constant tone is heard, it indicates the variable transfer was not successful. If the transfer was not successful, repeat performance measure 2.

c. Begin secure transmission.

## REFERENCES

TM 11-5810-256-OP-2, Operating Procedures for Communications Security Equipment TSEC/KY-57 in Manpack Operations, Dec 78.

TM 11-5810-256-OP-3, Operating Procedures for Communications Security Equipment TSEC/KY-57 in Wheeled Vehicles, Dec 78.

TM 11-5810-256-OP-4, Operating Procedure for Communication Security Equipment TSEC/KY-57 in Tracked Vehicles, Dec 78.

TEC Lesson 201-113-4572-A (FOUO), Operation of TSEC/KY-57 (SECURE).

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**TASK****113-618-1001**

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**Install Radio Wire Integration (RWI) System**

---

**CONDITIONS**

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. Installed Radio Set AN/VRC-46 and components (not installed).
2. Radio Set Control Group AN/GSA-7, AN/GRA-6, or AN/GRA-39.
3. Switchboard, Telephone, Manual SB-22/PT or SB-22A/PT.
4. Field Wire WD-1/TT on Reel DR-8.
5. Necessary batteries.
6. TM 11-5820-401-12.
7. TM 11-5135-15.
8. Tool Equipment TE-33.
9. Cable Assembly CX-7474/U.

Supervision and assistance will be available.

**STANDARDS**

This task has been performed correctly when, in 30 minutes, the components have been installed in their mounts without causing damage to the components or mounts, the antenna is erected, all cable connections are made and the RWI is ready to be operated according to performance measures 1 through 10.

PERFORMANCE MEASURES

1. Insure that Radio Set AN/VRC-46 is properly installed. (Refer to TM 11-5820-401-12, chap 2, sec II, para 2-5 thru 2-13, pp 2-2 thru 2-43 as applicable, and task 113-587-1004.)
2. Install Radio Set Control AN/GSA-7. (Refer to TM 11-5135-15, chap 2, sec I, para 11, pp 10 thru 13, and TM 11-5820-401-12, chap 6, sec II, para 6-9, pp 6-9 thru 6-15.)
  - a. Insure Radio Set Control AN/GSA-7 is complete. (Refer to fig 1.)

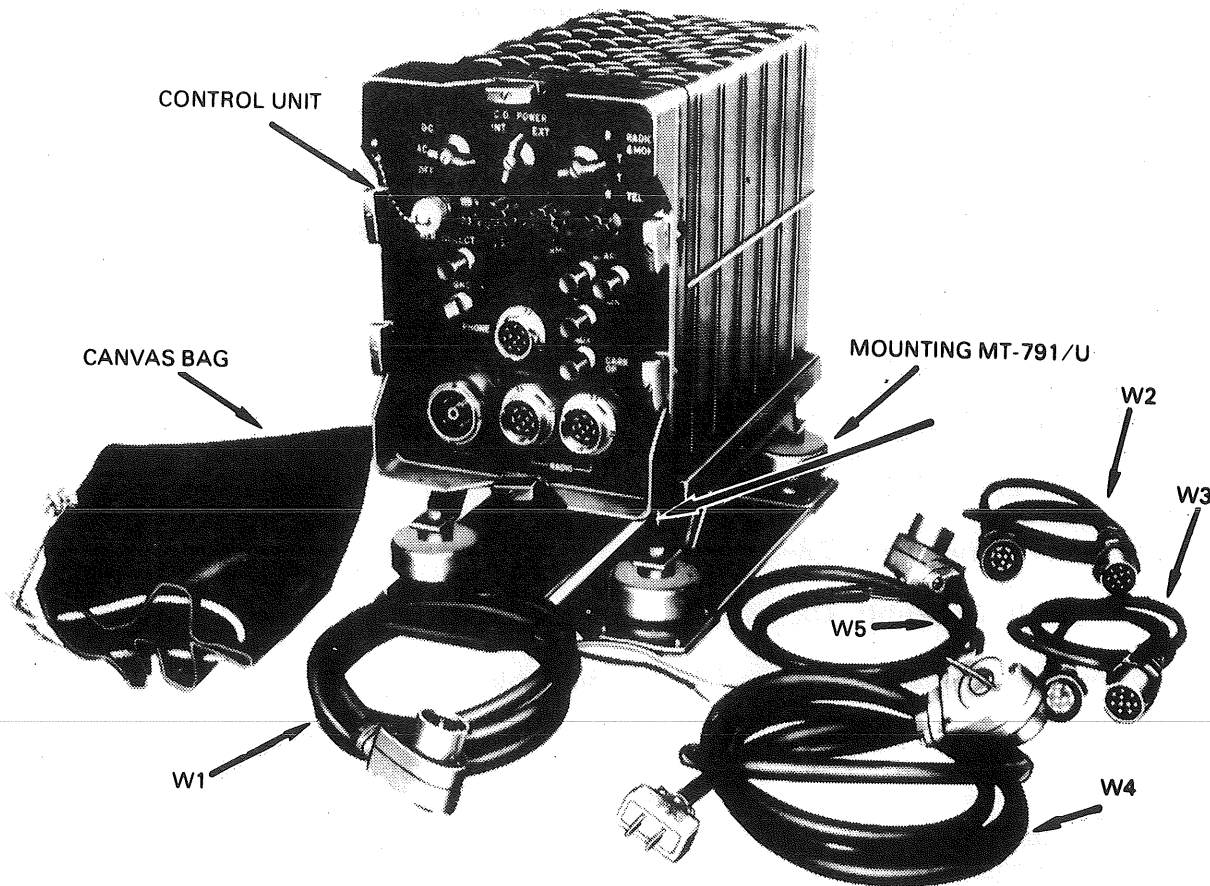


Figure 1. Radio Set Control AN/GSA-7.

- b. Insure Cable Assembly, Special Purpose, Electrical CX-7474/U is present. (Refer to fig 2, and TM 11-5820-401-12, chap 6, sec II, para 6-9a(1), b(2), p 6-9.)

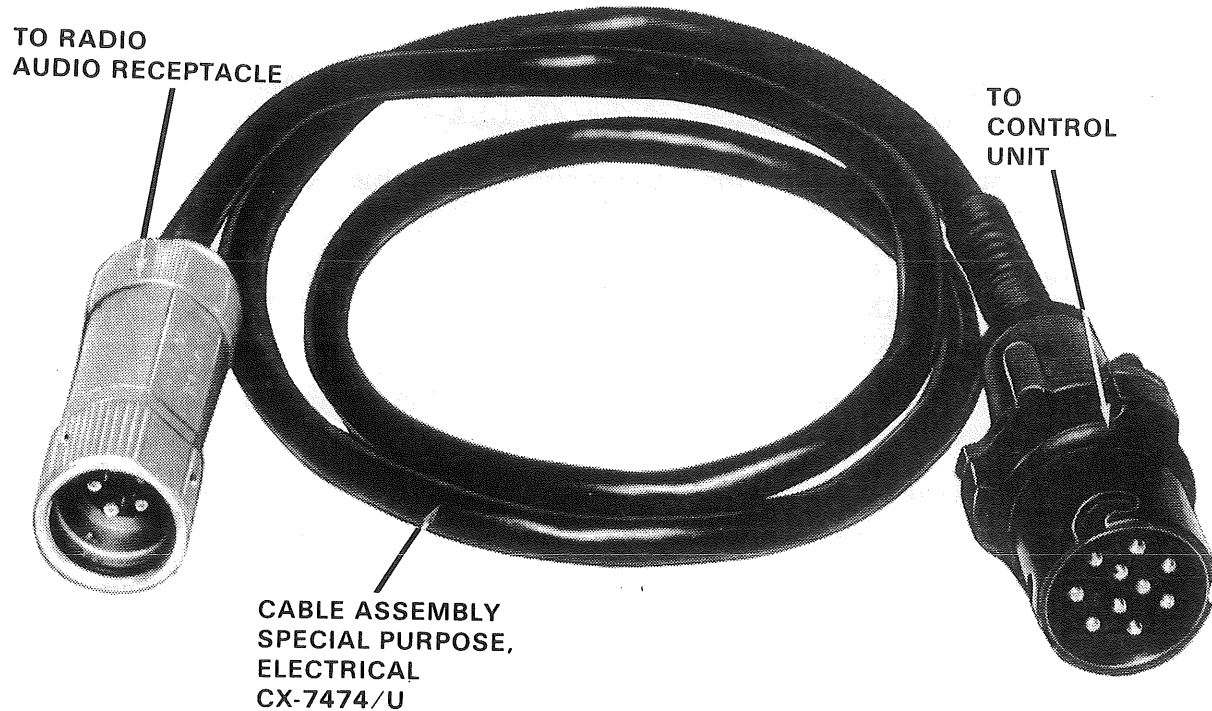


Figure 2. Cable Assembly, Special Purpose, Electrical CX-7474/U.

NOTE: This cable is required to connect the AN/GSA-7 with all receiver-transmitters of the AN/VRC-12 series radios.

- c. Install the AN/GSA-7 as shown in figure 3.

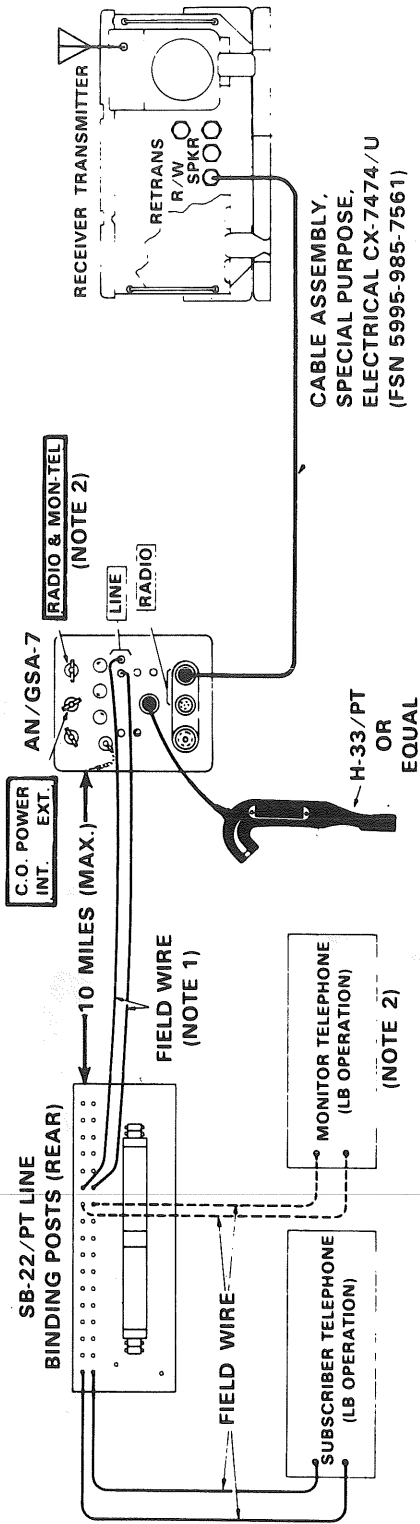
NOTE: Insure that the Radio Set AN/VRC-46 SQUELCH switch is in the OFF position (NEW or OLD).

3. Connect Radio Set Control AN/GSA-7 to a power source as required. (Refer to TM 11-5135-15, chap 2, sec I, para 11a, p 10.)
4. Insure POWER SELECTOR switch of the AN/GSA-7 is preset to correct power setting. (Refer to TM 11-5135-15, chap 2, sec I, para 11i thru j, p 11.)
5. Energize the AN/GSA-7 and the AN/VRC-46. (Refer to TM 11-5820-401-12, chap 6, sec II, para 6-9a thru c, pp 6-8 and 6-9.)
6. Connect the AN/GSA-7 to the AN/VRC-46. (Refer to TM 11-5820-401-12, chap 6, sec II, para 6-9b, p 6-9.)

- a. Connect the 10 pin connector of Cable CX-7474/U to one of the two RADIO connectors of the AN/GSA-7.
  - b. Connect the 5 pin connector of Cable CX-7474/U to the RETRANS R/W connector of the AN/VRC-46.
7. Connect the Switchboard, Telephone, Manual SB-22/PT or SB-22A/PT to the AN/GSA-7. (Refer to TM 11-5820-401-12, chap 6, sec II, para 6-9b(4)(e), p 6-9.)
- a. Connect Field Wire WD-1/TT to the LINE binding posts of the AN/GSA-7.
  - b. Connect distant end of Field Wire WD-1/TT to SB-22/PT or SB-22A/PT terminals.
  - c. Connect Handset H-33/PT to the AUDIO connector of the AN/GSA-7.
  - d. Set the MONITOR switch of the AN/GSA-7 to the T-RAD & MON position and listen for rushing noise from the radio set.

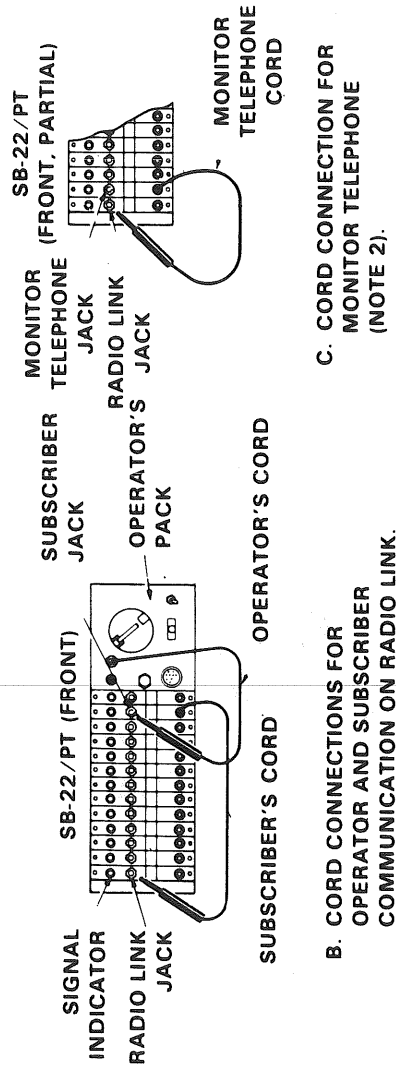
NOTE: If you do not hear rushing noise or it ceases, and you begin to hear BEEPS from the AN/GSA-7 (indicating the radio has been keyed), transpose the field wires at the line binding posts of the AN/GSA-7. The rushing noise should stop. If rushing noise does not stop check field wire for breaks or shorts, and check to insure no switchboard cord is connected to the radio link jack as shown in item B and C of figure 3.

8. Completed RWI system installation utilizing Radio Set Control AN/GSA-7, Radio Set AN/VRC-46, and Switchboard, Telephone, Manual SB-22/PT or SB-22A/PT is shown in figure 3.
9. Install Radio Set Control Group AN/GRA-6 for remote or RWI operation. (Refer to fig 4, and TM 11-5820-401-12, chap 6, sec II, para 6-10a thru b, pp 6-15 and 6-16.)
10. Install Radio Set Control Group AN/GRA-39 for remote or RWI operation. (Refer to fig 5, and TM 11-5820-401-12, chap 6, sec II, para 6-8a thru b, pp 6-6 thru 6-8.)



A. CONNECTIONS AND SWITCH POSITIONS.

- NOTES:
1. IF RECEIVER-TRANSMITTER IS KEYED, TRANSPOSE THESE CONNECTIONS AT SB-22/PT.
  2. THE MONITOR TELEPHONE IS LOCATED AT SB-22/PT TO ENABLE SWITCHBOARD OPERATOR TO HEAR INCOMING RADIO CALLS ON THE HANDSET WHEN THERE IS NO OPERATOR AT THE AN/GSA-7.



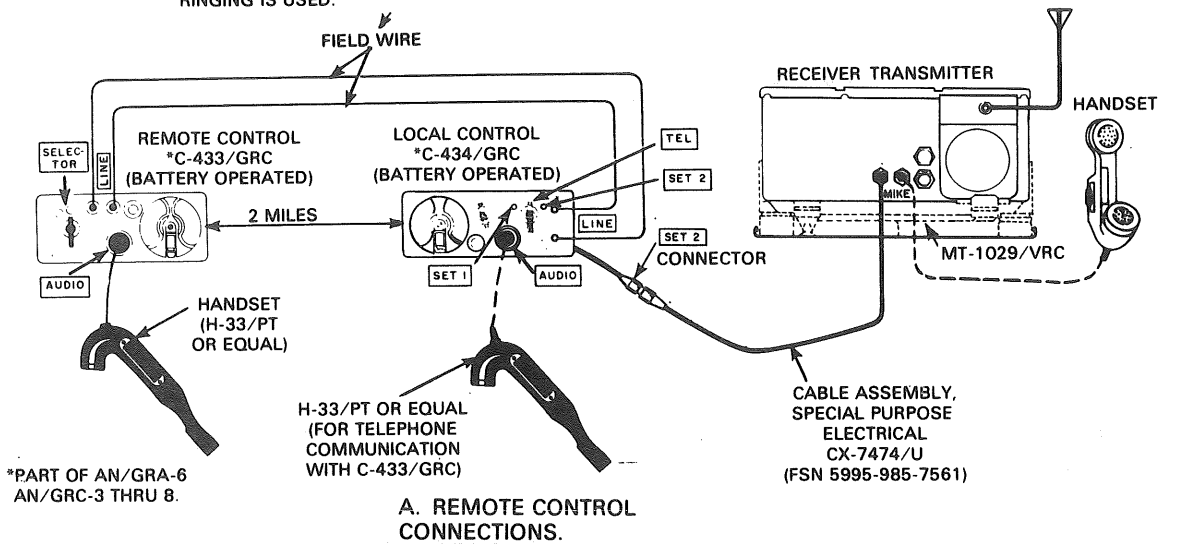
B. CORD CONNECTIONS FOR OPERATOR AND SUBSCRIBER COMMUNICATION ON RADIO LINK.

C. CORD CONNECTION FOR MONITOR TELEPHONE (NOTE 2).

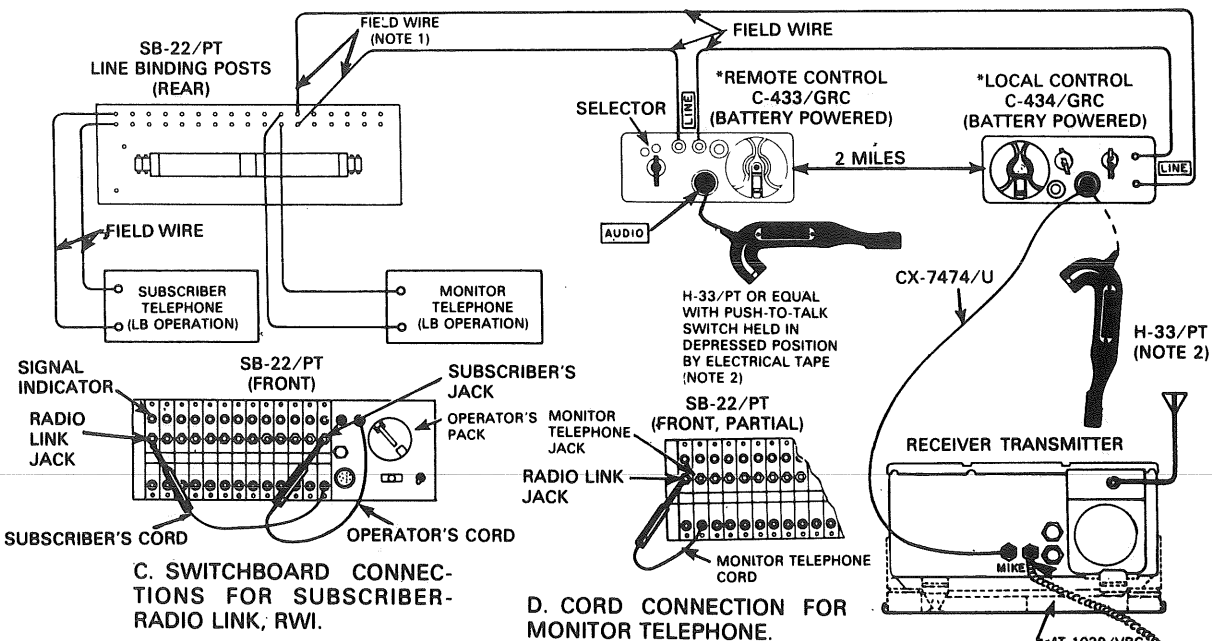
Figure 3. Connections and Control Settings of AN/GSA-7 and SB-22/PT to Provide Radio/Wire Integration Operation for Receiver-Transmitter.



**WARNING**  
 POTENTIAL AS HIGH AS 45 VDC EXIST ON THESE WIRES WHEN THE RADIO IS KEYS, AND AS HIGH AS 60 VAC WHEN TELEPHONE RINGING IS USED.



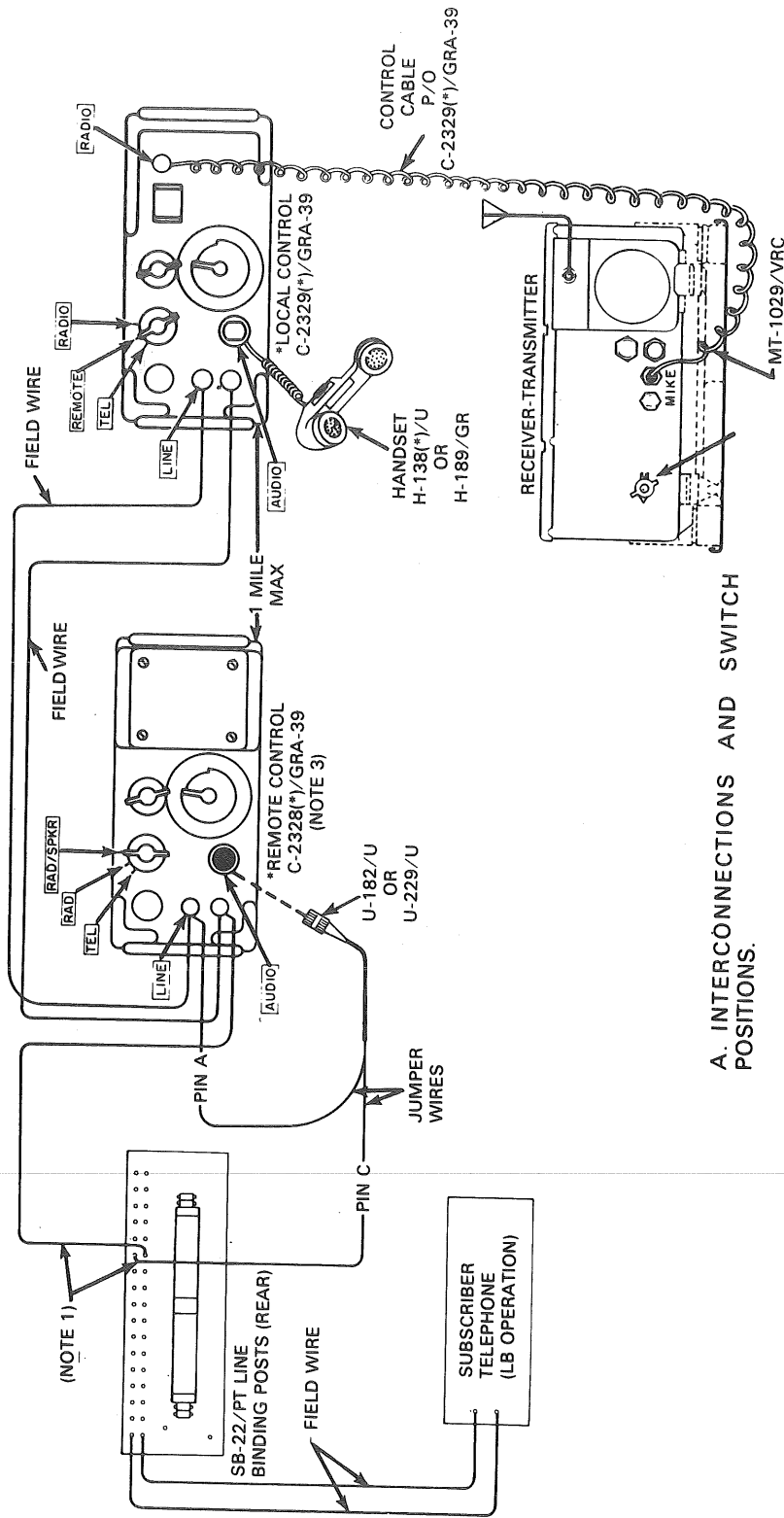
\*PART OF AN/GRA-6  
 AN/GRC-3 THRU 8.



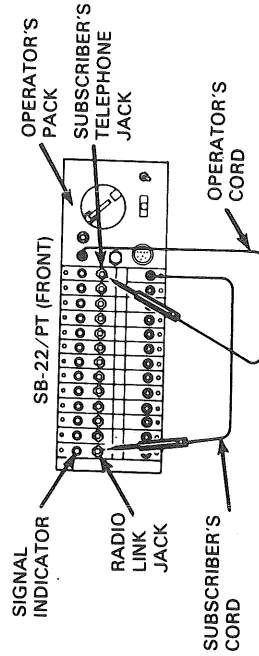
**NOTES:**

1. IF RECEIVER-TRANSMITTER IS KEYS, TRANSPOSE CONNECTION OF THESE WIRES AT SB-22/PT.
2. REQUIRED FOR TELEPHONE COMMUNICATION WITH SWITCHBOARD.
3. \*PART OF AN/GRA-6.

Figure 4. Connections for Remote Control Operation and RWI Operation of Receiver-Transmitters Using AN/GRA-6.



A. INTERCONNECTIONS AND SWITCH POSITIONS.



B. SWITCHBOARD CONNECTIONS FOR SUBSCRIBER-RADIO LINK.

NOTES:

\*PART OF AN/GRA-39(\*)

1. IF RECEIVER-TRANSMITTER IS KEYED, TRANSPOSE CONNECTION OF THESE WIRES AT SB-22/PT.

THE REMOTE CONTROL IS LOCATED NEXT TO SB-22/PT TO ENABLE SWITCHBOARD OPERATOR TO HEAR INCOMING RADIO CALLS.

Figure 5. AN/GRA-39(\*) for Remote Control and Radio/Wire Integration with AN/VRC-12 Series Radios.

## SKILL LEVEL 1

### REFERENCES

TM 11-5820-401-12, w/C1 thru 3, Operator's and Organizational Maintenance Manual (Including Repair Parts and Special Tools List): AN/VRC-12 AN/VRC-43, AN/VRC-44, AN/VRC-45, AN/VRC-46, AN/VRC-47, AN/VRC-48, AN/VRC-49, AN/VRC-54, AN/VRC-55; Mounting RT-1029/VRC and MT-1898/VRC; Antenna AT-912/VRC; Control, Frequency Selector C-2742/VRC and Control, Radio Set C-2299/VRC, Sep 72.

TM 11-5135-15, w/C3 thru 6, 8 and 9, Radio Set Control AN/GSA-7, May 58.

TEC Lesson 201-113-4530-A, Installation of Radio Wire Intergration (RWI) Components.

TEC Lesson 936-061-0121-F, AN/GRA-39 Installation and Testing.

TC 11-4, Handbook for AN/VRC-12 Series of Radio Sets, Apr 77.

TC 24-3, Radio Wire Intergration Installation and Operation Tips, Nov 76.

**TASK****113-618-2001**

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**Operate Radio Wire Integration (RWI) System**

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**CONDITIONS**

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. Installed RWI System.
2. Distant radio station.
3. TM 11-5820-401-12.
4. CEOI.

Supervision and assistance will be available.

**STANDARDS**

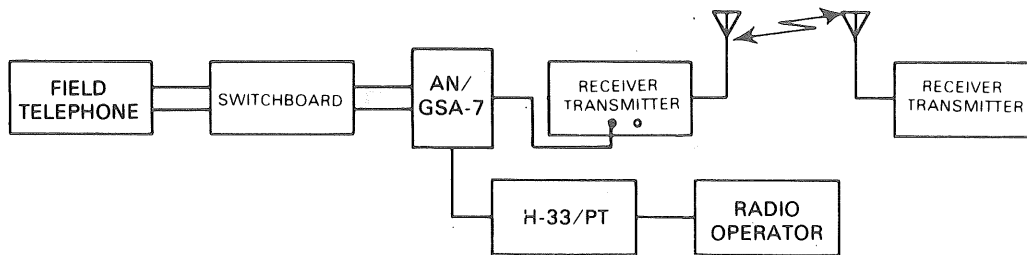
Task standard has been met when, in 20 minutes, the RWI system has been placed into operation according to performance measures 1 through 6.

**PERFORMANCE MEASURES**

1. Determine call sign and frequency for RWI operation. (Refer to CEOI.)

**WARNING:** Insure all equipment components are properly grounded prior to operation.

2. Adjust Radio Set Control AN/GSA-7 for operation. (Refer to TM 11-5820-401-12, chap 6, sec II, para 6-9b, p 6-9.)
  - a. Figure 1 shows a typical RWI system as discussed in this task.



AN/GSA-7 AT ONE STATION; RADIO OPERATOR REQUIRED AT AN/GSA-7

113-618-2001

Figure 1. Typical Radio Wire Integration (RWI) System.

- b. Set MONITOR switch on AN/GSA-7 to T-RAD & MON.
  - c. Insure POWER SELECT of AN/GSA-7 is preset for supplied power.
  - d. Attach H-33/PT to PHONE connector of AN/GSA-7.
  - e. Energize AN/GSA-7.
3. Adjust Radio Set AN/VRC-46 for operation. (Refer to TM 11-5820-401-12, chap 6, sec II, para 6-9b(2) and (3), p 6-9 and task 113-587-2003.)
    - a. Set assigned operating frequency.
    - b. Turn SQUELCH switch to OFF (OLD or NEW).
    - c. Insure Cable CX-7474/U is connected to the RETRANS R/W connector of the radio set.
    - d. Energize radio set.
  4. Conduct operational check of Radio Set Control AN/GSA-7. (Refer to TM 11-5820-401-12, chap 2, sec II, para 6-9d(1), pp 6-11 and 6-12.)
    - a. Set MONITOR switch of AN/GSA-7 to T-RADIO & MON.
    - b. Use H-33/PT to call distant radio station and conduct radio check.

5. Receive and process traffic from distant radio station. (Refer to TM 11-5820-401-12, chap 6, sec II, para 6-9d(1), pp 6-11 and 6-12.)
  - a. Advise distant radio station to standby while you notify requested switchboard subscriber of RWI call.
  - b. Hold MONITOR switch of AN/GSA-7 to R-TEL to ring the switchboard operator. When the operator answers, request that he prepare the desired subscriber for RWI operation.
  - c. Upon notification by the switchboard operator that the subscriber is ready, place the MONITOR switch of the AN/GSA-7 to R-RADIO & MON; communication between the distant radio station and the switchboard subscriber will proceed automatically.
6. Process traffic from wire terminating equipment. (Refer to TM 11-5920-401-12, chap 6, sec II, para 6-9c(3) and d(1), pp 6-9 and 6-12.)
  - a. Upon receiving notice from the switchboard operator that a subscriber desires the use of your RWI facilities, turn the MONITOR switch of the AN/GSA-7 to T-TEL.
  - b. Determine call sign of station that switchboard subscriber desired RWI with.
  - c. Insure that switchboard subscriber is aware that he is to use radio procedures and call signs.
  - d. Place MONITOR switch of AN/GSA-7 to T-RADIO & MON, establish contact with distant radio station and advise that he is to receive an RWI call.
  - e. Place MONITOR switch of AN/GSA-7 to T-TEL and advise switchboard operator that distant radio station is prepared to receive traffic.
  - f. Place MONITOR switch of AN/GSA-7 to T-RADIO & MON, communication between switchboard subscriber and distant station will proceed automatically.

REFERENCES

TM 11-5820-401-12, w/C1 thru 3, Operator's and Organizational Maintenance Manual (Including Repair Parts and Special Tools List): AN/VRC-12, AN/VRC-43, AN/VRC-44, AN/VRC-45, AN/VRC-46, AN/VRC-47, AN/VRC-48, AN/VRC-49, AN/VRC-54, AN/VRC-55; Mounting RT-1029/VRC and MT-1898/VRC; Antenna AT-912/VRC; Control, Frequency Selector C-2742/VRC and Control, Radio Set C-2299/VRC, Sep 72.

TEC Lesson 201-113-4531-A, RWI: Operation.

TEC Lesson 936-061-0122-F, AN/GRA-39 Operation.

TC 11-4, Handbook for AN/VRC-12 Series of Radio Sets, Apr 77.

TC 24-3, Radio Wire Intergration Installation and Operation Tips, Nov 76.

**TASK****113-620-1001**

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**Install Radio Set AN/GRC-106(\*)**

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**CONDITIONS**

This task is performed in a tactical or nontactical situation, under all weather conditions, may be performed in an NBC environment. Given a requirement and --

1. Radio Set AN/GRC-106(\*).
2. TM 11-582-520-12.
3. 8-inch flat tip screwdriver.
4. Pliers.
5. Vehicle with Mount MT-3140/GRC and Mast Base AB-652/GR installed.

Supervision and assistance will be available.

**STANDARDS**

This task has been performed correctly when, in 20 minutes, the radio is installed in its mount without damage to the radio or mount, the antenna is erected, all cable connections are made and the radio is ready to be tuned and operated according to performance measures 1 through 4.

**PERFORMANCE MEASURES**

1. Position AN/GRC-106(\*) in Mount MT-3140/GRC-106 securely. (Refer to fig 1, and TM 11-5820-520-12, chap 2, sec II, para 2-5, pp 2-2 and 2-3.)
  - a. Place the RT-834/GRC in MT-3140/GRC-106 first.
  - b. Place the AM-3349/GRC on top of the RT-834/GRC.
  - c. Secure the amplifier to the receiver-transmitter with the cross bar assembly.



CAUTION: The SERVICE SELECTOR switch on the RT-834 or RT-662/GRC and the PRIMARY POWER ON/OFF switch of the AM-3349/GRC must be in the OFF position during installation. Be sure the high voltage reset switch is in OPERATE position.

WARNING: Dangerous voltage exists at the antenna and antenna connectors of the AM-3349. Death can result due to accidental contact.

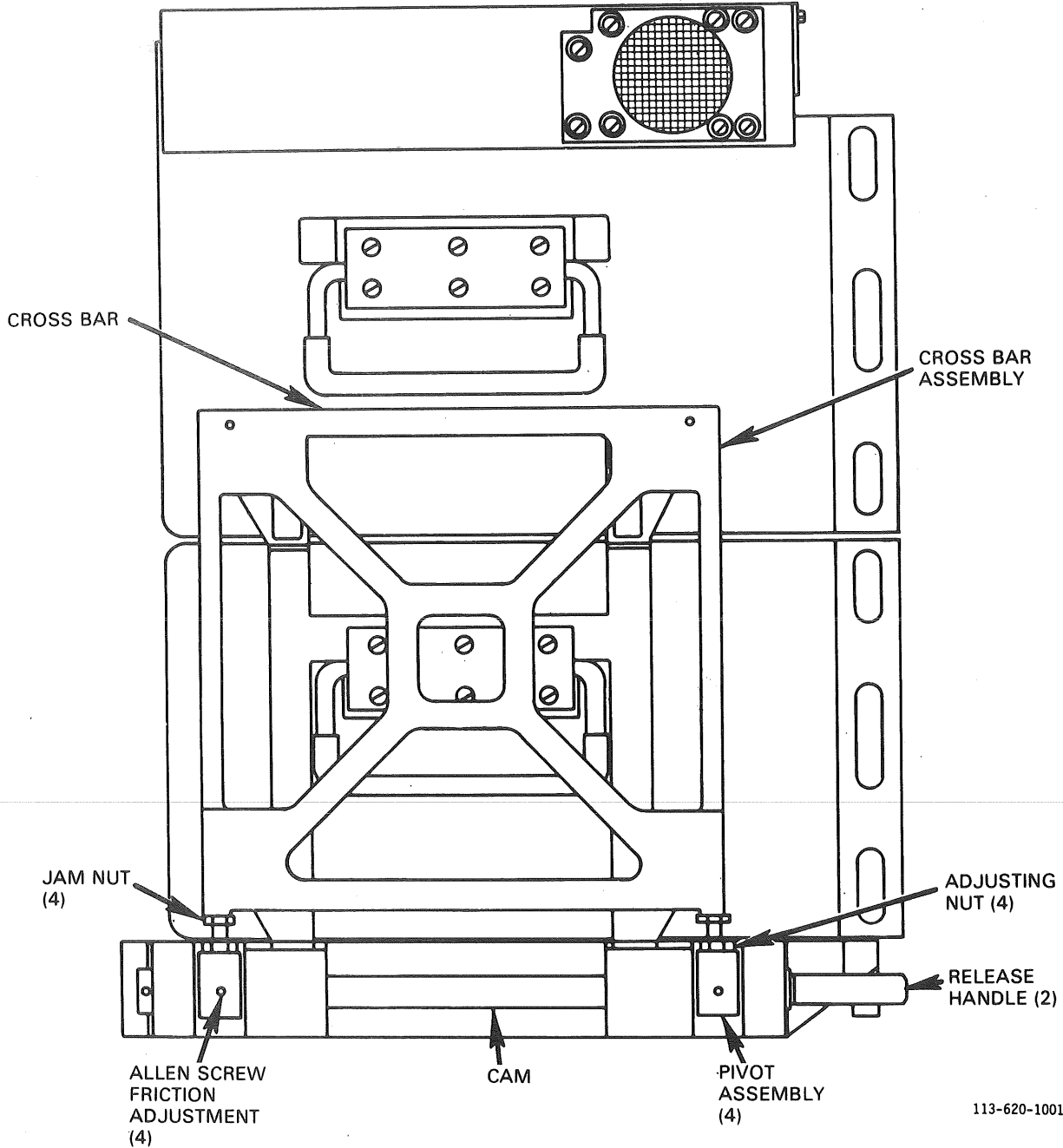
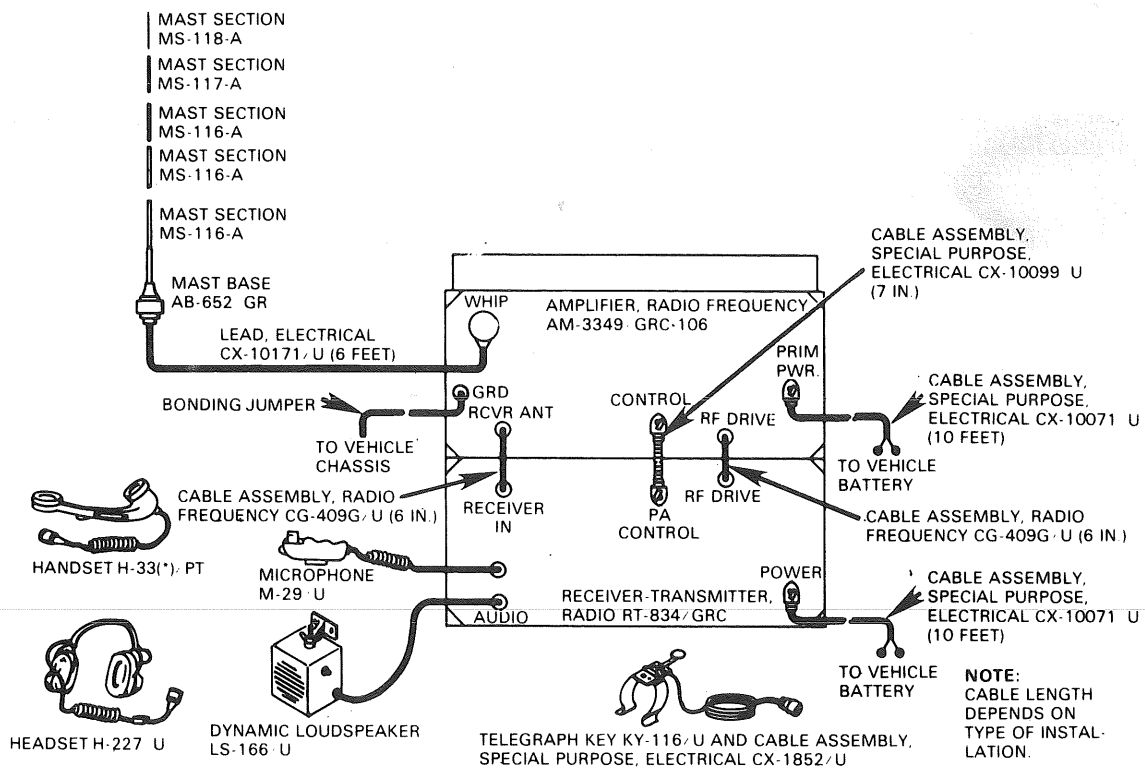


Figure 1. Radio Set AN/GRC-106(\*) Typical Installation Mounting Details.

113-620-1001

2. Connect all cables. (Refer to fig 2, and TM 11-5820-520-12, chap 2, sec II, para 2-6, pp 2-4.1 thru 2-6.)
3. Connect audio accessories. (Refer to fig 2, and TM 11-5820-520-12, chap 2, sec II, para 2-6, pp 2-4.1 thru 2-6.)
4. Install whip antenna. (Refer to fig 2, and TM 11-5820-520-12, chap 2, sec II, para 2-6b thru c, p 2-4.1.)

NOTE: If Radio Set AN/GRC-106(\*) is to be operated at the halt for extended periods, ground the radio set.



113-620-1001

Figure 2. Installation Diagram for Radio Set AN/GRC-106(\*)

REFERENCES

TM 11-5820-520-12, w/C1 thru 10, Operator's and Organizational Maintenance Manual: Radio Sets AN/GRC-106 and AN/GRC-106A, Feb 71.

TEC Lesson 201-113-4506-F, Install AN/GRC-106 and Perform Preoperational Checks.

Army Correspondence Course SSO 730, Radio Set AN/GRC-106(\*) Operation.

Army Correspondence Course SS9 740, Radio Set AN/GRC-106(\*) (SOJT).

**TASK****113-620-2001**

---

**Operate Radio Set AN/GRC-106(\*)**

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**CONDITIONS**

This task is performed under all weather conditions in a field or a garrison location and may be performed in an NBC environment. To accomplish this task you will need a complete Radio Set AN/GRC-106(\*), already positioned, with a proper ground, antenna connection, and power supply; and TM 11-5820-520-12.

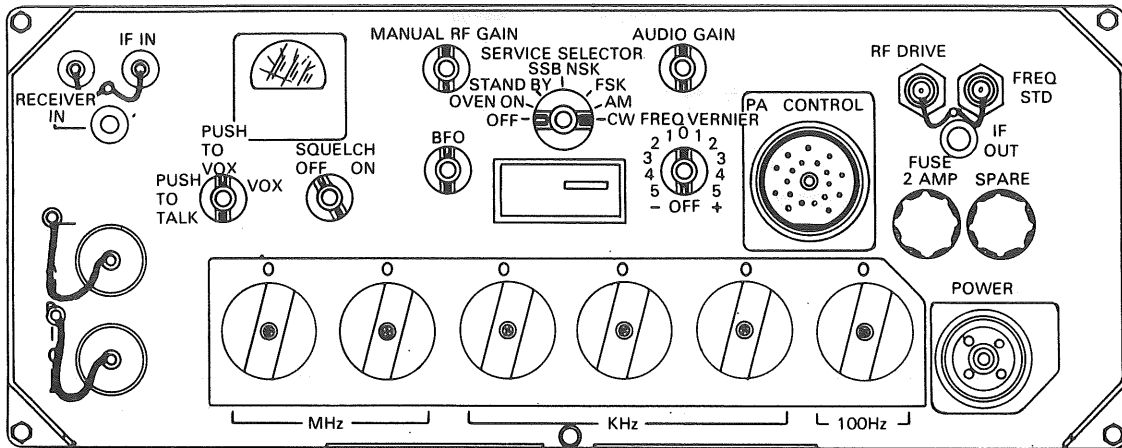
Supervision and assistance will be available.

**STANDARDS**

This task has been performed correctly when, in 20 minutes, the meter readings on the radio set conform to the requirements in performance measures 3 and 4, and the radio set has been placed into and taken out of operation according to performance measures 1 through 6.

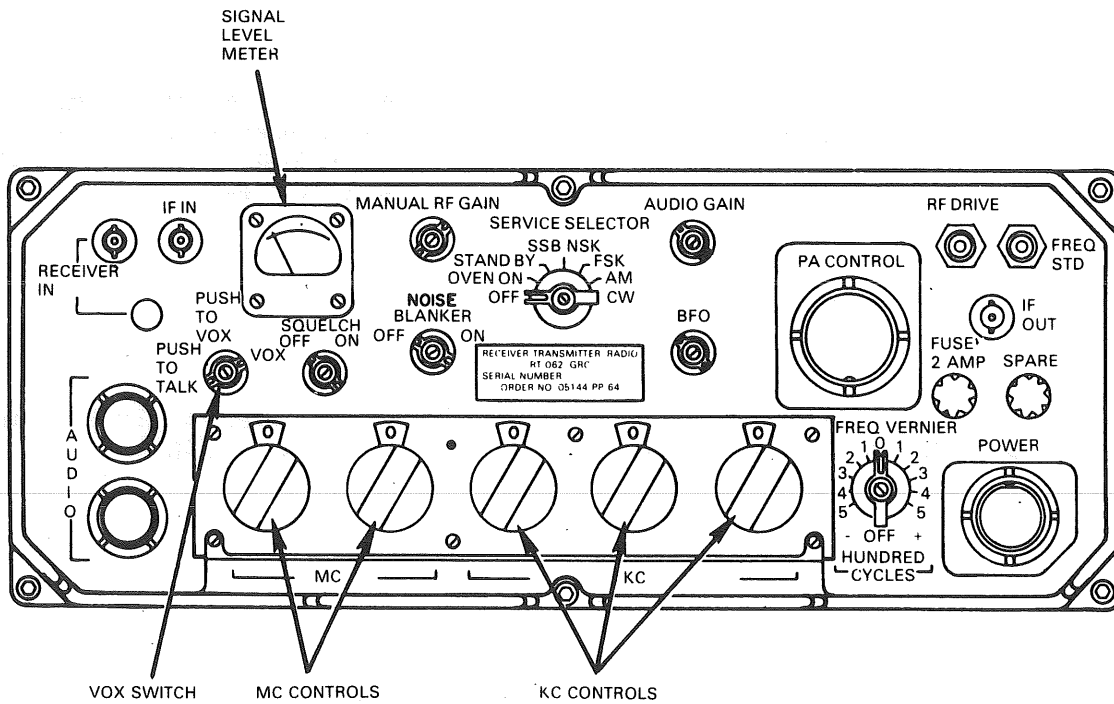
**PERFORMANCE MEASURES**

1. Determine operating frequency.
2. Implement preliminary starting procedure. (Refer to fig 1 thru 4, and TM 11-5820-520-12, chap 3, sec II, para 3-4, p 3-6.)



113-620-2001

Figure 1. Receiver-Transmitter, Radio RT-834/GRC, Controls, Indicators, and Connectors.



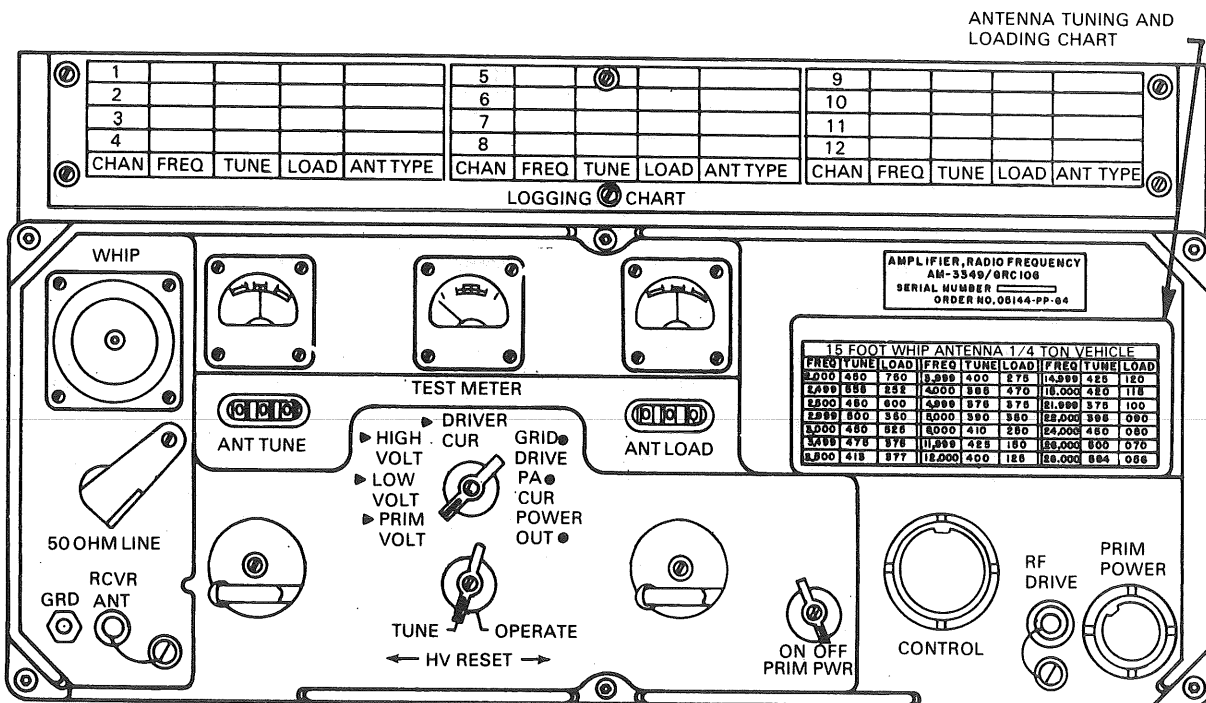
113-620-2001

Figure 2. Receiver-Transmitter, Radio RT-662/GRC, Controls, Indicators, and Connectors.

STEP	UNIT	CONTROL OR SWITCH POSITION	ACTION OR INDICATION
1	RT-662/GRC or RT-834/GRC	SERVICE SELECTOR switch: OVEN ON	Allow a minimum of 10 minutes for warmup.
2	RT-662/GRC or RT-834/GRC	MANUAL RF GAIN control: Fully clockwise	None.
3	RT-662/GRC or RT-834/GRC	AUDIO GAIN control: Approximately midrange	None.
4	RT-662/GRC or RT-834/GRC	SQUELCH switch: OFF	None.
5	RT-662/GRC or RT-834/GRC	FREQ VERNIER control: OFF	None.
6	RT-662/GRC or RT-834/GRC	VOX switch: PUSH TO TALK	None.
7	RT-662/GRC or RT-834/GRC	BFO control: Approximately midrange	None.
8	RT-662/GRC	NOISE BLANKER: OFF	None.
9	AM-3349/GRC-106	HV RESET switch: OPERATE	None.
10	AM-3349/GRC-106	PRIM. PWR switch: OFF	None.

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Figure 3. Operator Presets for Radio Set AN/GRC-106(\*).



113-620-2001

Figure 4. Amplifier, Radio Frequency AM-3349/GRC-106 Controls, Indicators, and Connectors.

3. Conduct starting procedures. (Refer to TM 11-5820-520-12, chap 3, sec II, para 3-5, p 3-7.)
  - a. Warm up RT-834(662) for 10 minutes. (Refer to step 1 of fig 3.)
  - b. Place SERVICE SELECTOR switch on RT receiver-transmitter to STANDBY.
  - c. Place PRIMARY POWER switch on AM-3349 to ON.
    - (1) After 90 seconds, blowers must energize and signal level meter should be in extreme right portion of the meter scale.
    - (2) If abnormal indication shows, refer to figure 1, Task 113-620-2001, Operators Troubleshooting Chart, items 1 and 2.

WARNING: Death on contact may result if operating personnel fail to observe safety precautions and fail to follow requirements of TB SIG 291.
  - d. Set SERVICE SELECTOR switch of RT-662/GRC or RT-834/GRC to SSB/NSK (or any operate mode, FSK, AM or CW). Signal level meter will return to extreme left portion of the meter scale.
  - e. Set the AM-3349/GRC-106 TEST METER switch to PRIM VOLT. Observe that the TEST METER pointer indicates within the area of the two dark GREEN wedges (top scale) when the SERVICE SELECTOR switch is in the SSB/NSK, FSK, AM, or CW positions.
  - f. Set TEST METER switch to POWER OUT.
4. Conduct tuning procedure for CW operation. (Refer to TM 11-5820-520-12, chap 3, sec II, para 3-6, pp 3-7, 3-8.)

- a. Set the RT-662/GRC or RT-834/GRC, MHz and the assigned frequency.
- b. Adjust the AM-3349/GRC-106 ANT TUNE control numbers on the antenna tuning and loading chart.
- c. Adjust the AM-3349/GRC-106 ANT LOAD control numbers on the antenna tuning and loading chart.

CAUTION 1: The AM-3349/GRC-106 HV RESET switch should not stay in the TUNE position for more than 2 minutes. If more than 2 minutes are required, set the AM-3349/GRC-106 HV RESET switch and the RT-662/GRC or RT-834/GRC-106 SELECTOR switch to STANDBY for 5 minutes. After 5 minutes cooling, set the SERVICE switch to the previous position, and the SELECTOR switch to TUNE, and proceed with the tuning procedure.

CAUTION 2: ANT TUNE and ANT LOAD controls interact with each other. To center the meter pointers, rotate them slowly in the direction that you want the pointers to go.

CAUTION 3: Be sure the antenna is properly loaded to prevent damage to the antenna while performing tuning procedures.

- d. Set the AM-3349/GRC-106 HV RESET switch for a deflection on the ANT TUNE and ANT LOAD meters.
- e. Adjust the AM-3349/GRC-106 ANT LOAD control scale reading on the ANT LOAD meter by rotating the control in the direction the meter pointer is to move.
- f. Adjust the AM-3349/GRC-106 ANT TUNE control scale reading on the ANT TUNE meter by rotating the control in the direction the meter pointer is to move. Then adjust the ANT LOAD meter as close to center scale as possible.
- g. Tuning of the AM-3349/GRC-106 is complete when center scale readings are obtained on the ANT TUNE and ANT LOAD meters.



**SKILL LEVEL 1**

TEC Lesson 201-113-4551-E/A, Radiotelegraph Procedure, Part 2, Calling and Answering.

TEC Lesson 201-113-4552-E/A, Radiotelegraph Procedure, Establishing a Net.

TEC Lesson 201-113-4553-E/A, Radiotelegraph Procedure, Authentication.

TEC Lesson 201-113-4554-E/A, Radiotelegraph Procedure, Opening a Net.

TEC Lesson 201-113-4555-E/A, Radiotelegraph Procedure, Free and Directed Net.

TEC Lesson 201-113-4556-E/A, Radiotelegraph Procedure, Message Format, Part 1.

TEC Lesson 201-113-4557-E/A, Radiotelegraph Procedure, Message Format, Part 2.

Army Correspondence Course SSO 470, The Automated Communications-Electronics Operation Instruction (CEOI).

Army Correspondence Course SSO 730, Radio Set AN/VRC-106(\*) Operation.

Army Correspondence Course SS9 740, Radio Set AN/GRC-106(\*) (SOJT).

TC 32-11, How to Get Out of a Jam, Apr 75.

**TASK****113-620-3001**

---

**Perform Daily Preventive Maintenance Checks and Services on Radio Set AN/GRC-106(\*)**

---

**CONDITIONS**

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC situation. Given a requirement and --

1. Radio Set AN/GRC-106(\*).
2. TM 11-5820-520-12.
3. Clean dry lint-free cloth.
4. Mild detergent solution.
5. Cleaning fluid Trichloroethane.
6. DA Form 2404.

Supervision and assistance will be available.

**STANDARDS**

This task has been performed correctly when the exteriors of all components are clean, all dials and knobs are tight, all cables are in good condition (no cracks or broken connectors), all fuses are of correct value, and those faults that you, as an operator, cannot correct are recorded on DA Form 2404, without error, and reported to your immediate supervisor according to performance measures 1 through 4.

**PERFORMANCE MEASURES**

1. Conduct daily preventive maintenance checks and services on Radio Set AN/GRC-106(\*). (Refer to fig 1, and TM 11-5820-520-12, chap 4, para 4-2 and 4-3, pp 4-1 and 4-2.)

**WARNING:** When using Trichloroethane to dampen a cleaning cloth, you must remember that its fumes are toxic when exposed to an open flame. Use only in a thoroughly ventilated area.

SEQ. NO.	ITEM TO BE INSPECTED	PROCEDURE
1	Exterior surfaces .....	Clean the exterior surfaces of the units comprising the AN/GRC-106(*).
		<b>WARNING</b>
2	Intercabling and connectors .....	Do not clean the equipment if the power is on. Check all interconnecting cables and connectors for cracks and breaks. Replace cables that have cracks or broken connectors.
3	Meter faces (glass) .....	Check to see that the meter faces (glass) are not loose or broken.
4	Fuses .....	Check fuses for correct value. Check spares for quantity and proper value.
5	Knobs, controls, and switches .....	While making the operational checks (item 6) observe that the mechanical action of each knob, switch, and control is smooth and free of external or internal binding.
		<b>WARNING</b>
6	Operational check .....	The following procedure requires the breaking of radio silence. This manual does not authorize the breaking of radio silence imposed by any command. Unauthorized violation of radio silence could result in courtmartial or possible death from hostile action. Operate the equipment on an authorized frequency to verify its capabilities.

113-620-3001

Figure 1. Operator's Preventive Maintenance Checks and Services.

2. Perform preventive maintenance checks and services at the following intervals: (Refer to TM 11-5820-520-12, chap 4, para 4-2, pp 4-1 and 4-2.)
  - a. Before equipment starts on a mission.
  - b. When equipment is initially installed.
  - c. When equipment is reinstalled after removal for any reason.
  - d. At least once each week if equipment is maintained in a stand-by condition.
3. Complete DA Form 2404 (Equipment Inspection and Maintenance Worksheet) as a daily maintenance form. (Refer to TM 38-750, chap 3, para 3-4c, pp 3-5 thru 3-7.)

4. Report all uncorrectable defects. (Refer to TM 38-750, chap 3, para 3-4d, pp 3-7 and 3-8.)
  - a. Notify your immediate supervisor of all uncorrectable faults found.
  - b. Submit DA Form 2404 to your supervisor or support maintenance personnel.

## REFERENCES

TM 11-5820-520-12, w/C1 thru 10, Operator's and Organizational Maintenance Manual: Radio Sets AN/GRC-106 and AN/GRC-106A, Feb 71.

TM 38-750, w/C1 thru 3, The Army Maintenance Management System (TAMMS), May 78.

TEC Lesson 201-113-4509-F, AN/GRC-106 Operator's Maintenance and Troubleshooting Procedures.

Army Correspondence Course SSO 730, Radio Set AN/GRC-106(\*) Operation.

Army Correspondence Course SS9 740, Radio Set AN/GRC-106(\*) (SOJT).

# TASK

## 113-620-2002

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### Perform Operator's Troubleshooting Procedures on Radio Set AN/GRC-106(\*)

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#### CONDITIONS

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. Radio Set AN/GRC-106(\*).
2. TM 11-5820-520-12.
3. TM 38-750.
4. DA Form 2404.

Supervision and assistance will be available.

#### STANDARDS

This task has been performed correctly when any discovered faults have been corrected in accordance with the corrective measures listed in figure 1, and those faults that you, as an operator, cannot correct are recorded on DA Form 2404, without error, and reported to your immediate supervisor according to performance measures 1 through 3.

#### PERFORMANCE MEASURES

1. Conduct troubleshooting procedures on any abnormal condition while operating AN/GRC-106(\*) during normal operation or during operational check in daily preventive maintenance checks and services. (Refer to fig 1, and TM 11-5820-520-12, chap 4, para 4-4 thru 4-6, pp 4-2 thru 4-4.)

**WARNING:** Dangerous voltages exist at the AM-3349/GRC-106 50-OHM LINE and WHIP antenna connectors. Be careful when working around the antenna or antenna connectors. Radio frequency voltages as high as 10,000 volts exist at these points. Operator and maintenance personnel should be familiar with the requirements of TB SIG 291 before attempting installation or operation of Radio Set AN/GRC-106(\*). Injury or DEATH could result from improper or careless operation.

ITEM	TROUBLE SYMPTOM	PROBABLE CAUSE	CHECK AND CORRECTIVE MEASURES
1	Blower motors in AM-3349/GRC-106 do not energize.	Probable troubles are— <i>a.</i> Defective RT-662/GRC or RT-834/GRC. <i>b.</i> Improper seating of the connector on Cable Assembly, Special Purpose, Electrical CX-10071/U that is connected to the AM-3349/GRC-106 PRIM POWER connector.  <i>c.</i> Loose connections at vehicle storage battery terminals. <i>d.</i> Improper connector seating of Cable Assembly, Special Purpose, Electrical CX-10099/U. <i>e.</i> Defective AM-3349/GRC-106 .....	<i>a.</i> Higher category repair required. <i>b.</i> Tighten the CX-10071 U connector screw handle.  <i>c.</i> Tighten connections at vehicle storage battery. <i>d.</i> Tighten the CX-10099/U cable connectors screw handles.  <i>e.</i> Set PRIM. PWR switch at OFF, then back to ON. If blower motors still do not energize, notify next higher category of maintenance.
2	Signal level meter pointer on the RT-662/GRC or RT-834/GRC front panel does not move to extreme right side of scale.	<i>a.</i> FUSE 2 AMP. on the RT-662/GRC or RT-834/GRC front panel is burned out. <i>b.</i> Improper seating of the connector on Cable Assembly, Special Purpose, Electrical CX-10071/U that is connected to the RT-662/GRC or RT-834/GRC POWER connector. <i>c.</i> Loose connections at vehicle storage battery terminals.	<i>a.</i> Check fuse. Replace if necessary.  <i>b.</i> Tighten CX-10071/U connector screw handle.  <i>c.</i> Tighten connections at vehicle storage battery.
3	TEST METER pointer does not indicate in the area of the two dark green wedges (top scale), when TEST METER switch is set at PRIM VOLT.	Defective AM-3349/GRC-106	Insure that blower motors are energized. If energized, higher category repair is required. If blower motors are not energized, set PRIM. PWR switch at OFF and then back to ON. If blower motors still do not energize and the TEST METER does not provide an indication, notify next higher category of maintenance.

113-620-2002

Figure 1. Operator's Troubleshooting Chart for Radio Set AN/GRC-106(\*) (Cont).

NOTE: Insure that fuse, 2 AMP, located on front panel of RT-834/GRC-106 or RT-662/GRC-106 is present prior to performing any checks or troubleshooting procedures.

ITEM	TROUBLE SYMPTON	PROBABLE CAUSE	CHECK AND CORRECTIVE MEASURES
4	TEST METER pointer does not indicate in the area of the two dark green wedges (top scale), when TEST METER switch is set at LOW VOLT.	Defective AM-3349/GRC-106	Higher category repair is required.
5	TEST METER pointer does not indicate in the area of the two dark green wedges (top scale), when TEST METER switch is set at HIGH VOLT.	Defective AM-3349/GRC-106	Set HV RESET switch at TUNE, wait approximately 30 seconds, and then turn it back to OPERATE. If indication is still abnormal, higher category repair is required. <b>CAUTION:</b> Be sure PRIM. PWR switch is set at OFF before checking cables or whip antenna.
6	Adjustment of the ANT. TUNE and ANT. LOAD controls does not vary indication of ANT. TUNE and ANT. LOAD meters.	a. Improper connector seating on CX-10171/U. b. Broken or defective whip antenna .....	a. Check seating and tighten connectors on CX-10171/U. b. Check antenna. Replace broken whip antenna mast sections.
7	TEST METER pointer on AM-3349/GRC-106 does not indicate in correct portion of meter scale when TEST METER switch is set at PA. CUR., DRIVER CUR., GRID DRIVE, or POWER OUT.	Same as item 3 .....	Same as item 3.

113-620-2002

Figure 1. Operator's Troubleshooting Chart for Radio Set AN/GRC-106(\*) (Cont).

2. List all faults that you, as an operator, cannot correct by use of the troubleshooting chart on DA Form 2404. (Refer to TM 38-750, chap 3, para 3-4c, pp 3-5 thru 3-7.)
3. Notify your immediate supervisor or supporting maintenance activity of any troubles you were unable to correct. (Refer to TM 38-750, chap 3, para 3-4d, pp 3-7 and 3-8.)

## REFERENCES

TM 11-5820-520-12, w/C1 thru 10, Operator's and Organizational Maintenance Manual: Radio Sets AN/GRC-106 and AN/GRC-106A, Feb 71.

TM 38-750, w/C1 thru 3, The Army Maintenance Management System (TAMMS), May 78.

TEC Lesson 201-113-4509-F, AN/GRC-106 Operator's Maintenance and Troubleshooting Procedures.

Army Correspondence Course SSO 730, Radio Set AN/GRC-106(\*) Operation.

Army Correspondence Course SS9 740, Radio Set AN/GRC-106(\*) (SOJT).



**TASK****113-620-1002**

---

**(RC)Install Radio Set AN/GRC-109**

---

**CONDITIONS**

This task is performed under all weather conditions in a field or a garrison location. You will be provided with a complete Radio Set AN/GRC-108 and TM 11-5820-474-14.

Supervision and assistance will be available.

**STANDARDS**

This task has been performed when, in 20 minutes, the radio set has been installed without damage to the radio or its components, the antenna has been selected and erected, and the radio set is ready to be tuned and operated according to performance measures 1 through 3.

**PERFORMANCE MEASURES**

1. Make preliminary connections (common antenna system). (Refer to TM 11-5820-474-14, chap 2, para 14d, p 15.)
  - a. Connect the H65 to the PHONES binding post on the receiver.
  - b. Connect the antenna lead-in to the ANT binding post on the transmitter.
  - c. Connect a length of rubber-covered wire between the ANT binding post on the receiver and the RCVR ANT binding post on the transmitter. (Keep this connection as short as possible.)
  - d. Connect a wire between the GRD binding post on the receiver and the RCVR GND binding post on the transmitter. (Keep this connection as short as possible.)

- e. Connect the ground system to the GND binding post on the transmitter.
2. Make unit interconnections (primary power options). (Refer to TM 11-5820-474-14, chap 2, para 15, pp 15 and 16.)

CAUTION: Do not make connections to primary power sources until all units are interconnected.

- a. Perform these steps for ac line operation:
    - (1) Plug the transmitter interconnecting cable into the TRANS PWR receptacle on the large or small power supply.
    - (2) Plug the receiver interconnecting cable into the RCVR PWR receptacle on the large or small power supply.
    - (3) Turn POWER SELECTOR switch on the power supply to OFF.
    - (4) Connect the power supply cord to the ac source.
  - b. Perform these steps for the hand-cranked generator operation with voltage regulator:
    - (1) Connect the transmitter interconnecting cable to the proper receptacle on the voltage regulator.
    - (2) Connect the receiver interconnecting cable to the proper receptacle on the voltage regulator.
    - (3) Connect the interconnecting cable on the voltage regulator to the receptacle on the hand-cranked generator.
3. Erect long wire or doublet antenna. (Refer to fig 2, and TM 11-5820-474-14, chap 2, para 14b, p 13.).
    - a. Installation of long wire antenna:
      - (1) Use 100-foot length of antenna wire and insulators.
      - (2) Make, if possible, the horizontal portion of the antenna 60 to 70 feet long, and vertical portion 30 to 40 feet long.
      - (3) If 100 feet of antenna wire cannot be used, use figure 1 for minimum antenna lengths for frequency being used.

Frequency (MHz)	Total minimum length (ft)
3 to 5	75
5 to 7	50
7 to 9	35
9 to 22	25

Figure 1. Long Wire Antenna Lengths.

113-620-1002

- b. The doublet antenna can also be used with this radio. (Refer to task 113-596-7001 for formula and erection of this antenna.)

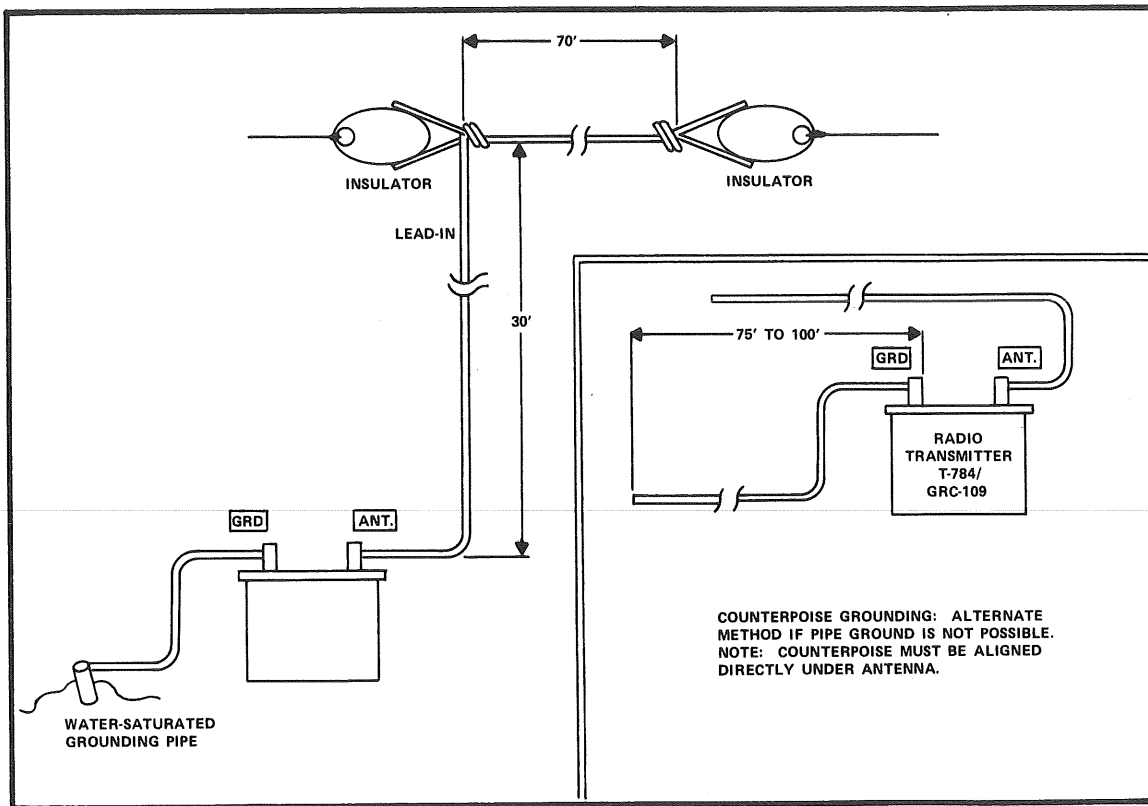


Figure 2. Long Wire Antenna Construction.

113-620-1002

## REFERENCES

TM 11-5820-474-14, w/C4 thru 6, Operator's, Organizational, Direct Support, and General Support Maintenance Manual: Radio Set, AN/GRC-109, May 62.

**TASK****113-620-2003****(RC)Operate Radio Set AN/GRC-109****CONDITIONS**

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. Receiver R-1004.
2. Transmitter T-784.
3. Power Supply PP-2685.
4. Coder-Burst Group AN/GRA-71.
5. Connecting components.
6. CEOI.
7. TM 11-5820-474-14.
8. TM 11-5835-224-12.

Supervision and assistance will be available.

**STANDARDS**

This task has been performed correctly when, in 20 minutes, the radio set is tuned with the Coder-Burst Group conforming to the requirements of paragraph 3 of this task, and an undistorted CW message has been sent by burst and manual means on the assigned frequency according to performance measures 1 through 5.

**PERFORMANCE MEASURES**

1. Prepare for transmission. (Refer to TM 11-5820-474-14, chap 2, para 14, 15, pp 13 thru 16.)
  - a. Make necessary interconnections between components. (Refer to fig 1, 2, and 3.)
  - b. Prepare provided message for burst transmission and manual CW. (Refer to TM 11-5835-224-12, chap 2, para 2.2, pp 16 thru 20.)
2. Perform preliminary starting procedures. (Refer to TM 11-5820-474-14, chap 3, sec II, para 18, p 20, and TM 11-5835-224-12, chap 2, para 2.3, pp 20 thru 24.)

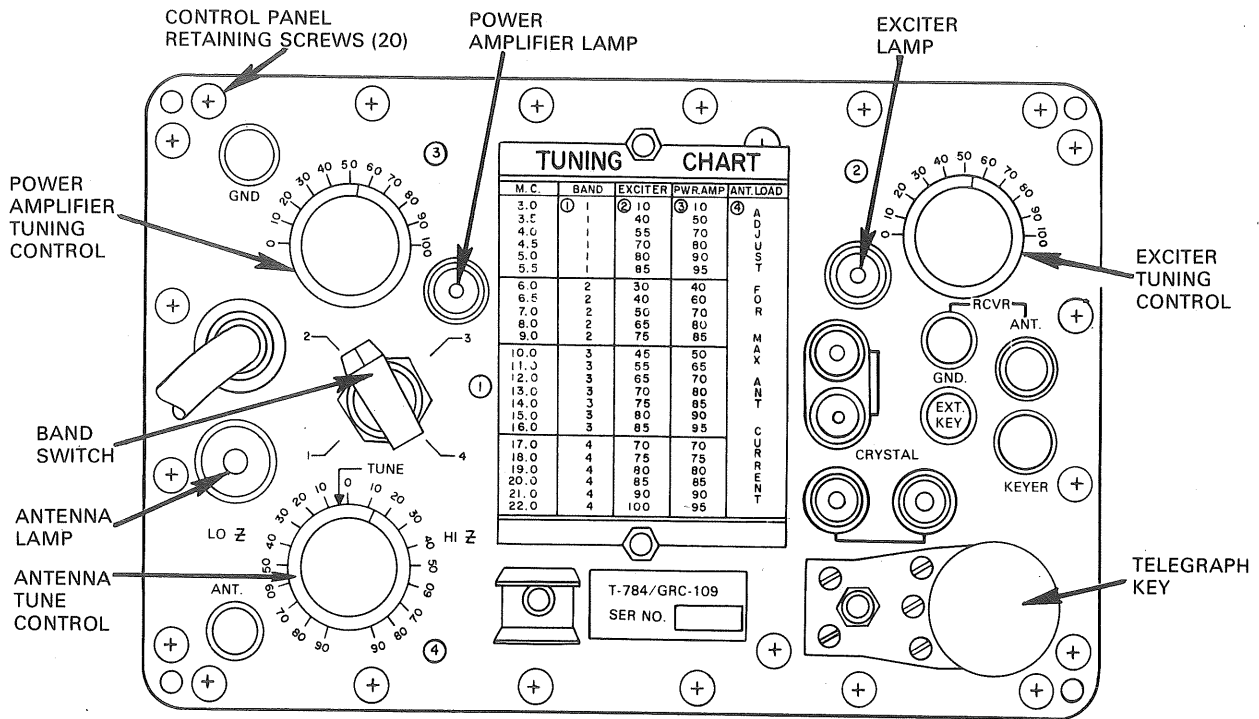


Figure 1. Transmitter T-784/GRC-109.

113-620-2003

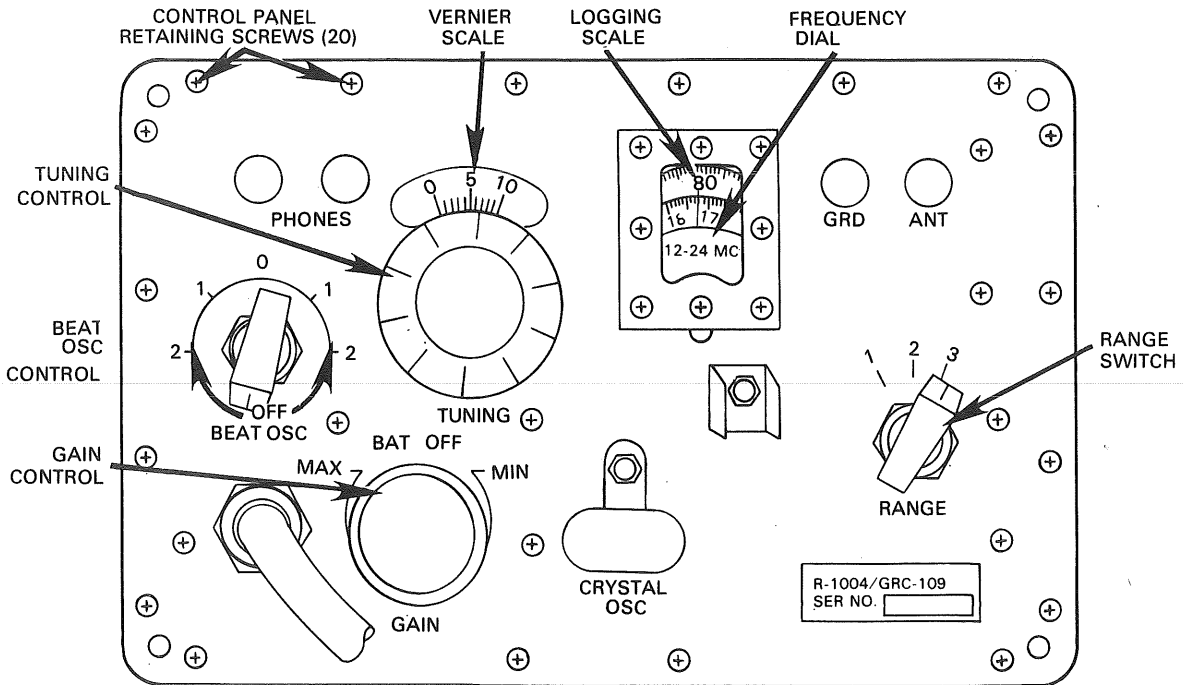
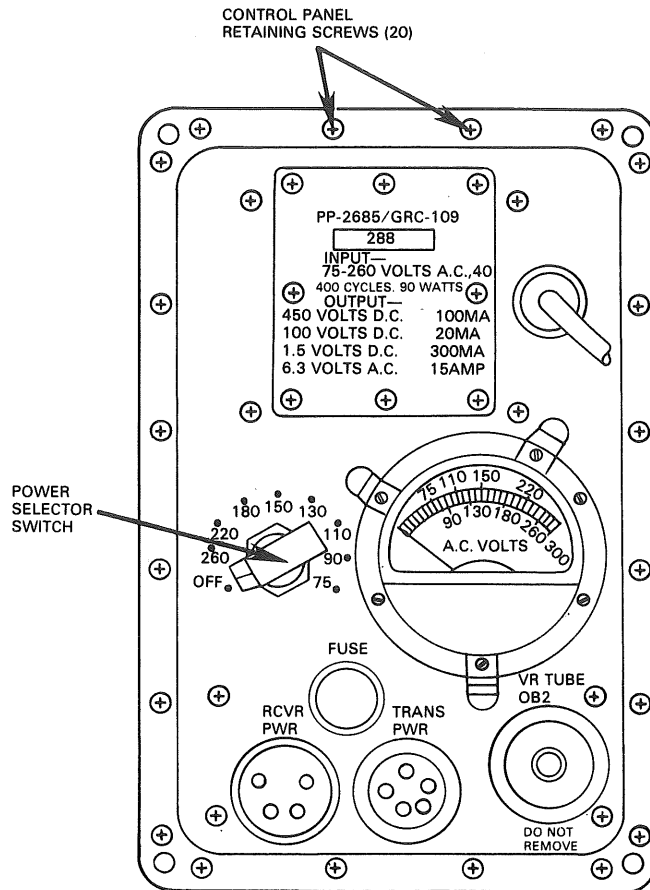


Figure 2. Receiver R-1004/GRC-109.

113-620-2003



113-620-2003

Figure 3. Power Supply PP-2685/GRC-109.

3. Tune radio set. (Refer to automated CEOI supplemental and TM 11-5820-474-14, chap 3, sec II, para 19 thru 21, pp 20 and 21.)
4. Send prepared 25 group CW message by burst and manual CW in accordance with unit SOP and automated CEOI supplemental.
5. Perform stopping procedures by turning POWER SELECTOR switch to OFF. (Refer to TM 11-5820-474-14, chap 3, sec II, para 26, p 22.)

## REFERENCES

TM 11-5820-474-14, w/C4 thru 6, Operator's, Organizational Direct Support, and General Support Maintenance Manual: Radio Set, AN/GRC-109, May 62.

TM 11-5835-224-12, w/C2 and 5, Operator and Organizational Maintenance Manual, Coder-Burst Transmission Group, AN/GRA-71, May 74.

TC 32-11, How to Get Out of a Jam, Apr 75.



**TASK****113-620-3002**

---

**(RC)Perform Operator's Daily Preventive Maintenance  
on Radio Set AN/GRC-109**

---

**CONDITIONS**

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. Radio Set AN/GRC-109.
2. TM 11-5820-474-14.
3. TM 38-750.
4. Clean dry lint-free cloth.
5. Mild detergent solution.
6. Cleaning fluid Trichloroethane.
7. DA Form 2404.

Supervision and assistance will be available.

**STANDARDS**

This task has been performed correctly when the exteriors of all components are clean, all dials and knobs are tight, all cables are in good condition (no cracks or broken connectors), all fuses are of correct value, and those faults that you, as an operator, cannot correct are recorded on DA Form 2404, without error, and reported to your immediate supervisor according to performance measures 1 and 2.

SEQUENCE NO.	ITEM	PROCEDURE
1	Completeness	Check for completeness of the radio set.
2	Publications	See that all publications are complete, serviceable, and current.
3	Cleanliness	See that the equipment is clean.
4	Cables and connectors	Inspect cables and connectors for cracks and breaks.
5	Desiccator crystals	Check desiccator crystals for a change from blue to pink.
6	Fuse caps, lamps	Check fuse caps and lamps for looseness.
7	Battery cable clips	Check battery cable clips for corrosion.
8	Telegraph keys	Check telegraph keys for corrosion and loose adjustments.
9	Insulators	Check insulators for dirt and moisture.
10	Glass	Check meter glass and frequency-indicator glass for breaks and cracks.
11	Antenna wire	Check antenna wire for corrosion, proper length, and breaks.
12	Controls	While making the operational test (item 13), check the action of each control for binding or scraping.
13	Operational test	Check the radio set for normal operation.

113-620-3002

Figure 1. Operator's Daily Preventive Maintenance Chart.

## PERFORMANCE MEASURES

1. Perform operator's daily maintenance. (Refer to TM 11-5820-474-14, chap 4, para 30 thru 32, pp 24.1 and 24.2.)
  - a. Item 13 must be performed in accordance with operational checklist. (Refer to fig 2.)
  - b. Correct defects that you, as an operator, are authorized to correct.
2. Complete DA Form 2404 and submit to your supervisor or support maintenance facility. (Refer to TM 38-750, chap 3, para 3-4C, pp 3-5 thru 3-7.)

ACTION	NORMAL INDICATION
1. Connect large or small power supply ac cord to ac source.	Ac voltage from 75 to 260 volts.
2. On large power supply, turn CHARGE-OPERATE switch to OPERATE for operation from 6-volt battery; turn power selector switch to BAT.	Operation of transmitter and receiver.
3. On large power supply, turn power selector switch to OFF for operation from hand-cranked generator; connect generator power cable to proper receptacle on unit; crank generator.	Operation of transmitter and receiver.
4. Depress telegraph key and adjust control (2) for maximum brilliance of exciter lamp (para 20b).	Maximum brightness of lamp...
5. Depress telegraph key and adjust control (3) for maximum brilliance of power amplifier lamp (para 20c).	Maximum brightness of power amplifier lamp.
6. Depress telegraph key and adjust controls (4) and (3) (para 20d and 3).	Maximum brightness of antenna lamp and power amplifier lamps.
7. Monitor receiver while advancing GAIN control toward MAX.	Rushing (hissing) sound in headset.
8. Tune receiver to transmitter frequency, turn on BEAT OSC control, depress telegraph key, and monitor signal.	Tone appears and disappears as telegraph key is depressed and released.
9. Adjust BEAT OSC control during cw reception.	Pitch varies with BEAT OSC control rotation.

113-620-3002

Figure 2. Operator's Checklist for Radio Set AN/GRC-109.

(The paragraphs referred to in this figure apply to TM 11-5820-474-14.)

## REFERENCES

TM 11-5820-474-14, w/C4 thru 6, Operator's, Organizational, Direct Support, and General Support Maintenance Manual: Radio Set, AN/GRC-109, May 62.

TM 38-750, w/C1 thru 3, The Army Maintenance Management System (TAMMS), May 78.

**TASK****113-620-2004**

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**(RC)Troubleshoot Radio Set AN/GRC-109**

---

**CONDITIONS**

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. Radio Set AN/GRC-109.
2. TM 11-5820-474-14.
3. TM 38-750.
4. DA Form 2404.

Supervision and assistance will be available.

**STANDARDS**

This task has been performed correctly when any discovered faults have been corrected in accordance with the corrective measures listed in figure 1, and those faults that you, as an operator, cannot correct are recorded on DA Form 2404, without error, and reported to your immediate supervisor according to performance measures 1 through 4.

**PERFORMANCE MEASURES**

1. Perform operator's troubleshooting procedures on Radio Set AN/GRC-109. (Refer to fig 1, and TM 11-5820-474-14, chap 4, para 34 and 34.1, pp 26 thru 30.)
2. Correct defects if necessary. Replacement parts or materials can be obtained from your team chief. (Refer to TM 11-5820-474-14, chap 4, para 34 and 34.1, pp 26 thru 30.)
3. Complete DA Form 2404 (Equipment Inspection and Maintenance Worksheet) as a daily maintenance form. (Refer to TM 38-750, chap 3, para 3-4c, pp 3-5 thru 3-7.)

ACTION	NORMAL INDICATION	CORRECTIVE MEASURES
1. Connect large or small power supply ac cord to ac source.	Ac voltage from 75 to 260 volts.	Check 2 AMP FUSE in large power supply. Check FUSE in small power supply. Check to see that A.C. VOLTS meter movement is not binding or stuck.
2. On large power supply, turn CHARGE-OPERATE switch to OPERATE for operation from 6-volt battery; turn power selector switch to BAT.	Operation of transmitter and receiver.	Check 15 AMP FUSE. Check to see that vibrator hums. Replace if necessary. Check interconnecting power cables and receptacles. Check battery for proper voltage and condition of electrolyte.
3. On large power supply, turn power selector switch to OFF for operation from hand-cranked generator; connect generator power cable to proper receptacle on unit; crank generator.	Operation of transmitter and receiver.	Check interconnecting power cables and connector-receptacle combinations.
4. Depress telegraph key and adjust control (2) for maximum brilliance of exciter lamp (para 20b).	Maximum brightness of lamp	Check transmitter crystal by substitution. Replace oscillator tube, V1, 6AC7 (para 34e).
5. Depress telegraph key and adjust control (3) for maximum brilliance of power amplifier lamp (para 20c).	Maximum brightness of power amplifier lamp.	Replace power amplifier tube V2, 2E26 (para 34).
6. Depress telegraph key and adjust controls (4) and (3) (para 20d and e).	Maximum brightness of antenna lamp and power amplifier lamps.	Check antenna system for shorts and improper connections. Replace antenna lamp (para 34). Replace power amplifier tube V2, 2E26 (para 34).

113-620-2004

Figure 1. Operator's Troubleshooting Chart for AN/GRC-109.

(The paragraphs referred to in this figure apply to TM 11-5820-474-14.)

ACTION	NORMAL INDICATION	CORRECTIVE MEASURES
7. Monitor receiver while advancing GAIN control toward MAX.	Rushing (hissing) sound in headset.	Check PHONES connections. Check headset. Check power source, interconnecting cables, and connector-receptacle combinations. By substitution, check receiver tubes V1, 1T4; V2, 1L6; V3, 1T4; V5, 1U5 (para 34f).
8. Tune receiver to transmitter frequency, turn on BEAT OSC control, depress telegraph key, and monitor signal.	Tone appears and disappears as telegraph key is depressed and released.	Check transmitter crystal by substitution. Check transmitter power source, telegraph key contacts, interconnecting cables, and connector-receptacle combinations. Check transmitter and receiver antennas.
9. Adjust BEAT OSC control during cw reception.	Pitch varies with BEAT OSC control rotation.	Check to see that BEAT OSC control is tight on shaft. Replace BFO tube, V6, 1T4 (para 34f).

113-620-2004

Operator's Troubleshooting Chart (Cont).

- 4. Report all uncorrectable defects.
  - a. Notify your immediate supervisor of all uncorrectable faults found.
  - b. Submit DA Form 2404 to your supervisor or support maintenance personnel.

REFERENCES

TM 11-5820-474-14, w/C4 thru 6, Operator, Organizational, Direct Support, and General Support Maintenance Manual: Radio Set, AN/GRC-109, May 62.

TM 38-750, w/C1 thru 3, The Army Maintenance Management System (TAMMS), May 78.

**TASK****113-620-1021**

---

**(RC)Install Radio Set AN/GRC-19(\*)**

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**CONDITIONS**

This task is performed under all weather conditions in a field or garrison location and may be performed in an NBC environment as directed by supervisor. Given:

1. A Radio Set AN/GRC-19(\*) with all basic issue items.
2. TM 11-5820-295-10.
3. 8-inch flat tip screwdriver.
4. Pliers.
5. A vehicle with the Mount MT-851/GRC-19 and Mast Base MP-65-B installed.

Supervision and assistance will normally be available.

**STANDARDS**

This task has been performed correctly when within 20 minutes the radio is installed in its mount without damage to the radio or mount, the antenna is erected, all cable connections are made, and the radio is ready to be tuned and operated according to performance measures 1 through 4.

**PERFORMANCE MEASURES**

1. Position AN/GRC-19(\*) in Mount MT-851/GRC-19 securely. (Refer to fig 1, and TM 11-5820-295-10, chap 2, para 14, p 11.)



**WARNING:** Voltages dangerous to life are used in this equipment. Before connecting or disconnecting any cables, be sure that the T-195(\*)/GRC-19 SERVICE SELECTOR switch is at OFF, also the function switch on the R-392/URR is at OFF.

**NOTE:** Two persons are required to lift the T-195(\*)/GRC-19 when it is removed from, or replaced on, the MT-851/GRC-19.

2. Connect all cables. (Refer to fig 2, and TM 11-5820-295-10, chap 2, para 16, p 11.)
3. Connect audio accessories. (Refer to fig 2.)
4. Install whip antenna. (Refer to fig 2, and TM 11-5820-295-10, chap 2, para 15, p 11.)

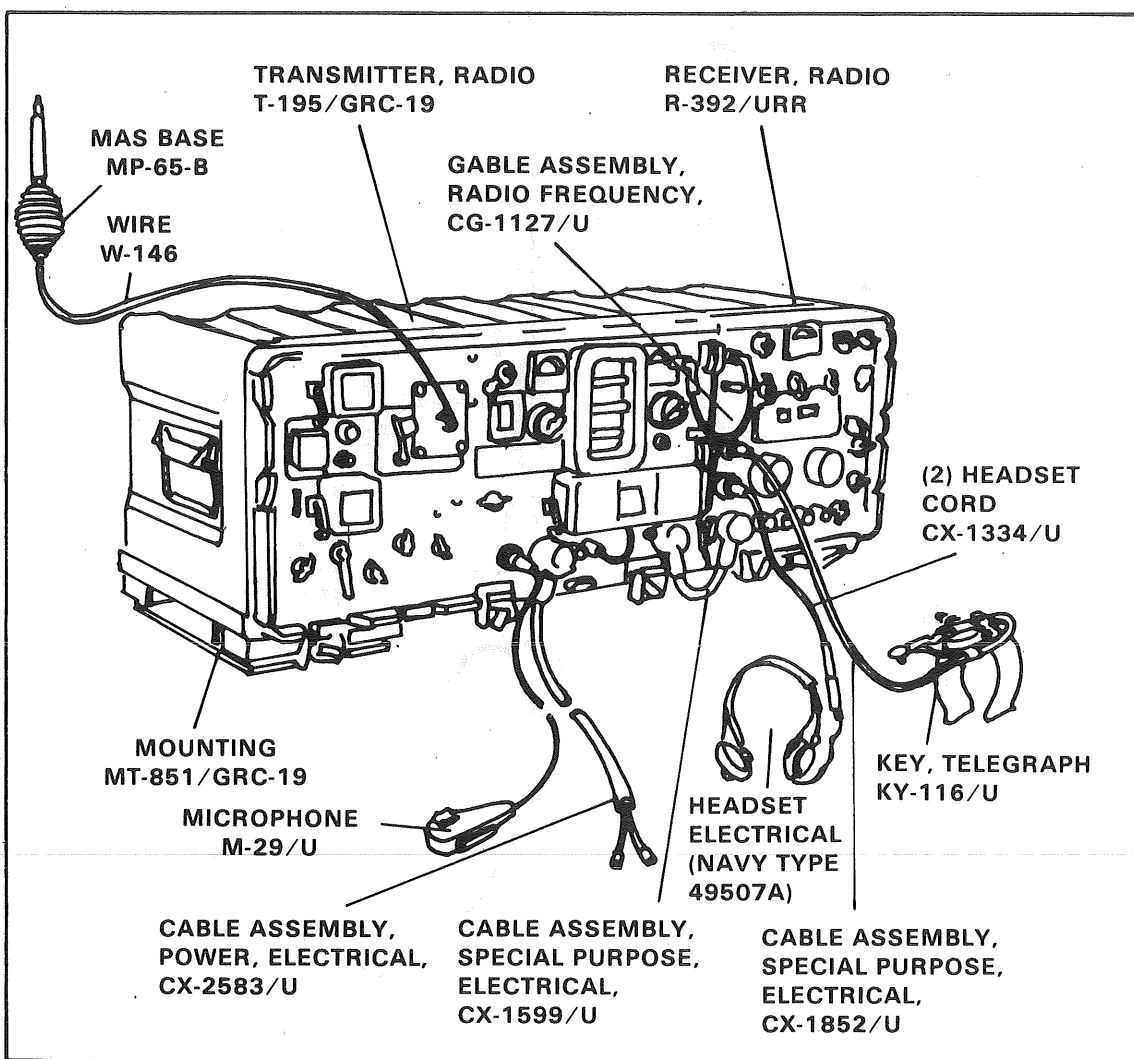
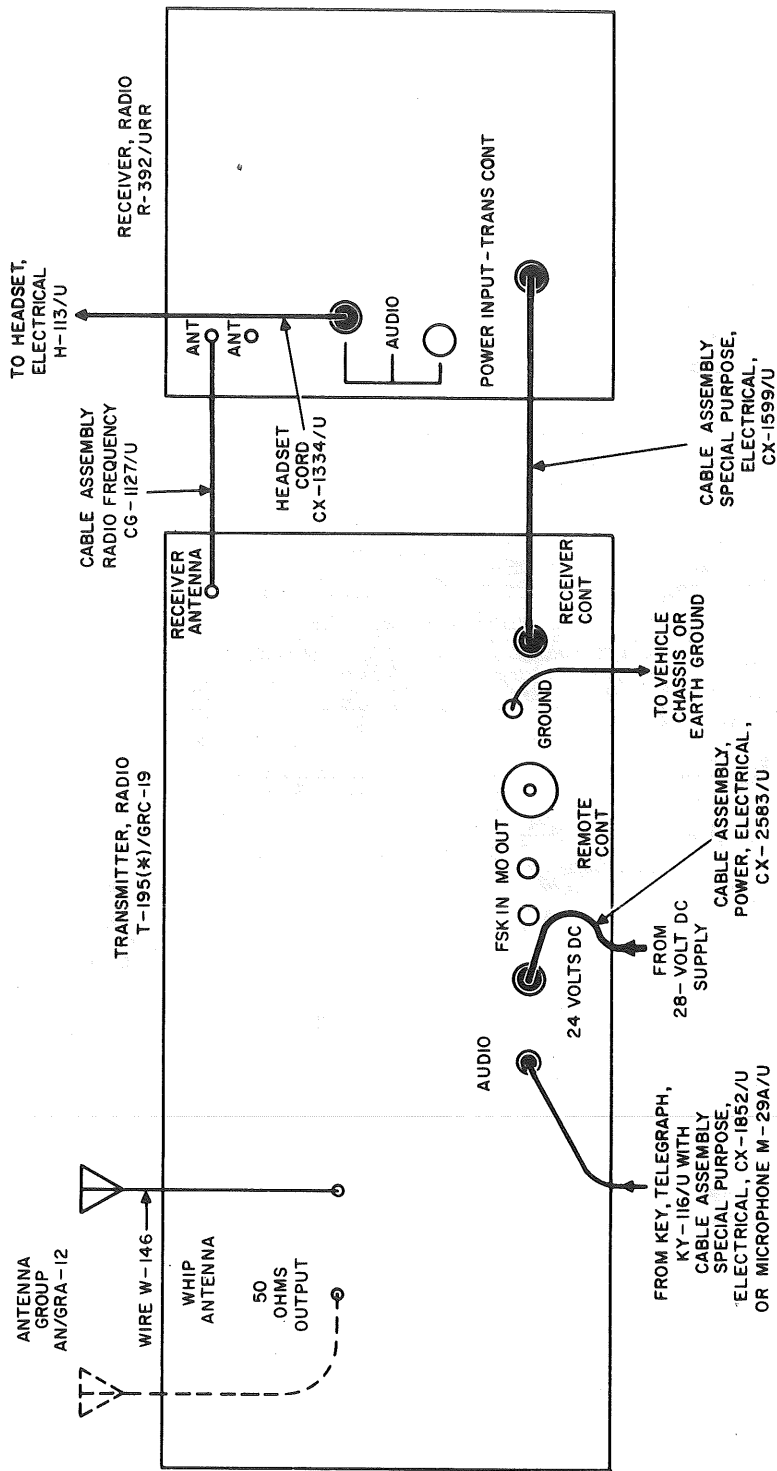


Figure 1. Radio Set AN/GRC-19(\*) Typical Installation Mounting Details.



TMS620-295-10-17

Figure 2. Radio Set AN/GRC-19 Cording Diagram for Normal Operation.

REFERENCES

TM 11-5820-295-10, w/C1 thru 3, Operator's Manual: Radio Set AN/  
GRC-19, Jun 63.

**TASK****113-620-2012**

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**(RC)Operate Radio Set AN/GRC-19(\*)**

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**CONDITIONS**

This task is performed in a field or garrison location, under all weather conditions, and may be performed in an NBC environment. Task is performed when directed by your supervisor. Your supervisor will provide you with:

1. An installed, operational Radio Set AN/GRC-19(\*).
2. TM 11-5820-295-10.
3. CEOI.
4. Compatible radio station to communicate with.

**STANDARDS**

This task is performed correctly when, within 30 minutes, you have placed the radio set into and out of operation in accordance with performance measures 1 through 8.

**PERFORMANCE MEASURES**

1. Determine operating frequency from current CEOI.
2. Perform preliminary starting procedures. (Refer to TM 11-5820-295-10, chap 3, sec II, para 22, p 17.)
3. Perform R-392/URR calibration and tuning. (Refer to TM 11-5820-295-10, chap 3, sec II, para 22, pp 17 and 18.)
4. Perform T-195(\*)/GRC-19 frequency presets. (Refer to TM 11-5820-295-10, chap 3, sec II, para 22, pp 17 and 18.)

5. Perform T-195(\*)/GRC-19 calibration and tuning. (Refer to TM 11-5820-295-10, chap 3, sec II, para 22, pp 17 thru 19.)
6. Perform operational procedures. (Refer to TM 11-5820-295-10, chap 3, sec II, para 23, pp 19 thru 21.)
7. Conduct voice operating with distance station. (Refer to ACP 125(D), chap 3, p 3-1.)
8. Perform stopping procedure. (Refer to TM 11-5820-295-10, chap 3, sec II, para 26, p 21-22.)
  - a. Set the T-195(\*)/GRC-19 service selector switch to OFF.
  - b. Set the R-392/URR function switch to OFF.

## REFERENCES

TM 11-5820-295-10, w/C1 thru 3, Operator's Manual: Radio Set AN/GRC-19, Jun 63.

ACP 125(D), w/C1 and 2, Communication Instructions Radio Telephone Procedure, Jul 70, w/US Suppl-2, Radiotelephone Procedures for the Conduct of Artillery and Naval Gunfire, Sep 64 (U).

# TASK

## 113-620-1003

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### Install Radio Set AN/FRC-93

---

#### CONDITIONS

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. Radio Set AN/FRC-93.
2. TM 11-5820-554-12.
3. FM 24-18.
4. Tool Kit TK-101/G.

Supervision and assistance will be available.

#### STANDARDS

This task has been performed correctly when, in 30 minutes, the radio is installed in accordance with the selected configuration without damage to the components, the Collins antenna has been erected, all cable connections are made and the radio is ready to be tuned and operated according to performance measures 1 through 5.

#### PERFORMANCE MEASURES

1. Connect Amplifier RF AM-3979/FRC-93 (30L-1) to Transceiver RT-718/FRC-93 (KWM-2/2A.) (Refer to TM 11-5820-554-12, chap 11, sec I and II, para 11-1 thru 11-9, pp 11-1 thru 11-2.)

WARNING: Do not block interlock switches of Amplifier RF AM-3979/FRC-93 (30L-1). Dangerous voltages are present in this equipment. The high voltage is interlocked with the amplifier covers, make no attempt to put the amplifier into service until all compartment covers are in place.

- a. Connect amplifier and transceiver as shown in figure 1 for traveling station installation.

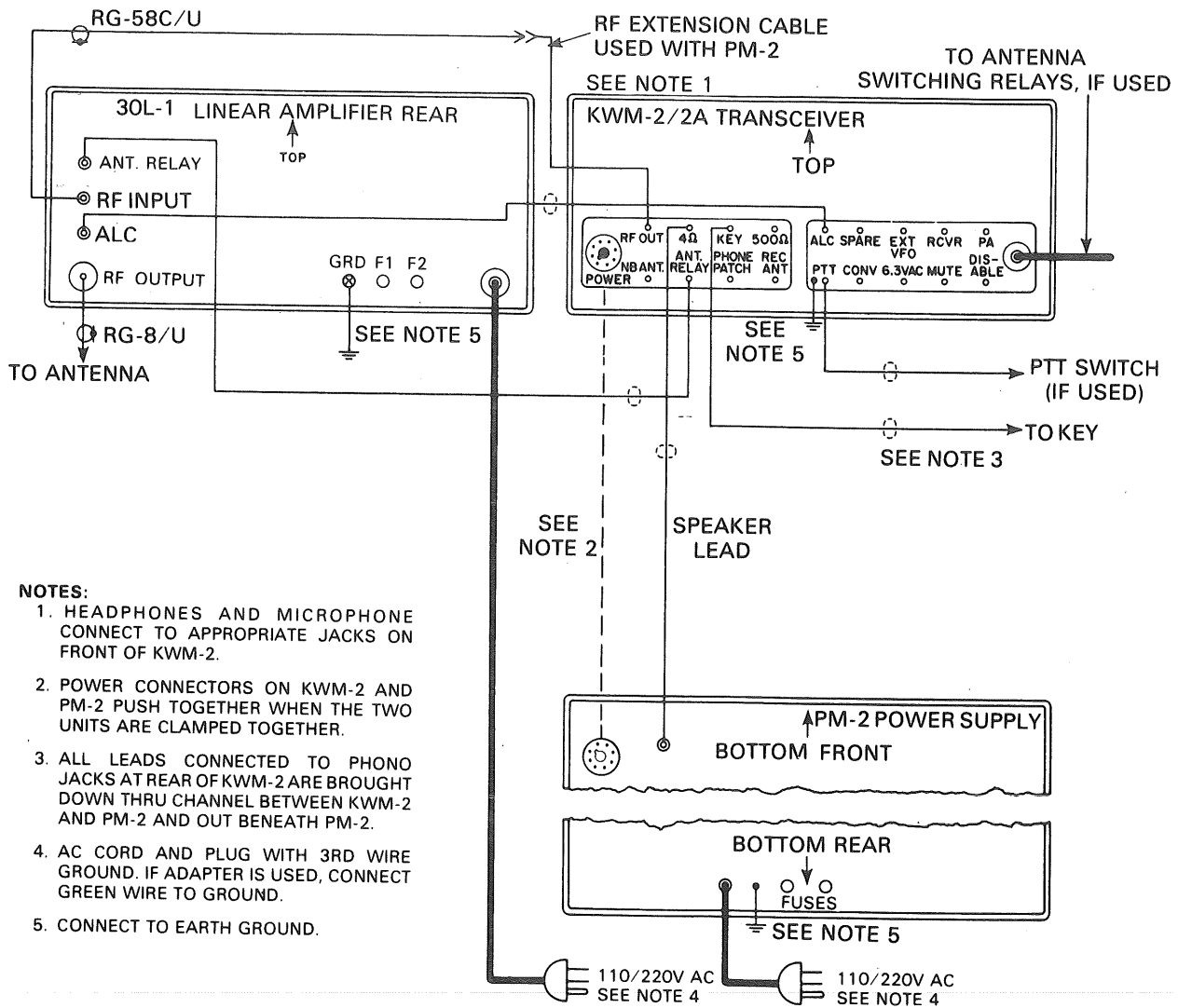
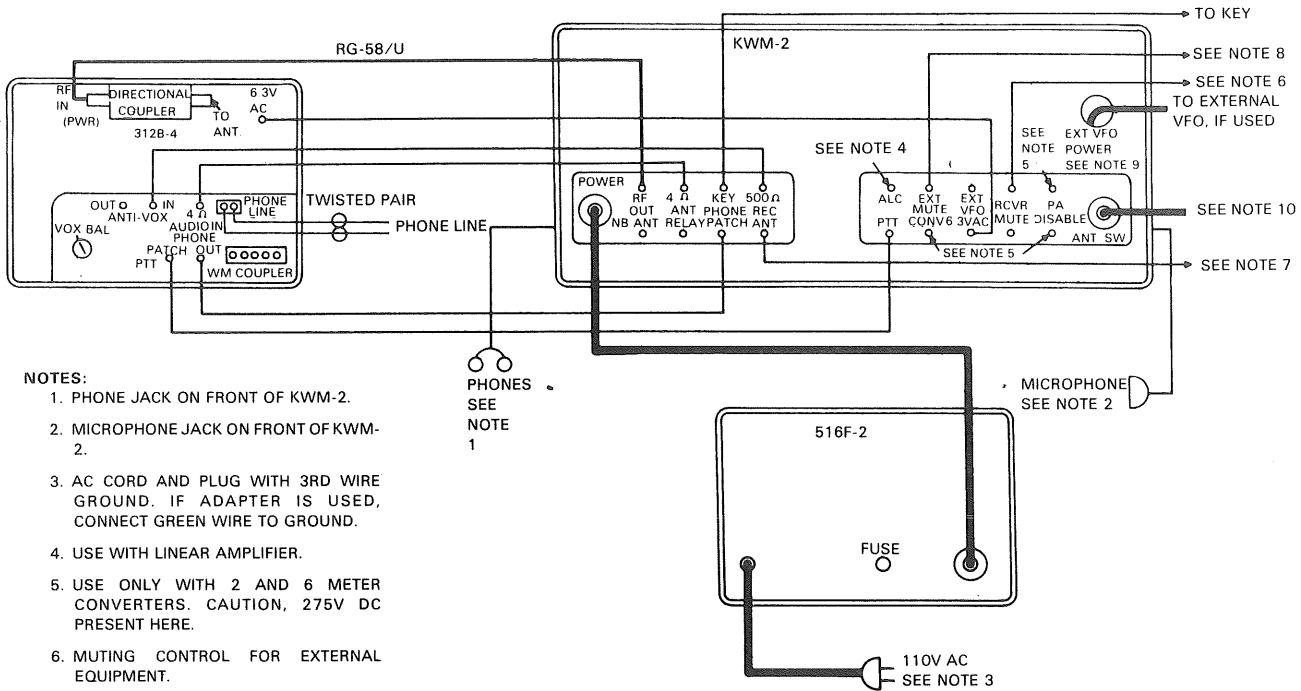


Figure 1. Traveling Station Installation

- b. Connect amplifier and transceiver as shown in figure 2 for fixed or mobile station interconnections.
2. Connect Control, Radio Set C-6118/FRC-93 or Control, Radio Set C-7515/FRC-93 to Transceiver RT-718/FRC-93 (KWM-2/2A). (Refer to TM 11-5820-554-12, chap 10, sec II, para 10-4, 10-5, p 10-3.)



a. Interconnect the C-6118/FRC-93 (Collins C-312B-4) as shown in figure 2.

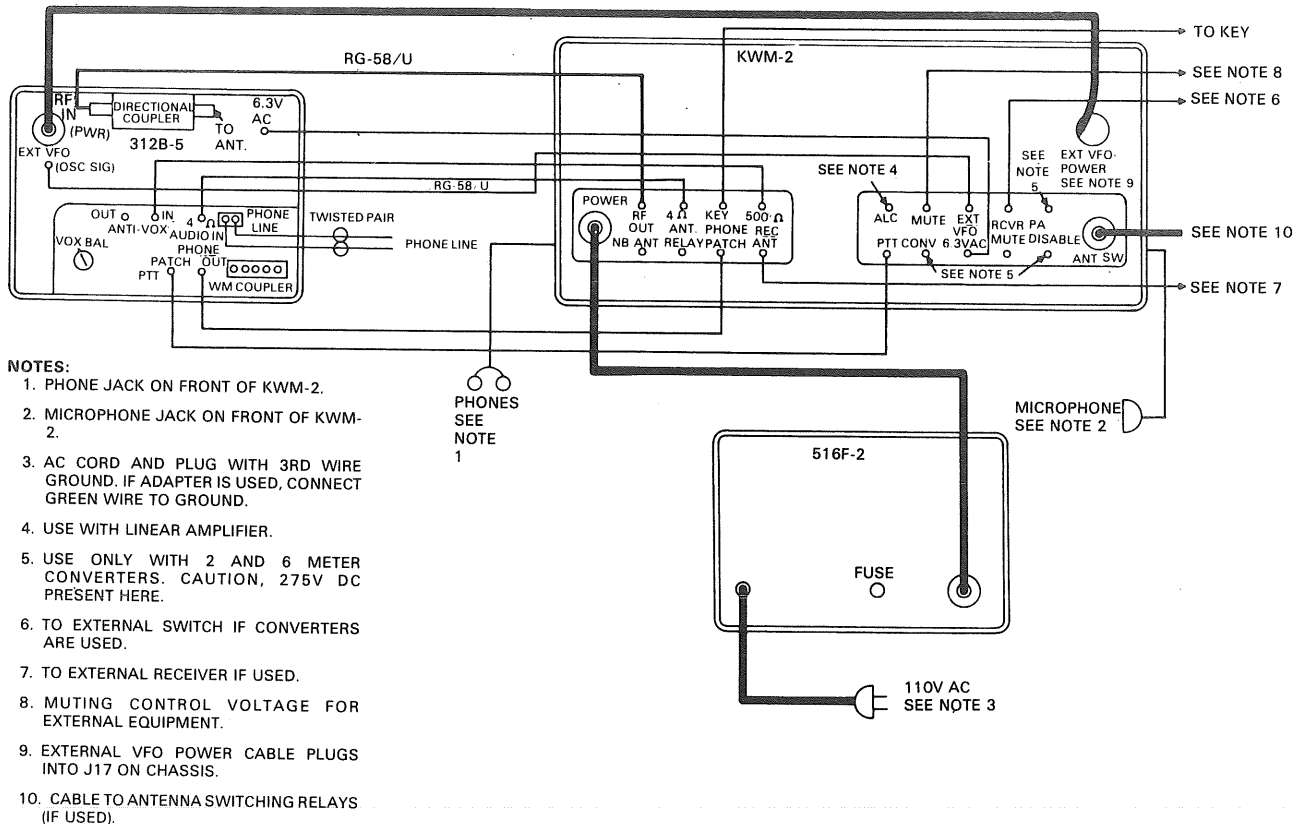


- NOTES:
1. PHONE JACK ON FRONT OF KWM-2.
  2. MICROPHONE JACK ON FRONT OF KWM-2.
  3. AC CORD AND PLUG WITH 3RD WIRE GROUND. IF ADAPTER IS USED, CONNECT GREEN WIRE TO GROUND.
  4. USE WITH LINEAR AMPLIFIER.
  5. USE ONLY WITH 2 AND 6 METER CONVERTERS. CAUTION, 275V DC PRESENT HERE.
  6. MUTING CONTROL FOR EXTERNAL EQUIPMENT.
  7. TO EXTERNAL RECEIVER IF USED.
  8. DO NOT USE.
  9. EXTERNAL VFO POWER CABLE PLUGS INTO J17 ON CHASSIS.
  10. CABLE TO ANTENNA SWITCHING RELAYS (IF USED).

113-620-1003

Figure 2. Fixed or Mobile Station Installation.

b. Interconnect the C-7515/FRC-93 (Collins C-312B5) as shown in figure 3.

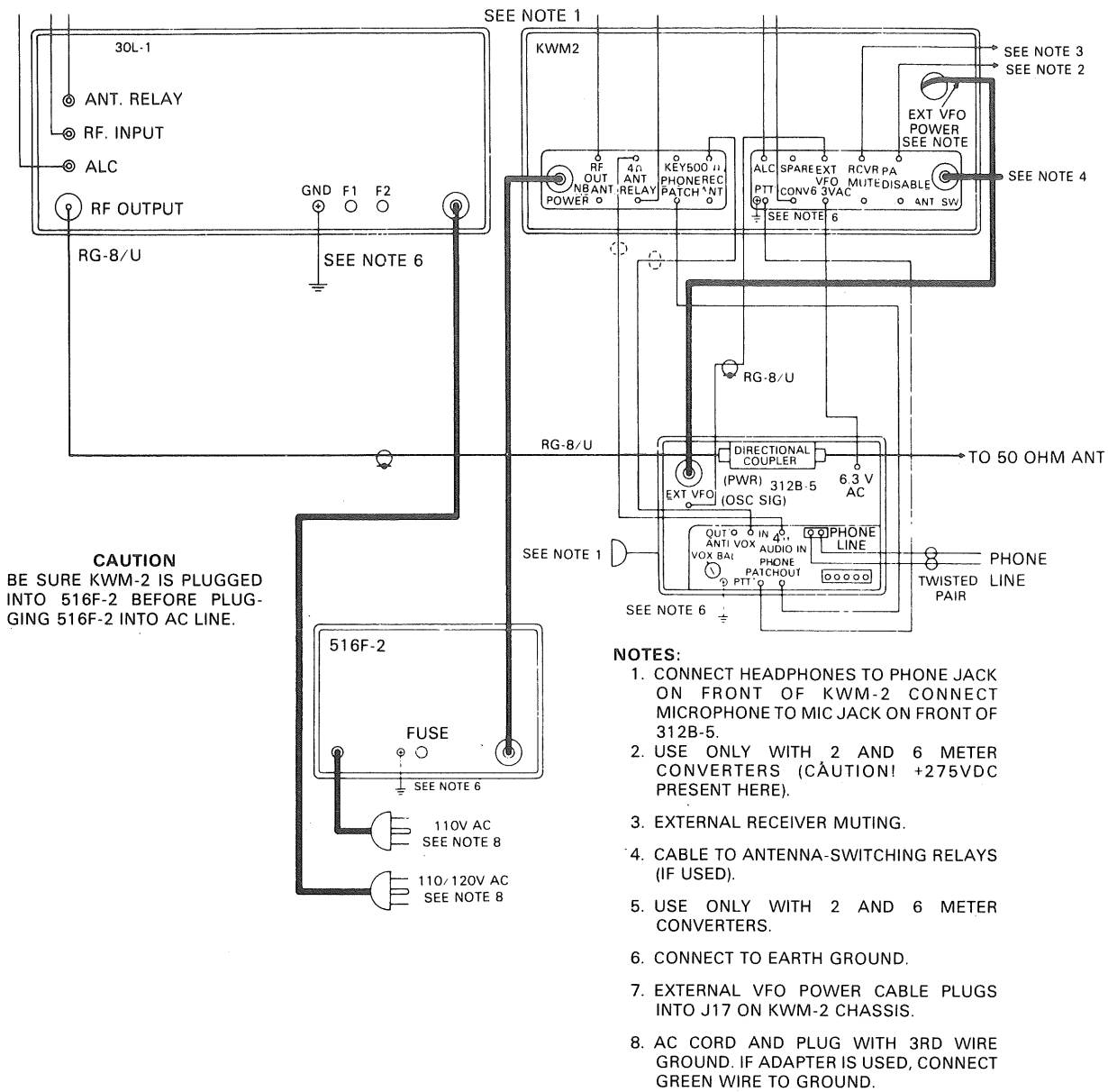


113-620-1003

Figure 3. Interconnects, Collins 312B-5 with KWM-2/2A.

- Insure that all equipment is properly interconnected and grounded in accordance with applicable TMs prior to applying power.
- Fixed or mobile station interconnections for Radio Set AN/FRC-93 are shown in figure 4.

**SKILL LEVEL 1**



113-620-1003

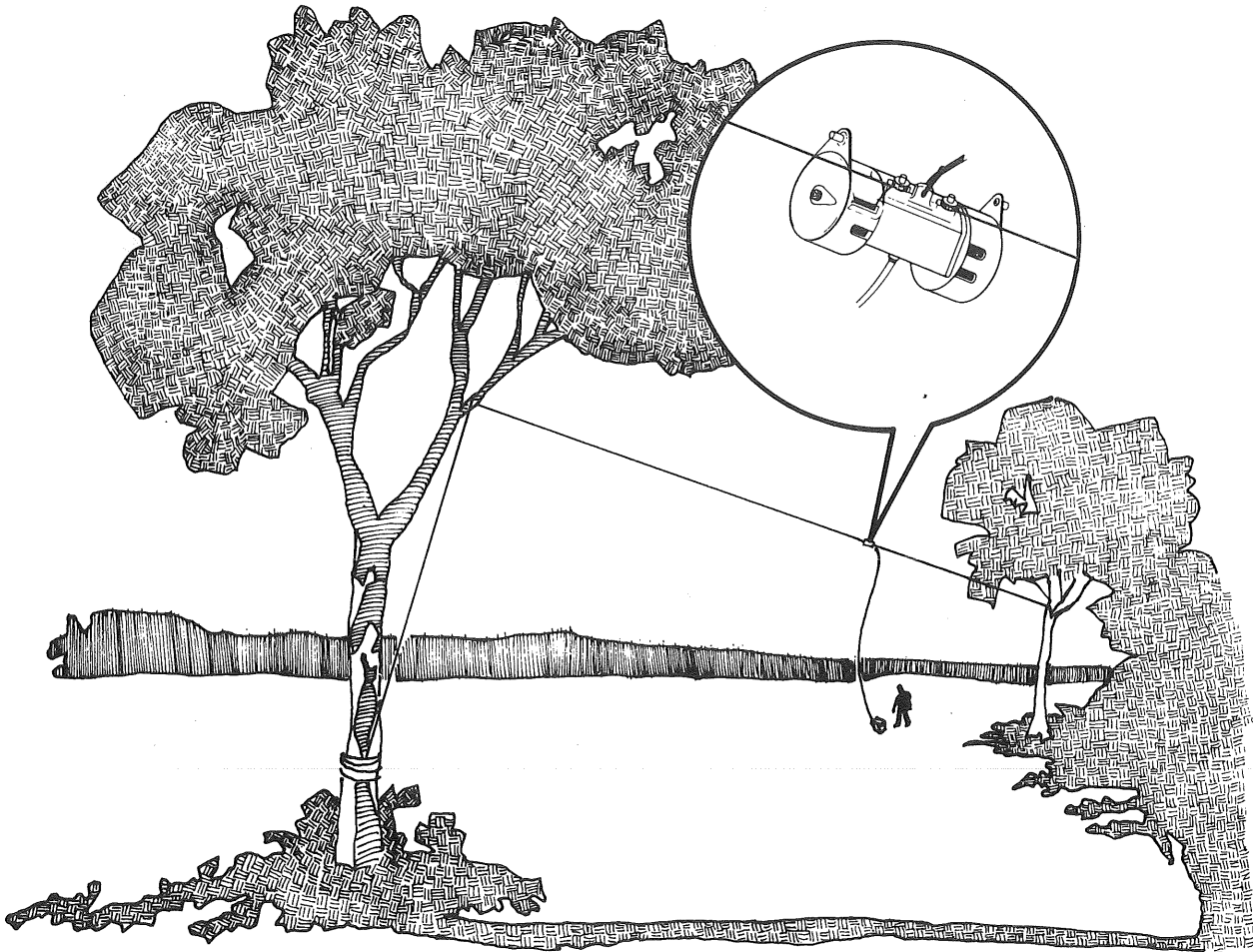
Figure 4. Fixed or Mobile Station Interconnections.

- e. The 516F-2 power supply is used with Radio Set AN/FRC-93 to provide power to Transceiver RT-718/FRC-93.

3. Site radio station. (Refer to FM 24-18, chap 6, sec I, para 75 thru 77, pp 72 thru 76.)
  - a. Insure radio is located in an area that will provide communication with all other radio stations.
  - b. Insure no manmade obstructions are present that would interfere with transmission or reception.
  - c. Insure that radio station is sited to meet tactical requirements. (Refer to FM 24-18, chap 6, sec I, para 75 thru 77, pp 72 thru 76.)
4. Ground equipment. (Refer to TM 11-5820-554-12, chap 3, sec II, para 3-7, p 3-3, fig 3-1, Note 8.)
  - a. Insure that equipment is grounded IAW applicable TM's prior to operation.
  - b. Insure that external power sources, i.e., generator set(s) are properly grounded in accordance with operator's TM for equipment used.
5. Erect antenna. (Refer to TM 11-5820-554-12, chap 13, sec II, para 13-1 thru 13-5, pp 13-1 thru 13-4.)
  - a. Install whip antenna for Radio Set AN/FRC-93 (for mobile installation only).
  - b. Installation of antenna systems other than Transportable Antenna (Collins 637T-2) will be accomplished under the supervision of your station NCOIC or support maintenance personnel.
  - c. To erect the Transportable Antenna (Collins 637T-2) follow these procedures:
    - (1) Insure all wire is wound onto the reels.
    - (2) Set both wire length pointers to zero by loosening the indicator clamp knobs, positioning the indicators to zero, and retightening the clamp knobs.
    - (3) Pull both wires out of the housing until the indicators indicate the desired frequency.
    - (4) Secure the wires at the desired length with the wire lock knobs (similar to binding posts) mounted on the antenna housing.

NOTE: For proper dipole operation, be sure that both indicators indicate the same frequency.

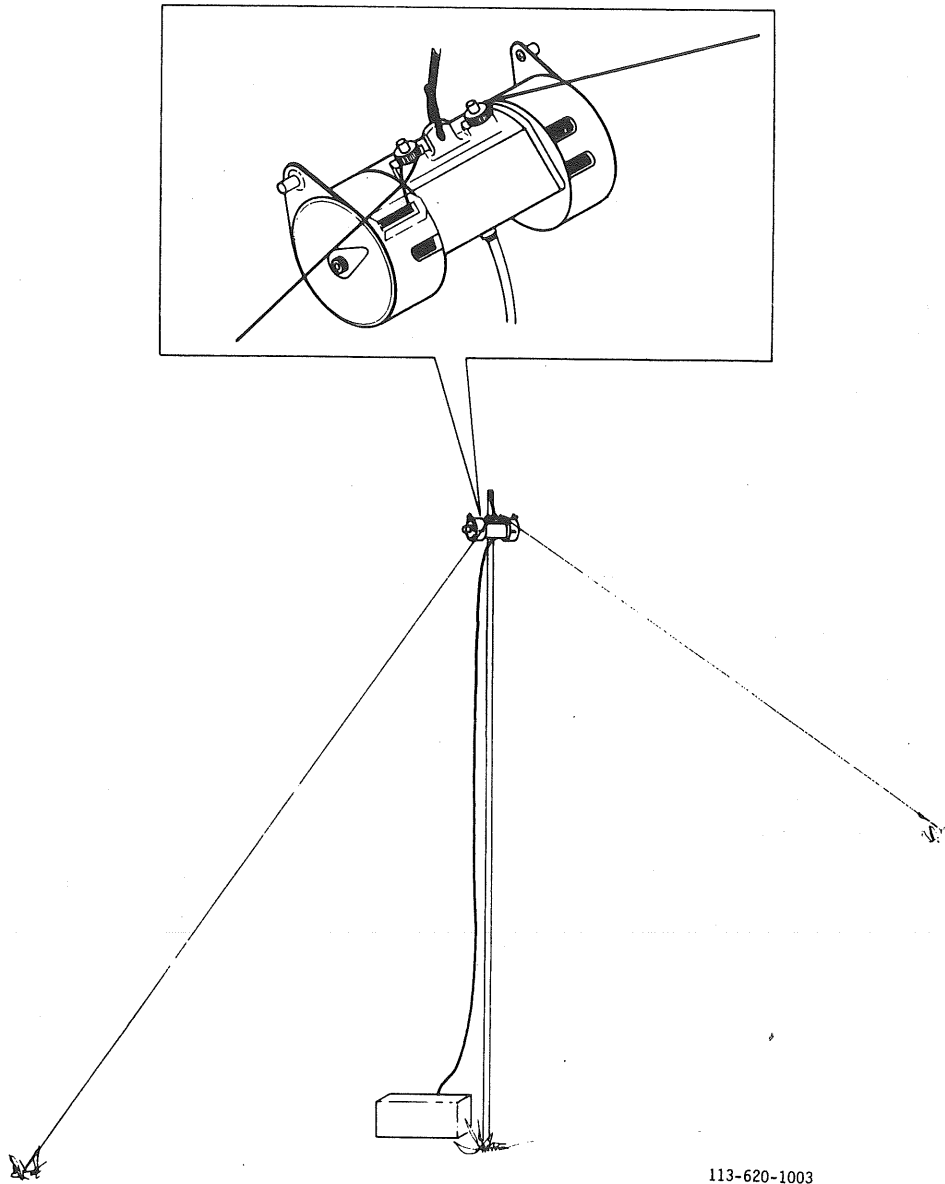
- (5) Connect the coaxial cable to the RF input connector on the antenna housing.
- (6) Raise the antenna to the desired height by passing each rope over a tree limb, tower or other vertical structure as shown in figure 5.



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Figure 5. Collins Antenna 637T-2, Dipole Antenna Fixture Connections.

- (7) The antenna reel housing may also be secured to a single vertical support structure and the elements tied off at ground level with guy ropes as shown in figure 6. This type of installation is referred to as an inverted "V."



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Figure 6. Collins Antenna 637T-2, Supported at Housing.

REFERENCES

TM 11-5820-554-12, w/C1 thru 4, Operator's and Organizational Maintenance Manual: Radio Set, AN/FRC-93(V)1, AN/FRC-93(V)2, AN/FRC-93(V)3, AN/FRC-93(V)4, AN/FRC-93(V)5, AN/FRC-93(V)6, and AN/FRC-93(V)7, Jun 76.

FM 24-18, Field Radio Techniques, Jul 65.

TC 11-6, Grounding Techniques, Sep 76.

**TASK****113-620-2005**

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**Operate Radio Set AN/FRC-93**

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**CONDITIONS**

This task is performed under all weather conditions in a field or a garrison location. You will be furnished with an operational Radio Set AN/FRC-93, TM 11-5820-554-12, and CEOI. One other station in the net will be prepared to work with you. Supervision and assistance will normally be available.

**STANDARDS**

This task has been performed correctly when, in 10 minutes, the meter readings on the radio set conform to the requirements in performance measures 2 through 6 of this task, and the radio set has been placed into and taken out of operation according to performance measures 1 through 7.

**PERFORMANCE MEASURES**

1. Your team chief will inform you of your operating frequency. Select the appropriate crystal for this frequency and insert it in RT-718/FRC-93. (Refer to TM 11-5820-554-12, chap 3, sec III, para 3-13, pp 3-11 thru 3-14.)

**CAUTION:** Avoid transmitter operation between 5.0 and 6.5 MHz. In this range the second harmonic of the IF frequency is nearly the same as the desired frequency. In transmit function some of this energy will pass through the tuned circuits and become spurious emission.

- a. Refer to crystal frequencies and operating bands chart, (fig 1) to determine appropriate crystal for assigned frequency. (Refer to TM 11-5820-554-12, chap 3, sec III, table 3-2, pp 3-12 thru 3-14.)



BAND-SWITCH POSITION	FREQUENCY BAND	CRYSTAL SUPPLIED	CRYSTAL SOCKET CONNECTED	TOTAL COVERAGE
1A - 3.4	3.4 - 3.6 MHz	6.555 MHz	1A	A 3.4 - 4.0 MHz
2A - 3.6	3.6 - 3.8 MHz	6.755 MHz	2A	
3A - 3.8	3.8 - 4.0 MHz	6.955 MHz	3A	
1B - 7.0	7.0 - 7.2 MHz	10.155 MHz	1B	B 6.5 - 9.5 MHz
2B - 7.2	7.2 - 7.4 MHz	10.355 MHz	2B	
1C - 14.0	14.0 - 14.2 MHz	8.5775 MHz	1C	C 9.5 - 15.0 MHz
2C - 14.2	14.2 - 14.4 MHz	8.6775 MHz	2C	
3C - 14.8	14.8 - 15.0 MHz	8.9775 MHz	3C	
1D - 21.0	21.0 - 21.2 MHz	12.0775 MHz	1D	D 15.0 - 22.0 MHz
2D - 21.2	21.2 - 21.4 MHz	12.1775 MHz	2D	
3D - 21.4	21.4 - 21.6 MHz	12.2775 MHz	3D	
1E - 28A	28.5 - 28.7 MHz	15.8275 MHz	1E	E 22.0 - 30.0 MHz
2E - 28B	As selected	Not furnished	2E	
3E - 28C	As selected	Not furnished	3E	

Figure 1. Crystal Frequencies and Operating Bands.

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- b. Plug appropriate crystal into crystal mounting board as shown in figure 2.
- c. Insure crystal is plugged into appropriate crystal socket designation and band-switch position is properly set. (Refer to fig 1 for crystal frequencies and operating bands.)

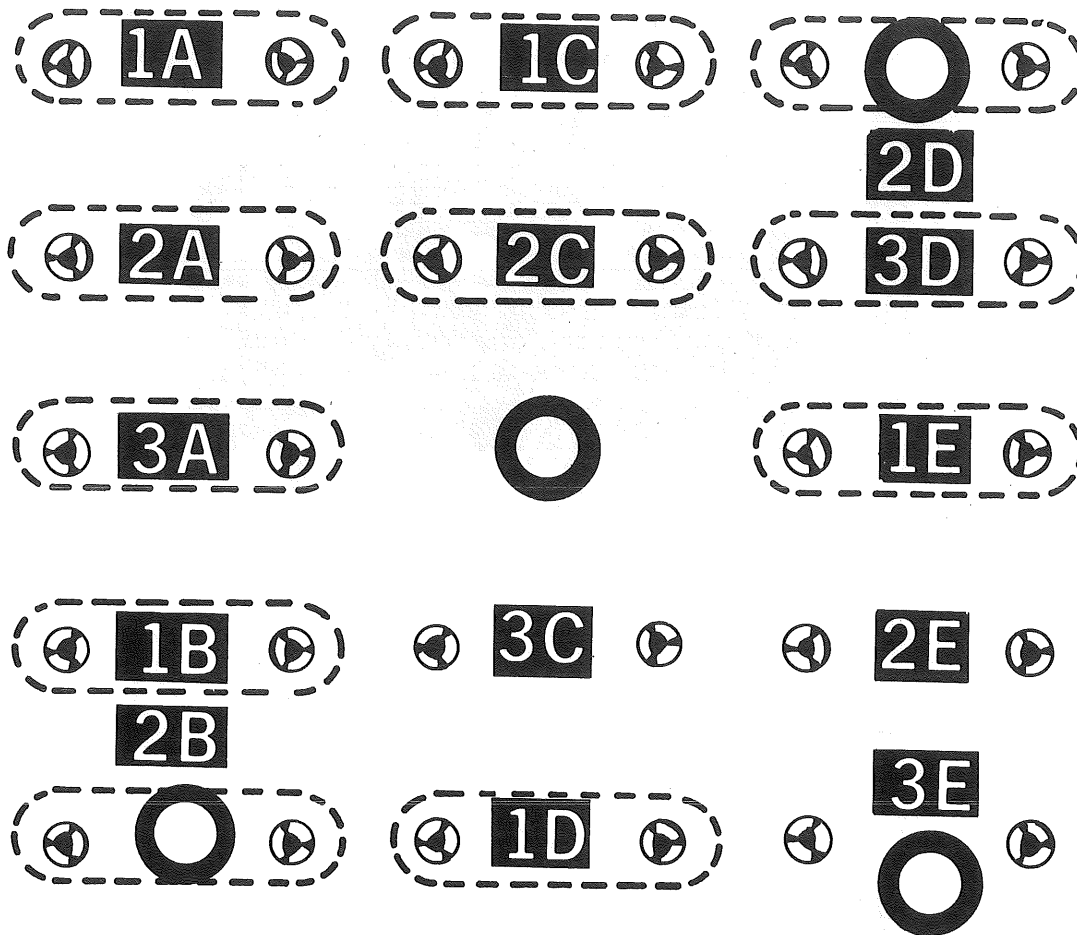


Figure 2. Crystal Socket Locations.

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- d. Insure that only the crystal grippers supplied with Crystal Unit Set, Quartz CK-31/FRC-93 (Collins Crystal Packet CP-1) are used when removing or inserting crystals.
2. Perform starting procedures and insure your Receiver RT-718/FRC-93 (KWM-2/2A) is correctly tuned. (Refer to fig 3 for operator controls.) Follow these steps to properly tune the receiver: (Refer to TM 11-5820-554-12, chap 3, sec III, para 3-9 thru 3-11, pp 3-6 and 3-7.)

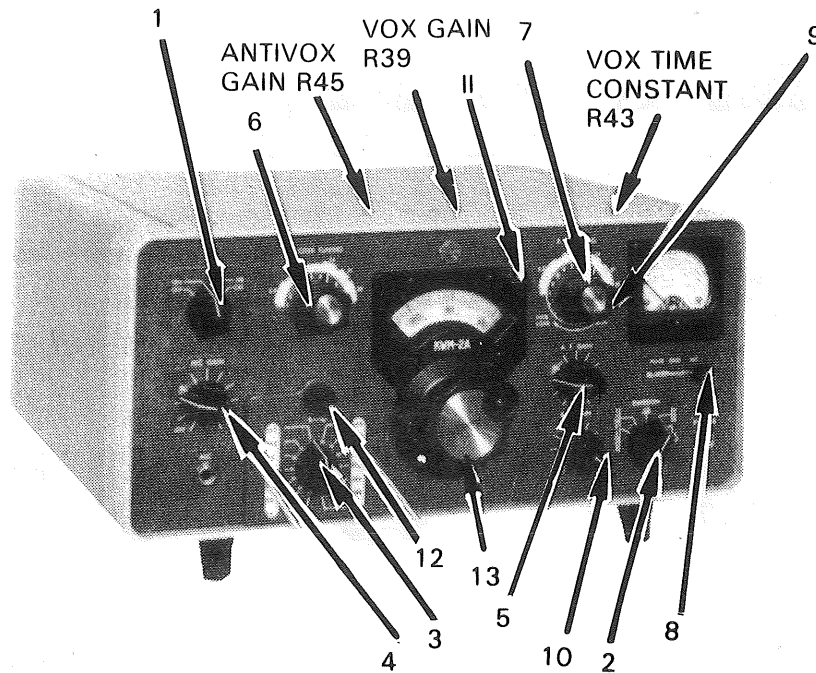


Figure 3. Operating Controls for Collins KWM-2-A.

**WARNING:** Extremely high voltage exists within this equipment. Insure all grounds and interlock switches are correct prior to placing equipment into operation.

- a. Place OFF-ON-NB-CAL switch (1) to the ON position.
- b. Set EMISSION switch (2) to the required sideband position.
- c. Insure BAND switch (3) is set to the desired band.

**NOTE:** If you are using the KWM-2A, set the CRYSTAL BOARD SELECTOR (12) as required in operator's manual so desired set of bands appear in the operator's window.

- d. Set the MIC GAIN control (4) fully counterclockwise.
- e. Set R.F. GAIN control (10) fully clockwise.
- f. Set VOX GAIN control fully counterclockwise.

NOTE: VOX GAIN control is located under top cover and should be set prior to applying power to equipment.

- g. Set ANTI-VOX GAIN control fully counterclockwise.

NOTE: ANTI-VOX GAIN control is located under top cover to left of VOX-GAIN control and should be set prior to applying power to equipment.

- h. Adjust A.F. GAIN control (5) until some receiver noise is heard in speaker.
- i. Adjust EXCITER TUNING control (6) to white portion of scale indicating the desired band.
  - (1) Rock control slightly to left and right to peak the receiver noise output. Transceiver is now ready to receive.
  - (2) Tune the selected 200 kHz band using the tuning control knob.
  - (3) Determine dial frequency by adding the dial reading to the BAND SWITCH (3) setting.
- j. Turn FUNCTION switch (1) to CAL positions.
  - (1) Tune dial to nearest 100 kHz point.
  - (2) Decrease R.F. GAIN control (10) as necessary for comfortable listening.
  - (3) Adjust tuning control until calibrate signal is zero beat.
  - (4) Set hairline on the 100 kHz mark with the zero set knob.

- k. Return FUNCTION switch (1) to the ON position and tune dial to desired frequency.
3. Insure your Transmitter RT-718/FRC-93 is properly tuned by utilizing the operating controls as shown in figure 3. Follow these steps to tune the transmitter. (Refer to TM 11-5820-554-12, chap 3, sec III, para 3-9 thru 3-12, pp 3-6 thru 3-11.)
- a. Set EMISSION switch (2) to TUNE position. Set P.A. TUNING control (7) to white portion of dial indicating the desired band for amateur operation.

NOTE: If Radio Set AN/FRC-93 is being operated outside amateur bands, ignore the amateur markings and set control according to TM.

- b. Set METER switch (8) to PLATE position.
- c. Advance MIC GAIN control (4) fully clockwise and rock the EXCITER TUNING control (6) to the left and right until maximum plate current is obtained.
- d. Immediately dip the plate current with the P.A. TUNING control (7).
- e. Return MIC GAIN control (4) to full counterclockwise position.
- f. Set METER switch (8) to GRID position.
- g. Advance MIC GAIN control (4) until grid current is obtained.
- h. Rock EXCITER TUNING control (6) to the left or right to obtain a peak in grid current indication.
- i. Turn MIC GAIN control (4) to OFF.
- j. Set EMISSION switch (2) to LOCK position.
- k. Advance MIC GAIN control (4) to provide a grid current reading of approximately 1/3 scale.
- l. Set METER switch (8) to PLATE position.

- m. Alternately dip plate current with P.A. TUNING control (7) and adjust loading with INCR LOAD control (9) until plate current is 230 ma at the dip.

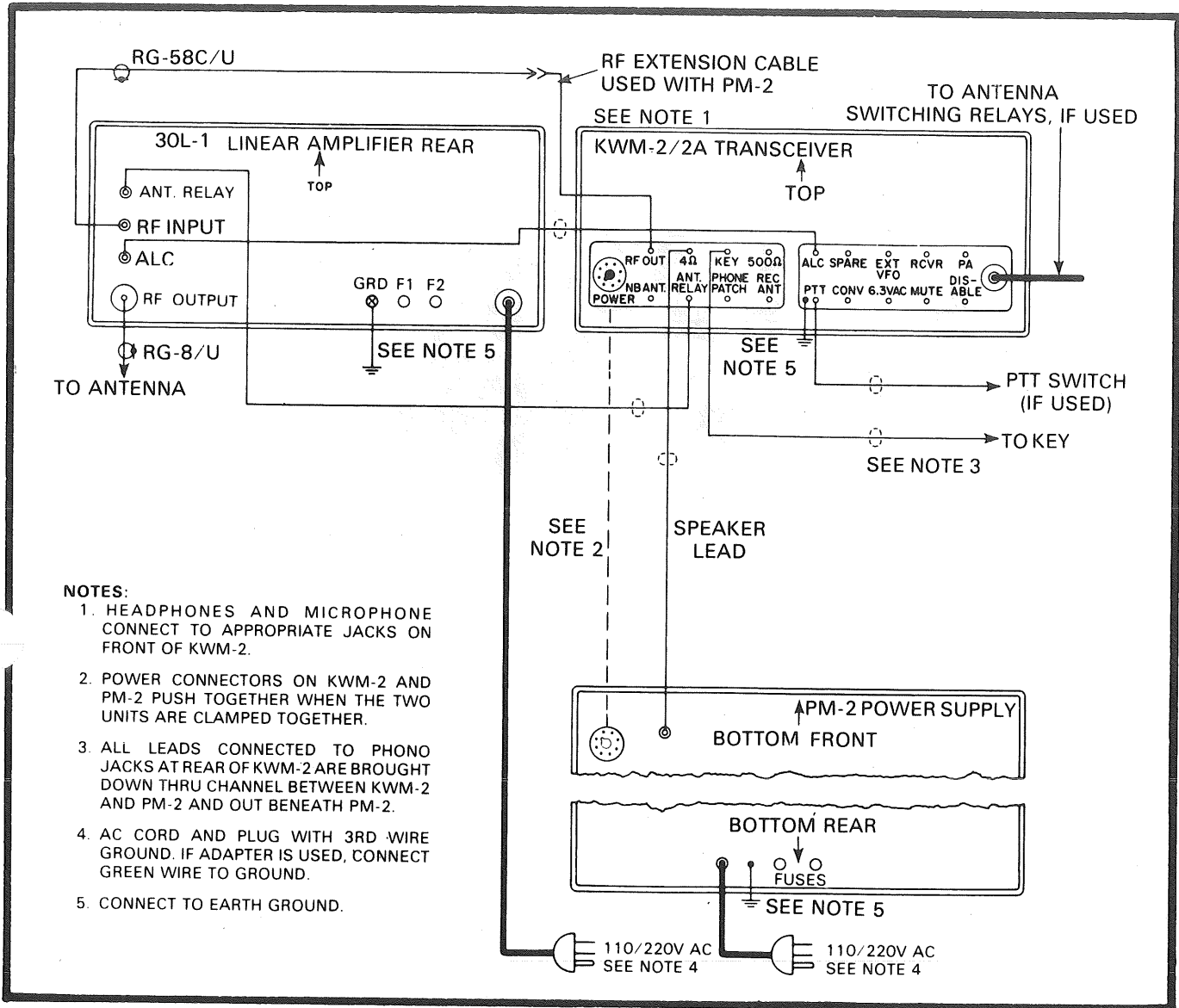
CAUTION: When operating the transceiver with the amplifier, RF AM-3979/FRC-93(30L-1) load to only 200 ma.

- n. Set EMISSION switch (2) to desired operating position.
4. Follow these steps to adjust Radio Set AN/FRC-93 for operation in the voice mode: (Refer to fig 3, and TM 11-5820-554-12, chap 3, sec III, para 3-12b, pp 3-7 thru 3-11.)
- a. Close-talk into microphone, increasing VOX GAIN control setting until VOX RELAY just operates; the close-talk will prevent background noise from tripping the radio set into transmit function.
  - b. Set METER SWITCH (8) to ALC position and increase setting of MIC GAIN control (4) to obtain an average reading of S6 for voice operation.
  - c. Leave MIC GAIN control (4) set as above, leave microphone in normal operating position.
  - d. Set FUNCTION switch (1) to CAL position, tune in calibrate signal and adjust A.F. GAIN control (5) for comfortable listening level.
  - e. Adjust EXCITER TUNING control (6) for an approximate 1000 Hz beat note.

NOTE: If VOX RELAY trips increase ANTI-VOX GAIN setting to minimum point necessary to prevent speaker output from tripping VOX. It may be necessary to increase VOX GAIN setting slightly after ANTI-VOX GAIN adjustment to compensate for the ANTI-VOX GAIN.

- f. Set FUNCTION switch (1) to ON position. The radio set is now ready for voice operation in SSB service.

5. Follow these steps to adjust Radio Set AN/FRC-93 for operation in the CW mode: (Refer to fig 3, and TM 11-5820-554-12, chap 3, sec III, para 3-12c, p 3-11.)
  - a. Connect CW key to RT-718/FRC-93. Place EMISSION switch (2) to CW position.
  - b. Depress key and adjust A.F. GAIN control (5) for comfortable monitoring level.
  - c. Hold key down and increase the VOX GAIN control setting until the vox relay operates.
  - d. Set METER switch (8) to ALC while sending a series of dots, adjust MIC GAIN control (4) for S3 meter reading of ALC.
  - e. When receiving, leave the A.F. GAIN control (5) set for comfortable monitoring level and adjust the received signal with the R.F. GAIN control (10).
6. Adjust and conduct tuning procedures for Amplifier, RF AM-3979/FRC-93(30L-1) by following these steps: (Refer to TM 11-5820-554-12, chap 11, sec II, para 11-4 thru 11-11, pp 11-1 thru 11-7.)
  - a. Insure RF AM-3979/FRC-93(30L-1) is correctly cabled and connected to RT-718/FRC-93 as shown in figure 4.



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Figure 4. Interconnection with Collins KWM-2/2A Portable (Traveling) Station.

b. See figure 5 for operating control of RF AM-3979/FRC-93 (30L-1).



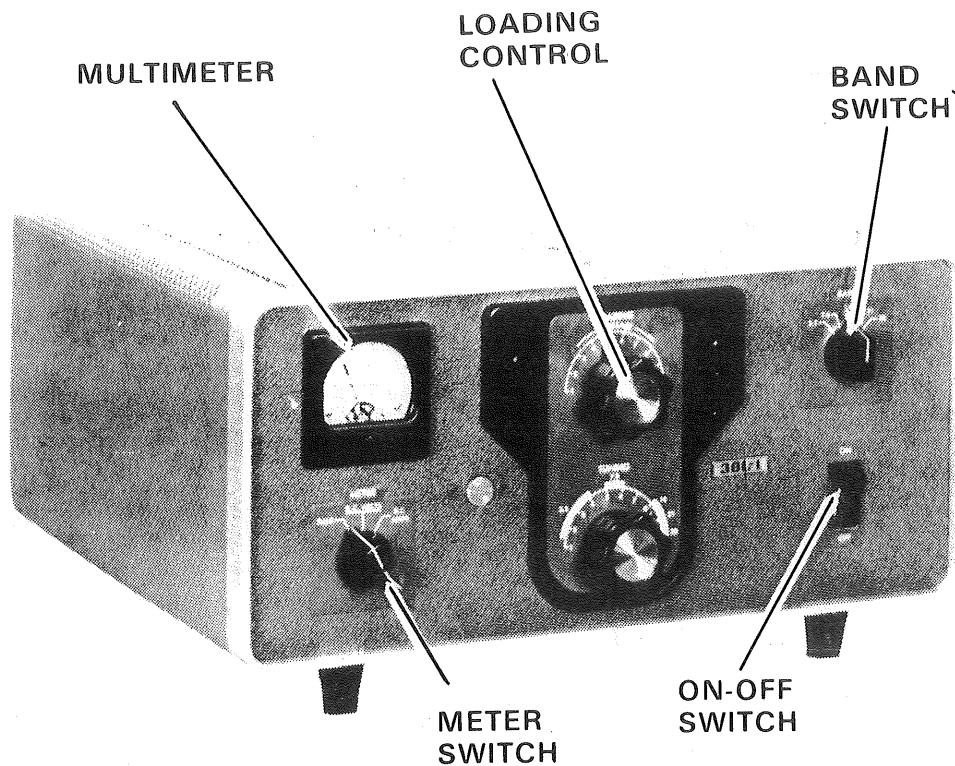


Figure 5. Operating Controls for Collins 30L-1.

- c. Connect the antenna for the band in use to the RF OUTPUT jack of the RF AM-3979/FRC-93(30L-1).
- d. Insure the ON-OFF switch of the RF AM-3979/FRC-93(30L-1) is in the OFF position.
- e. Tune and load RT-718/FRC-93 as described earlier in this task for the proper mode of operation.
- f. Set EMISSION switch (2) of the RT-718/FRC-93 to the TUNE position and set MIC GAIN control (4) to the OFF position. (Refer to fig 3.)
- g. Set the RF AM-3979/FRC-93(30L-1) METER switch to the TUNE position.
- h. Set the RF AM-3979/FRC-93(30L-1) BAND switch to the same band as shown on the transceiver.
- i. Set loading control of RF AM-3979/FRC-93(30L-1) to 1 on the dial.

- j. Set TUNING control of RF AM-3979/FRC-93(30L-1) to white area of band in use.
- k. Press the RF AM-3979/FRC-93(30L-1) OFF-ON switch to the ON position.
- l. Set MIC GAIN control (4) of RT-718/FRC-93 to about 3/4 full scale.
- m. Immediately adjust tuning control of RF AM-3979/FRC-93(30L-1) for multimeter dip.
- n. Alternately adjust tuning and loading controls of the RF AM-3979/FRC-93(30L-1) for zero multimeter reading.

NOTE: The meter will indicate zero at the dip when the amplifier is properly tuned and loaded. ALWAYS MAKE THE TUNING ADJUSTMENT FOR METER DIP THE LAST ADJUSTMENT.

- o. Refer to Multimeter Scale Values chart (fig 6) to insure proper tuning and loading of RF AM-3979/FRC-93(30L-1).

<b>MULTIMETER SCALE VALUES.</b>		
<b>METER SWITCH SETTING</b>	<b>FULL-SCALE INDICATION</b>	<b>NORMAL INDICATION</b>
TUNE .....	Not applicable.....	Zero when Collins 30L-1 is properly loaded.
DC VOLTS.....	2,000 volts .....	1,800 volts (no modulation) 1,600 volts (at rated load)
DC AMPS .....	1.0 amp (1,000 ma) .....	600 ma (keydown cw) 300 to 350 ma (ssb voice peaks) 110 ma (keyed, no excitation)

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Figure 6. Multimeter Scale Values Chart.

- p. Switch RT-718/FRC-93 to desired mode of operation.

CAUTION: Do not operate the RF AM-3979/FRC-93 (30L-1) into a load presenting a VSWR greater than 2 to 1. Do not operate the amplifier in continuous key down condition at full input for more than 30 seconds. The power supply may be damaged. Do not use the 30L-1 in FSK, AM, or FM service. Do not use slow-blow fuses or fuses larger than the 8-ampere type supplied.

- q. Insure that when operating the AN/FRC-93 with Control C-6118/FRC-93 that you follow the operating procedures as outlined in chapter 10 of reference.

NOTE: The Control C-6118/FRC-93 will be found in most fixed station locations.

7. Perform stopping procedures.

- a. To stop Amplifier, RF AM-3979/FRC-93 follow these steps:
- (1) Place ON-OFF switch to OFF.
  - (2) Insure METER SWITCH is left in DC VOLTS position.
  - (3) Insure BAND SWITCH is left in proper operating band.
- b. To stop Control, Radio Set C-6118/FRC-93 (Collins 312 B-4) follow these steps:
- (1) Set FUNCTION switch to NORMAL.
  - (2) Set PHONE PATCH switch to OFF.
  - (3) Set WATTMETER switch to FORWARD 200 position.
- c. To stop Control, Radio Set C-7515/FRC-93 (Collins 312 B-5) follow these steps:
- (1) Set FUNCTION switch to NORMAL.
  - (2) Set PHONE PATCH switch to OFF.
  - (3) Set WATTMETER switch to FORWARD 200 position.
  - (4) Set VFO switch to the REC - XMIT position, or to that position prescribed by local station SOP.

- d. To stop Receiver-transmitter RT-718/FRC-93 (Collins KWM-2/2A) follow these steps:
- (1) Place MIC GAIN control (4) to OFF.
  - (2) Place A.F. GAIN control (5) fully counterclockwise.
  - (3) Place R.F. GAIN control (10) fully counterclockwise.
  - (4) Insure METER switch (8) is left in ALC position.
  - (5) Insure EMISSION switch (2) is at USB, SSB or CW.
  - (6) Insure BAND SWITCH (3) is left at last operating band.
  - (7) Place FUNCTION switch (1) to OFF.

## REFERENCES

TM 11-5820-554-12 w/C1, Operator's and Organizational Maintenance Manual for Radio Set, AN/FRC-93(V)1, AN/FRC-93(V)2, AN/FRC-93(V)3, AN/FRC-93(V)4, AN/FRC-93(V)5, AN/FRC-93(V)6, and AN/FRC-93(V)7, Jun 76

TEC Lesson 201-113-4545-A, Maintain Circuit Log and Operator's Number Sheet

TEC Lesson 201-113-4550-E/A, Radiotelegraph Procedure, Part 1, Calling and Answering.

TEC Lesson 201-113-4551-E/A, Radiotelegraph Procedure, Part 2, Calling and Answering.

TEC Lesson 201-113-4552-E/A, Radiotelegraph Procedure, Establishing a Net.

TEC Lesson 201-113-4553-E/A, Radiotelegraph Procedure, Authentication.

TEC Lesson 201-113-4554-E/A, Radiotelegraph Procedure, Opening a Net.

TEC Lesson 201-113-4555-E/A, Radiotelegraph Procedure, Free and Directed Net.

TEC Lesson 201-113-4556-E/A, Message Format, Part 1.

TEC Lesson 201-113-4557-E/A, Message Format, Part 2.

TC 32-11, How to Get Out of a Jam, Apr 75.

**TASK****113-620-1004****(SF)Install Radio Set AN/PRC-74B****CONDITIONS**

This task is performed under all weather conditions in an Unconventional Warfare Operations Area (UWOA) by a Special Forces Operational Detachment (SFOD). To accomplish this task your chief will provide you with:

1. Radio Set AN/PRC-74B.
2. Battery Box CY-6314.
3. Complete accessory kit.
4. Coder-Burst Group AN/GRA-71.
5. TM 11-5820-590-12-1.
6. TM 11-5835-224-12.
7. FM 24-18.

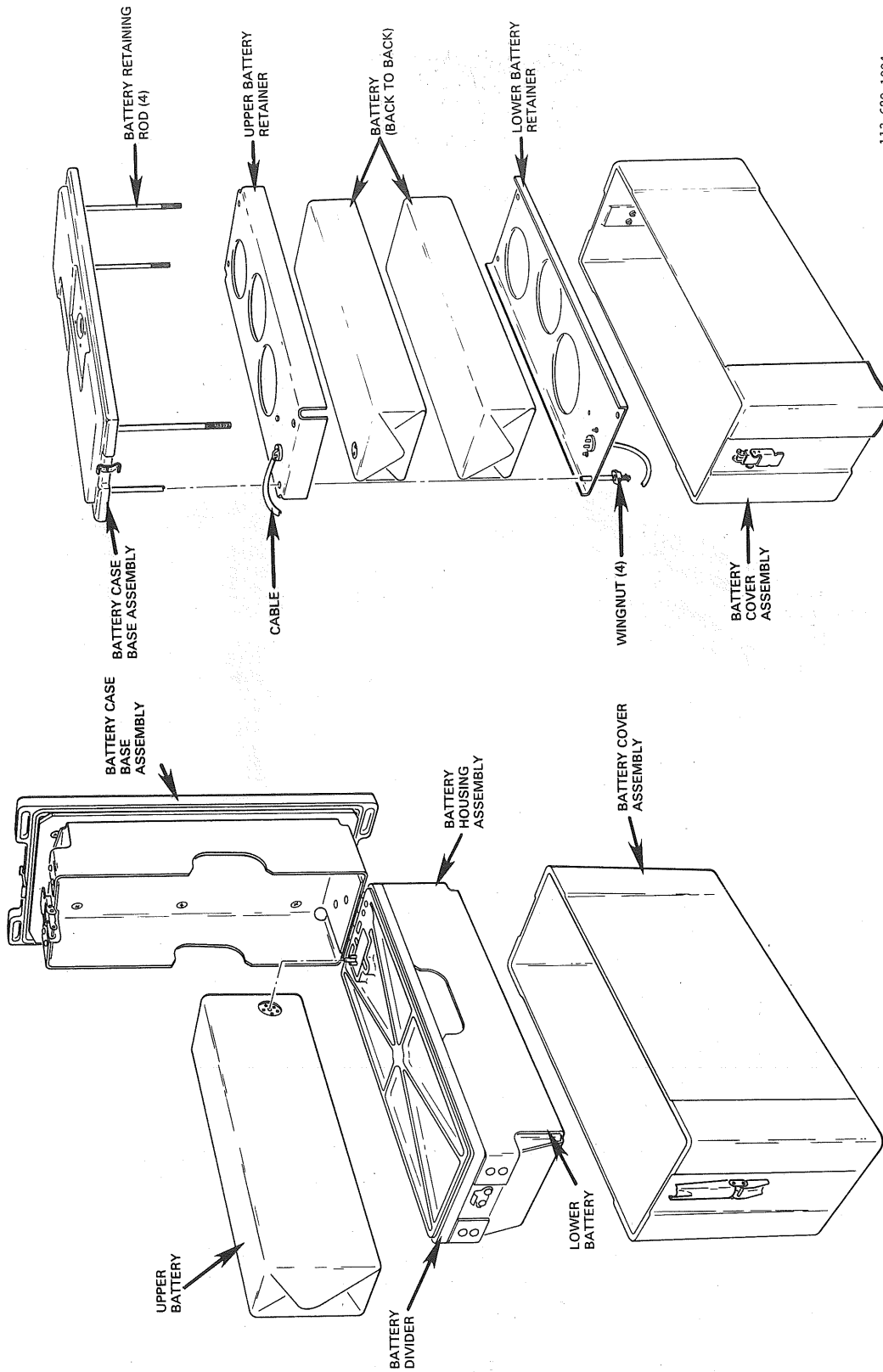
Supervision and assistance will be available.

**STANDARDS**

This task has been performed correctly when, in 15 minutes, the battery is installed in the radio without damage to the battery or radio, the antenna is erected, all cable connections are made, and the radio is ready to be tuned and operated according to performance measures 1 through 5.

**PERFORMANCE MEASURES**

1. Check that equipment is complete. (Refer to TM 11-5820-590-12-1, chap 1, sec II, para 1-6, p 1-3.)
2. Prepare Radio Set AN/PRC-74B for man-pack operation. (Refer to TM 11-5820-590-12-1, chap 2, para 2-3a, pp 2-1 thru 2-2.)
  - a. If utilizing battery pack (Battery Box CY-6314/PRC-74) insure that batteries are installed as shown in figure 1.
  - b. Place battery pack on a flat surface so that connector on the battery pack is facing upward.
  - c. Mate connector J301 on the bottom of receiver-transmitter unit with connector on battery pack.



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Figure 1. Dry Battery for Battery Boxes CY-6314A/PRC-74 or CY-6314/PRC-74.

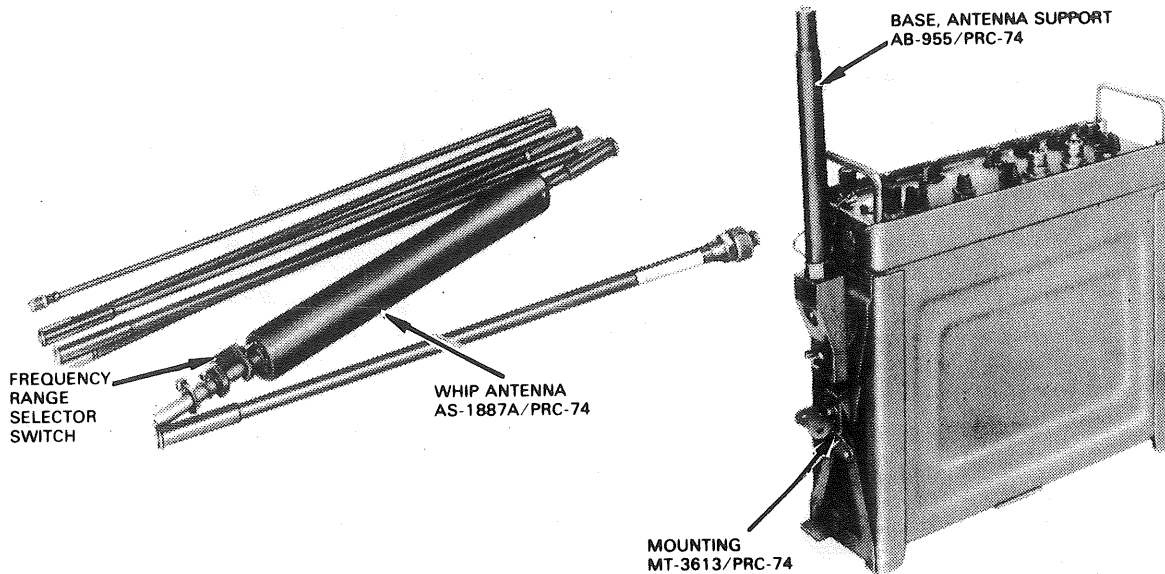


Figure 2. Radio AN/PRC-74B with Antenna.

- d. Engage and lock the two latches located on both sides of receiver-transmitter unit.
- e. Attach Whip Antenna Mounting Bracket MT-3613/PRC-74 supplied with Radio Set AN/PRC-74Bas shown in figure 2 by performing these procedures:

NOTE: Whip Antenna AS-1887/PRC-74 is the least effective of the three antennas provided with Radio Set AN/PRC-74. The whip antenna is mounted on a swivel to permit the operator to lay the radio on the ground and swivel the antenna into the upright position. Under combat conditions this permits the operator to use the radio while in a prone position.

- (1) Attach whip mounting bracket to side of radio set as shown in figure 2.
  - (2) Assemble whip antenna.
  - (3) Attach whip antenna to antenna support base and screw antenna support base into whip antenna mounting bracket.
  - (4) Set frequency range selector switch (fig 2) located at bottom of antenna loading coil to correspond with operating frequency.
3. Site Radio Set AN/PRC-74B. (Refer to FM 24-18, chap 6, sec I, para 75 thru 77, pp 72 thru 76.)
  4. Erect slant wire antenna for AN/PRC-74B. (Refer to TM 11-5820-590-12-1, chap 2, para 2-5b, pp 2-3 thru 2-4.1.)
    - a. Unwind one of the dipole antenna reels shown in figure 3 until the mark on the antenna wire matches the scale on the antenna reel as shown in figure 4.



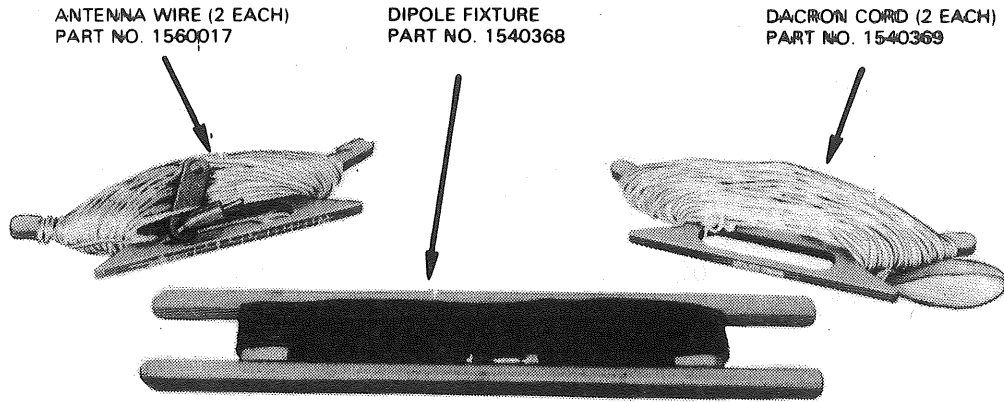


Figure 3. Antenna Kit MK-911A/PRC-74.

MC SELECTOR POSITION	UNWIND TO MARK	LENGTH (FT)
11, 10, or 9 .....	1	19
8 or 7 .....	2	26
6 .....	3	33
5 .....	4	47
4 .....	5	58
3 .....	6	67
2.5 .....	7	78
2 .....	Full	93

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Figure 4. MC Selector Positions.

- b. Fasten antenna wire to notch on reel and lay reel approximately 20 feet from selected antenna support.

- c. Insert RED plug of antenna wire into ANT (RED) terminal of radio set.
- d. Insert BLACK plug of the remaining antenna reel into BLACK GRD connector terminal of the radio set. Unwind the reel until it is approximately  $1\frac{1}{2}$  the length of the transmitting reel and position it so that it is on a line opposite antenna. When the antenna is completely erected, this reel will act as a counterpoise for the antenna.
- e. Attach a weight to one end of dacron cord provided with antenna kit and throw the weight over any convenient antenna support and raise antenna broadside to receiving station as shown in figure 5.

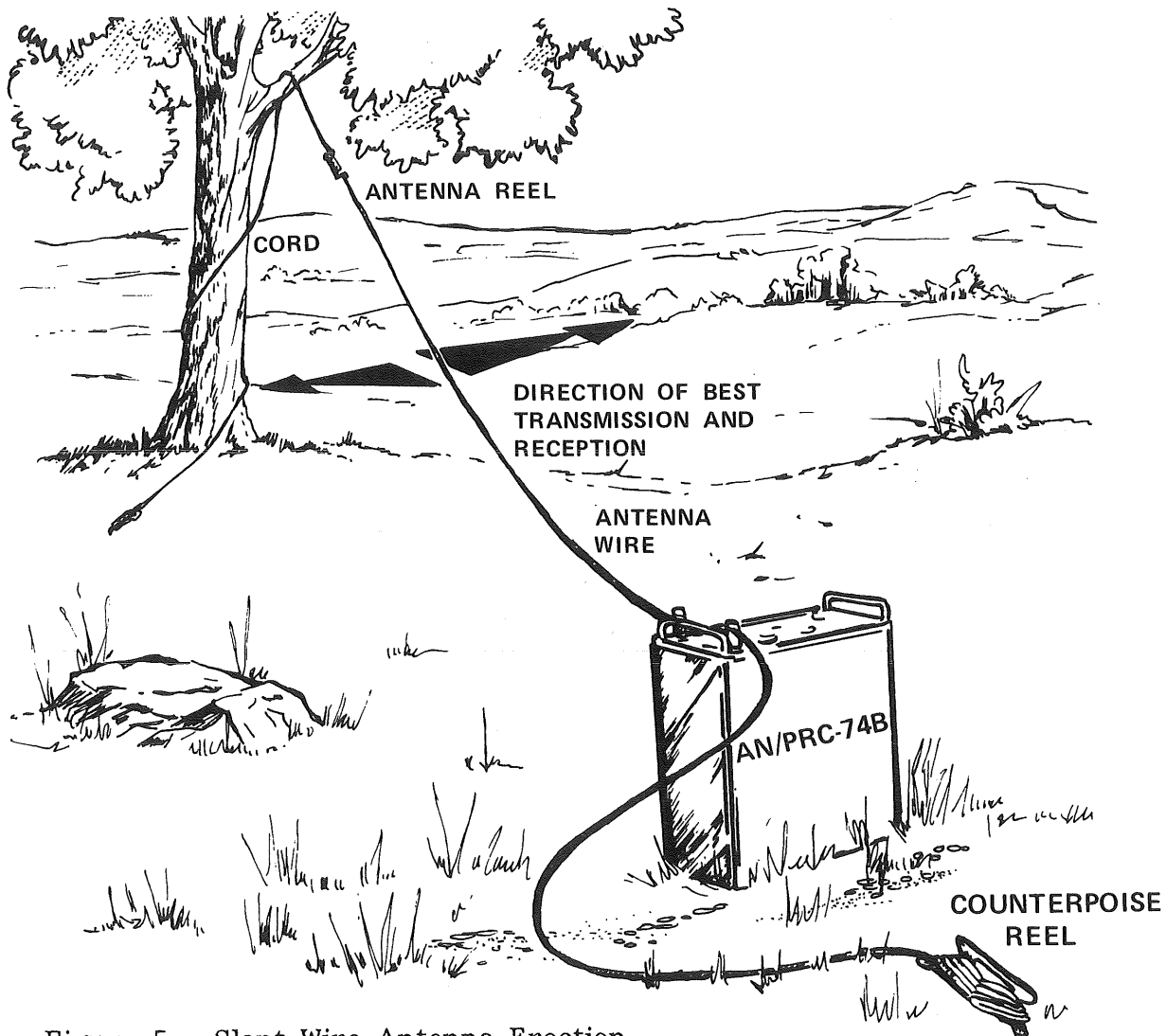


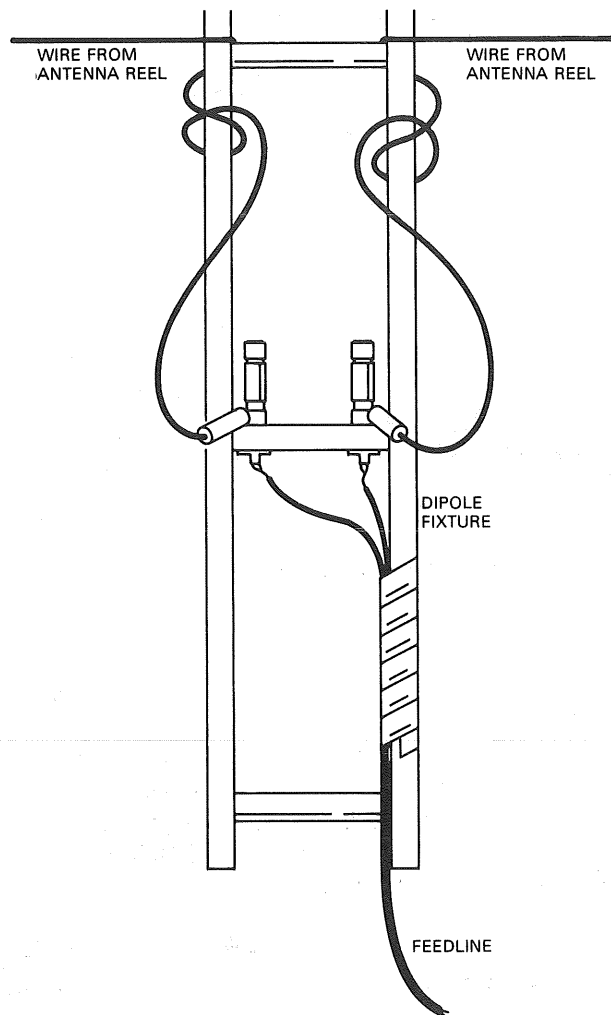
Figure 5. Slant Wire Antenna Erection.

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5. Erect dipole antenna for Radio Set AN/PRC-74B. (Refer to TM 11-5820-590-12-1, chap 2, para 2-5c, pp 2-4.1 thru 2-8.)

NOTE: The dipole antenna is the most effective antenna and, time and tactical circumstances permitting, should be used in preference to either the whip or slant wire antenna.

- a. Attach each dipole antenna wire to dipole antenna fixture as shown in figure 6.



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Figure 6. Dipole Antenna Fixture Connections.

- b. Determine length of each side of the antenna. (Refer to fig 4.)
- c. Insert either lead of feedline to ANT (RED) terminal and the other to GRD (BLACK) terminal on unit of AN/PRC-74B.
- d. Erect antenna as illustrated in figure 7.

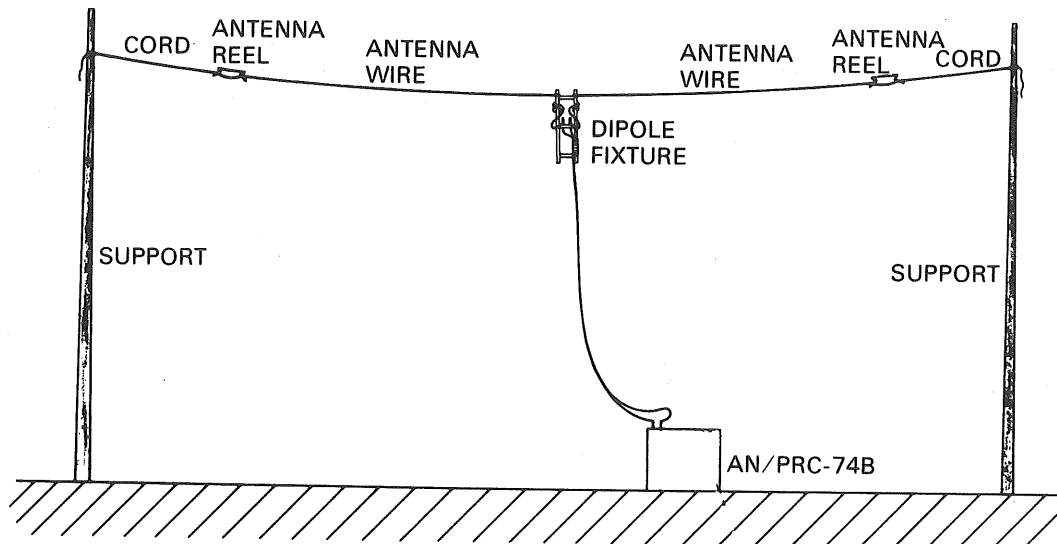


Figure 7. Doublet Antenna Instructions.

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#### REFERENCES

TM 11-5820-590-12-1, w/C1 thru 6, Operator's and Organizational Maintenance Manual (Including Repair Parts and Special Tools Lists): Radio Set AN/PRC-74B, AN/PRC-74C; Power Supplies, PP-4514/PRC-74 and PP-4514A/PRC-74; Battery Boxes, CY-6121/PRC-74, CY-6314/PRC-74 and CY-6314A/PRC-74, Mar 67.

TM 11-5835-224-12, w/C2 and 5, Operator's and Organizational Maintenance Manual: Coder-Burst Transmission Group, AN/GRA-71, May 74.

FM 24-18, Field Radio Techniques, Jul 65.

**TASK****113-620-2006**

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**(SF)Operate Radio Set AN/PRC-74B**

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**CONDITIONS**

This task is performed under all weather conditions in an Unconventional Warfare Operations Area (UWOA) by a Special Forces Operational Detachment (SFOD). To accomplish this task your team will be provided with a Radio Set AN/PRC-74B, a Coder-Burst Transmission Group AN/GRA-71, TM 11-5820-590-12-1, TM 11-5835-224-12, a 25 group message, and local CEOI. Supervision and assistance are normally available.

**STANDARDS**

This task has been performed correctly when, in 10 minutes, the radio is tuned with the Coder-Burst Group conforming to the requirements of performance measure 4 of this task, and an undistorted CW message has been sent by burst and manual means on the assigned frequency according to performance measures 1 through 7.

**PERFORMANCE MEASURES**

1. Preparation for transmission. (Refer to TM 11-5820-590-12-1, chap 2, para 2-3, pp 2-1 and 2-2.)
2. Orient and erect antenna to Special Forces Operational Base (SFOB). (Refer to TM 11-5820-590-12-1, chap 2, para 2-4 and 2-5, pp 2-3 thru 2-8.)
3. Prepare provided 25 group message for burst and manual CW transmission. (Refer to CEOI, and TM 11-5835-224-12, para 2.1 thru 2.4, pp 14 thru 28.)
4. Operate Radio Set AN/PRC-74B and Transmission Coder-Burst Group AN/GRA-71. (Refer to TM 11-5820-590-12-1, Chap 3, para 3-1 thru 3-4, pp 3-1 thru 3-3, and TM 11-5835-224-12, para 2.1 thru 2.4, pp 14 thru 28.)

5. Transmit 25 group message by burst and manual CW in accordance with CEOI and unit SOP.
6. Receive a 25 group manual CW message from base at 15 gpm.
7. Perform stopping procedure. (Refer to TM 11-5820-590-12-1, chap 3, para 3-2 thru 3-6, pp 3-2 thru 3-4.2.)

## REFERENCES

TM 11-5820-590-12-1, w/C1 thru 6, Operator's and Organizational Maintenance Manual (Including Repair Parts and Special Tools Lists): Radio Set AN/PRC-74B, AN/PRC-74C; Power Supplies, PP-4514/PRC-74 and PP-4514A/PRC-74; Battery Boxes, CY-6121/PRC-74, CY-6314/PRC-74 and CY-6314A/PRC-74, Mar 67.

TM 11-5835-224-12, w/C2 and 5, Operator's and Organizational Maintenance Manual: Coder-Burst Transmission Group, AN/GRA-71, May 74.

# TASK

## 113-622-1001

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### Install Radio Set, Control Group, AN/GRA-6

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#### CONDITIONS

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. Radio Set Control Group AN/GRA-6.
2. TM 11-5038.
3. TM 11-5820-401-12.
4. Four Batteries BA-30.
5. One Battery BA-414A/U.
6. One Reel DR-8 with Wire WD-1.
7. Installed Radio Set AN/VRC-46.
8. Tool Equipment TE-33.
9. Cable Assembly CX-7474/U.

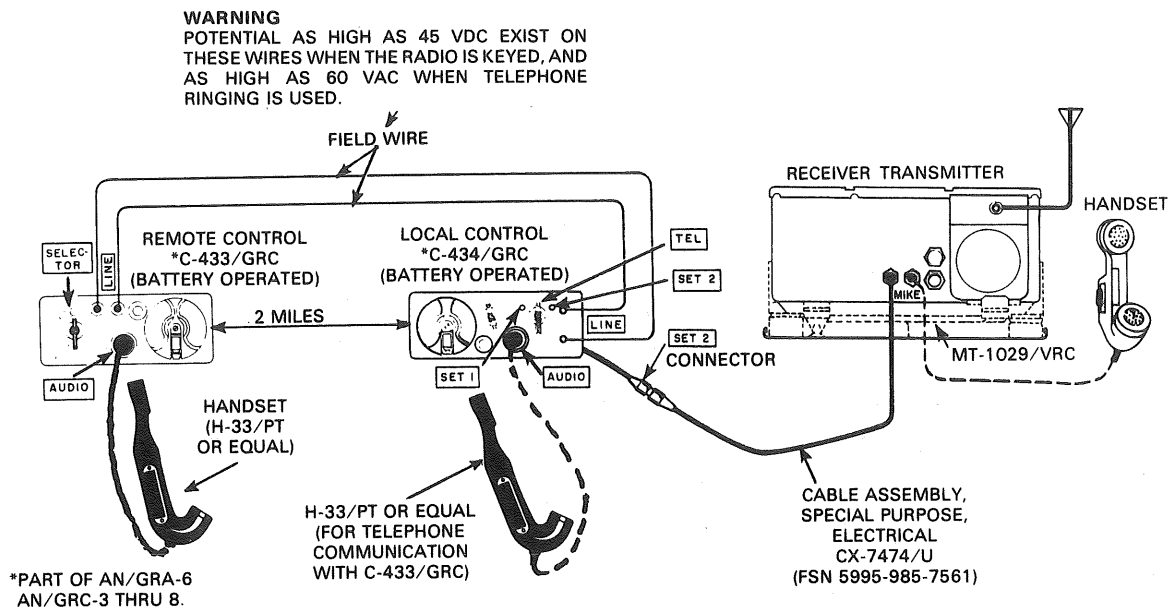
Supervision and assistance will be available.

#### STANDARDS

This task has been performed correctly when, in 10 minutes, the AN/GRA-6 components have been set up and connected without damage to the radio set according to the requirements in figure 1 of this task, all cable connections are made and the AN/GRA-6 is ready to be operated according to performance measures 1 through 3.

#### PERFORMANCE MEASURES

1. Install Radio Set Control Group AN/GRA-6. (Refer to fig 1, and TM 11-5820-401-12, chap 6, sec II, para 6-10a, pp 6-15 and 6-16, and TM 11-5038, chap 2, sec I, para 14 thru 16, pp 10 thru 15.)



113-622-1001

Figure 1. Remote Control Connections of AN/GRA-6.

- a. Prepare Remote Control C-433/GRC of Radio Set Control Group AN/GRA-6 for installation.

NOTE: Insure Cable Assembly, Special Purpose, Electrical CX-7474/U is present. This cable is used to connect the AN/GRA-6 Local Control C-434/GRC to all AN/ VRC-12 series radios.

- (1) Unsnap clamps on left and right rear sides of Remote Control C-433/GRC.
  - (2) Remove control case cover and insert two Batteries BA-30 and one Battery BA-414A/U.
  - (3) Replace control case cover and snap clamps closed.
  - (4) Attach Handset H-33/PT (or equal) to remote unit AUDIO connector.
- b. Prepare Local Control C-434/GRC of Radio Set Control Group AN/GRA-6 for installation.



- (1) Unscrew wing-nut retaining screws located on left and right front sides of control unit.
- (2) Remove control case cover and insert two Batteries BA-30 into battery compartment.

CAUTION: When removing case cover, insure housing compartment door for Set 1 and Set 2 cables is open to allow cover to be removed without binding cables.

- (3) Replace control case cover and tighten wing-nut retaining screws.
  - (4) Remove Set 2 cable from rear of case and secure housing door.
  - (5) Connect Cable Assembly, Special Purpose, Electrical CX-7474/U to Set 2 cable as shown in figure 1.
  - (6) Attach Handset H-33/PT or equal to local control unit AUDIO connector.
2. Connect Local Control C-434/GRC to Radio Set AN/VRC-46. (Refer to TM 11-5820-401-12, chap 6, sec II, para 6-10a, p 6-15.)
    - a. Place local control next to radio set.
    - b. Interconnect local control unit and radio set with Cable Assembly, Special Purpose, Electrical CX-7474/U as shown in figure 1.

NOTE: Insure 5 pin connector of Cable Assembly, Special Purpose, Electrical CX-7474/U is connected to RETRANS R/W connector of Radio Set AN/VRC-46.

3. Connect Field Wire WD-1/TT between local and remote control units of Radio Set Control Group AN/GRA-6. (Refer to TM 11-5820-401-12, chap 6, sec II, para 6-10d and e, p 6-15.)
  - a. Locate the remote unit approximately 1/4-mile from the radio set and local control unit.

NOTE: If installation requires more than 1/4-mile of field wire, the wire will normally be installed by a field wireman.

- b. Attach the field wire to the L1 and L2 binding posts of the local and remote control units of Radio Set Control Group AN/GRA-6.

#### REFERENCES

TM 11-5038, w/C3, 4, 6 thru 9, Control Group AN/GRA-6, Apr 51.

TM 11-5820-401-12, w/C1 thru 3, Operator's and Organizational Maintenance Manual, Including Repair Parts and Special Tool Lists for AN/VRC-12 Series Radio Sets, Sep 72.

TEC Lesson 201-113-4511-F, Control Group AN/GRA-6, Part 1 (Installation).

# TASK

## 113-622-2001

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### Operate Radio Set, Control Group, AN/GRA-6

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#### CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. You will be provided with:

1. Radio Set Control Group AN/GRA-6 installed using Radio Set AN/VRC-46.
2. CEOI.
3. TM 11-5820-401-12.
4. TM 11-5038.
5. Distant radio station.

Supervision and assistance will normally be available.

#### STANDARDS

This task has been performed correctly when, in 10 minutes, the AN/GRA-6 and the radio set have been aligned according to the requirements in performance measure 1 of this task, and the radio set control group has been placed into and taken out of telephone and radio communication according to performance measures 1 through 5.

#### PERFORMANCE MEASURES

1. Perform preliminary starting procedures. (Refer to TM 11-5038, chap 2, sec II, para 17 thru 19, pp 14 and 15.)

**WARNING:** Insure Radio Set AN/VRC-46 is installed and grounded IAW TM 11-5820-401-12 prior to operating Radio Set Control Group AN/GRA-6.

- a. Energize Radio Set AN/VRC-46.
- b. Set frequency of Radio Set AN/VRC-46 to operating frequency contained in CEOI.
- c. Turn SQUELCH switch on Radio Set AN/VRC-46 to OFF (OLD or NEW).
- d. At local control unit, set REMOTE switch to SET 1.
- e. At remote control unit, set SELECTOR switch fully counter-clockwise (for the left hand write-in position).
- f. Operate H-33/PT PUSH-TO-TALK switch and observe that radio set has been keyed.
- g. If radio set is not keyed, reverse field wire connections to L1 and L2 binding posts of either remote or local unit and re-check keying of radio set.

WARNING 1: Voltage as high as 45 volts dc are present on the field wire when the radio set is keyed from the remote unit.

WARNING 2: Do not touch binding posts of local or remote unit when ringing, receiving ring or transmitting because of high voltage presence.

2. Conduct telephone communication between control units. (Refer to TM 11-5038, chap 2, sec II, para 18, pp 14 and 15.)
  - a. To prevent accidental keying of radio set by remote control unit handset, always set LOCAL CONTROL UNIT switch to TEL ONLY, when not in use.
  - b. To ring from either local or remote unit, crank handle of ringing generator.
  - c. Conduct telephone communications between units.
  - d. At local control unit, set LOCAL switch to TEL; at remote control unit, set SELECTOR switch to TEL.

3. Conduct PUSH-TO-TALK operations. (Refer to TM 11-5038, chap 2, sec II, para 26 thru 28, pp 19 thru 21.)
  - a. Local Control Unit C-434/GRC: To communicate on the radio at the local control unit, use the handset connected to the radio as shown in figure 1 of task 113-622-1001.
  - b. Remote Control Unit C-433:
    - (1) At local control unit, set REMOTE switch to SET 1.
    - (2) At remote control unit, set SELECTOR switch fully counter-clockwise.
    - (3) Operate H-33/PT at remote control unit to communicate on radio using PUSH-TO-TALK radio operation with proper call signs and radio procedures.
4. Conduct break-in operation. (Refer to TM 11-5038, chap 3, sec II, para 31, pp 21 and 22.)
  - a. Monitor remote unit to insure that local operator is using correct radio procedures.
  - b. To break-in on local operator while he is transmitting, set SELECTOR switch of remote unit to TEL position and crank ringer.
  - c. To break-in on remote operator while he is transmitting, set REMOTE switch to TEL ONLY position and crank ringer. Remote operator will automatically be taken out of circuit for radio operation.
5. Conduct stopping procedures when operation is complete. (Refer to TM 11-5038, chap 3, sec II, para 32, p 22.)
  - a. At remote unit place SELECTOR switch in TEL position, crank ringer and tell local operator to turn Radio Set AN/VRC-46 to OFF position.
  - b. At local unit place REMOTE switch to TEL ONLY position and inform remote operator that station is closing down.

- c. Disconnect field wire from binding posts.
- d. Remove batteries from remote unit and store unit in Carrying Case CW-189/GR.
- e. Recover field wire.

NOTE: If more than 1/4-mile of field wire is used it will normally be recovered by a field wireman.

- f. Remove batteries from local unit.
- g. Store unit in Carrying Case CW-189/GR.

#### REFERENCES

TM 11-5038, w/C3, 4, 6 thru 9, Control Group AN/GRA-6, Apr 51.

TM 11-5820-401-12, w/C1 thru 3, Operator's and Organizational Maintenance Manual, Including Repair Parts and Special Tool Lists for AN/VRC-12 Series Radio Sets, Sep 72.

TEC Lesson 201-113-4512-F, Control Group AN/GRA-6, Part 2 (Operations).

# TASK

## 113-622-1002

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### Install Radio Set, Control Group, AN/GRA-39

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#### CONDITIONS

This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. Radio Set Control Group AN/GRA-39.
2. TM 11-5820-477-12.
3. Installed Radio Set AN/VRC-46.
4. Field Wire WD-1/TT Reel DR-8.
5. Batteries.
6. Tool Equipment, TE-33.

Supervision and assistance will be available.

#### STANDARDS

This task has been performed correctly when, in 10 minutes, the AN/GRA-39 components have been properly set up for installation according to performance measures 1 and 2 of this task, and the AN/GRA-39 has been installed and is ready to be operated according to performance measures 1 through 4.

#### PERFORMANCE MEASURES

1. Preparing Local Control Unit, C-2329/GRA-39 for operation. (Refer to TM 11-5820-477-12, chap 2, para 2-4, p 2-1.)
  - a. Refer to figure 1 and 2 for familiarization with operator controls.

- b. Unsnap the two rear cover clamps and remove the rear cover.
- c. Inspect the battery compartment, and if needed, clean compartment and battery contacts with a pencil eraser.
- d. Install batteries and insure battery terminals are in contact with the battery contacts.
  - (1) Insure batteries are held in place under tension.
  - (2) Insure that battery compartment case is not cracked.
- e. Insure all operating controls are free from internal or external binding.

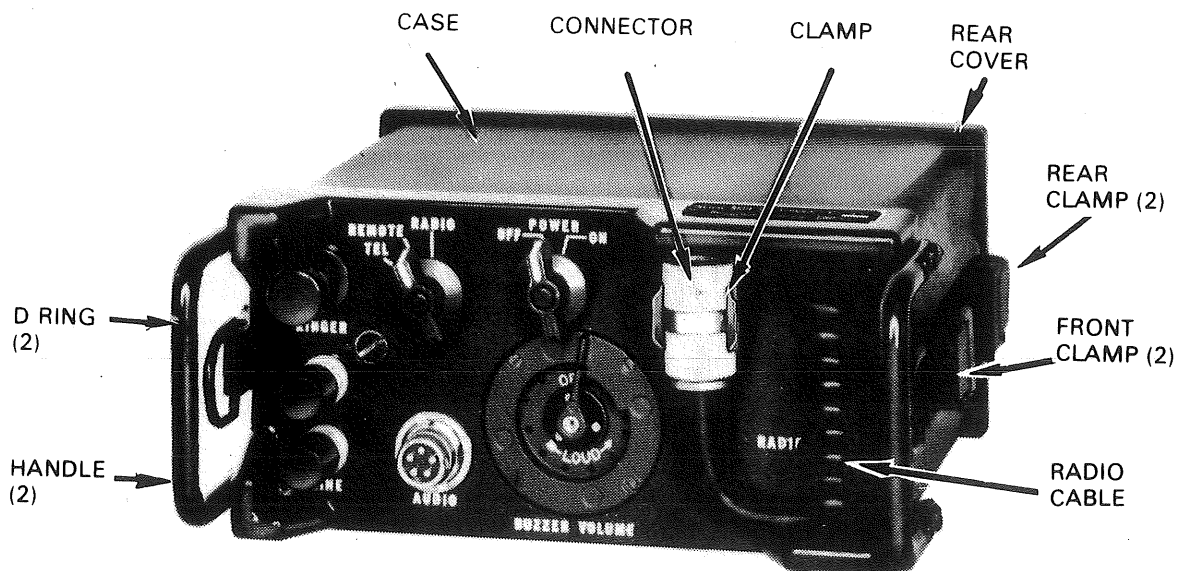


Figure 1. Local Control C-2329/GRA-39.



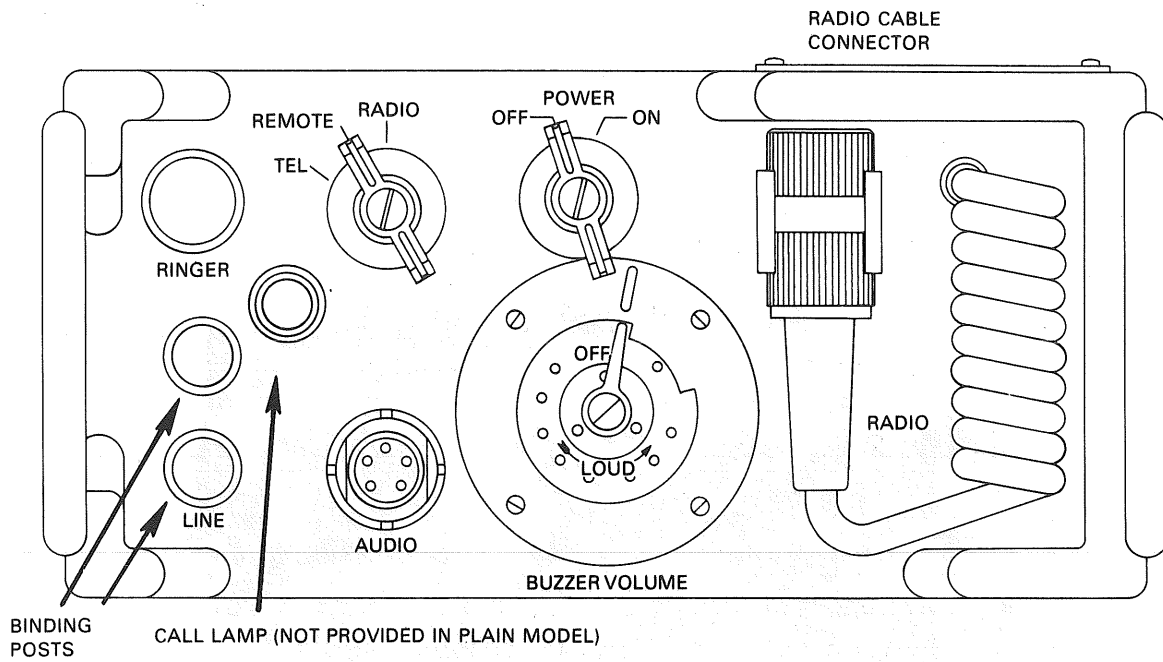


Figure 2. Local Control Unit, Controls, Indicator, and Connectors.

113-622-1002

2. Preparing Remote Control Unit, C-2328/GRA-39 for operation. (Refer to TM 11-5820-477-12, chap 2, para 2-4, p 2-1.)
  - a. Refer to figures 3 and 4 for familiarization with operator controls.
  - b. Unsnap the two rear cover clamps and remove the rear cover.
  - c. Inspect battery compartment and perform the functions described for the local unit as needed.
  - d. Install batteries, insure proper contact with terminals and that batteries remain in the case under tension.
  - e. Replace rear cover and snap the two clamps in place.
  - f. Insure all operating controls are free from internal or external binding.
3. Connect Local Control Unit, C-2329/GRA-39 to radio set. (Refer to TM 11-5820-401-12, chap 6, sec II, para 6-8a, p 6-6.)
  - a. Locate local control unit next to radio and connect local control unit radio cable to RETRANSMIT R/W connector (RT-246/VRC or RT-524/VRC) or the audio connector (AN/PRC-77).
  - b. Attach Field Wire, WD-1/TT to binding posts of local control unit.

NOTE: Tie field wire to a solid object prior to connecting to local control unit binding posts. This will prevent the local unit from being damaged should wire be pulled by either man or vehicle.
  - c. Lay field wire to remote control site.
4. Connect Remote Control Unit, C-2328/GRA-39. (Refer to TM 11-5820-477-12, chap 2, para 2-5, pp 2-1 thru 2-5, fig 2-3.)
  - a. Tie field wire off to solid object leaving sufficient wire to connect to remote unit.

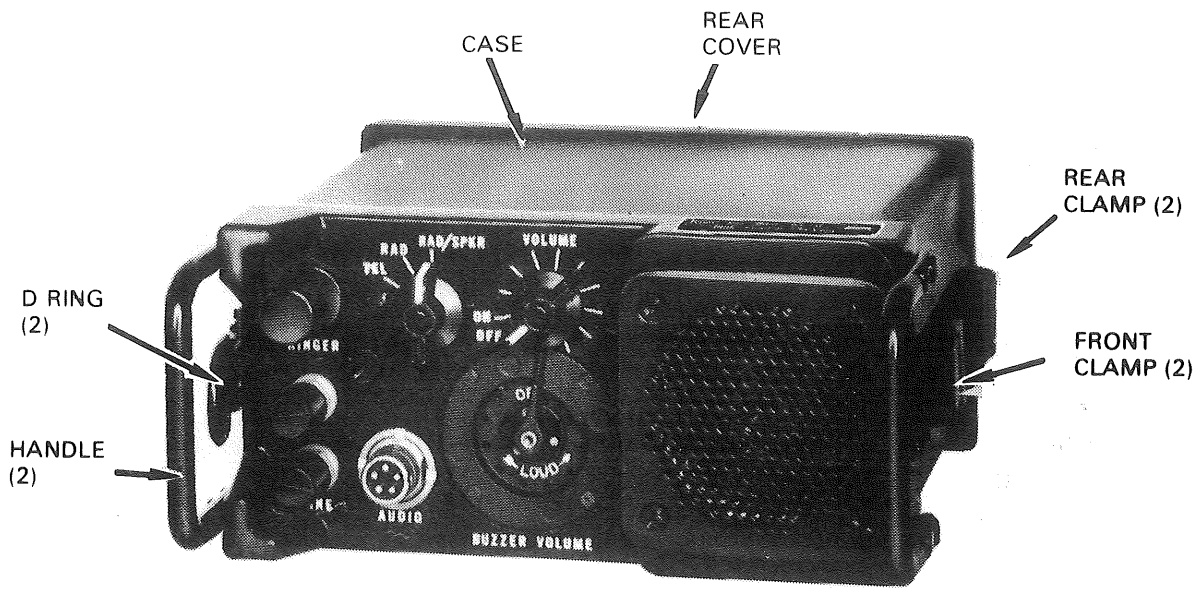
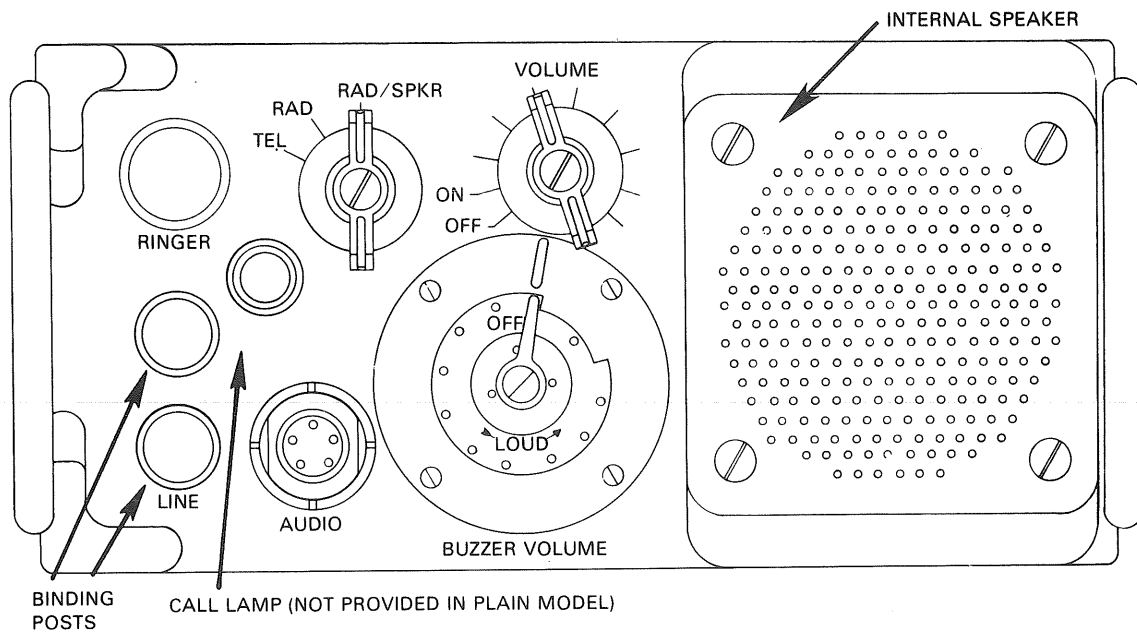


Figure 3. Remote Control C-2328/GRA-39.



113-622-1002

Figure 4. Remote Control Unit, Controls, Indicator, and Connectors.

- b. Connect field wire to binding posts of remote control unit.
- c. Attach Handset H-189/GR to AUDIO connector of remote control unit.

REFERENCES

TM 11-5820-477-12, Operator's and Organizational Maintenance Manual: Radio Set Control Groups AN/GRA-39, AN/GRA-39A, and AN/GRA-39B, Jul 75.

TM 11-5820-401-12, w/C1 thru 3, Operator's and Organizational Maintenance Manual, Including Repair Parts and Special Tool Lists for AN/VRC-12 Series Radio Sets, Sep 72.

# TASK

## 113-622-2002

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### Operate Radio Set, Control Group, AN/GRA-39

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#### CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. You will be provided with:

1. Radio Set AN/VRC-46 (installed).
2. Radio Set Control Group AN/GRA-39.
3. TM 11-5820-477-12.
4. CEOI.
5. Assistant operator at local control unit.
6. Distant radio station with which to operate.

Supervision and assistance will be available.

#### STANDARDS

This task has been performed correctly when, in 10 minutes, the AN/GRA-39 and the radio set have been aligned and started according to performance measures 1 through 3 of this task and the radio set control group has been placed into and taken out of telephone and radio communication according to performance measures 1 through 6.

#### PERFORMANCE MEASURES

1. Insure Radio Set Control Group, AN/GRA-39 is properly installed. (Refer to TM 11-5820-477-12, chap 2, para 2-4 thru 2-5, pp 2-1 thru 2-5, fig 2-3 and 2-4.)
2. Start Local Control Unit, C-2329/GRA-39. (Refer to TM 11-5820-477-12, chap 3, sec II, para 3-3, p 3-3.)

- a. Turn POWER switch to ON.
  - b. Set BUZZER VOLUME control to approximately midrange.
3. Start Remote Control Unit, C-2328/GRA-39. (Refer to TM 11-5820-477-12, chap 3, sec II, para 3-3, p 3-3.)
- a. Turn VOLUME Control (ON/OFF switch) to approximately midrange.
  - b. Set BUZZER VOLUME control to approximately midrange.
4. Conduct telephone communication check between local and remote control units. (Refer to TM 11-5820-477-12, chap 3, sec II, para 3-4a, p 3-3.)

NOTE: During operation, adjust BUZZER VOLUME controls for desired level.

- a. Press RINGER button several times in quick succession to gain attention of other operator.
  - b. Set remote control unit TEL-RAD-RAD/SPKR switch to TEL.
  - c. Turn and hold local control unit TEL-REMOTE-RADIO switch to TEL.
  - d. Press handset PUSH-TO-TALK switch to talk to the other operator; release to listen.
5. Conduct radio transmission and reception check from remote control unit. (Refer to TM 11-5820-477-12, chap 3, sec ii, para 3-4b, pp 3-3 and 3-4.)
- a. Have operator at local unit place TEL-REMOTE-RADIO switch of local control unit to REMOTE position.
  - b. Have local control unit operator adjust radio volume control for a comfortable listening level at local control unit handset to prevent excessive audio level (squeal) at remote unit.
  - c. Set TEL-RAD-RAD/SPKR switch of remote control unit to RAD or RAD/SPKR.
  - d. Adjust VOLUME control on remote unit to desired listening level for either handset or speaker operation of remote unit.

## SKILL LEVEL 1

- e. Press handset PUSH-TO-TALK switch to transmit; release to receive.
  - f. Use proper radio call signs and procedures to conduct radio check with distant station.
6. Conduct radio transmission and reception check from local control unit. (Refer to TM 5820-477-12, chap 3, sec II, para 3-4c, pp 3-4.)
- a. Turn and hold TEL-REMOTE-RADIO switch of local control unit to RADIO.
  - b. Press handset PUSH-TO-TALK switch to transmit; release to receive.
  - c. Use proper radio call signs and procedures to conduct radio check with distant station.

## REFERENCES

TM 11-5820-477-12, Operator's and Organizational Maintenance Manual: Radio Set Control Groups AN/GRA-39, AN/GRA-39A, and AN/GRA-39B, Jul 75.

TC 24-3, Radio Wire Intergration (RWI) Installation and Operation Tips, Nov 76.

**TASK****113-623-3001**

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**Prepare DA Form 2404 (Equipment Inspection and Maintenance Worksheet) as a Daily and Weekly Maintenance Report**

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**CONDITIONS**

This task is performed under all weather conditions in a field or a garrison location. You will be provided with DA Form 2404 (Equipment Inspection and Maintenance Worksheet), TM 38-750, and applicable operator's TM for equipment to be inspected. Supervision and assistance will normally be available.

**STANDARDS**

Task standard has been met when DA Form 2404 has been prepared as a daily and weekly maintenance report according to TM 38-750 and performance measures 1 and 2.

**PERFORMANCE MEASURES**

1. Prepare DA Form 2404 as a daily maintenance report. (Refer to fig 1, and TM 38-750, chap 3, para 3-4c, pp 3-5 thru 3-7.)
  - a. Place the vehicle or organizational control number in upper right hand corner (outside margin), for example: A-312.
  - b. Block 1: Place name of organization. DO NOT designate organization's location.
  - c. Block 2: Place full nomenclature and model of equipment as it appears on front cover of appropriate Technical Manual.
  - d. Block 3: Line out Registration/Serial/FSN as appropriate.
  - e. Block 4a thru 4d: If not applicable LEAVE BLANK, do not X or / out.
  - f. Block 5: Place calendar date in this block only when an uncorrectable fault is found.



NOTE: The sample DA Form 2404 (fig 1) shows that a daily maintenance check was conducted on 1, 2, 3 and 4 Feb 77; operator's initials in column 10e indicate no faults were found.

- g. Block 6: Place type of inspection (daily) being performed.
- h. Block 7: If one TM is used, place the TM number and date on the left hand side. If more than one TM is used, use both blocks.

NOTE 1: Enter the manual number followed by w/C and the latest change number. Enter the date of the latest change.

NOTE 2: When the manual has been reprinted and includes all changes, record the information as stated in above note, except record the date of the basic manual.

- i. Block 8a: Place rank and signature when an uncorrectable fault is found and equipment must be turned in to support maintenance.
- j. Block 8b: Leave blank.
- k. Block 9a: Your supervisor or support maintenance personnel will sign his name in this block, verifying the uncorrectable fault does exist.
- l. Block 9b: Leave blank.
- m. Block 10: Leave blank unless DA Form 2404 is being used to record an ESC.
- n. Column a: For correct item number, refer to the Operator's Daily Preventive Maintenance Checks and Services Chart contained in the operator's TM. In figure 1 the number is 5.

- o. Column b: Indicate equipment status symbol; refer to TM 38-750. Your supervisor will explain whether you may or may not be required to complete this item.
- p. Column c: Record the dates that daily services are performed and no uncorrectable faults are found. When an uncorrectable fault is found, place the date the uncorrectable fault is found in block 5.
- q. Column d: Self-explanatory and also used by support maintenance personnel. Enter any corrective action.
- r. Column e: Initial each time services are performed and no uncorrectable fault is found.

NOTE 1: Once you have completed DA Form 2404 as a daily maintenance report, you should notify your immediate supervisor or support maintenance personnel of any uncorrectable faults found as soon as possible. If no uncorrectable faults are found, the completed DA Form 2404 will remain with the equipment log book or the unit TAMMS section until the next daily inspection.

NOTE 2: Whenever DA Form 2404 is to accompany equipment being turned into support maintenance for repair, insure that you list all symptoms or uncorrectable faults in Column 10c. The more detailed you are in describing the uncorrectable fault or its symptoms, the quicker your support maintenance personnel will be able to repair and return the equipment to you.

A312

EQUIPMENT INSPECTION AND MAINTENANCE WORKSHEET (TM 38-750)										
1 ORGANIZATION <b>Co A, 141st SIG BN</b>					2 NOMENCLATURE AND MODEL <b>RADIO SET AN/GRC-106A</b>					
3 REGISTRATION / SERIAL / EGR <b>1369</b>		4a MILES	5a HOURS	6a ROUNDS FIRED	6b HOT STARTS	7 DATE <b>7 FEB 78</b>	8 TYPE INSPECTION <b>DAILY</b>			
7 APPLICABLE REFERENCE										
TM NUMBER <b>11-5820-520-12</b>			TM DATE <b>FEB 71</b>		TM NUMBER			TM DATE		
INSTRUCTIONS—Perform each check listed in the TM applicable to the inspection performed. Following the sequence listed in pertinent TM, complete form as follows. COLUMN a—Enter TM item number. COLUMN b—Enter the applicable condition status symbol. COLUMN c—Enter deficiencies and shortcomings. COLUMN d—Show corrective action for deficiency or shortcoming listed in Column c. COLUMN e—Individual ascertaining completed corrective action initial in this column.										
ALL INSPECTIONS AND EQUIPMENT CONDITIONS RECORDED ON THIS FORM HAVE BEEN DETERMINED IN ACCORDANCE WITH DIAGNOSTIC PROCEDURES AND STANDARDS IN THE TM CITED HEREON.										
8a SIGNATURE (Person(s) performing inspection) <b>PFC- George A. Moore</b>			8b TIME		9a SIGNATURE (Maintenance Supervisor) <b>SGT Richard P. Ramsey</b>			9b TIME		10 MANHOURS REQUIRED
TM ITEM NO. a	STATUS b	DEFICIENCIES AND SHORTCOMINGS			CORRECTIVE ACTION			INITIAL WHEN CORRECTED c		
		<b>1 FEB '78</b>						<b>T.A.K.</b>		
		<b>2 FEB '78</b>						<b>T.A.K.</b>		
		<b>3 FEB '78</b>						<b>T.A.K.</b>		
		<b>4 FEB '78</b>								
<b>5</b>	<b>X</b>	<b>ANT TUNE AND LOAD</b>								
		<b>WILL NOT ALLOW PRESET</b>								

DA FORM APR 79 2404

113-623-3002

Figure 1. DA Form 2404 used to record Daily Maintenance.

2. Prepare DA Form 2404 as a Weekly Maintenance Report. (Refer to TM 38-750, chap 3, para 3-4c, pp 3-5 thru 3-7, and fig 2.)
  - a. DA Form 2404 is filled out the same for a weekly report as it is for a daily report; only the dates in Column 10c will reflect weekly services rather than daily services.
  - b. DA Form 2404 will normally be kept with the equipment log book or at the unit TAMMS section until an uncorrectable fault is found.

A 312

EQUIPMENT INSPECTION AND MAINTENANCE WORKSHEET <small>(TM 38-750)</small>						
1 ORGANIZATION <b>CO A, 141<sup>st</sup> SIG BN</b>			2 NOMENCLATURE AND MODEL <b>RADIO SET CONTROL GROUP AN/GRA-39</b>			
3 REGISTRATION / SERIAL / PART <b>1013</b>	4a MILES	b HOURS	c ROUNDS FIRED	d HOT STARTS	5 DATE <b>25 FEB 78</b>	6 TYPE INSPECTION <b>WEEKLY</b>
7 APPLICABLE REFERENCE						
TM NUMBER <b>11-5820-477-12</b>	TM DATE <b>JULY 75</b>	TM NUMBER	TM DATE			
INSTRUCTIONS—Perform each check listed in the TM applicable to the inspection performed. Following the sequence listed in pertinent TM, complete form as follows. COLUMN a—Enter TM item number. COLUMN b—Enter the applicable condition status symbol. COLUMN c—Enter deficiencies and shortcomings. COLUMN d—Show corrective action for deficiency or shortcoming listed in Column c. COLUMN e—Individual ascertaining completed corrective action initial in this column.						
ALL INSPECTIONS AND EQUIPMENT CONDITIONS RECORDED ON THIS FORM HAVE BEEN DETERMINED IN ACCORDANCE WITH DIAGNOSTIC PROCEDURES AND STANDARDS IN THE TM CITED HEREON.						
8a SIGNATURE (Person(s) performing inspection) <b>PFC- George A Moore</b>		8b TIME	9a SIGNATURE (Maintenance Supervisor) <b>SGT Richard P. Ramsey</b>		9b TIME	10 MANHOURS REQUIRED
TM ITEM NO a	STATUS b	DEFICIENCIES AND SHORTCOMINGS c		CORRECTIVE ACTION d	INITIAL WHEN CORRECTED e	
		<b>4 FEB '78</b>			<b>D.A.M</b>	
		<b>11 FEB '78</b>			<b>D.A.M</b>	
		<b>18 FEB '78</b>			<b>D.A.M</b>	
<b>5</b>	<b>X</b>	<b>BATTERY COMPARTMENT OF LOCAL UNIT CORRODED AND BATTERY CONTACTS BROKEN</b>				
<b>DA FORM 2404 APR 79</b>						

113-623-3002

Figure 2. DA Form 2404 used to record Weekly Maintenance.

NOTE: Once you have made the entries on DA Form 2404 as a weekly maintenance report, you should notify your immediate supervisor or support maintenance personnel of any uncorrectable faults found as soon as possible. If no uncorrectable faults are found, the DA Form 2404 will remain with the equipment log book or unit TAMMS section until the next weekly inspection.

REFERENCES

TM 38-750, w/C1 thru 3, The Army Maintenance Management System (TAMMS), May 78.

# TASK

## 071-327-0202

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### Lead Physical Conditioning Activities

---

#### CONDITIONS

Given a platoon or company size unit in formation, with a requirement to conduct a specified physical activity. (Activity will be predesignated so that time is available for preparation.)

#### STANDARDS

1. Be physically fit to lead physical conditioning activities.
2. Give enough time between commands to permit the average man to understand the preparatory command before the command of execution is given.
3. Be able to form and control the extended rectangular formation, circle formation, and double-time column (while performing the run portion of physical conditioning activities).
4. Lead each exercise in accordance with FM 21-20.
5. Demonstrate each exercise (at least three repetitions) with cadence.
6. Follow guidance given concerning what, when, where, and how long activity is to be conducted.

#### PERFORMANCE MEASURES

1. How to Prepare. Once guidance is given concerning the conditioning requirement, preparations must be made.

- a. What is the requirement? You must be familiar with the exercises in FM 21-20 if leading them is your requirement. This will require study and practice. It is also your responsibility to insure that your assistant instructors (if available) know the exercises so they can effectively supervise and demonstrate. If your requirement is, or includes, a conditioning run, you must insure that your road guards (if used), pace men, lead rank, and assistant instructors are proficient enough runners to set a good pace (an example) for the rest of the group.
  - b. When? An assigned starting time is just that. It is your responsibility to insure that the requirement does start on time and a system is set up to deal with late arrivals. Your assistant instructors should note the name of any individual who is late, then place him in the formation. He still needs to take part in the conditioning; he can be sent to his supervisor to explain and be dealt with after the formation.
  - c. Where? Once given a location to perform the requirement, you must determine if it is feasible to do it there and what plans must be made to best fit the requirement to the area. The area must be large enough. If it is a controlled area, you must insure that only you have planned to use it during your requirement time period. If the area becomes useless during bad weather (for example, knee deep in mud when it rains), an alternate area must be secured.
  - d. How long? You will be given a period of time in which to complete the requirement. Plans should be made with an eye to coming as close as possible to the required time without going over it, since improper use of time can snowball through a training day and wreck a unit's schedule and morale. Timing is a function of practice. Rehearse exercises. On a run, match a realistic pace to an appropriate distance. You, not the pace man, are responsible for the pace. Allow yourself a small time leeway and don't make the instructor for the next period suffer for your lack of timing.
2. Preparatory Commands and Commands of Execution. The preparatory command describes and specifies what is required, and the command of execution calls into action what has been prescribed. All preparatory commands are given with a rising inflection. The interval between commands is long enough to permit the average man to understand the first one before the second one is given.

3. Extended Rectangular Formation (fig 1). The formation used most frequently for carrying on physical training activities is the extended rectangular formation. This formation is the best type to use for large numbers of men because it is easy to control. The following commands are given to form this formation.

NOTE: In figure 1, the baseman is represented by a white circle.

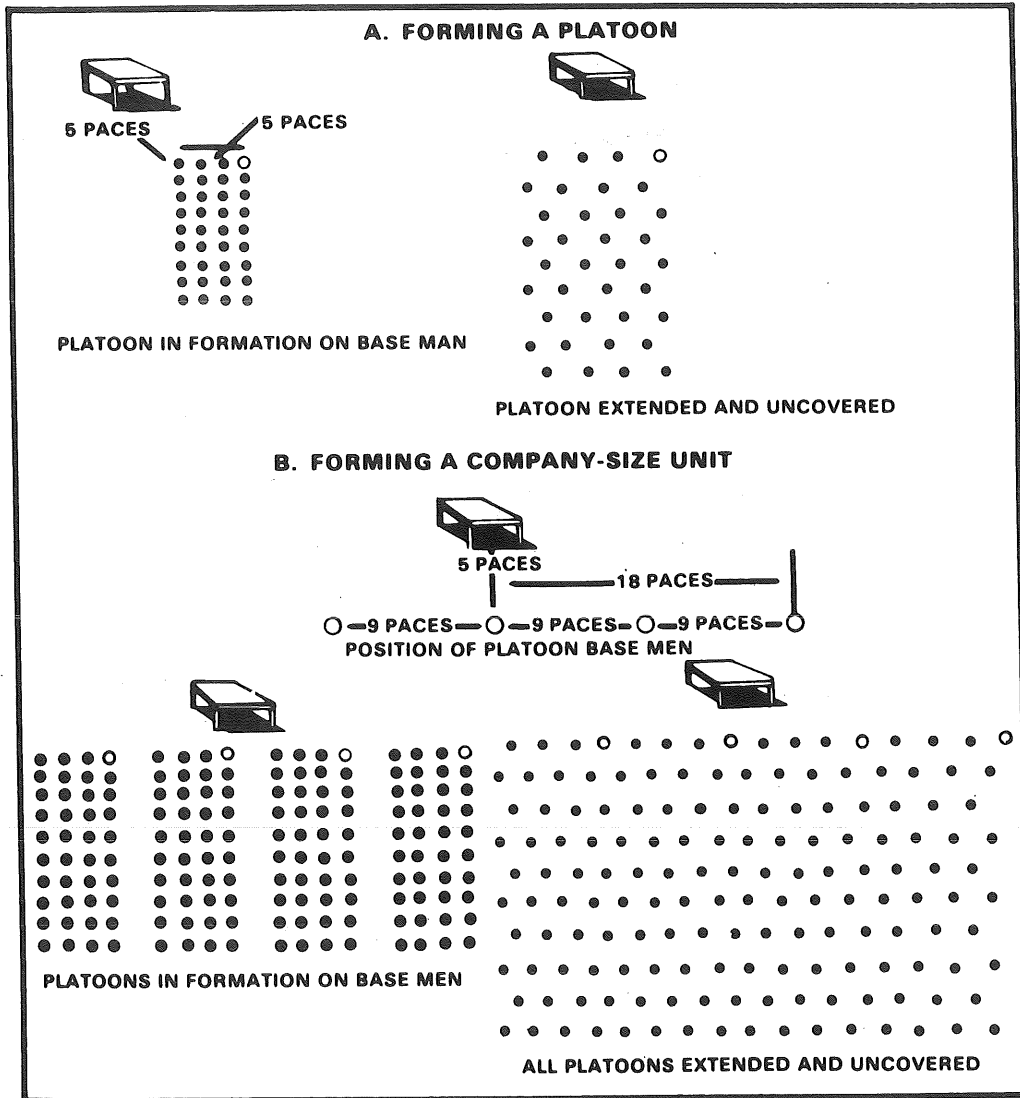


Figure 1. Forming the extended rectangular formation.

- a. **FALL OUT AND FALL IN ON THE BASEMAN.** At this command, all personnel run to the designated area and re-form. This procedure is preferred to marching the unit into position. If more control is desired, the unit may march at double time to the vicinity of the baseman and then be directed to fall out and fall in on him. Time is wasted in the field due to needless maneuvering of troops at quick time in an effort to position the unit on the exact spot for the exercises.
- b. A company size unit assumes the extended rectangular formation from a column of three's or four's at normal intervals between squads. This extension can also be executed from a company mass without interval between platoons. In extending either a platoon or company size unit, take your place at the head of the column and command.
  - (1) **EXTEND TO THE LEFT, MARCH.** At this command, the men in the right flank file stand fast with arms extended sideward. All other men turn to the left and run forward at double time. After taking a sufficient number of steps, all men face the front with both arms extended sideward. The distance between fingertips is about 12 inches and dress is right.
  - (2) **ARMS DOWNWARD, MOVE.** At this command, the arms are lowered smartly to the sides.
  - (3) **LEFT, FACE.**
  - (4) **EXTEND TO THE LEFT, MARCH.** At this command, the men in the right flank file stand fast with arms extended sideward. All other men turn to the left and run forward at double time. Spacing is the same as in (1) above and dress is right.
  - (5) **ARMS DOWNWARD, MOVE.** Same as in (2) above.
  - (6) **RIGHT, FACE.**
  - (7) **FROM FRONT TO REAR, COUNT OFF.** At this command, the leading man in each column turns his head to the right rear, calls off "one" and faces the front. Successive men in each column call off in turn, "two," "three," "four," "five," in the same manner.



- (8) EVEN NUMBERS TO THE LEFT, UNCOVER. At this command, each even numbered man stride-jumps to the left, squarely in the center of the interval. In doing this, he swings his left leg sideward and jumps from his right foot to his left foot and smartly brings the right into position against the left.
- c. To assemble the unit, command: ASSEMBLE TO THE RIGHT, MARCH. At this command, all return to their original position in the column at double time and reform on the baseman.
- d. It is recommended that the area of grounding equipment and weapons be at the edge of, or well away from the area to be used for exercising. To conserve time and insure proper position of the unit, the baseman or, if the unit is composed of several platoon size groups, the various basemen may precede the unit and establish their positions in relation to the instructor's platform.
4. Circle Formation. The circle formation is effective for the conduct of various exercise activities (fig 2). This formation has an advantage in that the supervision of all men is facilitated, and a moving formation is available which provides control. Guerrilla exercises, grass drills, and some forms of running are examples of activities which are more easily conducted in the circle formation than in the extended rectangular formation.

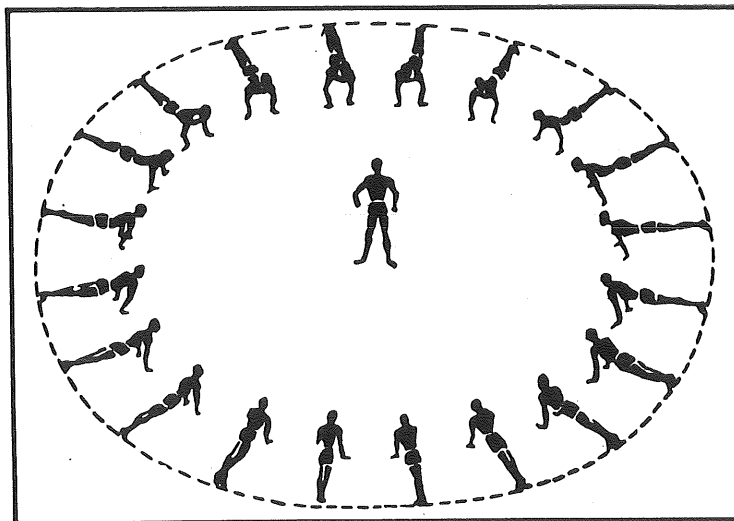


Figure 2. The circle formation.

- a. When a platoon is to form a circle, the commands are CIRCLE FORMATION, MARCH, FOLLOW ME. Upon this command, the right flank squad of the column moves forward at double time with the leader of the platoon group gradually forming a circle in a counterclockwise direction. Each succeeding file falls in behind that on the right. After the rough outline of the circle is formed, the leader commands, PICK UP A FIVE YARD INTERVAL. This is to insure the interval between men is uniform prior to starting exercises.
  - b. The group may be halted and faced toward the center, or if instruction is not necessary, the exercise activity may be executed without stopping the platoon.
5. Conditioning Run. This is nothing more than a column moving over a prescribed course at double time. Reflector-vested road guards must be placed ahead of and behind the column if the course follows a road or vehicle trail. A designated pace man runs in the right guide position and, under the direction of the instructor in charge, sets and maintains the pace for the run. Routes should be selected and announced, if necessary, in accordance with post and unit SOPs.
6. Leadership Techniques.
- a. Unless you experience all the exercises, you cannot appreciate how strenuous they are, what movements are the most difficult, where the errors in performance are likely to occur, and what the proper cadence should be.
  - b. You must give all the men careful supervision and participate in the exercises to show that you can do them. When you participate, your assistant instructors should supervise because it is difficult for you to supervise and exercise simultaneously.
  - c. The men should never be kept too long in one position, especially a constrained one. They should never have to perform so many repetitions of an exercise that they lose the correct form. Slight deviations from the proper form reduce the value of the exercise.
  - d. Avoid long explanations. As a rule, it should be necessary to give a full explanation of new exercises only once. Minor corrections should be made to the entire class while the exercise is in progress (for example, "heads up," "knees straight"). If necessary, follow this correction by the name of the man who is at fault.

- e. The heavy demand on your voice can be lightened by training assistant instructors to assume some of the instruction and by employing mass cadence.
- f. Insure each exercise is performed in accordance with FM 21-20. Review and practice is usually required in order to perform them properly.
- g. Use of a cue card (3 x 5 or scrap of paper) is recommended while leading exercises. This will prevent forgetting any exercise and help present a smooth period of training.

REFERENCES

FM 21-20, Physical Readiness Training, Mar 73.

**TASK****071-328-5301**

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**Inspect Personnel/Equipment**

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**CONDITIONS**

Given personnel or equipment to be inspected, specified amount of time, inspection site, and unit SOP for inspections.

**STANDARDS**

Within the time specified, inspect personnel or equipment and note deficiencies.

**PERFORMANCE MEASURES**

1. Personnel.
  - a. Start at the head. Check headgear, haircut, and shave.
  - b. Inspect collar insignia and awards.
  - c. Check gig line and belt buckle.
  - d. Check footgear.
  - e. Check uniform for general appearance, fit, and patches.
  - f. Check Identification Card (DD Form 2A) and ID tags.

NOTE: Before inspecting, be thoroughly familiar with unit standards.

2. Equipment.
  - a. Before inspection, study applicable TM. Pay particular attention to section on preventive maintenance checks and services and the basic issue items list.

- b. Begin inspection at a readily recognizable point on equipment.
- c. Inspect in an orderly sequence. This saves motion and eliminates chances of missing important items.
- d. Note deficiencies as you find them. Don't try to remember all of them.
- e. Inspection should be complete when you return to the starting point.

**REFERENCES**

Unit SOP

FM 22-5, Drill and Ceremonies.

**TASK****071-329-1006**

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**Navigate From One Position on the Ground  
To Another Point**

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**CONDITIONS**

Given a standard 1:50,000 scale military map, compass, a coordinate scale and protractor, and designated start and finish points no more than 3,000 meters apart. The field location of the task should appear on the military map and contain varying types of terrain. Weather conditions should not be considered a limiting factor.

**STANDARDS**

Within 1 hour, move from the start point to the finish point.

**PERFORMANCE MEASURES**

1. Locate the start point and finish point on the map and determine where the start point is on the ground.
2. Determine the grid azimuth from the start point to the finish point on the map.
3. Convert the grid azimuth to a magnetic azimuth.
4. Determine the distance between the start point and the finish point on the map.
5. Convert the map distance to pace count.
6. Place the azimuth between the start point and the finish point under the fixed black index line of the compass.
7. When planning the route between points, select terrain features that will be encountered by making a map reconnaissance.

8. Make mental checklist of such features.
9. Move to the start point to begin pace count.
10. While moving along the route, check against your "list."
11. After reaching the finish point, conduct a detailed terrain analysis to confirm your location.

REFERENCES

FM 21-26, Map Reading, Jan 69, w/C1.

TEC Lesson 930-071-0018-F, Navigating with Map and Compass.

**TASK****071-329-1015**

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**Locate an Unknown Point on a Map or on the Ground by Resection**

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**CONDITIONS**

In a field at an unknown location, given a standard 1:50,000 scale military map of the area, a compass, straightedge, coordinate scale and protractor, pencil, and two terrain features visible from your location and identifiable on the map.

**STANDARDS**

Within 10 minutes, determine the 100,000-meter square identification letters and six-digit coordinates of your location to within 100 meters of the actual grid coordinates.

**PERFORMANCE MEASURES**

**RESECTION** is a way to locate one's position on a map. Magnetic azimuths are measured to two points on the ground which can be identified on the map. These magnetic azimuths are changed to grid azimuths, and the back azimuths of these grid azimuths are determined. Next, the converted back azimuths are drawn from the known points on the map. Where these two/three lines resect (cross) is your location.

**1. Map and Compass Method (fig 1).**

**NOTE:** A 10 degree easterly G-M angle is used in the examples. Map not to scale.

**Step 1:** Determine the G-M angle of the map that you are using.

**Step 2:** Locate two known positions on the ground and mark them on your map (fig 1a).



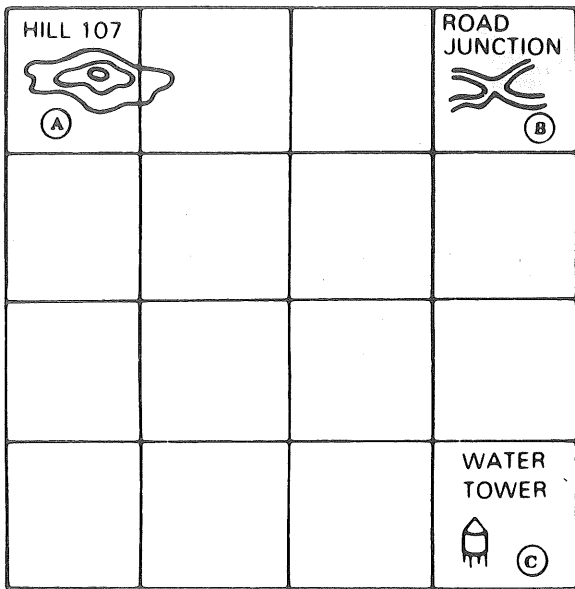


Figure 1a.

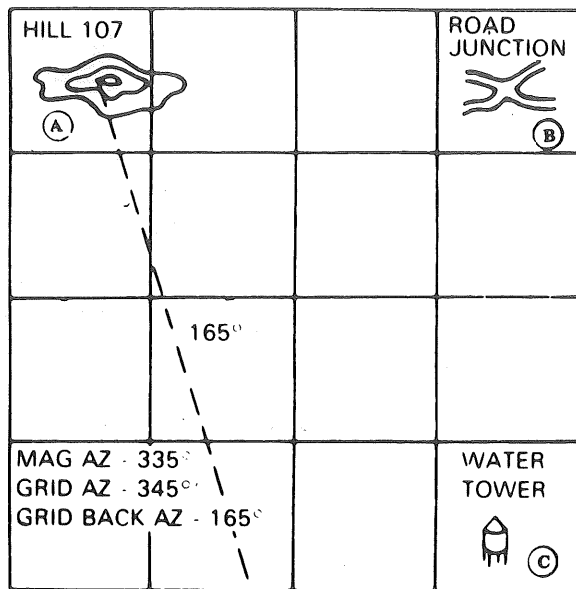


Figure 1b.

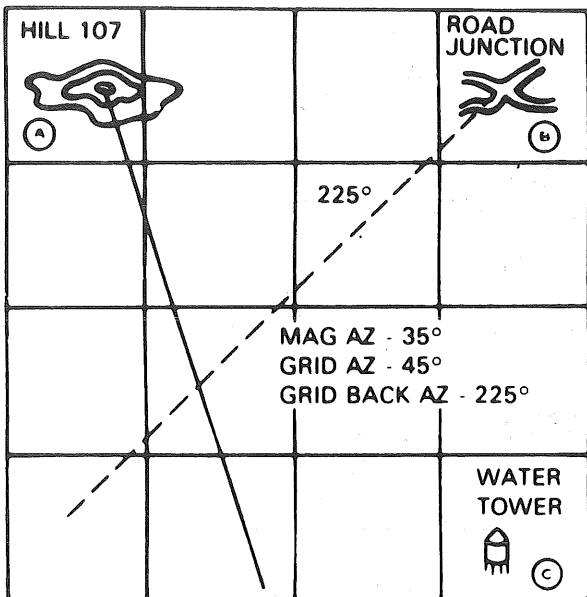


Figure 1c.

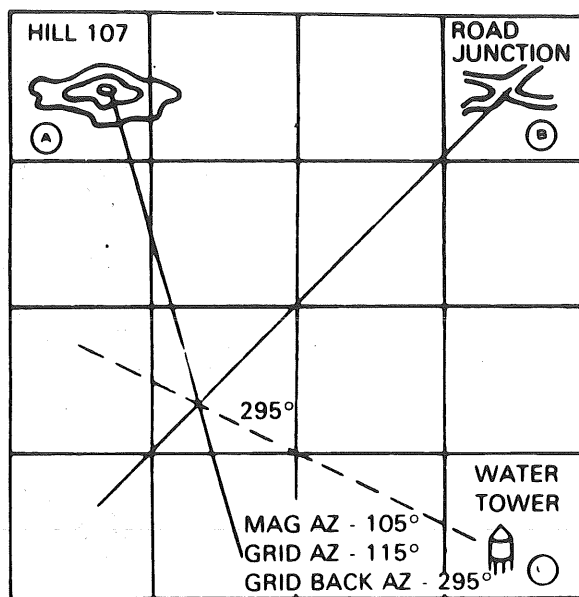


Figure 1d.

Figure 1. Map and compass method.

Step 3: Measure the magnetic azimuth to one of the known locations: change this to a grid azimuth (fig 1b).

- a. If it is a westerly G-M angle, subtract the number of degrees in the G-M angle to your magnetic azimuth.

- b. If it is an easterly G-M angle, add the number of degrees in the G-M angle to your magnetic azimuth.

Step 4: Change this grid azimuth to a back azimuth.

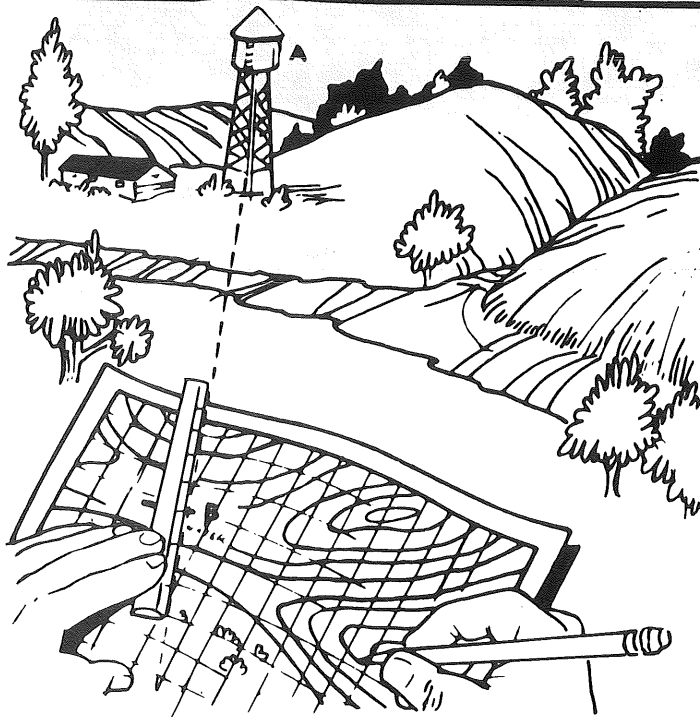
Step 5: Place the protractor on the map insuring that the zero degrees indicator on the protractor is pointing to the top of the map (north) and the index point is placed center mass on this location. Place a tick mark on the number of degrees you want to plot. Remove protractor from the map and draw a line on the map from this position on the grid back azimuth you found, in the direction of your unknown position.

Step 6: Repeat steps 3 through 5 for a second and third known position.

## 2. Modified Resection.

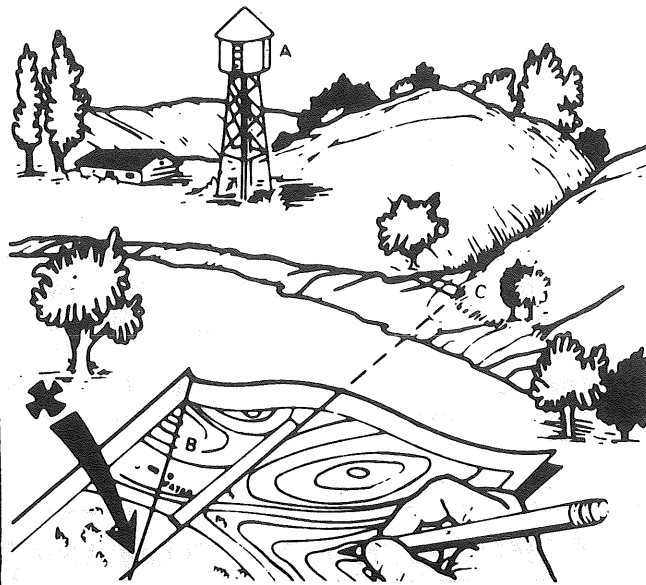
First orient your map, then find some feature that you can also find on the map, such as the water tower in the previous example. Just like before, put a straightedge through the water tower on the map and align the straightedge so that it points exactly at the real water tower. Draw a line along the ruler. The point where the line crosses the linear feature which you know you are on (road, river bank, etc.) is your location.

### RESECTION WITHOUT A COMPASS



Orient your map as closely as you can using one of the ways you've learned about finding direction—compass, sun watch, or stars. Then, look for some feature—like a water tower (A)—that you can also find on the map. Put a ruler or straightedge on the map, and place its edge right next to the water tower symbol (B) on the map. Then align the straightedge so that it points exactly at the real water tower. Draw a line along the ruler (the line will cross the symbol for the water tower on your map).

Next, find another feature—like a road junction, and do the same thing. Lay the straightedge on your map and point it at the real road junction (C), while at the same time its edge crosses over the road junction (D) on the map. Draw another line along the ruler until it crosses (intersects) the first line. The point where the lines cross is your location (X). If you do the same thing with a third line, it may help locate your position more accurately.



**REMEMBER** Don't move your map once you've got it properly oriented.

**REMEMBER:** Always orient your map as closely as you can. The compass is the best way. If you do not have a regular straightedge, use your rifle cleaning rod, a section of a radio antenna, or even the edge of a C-ration box.

#### REFERENCES

FM 21-26, w/C1, Map Reading, Jan 69.

TEC Lesson 930-071-0018-F, Navigating with Map and Compass.

**TASK****874-896-2010**

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**Prepare to Conduct Individual Training**

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**CONDITIONS**

Given a requirement to train a specified number of soldiers on a soldier's manual task; the applicable soldier's manual; an outline for task training; and access to training aids, devices, facilities, and areas.

**STANDARDS**

1. Arrange to obtain sufficient resources to train the number of soldiers specified and to conduct a rehearsal.
2. Prepare the area and all equipment for the rehearsal and training session.
3. Conduct a supervised rehearsal that includes:
  - a. A training statement.
  - b. Safety requirements to be observed during training (if any).
  - c. A pretest (if applicable).
  - d. An orientation statement.
  - e. A demonstration (if applicable).
  - f. Training on each task step.
  - g. Skill practice and feedback.
  - h. A post test (performance test).
  - i. Record the results of training.

PERFORMANCE MEASURES

1. Review the task for training to be sure that you can perform to standard. If you cannot perform to standard, review any TEC lesson or training literature (i.e., SM or training plans, ACCP, correspondence courses, etc.) that will help you master the task. Then have your supervisor or a peer give you the performance test to make sure that you can perform to standard.
2. Identify the equipment, training areas, and training devices you will need to train the task. Also identify any preparations you must make before the training session. For example, partial disassembly of the equipment or marking the training area. Check the conditions statement of the training objective to see what preparations are required.
3. Make arrangements to obtain all the resources identified for the rehearsal and training session. Obtain and prepare your rehearsal and training resources as each is needed.
4. Have a peer or supervisor watch your rehearsal and make a critique. Remember a rehearsal is not a show. It is an opportunity to check your preparations and practice the sequence you will use later during the actual training session. To get the most out of your rehearsal, you should treat the person who is making a critique as a trainee and provide the same training you plan to give during the actual training session.
5. Use the training outline to conduct the rehearsal.
  - a. Give a Training Statement. In your own words, tell the soldiers what they have to do, under what conditions, and how well they have to do it (task, conditions, and standards).
  - b. State the Safety Requirements. Tell the soldiers the safety points you expect them to observe during the session. You can get these safety requirements from the training outline.
  - c. Pretest the Soldier. Ask the soldiers if they think they can perform the task to standard. Those who indicate they can perform the task must pass the actual performance test before receiving credit for the task. If they can perform the task, make the correct entries in the job book and use them as assistant (peer) trainers. Those who cannot perform the task will attend training. Sometimes a pretest is not possible. For example, when you take the soldiers to the range to qualify with their weapons, you will not be able to pretest because of range operating procedures.

- d. Give an Orientation Statement. Explain to the soldiers why these tasks are important. The importance of some tasks is obvious and does not require explaining; but when an explanation is necessary, try to show the task's relationship to the soldier's job or the unit's mission.
- e. Include a Demonstration. If you feel it will help the soldiers learn the task quicker or make it easier for them, include a demonstration. An example of a demonstration is to show the soldiers a finished product, such as a properly constructed and camouflaged foxhole. Remember, you are the one who decides if a demonstration is useful.
- f. Include Training on Each Task Step. This is what the trainer does to get the soldiers trained so that they can practice the task. This is normally a talk-through or demonstration walk-through of the task steps. The important thing is to get the soldiers doing the steps with a minimum amount of talk and delay.
- g. Include Skill Practice and Feedback. Watch the soldiers perform the task. Point out and correct all errors they make. Remember to keep the standards in mind so that you can help them. When they meet the standards and are ready for the performance test, have them notify you that they are ready to be tested.
- h. Conduct the Performance Test. This is the test you give to make sure the training objectives have been met. If the soldier fails the performance test, tell him what he did wrong and how to correct his errors; and have him practice again until he is ready for another performance test. The only way for the soldier to get credit for training is to pass the performance test.
- i. Record the Results of the Training. You can use the job book for your section or squad or you can record the results in the soldier's manual.

## REFERENCES

FM 21-6, How to Prepare and Conduct Military Training.

# TASK

## 874-896-2020

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### Conduct Individual Training

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#### CONDITIONS

Given a requirement to train a specified number of soldiers on a soldier's manual task; the applicable soldier's manual; an outline for task training; adequate time; and access to training aids, devices, facilities, and areas.

#### STANDARDS

1. Each soldier identified for training must perform the soldier's manual tasks to standard.
2. Training must include:
  - a. The training statement.
  - b. The safety requirements (if any).
  - c. Pretest (if appropriate).
  - d. The orientation statement.
  - e. A demonstration (if appropriate).
  - f. Training in each task step.
  - g. Skill practice and individual feedback.
  - h. A performance test.
  - i. Recording and reporting the results of training.

## PERFORMANCE MEASURES

1. Conduct the Training Session:
  - a. Give a training statement.
  - b. State the safety requirements.
  - c. Pretest (if appropriate). Ask the soldiers if they can pass the performance test. Give the performance test to those soldiers who say they can perform the task. Use the soldiers who pass the pretest as assistant (peer) instructors. Those who say they cannot do the task should go right into training. The results of the pretests determine what training the soldiers need to get them ready to pass the performance test. This means that if a soldier missed only one step during the pretest, tell him what he did wrong and how to correct it, let him practice, and then test him rather than make him sit through a demonstration and orientation he doesn't need.
  - d. Give orientation statement.
  - e. Conduct demonstration (if appropriate).
  - f. Train soldiers in each task step. Conduct only the training necessary to get the soldiers ready to practice on their own. Demonstrate each step and let them practice the step.
  - g. Conduct skill practice. The key to a good training session is to involve the soldiers in supervised skill practice as soon as possible and give them the performance test.
  - h. Conduct the performance test. Be sure that each of the soldiers passes the performance test before he is given credit for training.
2. Record the Results of Training. If there is no job book for the skill level of the training, you may want to record the results of this training in a soldier's manual or a commander's manual. Remember, no matter what system you use, it is your record; and the information will help you plan the training your soldiers need.



3. Report the Results of Training. (Provide feedback/input.) Inform your commander/supervisor of the results of the training. Did training occur? Is additional time needed? How many soldiers failed/passed the performance test? Is training needed to correct problems with related tasks, etc.? The commander relies on your knowledge of your soldier's proficiency to keep him informed of the status of training within the unit. This is not always done in a meeting, but may take place any time you have the opportunity to speak with your commander. Unit SOP may require "training meetings" to be held regularly, but this is not the only time you pass on information about your soldiers.

NOTE: Training soldiers is not just following a sequence of events. It involves your giving what you know to soldiers who are trying to learn. All the knowledge and skills you have learned in becoming a noncommissioned officer must be put into practice when you conduct training. You have the skills and knowledge of a leader, so it is important that you polish training skills and become a trainer capable of sharing that knowledge.

#### REFERENCES

FM 21-6, How to Prepare and Conduct Military Training, Nov 75.

#### SQT ADMINISTRATION REQUIREMENTS

This task can only be properly verified as a Performance Certification Component (PCC) of the SQT.

**TASK****874-896-3050**

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**Develop an Outline for Task Training**

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**CONDITIONS**

Given a soldier's manual for an MOS in the unit; a training objective (task, conditions, standards); access to available training documents (FM, TC, ARTEPs, TM); the job aid, "Outline for Task Training."

**STANDARDS**

1. Training outline must identify any subtasks and the required training sequence.
2. Training outline must include the following for each training objective and subtask:
  - a. Training objective (task, conditions, standards).
  - b. Required resources.
  - c. Training statement.
  - d. Safety statement (if appropriate).
  - e. Pretest.
  - f. Orientation statement.
  - g. Demonstration guidelines (if applicable).
  - h. Performance steps.
  - i. Skill practice reminder/section.
  - j. Performance test to include standards.

k. Record and report results of training.

l. References.

NOTE: An outline for task training is NOT a lesson plan. A lesson plan is used in a formal school--not in the field. The outline for task training organizes all the information a trainer needs for training into a logical step-by-step sequence.

#### PERFORMANCE MEASURES

1. Review Training Objective. The training objective is usually given to you (at least the task statement) by the training guidance. So when you have identified a task for training, find that task in your soldier's manual. There you have the TASK, CONDITIONS, and STANDARDS that make up a training objective.
2. Identify Required Resources. This is the equipment, location(s), time of day, training aids, amount of ammunition, etc., that each soldier must have to do this training. This information is found in the conditions statement of the training objective and in other sources. TASC (Training and Audiovisual Support Center) catalogs, your own experience from having worked on this task before, your sergeant, and maybe even the unit schedule are all places to find resources. The information listed in the conditions statement, on the unit schedule, or in the guidance you get from the unit leader or company commander should have all the "required" resources. All other resources, such as a training aid that you remember using before, are not required but may be nice to have because you feel that your soldiers will learn easier by using them.
3. Write the Training Statement. This is a sentence (or two) that will tell the soldiers what they must do (the task) and how well they must do it (the standard). For example: Put on a protective mask within 9 seconds (15 seconds if you have a hood attached) after hearing the alarm "GAS."
4. Identify the Safety Statement. This may not be given on every task. The safety statement is used only when there is a safety hazard. This may be spelled out for you in the soldier's manual, unit schedule, or training guidance. At other times, your experience will tell you what safety hazards are to be recognized and avoided. You must prepare a safety statement when there is a need for it and read it to the soldiers before conducting training.

5. Include a Pretest Reminder. Make a note to remind yourself to give a pretest before conducting training. This pretest is given to all soldiers who feel they can do the task to standard without training. Tell them what to do (task) and how well to do it (standard). This pretest is a performance test. The pretest will identify soldiers who already know the task and who can be used as peer trainers. There may be times when a pretest is not applicable, such as when you are at the range qualifying with your weapons.
6. Prepare an Orientation Statement. This statement tells the soldiers why they are being trained in this task. Put it in your own words so your soldiers know why they are being trained in this task.
7. Decide on the Demonstration Guidelines. The demonstration may not be used every time you train a task. You must decide whether or not a demonstration of the end result of training will help your soldiers learn the task. For example, given the task of "Camouflage Self and Individual Equipment," you may want a well-camouflaged soldier hiding in a temporary battlefield position. This gives them an idea of what you want them to do and how important it can be. For another task, such as "Engage Targets With an M16 Rifle," you may not choose to give a demonstration. Would it really help your soldiers learn this task? It is doubtful.
8. Identify the Performance Steps. These steps are for you, the trainer, to follow when conducting training. They contain information on "how to do the task." In general, the steps are found in the soldier's manual. Soldier's manuals refer to them as performance steps, training steps, and subtasks. You may have to include information or details that will help explain what actions will take place. If there is a subtask you feel is hard to train, you may want to develop a separate outline for training that subtask.
9. Include Skill Practice. Include a reminder to skill practice or write out some skill practice exercises. Skill practice is very beneficial to the soldiers. The skill practice gives them the opportunity to do the task while the trainer or qualified peer trainer is available to point out errors, make corrections, and answer questions. Skill practice exercises should be similar to the performance test.

## SKILL LEVEL 2

10. Develop Performance Test. This may also be called the post test. This is the after-training test you give the soldiers to be sure they learned the task just trained. The statement you read them should be the same as the training statement and pretest. The soldiers must perform the task to the standard called for by the training objective.
11. Record and Report Results of Training. Allow yourself time to tell all the soldiers how well they did on the performance test.

NOTE: If there is no job book for the skill level receiving the training, consider using the soldier's manual or commander's manual for recording the training given.

12. Identify the References. Usually, this will be the soldier's manual for your MOS or the references called for by the soldier's manual task. The reference may include TEC lessons, FMs, ARs, TCs, and other items.

NOTE: The outline for task training is just a checklist for you to use when preparing to conduct training and does not have to be a long, time-consuming drill. It doesn't have to be written, typed, or available for inspection. Many of the points are just reminders to you of things to do while you are training your soldiers. After you have used the job aid a few times; each of the 12 steps will be familiar to you so that you can recall them from memory.



Outline for Task Training Chart

## REFERENCES

FM 21-6, How to Prepare and Conduct Military Training, Nov 75.

## SQT ADMINISTRATION REQUIREMENTS

This task can only be properly verified as a Performance Certification Component (PCC) of the SQT.

## "Outline for Task Training" Job Aid

**For Each Task to be Trained:**

STEPS	PROCEDURE
1	<b>TRAINING OBJECTIVE</b> - task, condition, and standard From: ● Soldier's Manual or ● Commander's/Supervisor's Guidance
2	<b>GATHER REQUIRED RESOURCES</b> - equipment, training aid ● Given in Conditions Statement ● Given in Plt Sgt/Leaders Guidance ● From trainers own experience
3	<b>TRAINING STATEMENT</b> - tells soldier what task he must do and how well he must do it ● Get from task and standard of training objective and put in your own words
4	<b>SAFETY STATEMENT</b> From: ● Soldier's Manual/Range Regulations ● Plt Sgt/Plt Ldr ● Trainer's own experience
5	<b>PRETEST</b> - To identify who needs training. Give only if appropriate. The pretest is the Performance Test, step 10
6	<b>ORIENTATION STATEMENT</b> - tells soldier why the task is important From: ● Supervisor's Guidance or ● Trainer's own experience
7	<b>DEMONSTRATION GUIDELINES</b> - Show soldiers how to do the task Give only what is appropriate.
8	<b>PERFORMANCE STEPS</b> - how to do the task in bite-size steps from Soldier's Manual or other references.
9	<b>SKILL PRACTICE</b> - To allow practice for task proficiency
10	<b>PERFORMANCE TEST</b> - Task and standard comes from training objective. The trainer insures the required conditions are met.
11	<b>RECORD AND REPORT RESULTS OF TRAINING</b> ● Give feedback to soldiers and record in Job Books ● Give input to supervisors on results of training
12	<b>REFERENCES</b> - TEC, FMs, TCs, ARs etc. Identified in Soldier's Manual

# TASK

## 113-571-7001

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### Perform Station/Net Duties

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#### CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. You will insure that you have all applicable unit SOP's, AR 105-31, AR 380-40, FM 24-18 and the CEOI for all nets to be operated at your radio station. Supervision and assistance will normally be available.

#### STANDARDS

This task has been performed correctly when you have insured that current DA Technical Manuals (TM), Army Regulations (AR), and unit/station SOP's are available for station management, shift schedules are being maintained, ECCM and MIJI Reports are being utilized and submitted (as required), entrance lists are being maintained, messages are being transmitted and received in accordance with applicable AR's and ACP's and station maintenance, equipment, and personnel reports are being submitted to higher headquarters as required according to performance measures 1 through 6 below.

#### PERFORMANCE MEASURES

1. Obtain appropriate references.
  - a. Insure current copies of the following are maintained:
    - (1) AR 105-31 (Record Communications).
    - (2) FM 24-18 (Field Radio Techniques).
  - b. Insure that TB 380-41 is present and safeguarded in accordance with current Army regulations.
2. Maintain shift schedules. (Refer to FM 24-18, chap 7, sec X, para 122 thru 126, pp 104 thru 108.)

- a. Check to insure shift schedules are current and being followed.
  - b. Check that oncoming operators are being briefed by outgoing operators on the following:
    - (1) Equipment condition.
    - (2) Unusual occurrences.
    - (3) Frequency changes.
    - (4) Suspected or known instances of enemy jamming.
    - (5) Change or changes due on CEOIs.
3. Submit ECCM (MIJI) Reports. (Refer to task 113-573-7001, and FM 24-18, chap 10, sec IV, para 172 thru 177, pp 135 thru 137.)
- a. Check that radio operators are able to recognize enemy jamming signals.
  - b. Check that radio operators are familiar with INITIAL REPORT message format upon recognition of enemy jamming.
  - c. Check that completed MIJI Reports are properly filled out and forwarded in accordance with unit SOP and CEOI.
  - d. Check that radio operators are familiar with and employ ECCM procedures as listed in unit SOP and equipment manuals applicable to equipment being operated.
4. Maintain AUTHORIZED ENTRANCE LIST. (Refer to TB 380-41.)
- a. Check that an AUTHORIZED ENTRANCE LIST is being maintained.
  - b. Check that operators are familiar with the AUTHORIZED ENTRANCE LIST and that they allow entrance only to those persons on the list.
5. Coordinate message handling. (Refer to AR 105-31, chap 6, pp 6-1 and 6-2.)
- a. Check that messages prepared on DD Form 173 are being prepared in accordance with chap 3 of AR 105-31.



- b. Check that message precedence is being correctly assigned by the drafter of the message in accordance with AR 105-31, chap 3, para 3-9, p 3-2.
  - c. Check that once messages are received for transmission that they are transmitted within the time frame required by their precedence.
  - d. Check that message handling is in accordance with AR 105-31.
6. Submit required reports. (Refer to FM 24-18, chap 10, sec IV, para 172 thru 174, p 135.)
- a. Check that MIJI Reports are prepared and submitted in accordance with local CEOI.
  - b. Submit maintenance, equipment, and personnel management reports as required.

REFERENCES

AR 105-31, Record Communications, Aug 77.

FM 24-18, Field Radio Techniques, Jul 65.

AR 380-40, Policy for Safeguarding and Controlling COMSEC Information, Feb 78.

TB 380-41, Procedure for Safeguarding Accounting, and Supply Control of COMSEC Material (U), Feb 78.

CEOI.

**TASK****113-571-7002**

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**Inspect Station/Net Operations**

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**CONDITIONS**

This task is performed under all weather conditions in a field or a garrison location. You will insure that you have in your possession ACP 124(C), ACP 125(D), (as applicable), FM 24-18, AR 380-5, Operator's and Organizational Maintenance Manuals (as applicable), and CEOI prior to your inspection. Supervision and assistance will normally be available.

**STANDARDS**

This task has been performed correctly when the station/net operations have been inspected, to include transmission and receipt of messages, communication security, submission of station reports, and all deficiencies found have been corrected, according to performance measures 1 through 6.

**PERFORMANCE MEASURES**

1. Obtain and review appropriate references.
  - a. ACP 124(C).
  - b. ACP 125(D).
  - c. AR 380-5.
  - d. CEOI.
  - e. FM 24-18.
  - f. Operator's and Organizational Maintenance Manuals.

2. Check processing of incoming messages. (Refer to ref d thru f.)
  - a. Insure that incoming radiotelegraph, radiotelephone, or radio teletypewriter messages are being properly received, filed, and recorded in the 16 line message format.
  - b. Insure that ENCODED radiotelegraph, radiotelephone, or radio teletypewriter messages are being DECODED prior to delivery (as required) by use of correct ENCODE/DECODE books.
  - c. Insure that incoming radiotelegraph, radiotelephone, or radio teletypewriter messages are being properly recorded in station log and are being properly delivered.
3. Check processing of outgoing messages. (Refer to ref d thru f.)
  - a. Insure that outgoing radiotelegraph, radiotelephone, or radio teletypewriter messages are being properly filed and prepared in the applicable 16 line message format.
  - b. Insure that outgoing radiotelegraph, radiotelephone, or radio teletypewriter messages are being ENCODED (as required) by use of correct ENCODE/DECODE books.
  - c. Insure that outgoing radiotelegraph, radiotelephone, or radio teletypewriter messages are being properly recorded in the station log.
4. Check station logs and forms by insuring that: (Refer to FM 24-18, chap 7, sec IX and X, para 120 thru 126, pp 100 thru 108.)
  - a. DA Form 4158 (Operator's Number Sheet/Log) is complete.
  - b. Separate serial number sheets with separate serial numbers for each station in the net are being maintained (applicable to NCS only).
  - c. A new series of station serial numbers is being initiated at 0001 hours Local or Greenwich time as directed by the Commander.
  - d. A new series of station serial numbers is initiated whenever call signs are changed.
  - e. No erasures are present on the station/net log. Changes will be made by drawing a single line through the errors and initialing.

- f. Operators are properly signing the station/net log when opening/closing the station/net or when being relieved.
5. Check observance of communication security. (Refer to ref a and FM 24-18, chap 7, sec XI, para 127 thru 130, pp 108 thru 111.)
    - a. Insure that all assigned operators are familiar with the provisions of AR 380-5.
    - b. Check physical security of radio station.
      - (1) Insure that CLASSIFIED material is being provided only to those personnel who possess proper clearance and have a NEED TO KNOW.
      - (2) Check to insure that accountability for CLASSIFIED material is being maintained.
      - (3) Insure that CLASSIFIED material is being properly stored.
      - (4) Check for the presence of a CLASSIFIED Material Destruction Plan.
    - c. Insure that transmission security measures are being employed by station personnel.
      - (1) Check station/net discipline.
      - (2) Insure that listening silence is not violated.
      - (3) Insure that unofficial conversations between operators are not taking place.
      - (4) Insure that plain language is not being used in place of authorized prosigns, prowords, or operating signals.
      - (5) Check to insure that only authorized procedures are being used.
  6. Submit required reports. (Refer to FM 24-18, chap 10, sec IV and V, para 172 thru 177, pp 135 thru 137.)
    - a. Submit required maintenance reports and requests.
    - b. Submit security reports.

c. Submit MIJI Reports as required.

REFERENCES

AR 380-5, Department of the Army Supplement to DOD 5200.1-R (DODISPR), Aug 79.

FM 24-18, Field Radio Techniques, Jul 65.

ACP 124(C), w/C1 and 2, Communication Instructions Radiotelegraph Procedure, Jul 69 (U).

ACP 125(D), Communication Instructions Radiotelephone Procedure, Jul 70, w/US Suppl-2, Radiotelephone Procedures for the Conduct of Artillery and Naval Gunfire, Sep 64 (U).

# TASK

## 113-574-1004

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### Operate in Radio Nets

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#### CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. You will insure that you have the current CEOI for the radio net(s) to be operated, applicable TM's for equipment to be operated, and Army Regulations and ACP's as required. Supervision and assistance will normally be available.

#### STANDARDS

This task has been performed correctly when you have properly entered the selected radio net, authenticated upon request of the NCS, transmitted and received traffic as directed by the NCS, performed duties as NCS, and have left and/or closed the net in accordance with applicable operating procedures and ACP for the radio net in which you are operating according to performance measures 1 through 5 below.

#### PERFORMANCE MEASURES

1. Determine operational net to be entered. (Refer to CEOI.)
  - a. Check current CEOI for frequency and call signs of radio net to be entered.
  - b. Check CEOI for mode of operation of radio net to be entered.
  - c. Check to insure that radio set to be used has been properly started and warmed up in accordance with the applicable Operator's and Organizational Maintenance Manual (TM).
2. Request permission to enter net. (Refer to ACP 125(D), chap 3, para 302 thru 308, pp 3-1 thru 3-9.)

- a. Establish communication with the NCS.
- b. Conduct radio check with the NCS.
- c. Request permission to enter net from the NCS.
- d. Authenticate upon request of the NCS.

NOTE: Should the NCS allow you to enter the net without first requesting that you authenticate, you should challenge the NCS to authenticate in order to insure the station responding is the NCS and not the enemy posing as the NCS.

3. Pass traffic as directed by the NCS. (Refer to ACP 125(D), chap 3, para 305, pp 3-4 thru 3-6.)
  - a. Insure radio silence has not been imposed prior to transmitting.
  - b. Contact the NCS and inform him of your message count and the precedence of your message(s).
  - c. Upon receiving permission from the NCS, pass your traffic using proper radio call signs and procedures.
4. Request permission to leave the net from the NCS. (Refer to ACP 125(D), chap 3, para 308, p 3-9.)
  - a. Inform the NCS of your reason for leaving the net.
  - b. Request permission to leave the net from the NCS.
  - c. Authenticate upon request of the NCS.
5. Perform functions of an NCS. (Refer to ACP 125(D), chap 3, para 301 thru 309, pp 3-1 thru 3-11.)
  - a. Open assigned net:
    - (1) Set radio set to assigned frequency.
    - (2) Use net call to call stations in net and identify yourself : the NCS.
    - (3) Insure stations reply in CEOI order.

- (4) Authenticate each station into the net.
- b. Advise substations of condition of net.
  - (1) Free net.
  - (2) Directed net.
  - (3) Listening silence.
- c. Determine message count and precedence of substations (directed net).
- d. Direct traffic flow within net by message precedence (directed net).
- e. Impose and lift radio silence as required.
- f. Monitor radio net at all times.
- g. Maintain net discipline.
- h. Close net.
  - (1) Advise substations of net closure.
  - (2) Advise substations of time and frequency that net will reopen by prearranged code or CEOI item.
  - (3) Authenticate substations out of net.

#### REFERENCES

ACP 125(D), Communication Instructions Radiotelephone Procedure, Jul 70, w/US Suppl-2, Radiotelephone Procedures for the Conduct of Artillery and Naval Gunfire, Sep 64 (U).

CEOI.



**TASK****113-587-7001**

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**Inspect Installed Operational Radio Sets**

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**CONDITIONS**

This task is performed under all weather conditions in a field or a garrison location. You will insure that you have in your possession the applicable Operator's and Organizational Maintenance Manual for the radio set you will inspect, DA Form 2404, Equipment Log Book, and any other pertinent publications. Supervision and assistance will normally be available.

**STANDARDS**

This task has been performed correctly when siting of the radio set has been checked, all components have been inspected for proper installation and grounding, erected antenna system has been checked, operational status of radio set has been determined, DA Form 2404 has been checked, all deficiencies have been corrected or reported, and all required reports have been submitted according to performance measures 1 through 8.

**PERFORMANCE MEASURES**

1. Obtain appropriate references for the radio or radio set you will inspect. (Refer to applicable TMs.)

NOTE: Refer to the applicable Skill Level 1 Task in this manual for the equipment you are inspecting.

2. Check siting of radio set. (Refer to FM 24-18, chap 6, sec II, para 75 thru 77, pp 72 thru 76.)
  - a. Good radio sites should have these characteristics:
    - (1) The best cover and concealment possible.
    - (2) Located relatively high on slope of hill or mountain, but not on open crests, slightly defiladed for concealment.

- (3) Near moist soil for good grounding.
  - (4) Antennas should extend above the surface of the ground and be clear of foliage.
  - (5) If operating on frequencies of 30 MHz and above, communication should be line-of-sight whenever possible.
  - (6) Located so that contact between radio station and message center is maintained by field telephone or messenger.
  - (7) Located in a position readily accessible to the unit commander and his staff.
- b. Avoid these sites:
- (1) At the base of a cliff or a deep ravine.
  - (2) In a tunnel or beneath an underpass or steel bridge.
  - (3) Between buildings, especially steel or reinforced concrete.
  - (4) Close to telephone and telegraph lines or high tension power lines.
  - (5) Next to heavily traveled roads and highways.
3. Check grounding system of radio set(s). (Refer to applicable TM.)
  4. Check antenna system of radio set(s). (Refer to applicable TM.)
  5. Check equipment mountings. (Refer to applicable TM.)
  6. Check tuned radio set. (Refer to applicable TM.)
  7. Correct deficiencies. (Refer to applicable TM.)
    - a. Correct those deficiencies that you, as a team chief, are authorized to correct.
    - b. Consult the applicable TM for the equipment you have inspected to determine your level of maintenance.
    - c. Inspect those deficiencies reported by operator personnel to insure they have been properly corrected.

8. Submit required reports. (Refer to TM 38-750, chap 3, para 3-4c, pp 3-5 thru 3-7.)
  - a. Check completed Operator's Daily Preventive Maintenance Checks and Services as recorded on DA Form 2404 (Equipment Inspection and Maintenance Worksheet).
  - b. Submit required reports to your supervisor, TAMMS section, or support maintenance facility.

#### REFERENCES

FM 24-18, Field Radio Techniques, Jul 65.

TM 38-750, w/C1 thru 3, The Army Maintenance Management System (TAMMS), May 78.

# TASK

## 113-596-7001

### Inspect Construction of a Doublet Antenna

#### CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. You will provide your team with three each Mast AB-155(\*)/U, TM 11-5820-256-10, Antenna Group AN/GRA-50, TM 11-5820-467-15, or sufficient W-1 Antenna Wire for the construction of the doublet antenna to the assigned frequency. Supervision and assistance will normally be available.

#### STANDARDS

This task has been performed correctly when the doublet antenna has been properly cut to frequency in accordance with performance measure 1 of this task and has been erected broadside to the distant station in accordance with performance measures 3 and 4.

#### PERFORMANCE MEASURES

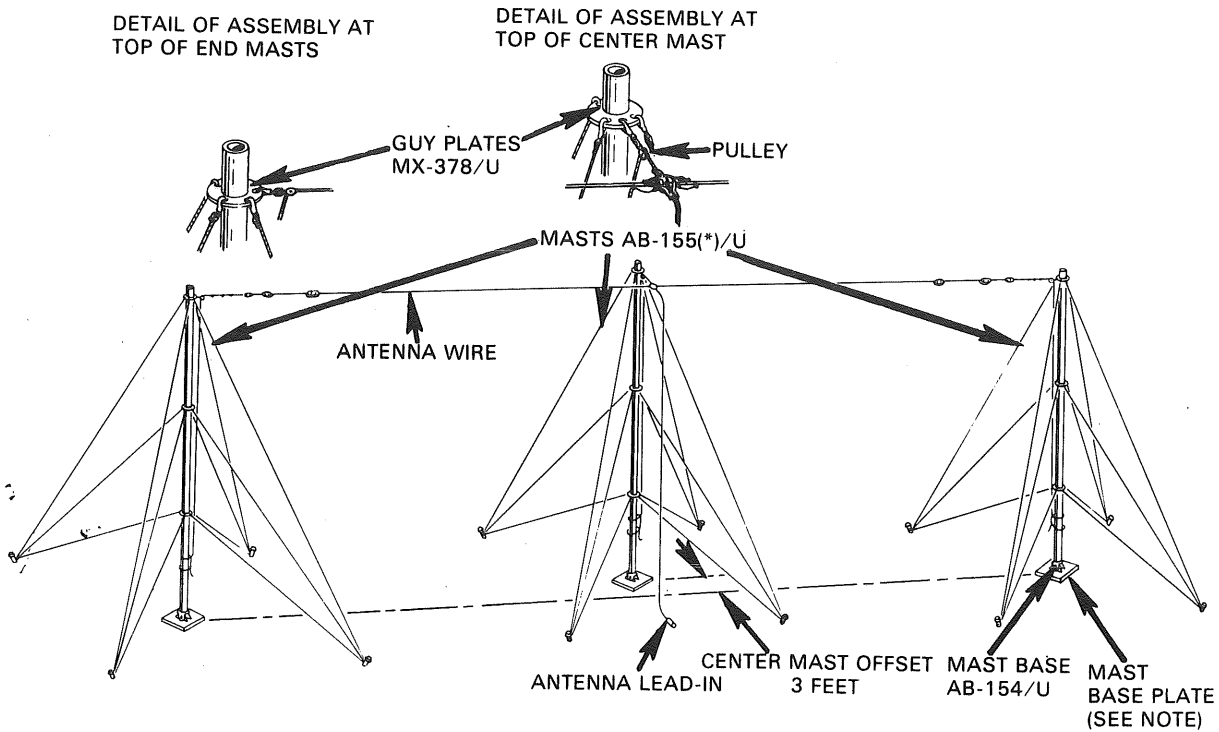
1. Construct antenna using W-1 Antenna Wire. (Refer to TM 11-5820-256-10, chap 2, para 2-6, pp 2-3 thru 2-7.)
  - a. Use formula  $\frac{468}{F}$
  - b. Frequency 2.600 MHz

EXAMPLE:  $\frac{468}{F} = \text{length}$

$$2.6 \frac{180 \text{ Ft.}}{468.}$$

180 Ft. halfwave or 90 Ft. Quarter Wave center fed (fig 1).

- Construct antenna using Antenna Group AN/GRA-50. (Refer to TM 11-5820-467-15, chap 2, para 11, pp 8 thru 14.)



NOTE:  
THE MAST BASE PLATE IS  
USED ONLY WHEN GROUND  
IS SOFT OR SANDY.

113-596-7001

Figure 1. Doublet Antenna, Erection Completed.

NOTE: Mast base plates are used in sandy soil.

- Prepare Mast AB-155(\*)/U for erection. (Refer to fig 2, and TM 11-5820-256-10, chap 2, para 2-6c, pp 2-3 and 2-4.)

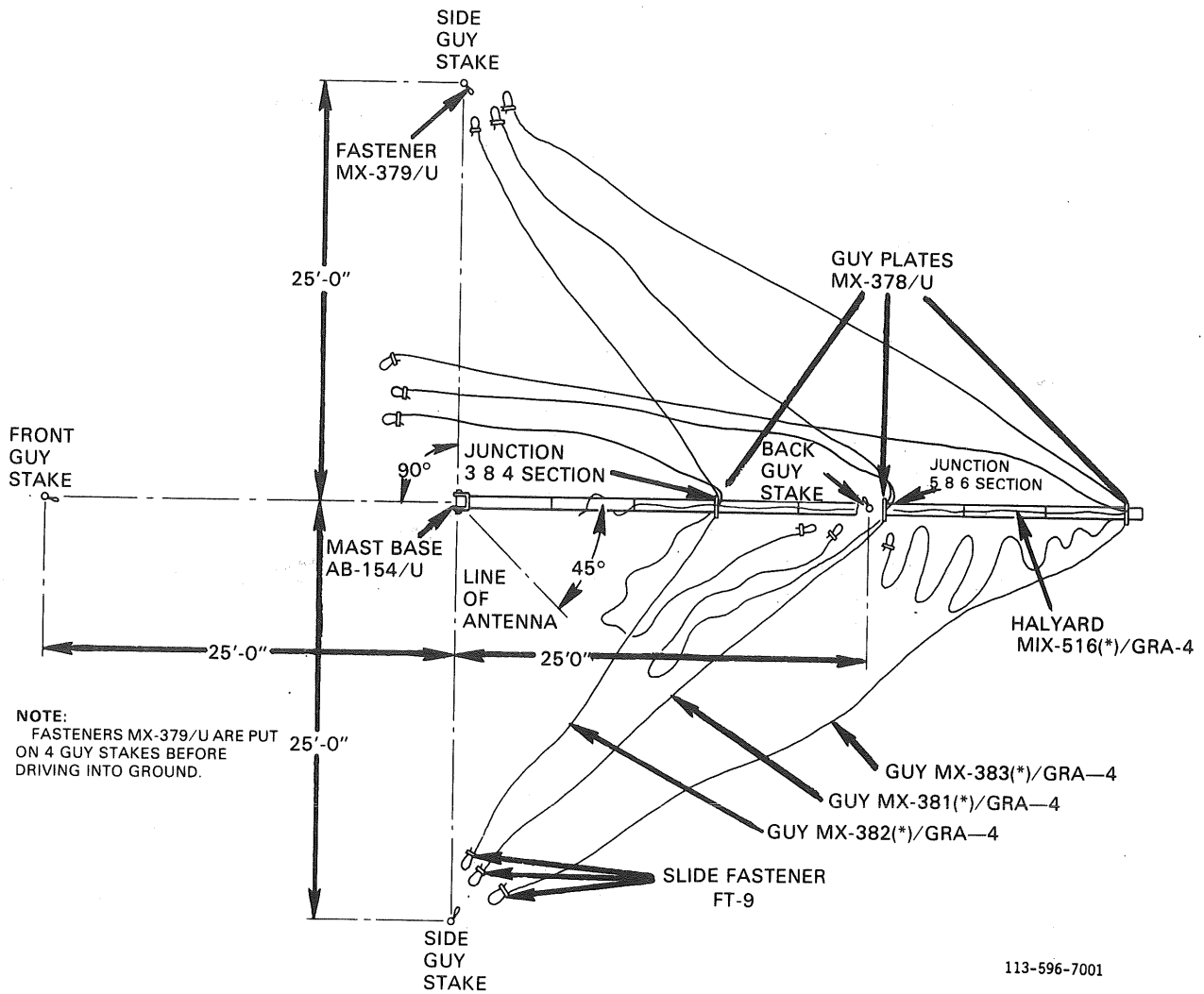
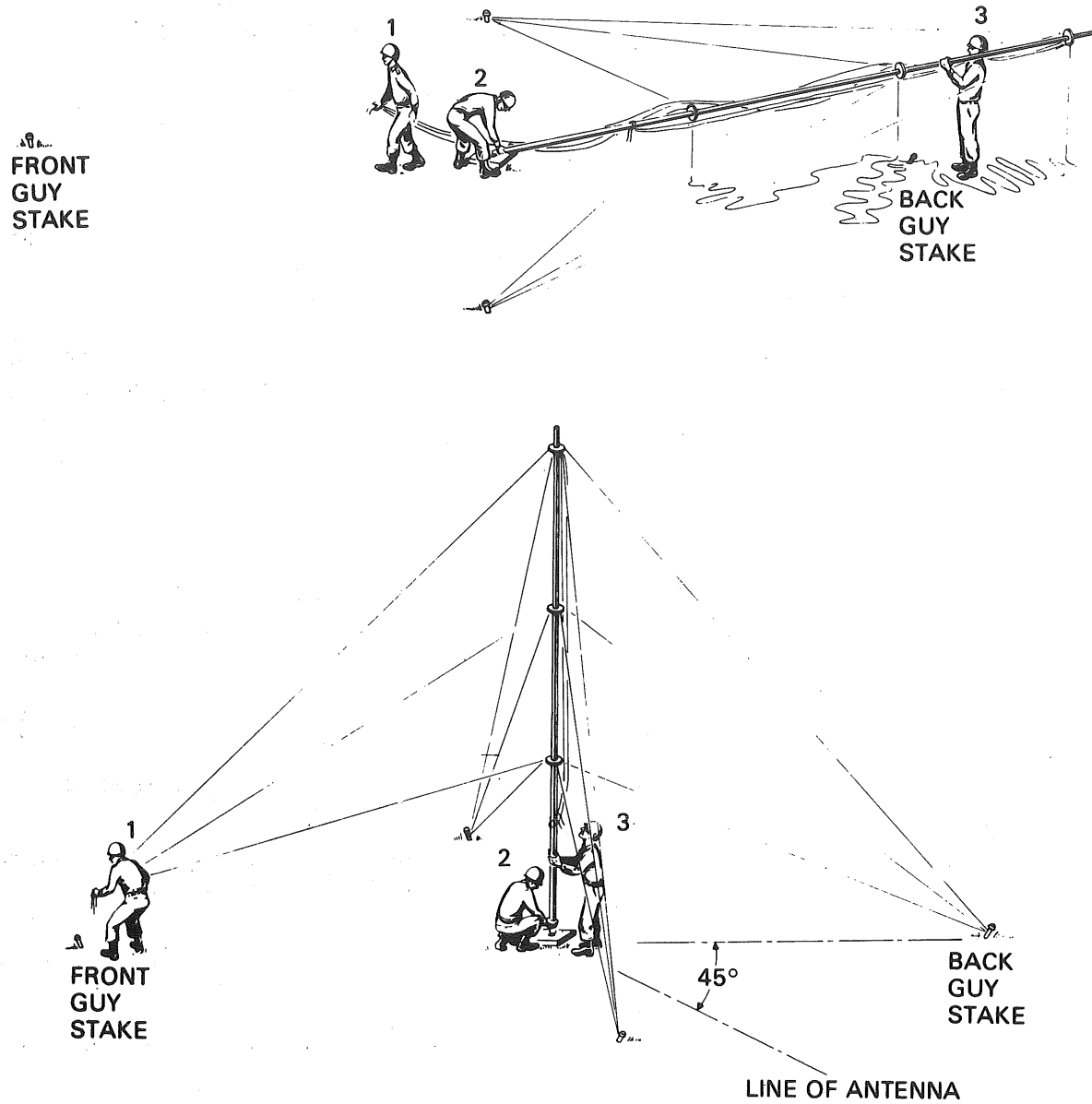


Figure 2. Preparing Mast AB-155(\*)/U for Erection.

4. Erect antenna. (Refer to fig 3, and TM 11-5820-256-10, chap 2, para 2-6d, p 2-4.)
  - a. Antenna must be broadside to the most distant station. Determine azimuth by using compass.

**SKILL LEVEL 2**



**Figure 3. Raising Assembled Mast AB-155(\*)/U.**

- b. Connect antenna lead-in to radio set. (Refer to fig 1, and TM 11-5820-256-10, chap 2, para 2-6g, p 2-4.)

REFERENCES

TM 11-5820-256-10, w/C1 thru 4, Operator's Manual: Radio Set AN/GRC-26D, Jun 69.

TM 11-5820-467-15, w/C3, 5, and 6, Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual: Antenna Group AN/GRA-50, Jul 61.



# TASK

## 113-596-7014

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### Direct Installation of RC-292 Antenna

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#### CONDITIONS

This task is performed in a tactical or nontactical situation under fair weather conditions, and may be performed in an NBC environment. Given a requirement and --

1. RC-292 Antenna.
2. Designated site for installation.
3. CEOI Extract.
4. Installation team (total two personnel).

#### STANDARDS

Task standard has been met when the installation site has been evaluated for natural and man-made hazards, tactical considerations, and the installation directed within 20 minutes.

#### PERFORMANCE MEASURES

**CAUTION: DO NOT INSTALL CLOSER THAN TWICE THE ERECTED HEIGHT TO POWER LINES.**

1. Evaluate installation site. (Refer to TB Sig 291, para 1b, p 1; para 3a(1), p 2; FM 24-18, chap 6, sec 1, para 75 and 76, pp 72 thru 75; TC 30-22, chap VI, pp 29 thru 61.)
  - a. Prior to installing or erecting any equipment, survey the area carefully for location of power lines, their height above ground level, and their proximity to the installation location.

- b. A position beneath a steel bridge or in the vicinity of steel or reinforced concrete structures should not be selected due to high RF absorption.
  - c. Locations adjacent to heavily traveled roads and highways or generator's can cause electrical interference.
  - d. The location should provide the best cover and concealment available consistent with good transmission and reception.
  - e. All positions should be properly camouflaged for protection against both aerial and ground observation. However, the antenna should not touch trees, brush, or camouflage material.
  - f. Open crests of hills and mountains must be avoided. A slightly defiladed position just behind the military crest gives better concealment and sometimes provides better transmission.
  - g. Antenna masking is the technique of hiding radio signals behind terrain.
  - h. When at all possible, select antenna sites that provide hills or mountains along the transmission path to the enemy.
  - i. Hills and forests also serve as obstacles.
2. Direct layout of installation site. (Refer to TM 11-5820-348-15, chap 2, sec II, para 2-4 and 2-5a(1), p 2-3.)
    - a. Positioning of base plate and stake.
    - b. Assembly of six mast sections AB-35/TRC-7.
    - c. Marking and driving of guy stakes.
  3. Direct assembly of antenna. (Refer to TM 11-5820-348-15, chap 2, sec II, para 2-5, pp 2-3 and 2-4; para 2-6a thru c, pp 2-4 and 2-5.)
    - a. Assembly of mast.
      - (1) Positioning of guy plates.
      - (2) Positioning of assembled mast.
    - b. Assembly of antenna.

(1) Verify operating frequency.

(2) Verify usage of antenna frequency chart.

(3) Assembly of Antenna Base MP-68.

c. Mounting antenna base.

d. Connecting of RF cable CG-107A/U.

e. Connection of guys.

(1) Routing.

(2) Securing.

(3) Tensioning.

4. Direct erection of antenna. (Refer to TM 11-5820-348-15, chap 2, sec II, para 2-6f, g, p 2-5.)

a. Preparation for raising.

b. Raising.

c. Adjusting.

#### REFERENCES

FM 24-18, Field Radio Techniques, Jul 65.

TC 30-22, Battlefield Survival and Radioelectronic Combat, Jul 78.

TB SIG 291, Safety Measures To Be Observed When Installing and Using Whip Antennas, Field Type Masts, Towers, Antennas, and Metal Poles that are used with Communication, Radar, and Direction Finder Equipment, Jun 56.

TM 11-5820-348-15, w/C2 and 4, Organizational, Direct Support, General Support, and Depot Maintenance Manual: Antenna Equipment RC-292, May 66.

**TASK****113-596-7015**

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**Direct Dismantling of an Installed RC-292 Antenna**

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**CONDITIONS**

This task is performed in a tactical or nontactical situation, under all weather conditions except electrical, wind, or ice storms, and may be performed in an NBC environment. Given a requirement and --

1. Installed RC-292.
2. Team of two personnel.

**STANDARDS**

Task standard has been met when the antenna has been lowered without damage, disassembled, inventoried, and packed in accordance with performance measures 1 through 4 within 15 minutes.

**PERFORMANCE MEASURES**

**WARNING:** Disconnect the radio set from the antenna before performing any disassembly.

1. Direct lowering of antenna. (Refer to TM 11-5820-348-15, chap 5, sec I, para 5-1, p 5-1; chap 2, sec II para 2-6f thru g, p 2-5.)

**CAUTION:** Survey antenna site to locate any power lines prior to lowering the antenna.

- a. Loosening.
  - (1) One team member to grasp guys (upper and lower) at one guy stake.
  - (2) The other team member to release the guys from base plate cleat.
- b. Lowering.
  - (1) First team member holds tension on guys, walks toward antenna; allowing the antenna to lower slowly; pivoting against one other set of guys.

- (2) Second team member walking backwards, helping to ease the mast to the ground.
2. Direct disassembly. (Refer to TM 11-5820-348-15, chap 5, sec I, para 5-1, p 5-1.)
  - a. Removal and coiling of CG-107/u.
  - b. Removal and winding of guys on Reels, RL-28 (two on a reel).
  - c. Removal and disassembly of antenna elements.
  - d. Removal of Antenna Base, MP-68.
  - e. Disassembly of Mast Sections AB-35/TRC-7.
  - f. Removal of guy stakes, swivel base, and base plate.
3. Check inventory and cleaning. (Refer to TM 11-5820-348-15, chap 1, sec II, para 1-6, p 1-2; chap 3, para 3-7, p 3-2.)
  - a. Direct cleaning and grouping of components (fig 1).

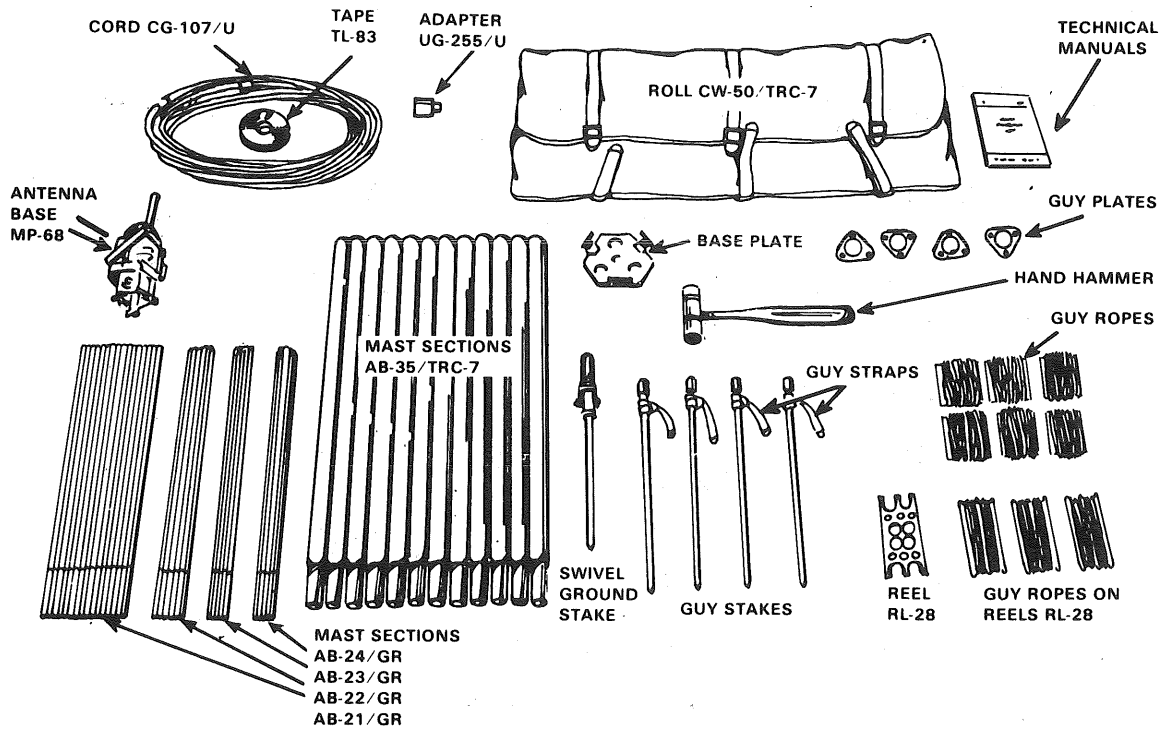


Figure 1

## b. Inventory components.

## QTY

2	Adapter, Connector UG-255/U (1 of 2 is a spare)
1	Antenna Base MP-68: SC-D-17306, 17307: 17308; 80063
1	Cable Assembly, Radio Frequency: Cord CG-107A/U (68 ft 3 in) SC-DL-22831; 80063
8	Guy: SC-D-16844-1; 80063 (2 of 8 are spare parts)
1	Mast Base AB-154/U: SC-D-28052; 80063
16	Mast Section AB-21/GR: SC-D-13614-AB21GR; 80063 (4 of 16 are pure parts)
6	Mast Section AB-22/GR: SC-D-13614-AB22GR; 80063 (2 of 6 are spare parts)
6	Mast Section AB-23/GR: SC-D-13614-AB23GR; 80063 (2 of 6 are spare parts)
6	Mast Section AB-24/GR: SC-D-13614-AB24GR; 80063 (2 of 6 are spare parts)
12	Mast Section AB-35/TRC-7: SC-D-16842; 80063
1	Plate, Base: SC-D-17261-1; 80063
4	Plate, Guy: SC-D-17262-2; 80063 (2 of 4 are spare parts)
4	Reel RL-28 (1 of 4 is a spare part)
4	Stake Guy: SC-D-33999; 80063 (1 of 4 is a spare part)
6	Stake Guy GP-2: Steel SC-B-61956; 80063 (For use in Arctic areas.) (3 of 6 are spare parts)
4	Strap, Webbing: SC-D-16844; 80063 (1 of 4 is a spare part)
1	Tape TL-83

## 4. Direct packing of components. (Refer to TM 11-5820-348-15, chap 5, sec I, para 5-2, p 5-1.)

- a. Mast Sections AB-35/TRC-7 and TM stacked in top broad pocket and strapped (fig 2).
- b. Antenna elements inserted into inner pocket beside mast sections, and strapped.
- c. Antenna Base, MP-68 in the short, broad pocket and strapped.
- d. Swivel base, AB-154/U, and guy stakes (with attached guy straps) in long pocket beside MP-68.
- e. Base plate, guy plates, guy ropes, tape, adapters, and hammer in long pocket beside antenna elements.
- f. CG-107/U coiled and positioned on top.
- g. End flaps folded in and strapped.
- h. Side flaps folded in and strapped.

NOTE: It may require both personnel to squeeze, hold, and strap the antenna.

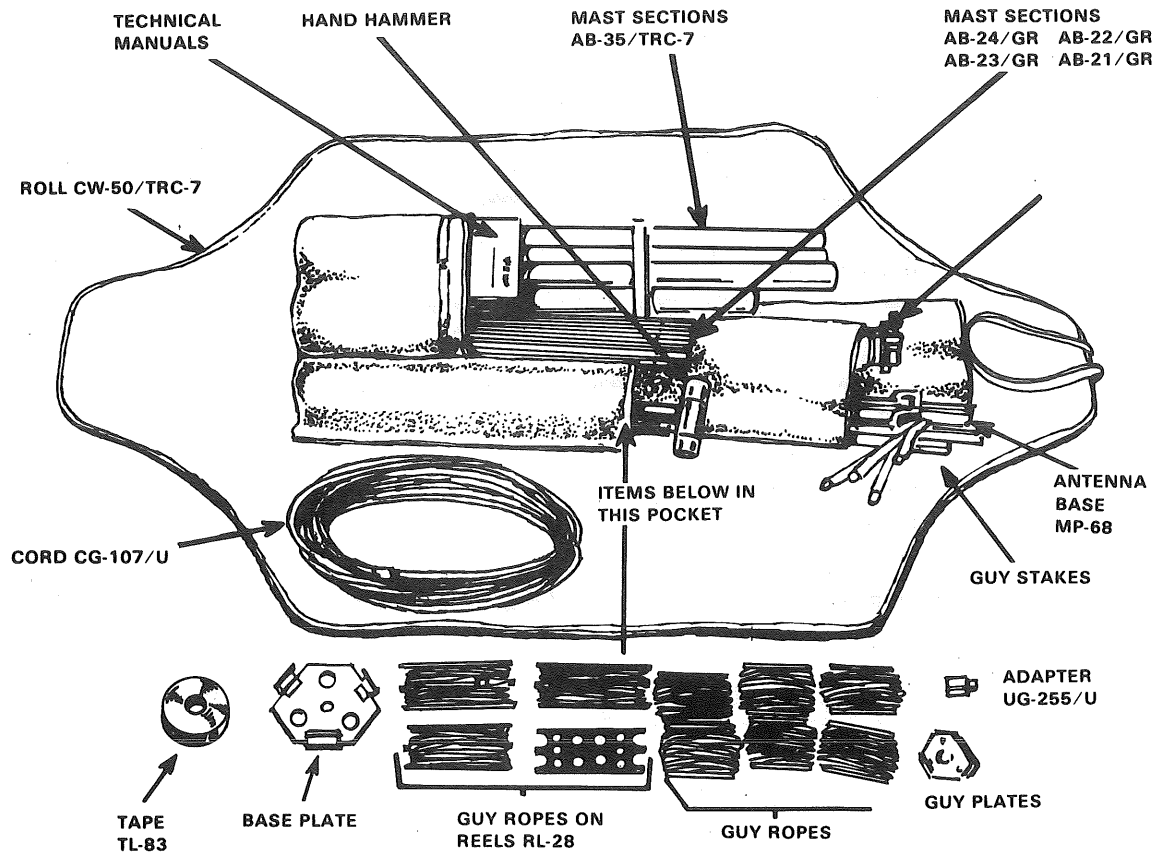


Figure 2. RC-292 packing in Bag, Roll, CW-50/TRC-7.

REFERENCES

TM 11-5820-348-15, w/C2 and 4, Organizational, Direct Support, General Support, and Depot Maintenance Manual: Antenna Equipment RC-292, May 66.

**TASK****113-601-7001**

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**Inspect Installed Operational Generator Sets**

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**CONDITIONS**

This task is performed under all weather conditions in a field or a garrison location. You will insure that you have the Operator's and Organizational Maintenance Manual for the generator set(s) you will inspect, DA Form 2404, Equipment Log Book, and any other pertinent publications. Supervision and assistance will normally be available.

**STANDARDS**

This task has been performed correctly when the selected generator set has been inspected for proper siting and grounding, correct setting of all controls, meters and gauges, all electrical connections properly made, proper storage of gasoline, all deficiencies have been corrected or reported, and all required reports have been submitted, according to performance measures 1 through 8.

**PERFORMANCE MEASURES**

1. Select generator set(s) to be inspected.
  - a. Generator Set 1.5 KW (TM 5-6115-323-14).
  - b. Generator Set 3 KW (TM 5-6115-271-14, TM 5-6115-365-15).
  - c. Generator Set 5 KW (TM 5-6115-332-14, TM 5-6115-365-15).
  - d. Generator Set 10 KW (TM 5-6115-275-14, TM 5-6115-365-15).
2. Check siting of generator set(s). Major points to check are: (Refer to applicable TM.)
  - a. Generator is provided with an adequate foundation.



- b. Generator does not exceed tilt of 15 degrees in any direction.
  - c. Drainage system is present for water runoff.
  - d. For trailer mounted generator sets, check the following:
    - (1) Check location and siting of trailer.
    - (2) Check trailer brakes.
    - (3) Check leg support of trailer.
3. Check grounding system. (Refer to applicable TM.)
  4. Check controls, meters, and gauges for proper settings. (Refer to applicable TM.)
    - a. Generator Set 10 KW. (Refer to Task 113-601-2003.)
    - b. Generator Set 5 KW. (Refer to Task 113-601-2001.)
    - c. Generator Set 3 KW. (Refer to Task 113-601-2005.)
    - d. Generator Set 1.5 KW. (Refer to TM 5-6115-323-14, chap 2, sec I, para 2-1 thru 2-2, pp 2-1 thru 2-4.)
  5. Check electrical connections and cables. (Refer to applicable TM.)
    - a. Check that load cables are properly connected to load terminals.
    - b. Check battery cables and connectors (as applicable) for tightness, corrosion, chips, and cracks.
  6. Check gasoline storage. (Refer to applicable TM.)
    - a. Check for presence of rubber "O" ring gaskets on tops of gasoline cans.
    - b. Insure auxiliary fuel cans are stored properly.
    - c. Insure auxiliary fuel cans are free from internal or external corrosion.
    - d. Insure emergency fire points are established and located so as to provide immediate access to generator operators.

7. Correct deficiencies. (Refer to appropriate TM.)
  - a. Correct those deficiencies that you, as a team chief, are authorized to correct.
  - b. Consult the applicable TM for the equipment you have inspected to determine your level of maintenance.
  - c. Inspect those deficiencies reported by operator personnel to insure they have been properly corrected.
8. Submit required reports. (Refer to TM 38-750, chap 3, para 3-4c, pp 3-5 thru 3-7.)
  - a. Check completed Operator's Daily Preventive Maintenance Checks and Services as recorded on DA Form 2404 (Equipment Inspection and Maintenance Worksheet).
  - b. Submit required reports to your supervisor, TAMMS section, or support maintenance facility.

## REFERENCES

TM 5-6115-271-14, w/C1, Operator/Crew, Organizational Intermediate (Field), (Direct and General Support) and Depot Maintenance Manual: Generator Set, Gasoline Engine Driven, Skid Mounted, Tubular Frame, 3 KW, 3 Phase, AC 120/208 and 120/240 V, 28 V DC, Aug 76.

TM 5-6115-275-14, Operator, Organizational, Intermediate (Field), (Direct Support and General Support), and Depot Maintenance Manual: Generator Set, Gasoline Engine Driven, Skid Mounted, Tubular Frame, 10 KW, AC, 120-208 V, Single Phase, Jun 77.

TM 5-6115-323-14, Operator/Crew, Organizational, Intermediate (Field), (Direct Support and General Support) and Depot Maintenance Manual: Generator Set 1.5 KW, Single Phase, AC, 120/240 V, 28 V DC, Jul 76.

TM 5-6115-332-14, Operator, Organizational, Intermediate (Field), Direct Support, General Support, and Depot Maintenance Manual: Generator Set, Tactical, Gasoline Engine: Air Cooled, 5 KW, AC, 120/240 V, Single Phase, 120/208 V, 3 Phase, Skid Mounted, Tubular Frame, Dec 77.

TM 5-6115-365-15, Operator, Organizational, Direct Support, General Support and Depot Maintenance Manual (Including Repair Parts and Special Tools List): Generator Sets, Gasoline and Diesel Engine Driven, Trailer Mounted, May 66.

TM 38-750, w/C1 thru 3, The Army Maintenance Management System (TAMMS), May 78.

**TASK****113-611-1001**

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**Select Team Radio Site**

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**CONDITIONS**

This task is performed under all weather conditions in a field or a garrison location. You will be provided with an Operations Order, a Letter of Instruction (LOI) or verbal orders from the commanding officer (VOCO) to establish a team radio site. You will utilize the Operations Order, LOI or VOCO, unit SOP, current maps, and FM 24-18 to select a team radio site. Supervision and assistance will normally be available.

**STANDARDS**

This task has been performed correctly when a team radio site has been selected from information and instructions provided you in the Operations Order, LOI, VOCO, and unit SOP and an alternate radio site has been selected in event communications cannot be obtained at the primary site according to performance measures 1 through 4.

**PERFORMANCE MEASURES**

1. Receive instructions. (Refer to Operations Order, LOI, or VOCO.)
  - a. Determine map grid coordinates for your radio station.
  - b. Determine support requirements for your radio station.
    - (1) Fuel.
    - (2) Oil.
    - (3) Rations and water.
    - (4) Maintenance.
    - (5) Troop health and welfare.

- c. Determine CEOIs and applicable security codes needed for operation of your radio station.
  2. Analyze technical requirements. (Refer to FM 24-18, chap 6, sec I, para 75, pp 72 thru 74.)
    - a. Determine best location within assigned GRID coordinates for your radio station.
    - b. Avoid man-made obstructions when locating radio site.
  3. Analyze tactical requirement. (Refer to FM 24-18, chap 6, sec I, para 76, pp 74 thru 75.)
    - a. Determine local command requirements for location of radio site.
    - b. Determine cover and concealment requirements for radio site.
    - c. Utilize practical considerations when locating radio site to include:
      - (1) Antenna siting.
      - (2) Remote operation.
      - (3) Antenna concealment.
      - (4) Camouflage.
    - d. Insure contact can be maintained at all times between the radio site and the serviced headquarters or communications center by one of the following means:
      - (1) Field telephone.
      - (2) Messenger.
  4. Determine best location for site. (Refer to FM 24-18, chap 6, sec I, para 77, pp 75 thru 76.)
    - a. Coordinate with the serviced headquarters or communications center on final site selected.
    - b. Select an alternate radio site in event radio communication cannot be established at the primary site.

**REFERENCE**

FM 24-18, Field Radio Techniques, Jul 65.

# TASK

## 113-618-7001

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### Inspect Installed Operational Radio Wire Integration System

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#### CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. You will be provided with:

1. TM 11-5805-262-12.
2. TM 11-5820-401-12.
3. TM 11-5135-15.
4. TM 38-750.
5. FM 24-18.
6. Equipment Log Book.
7. ACP 125(D).
8. DA Pam 310-4.
9. and DA Form 2404.

Supervision and assistance will be available.

#### STANDARDS

This task has been performed correctly when the inspected radio-wire integration system is installed properly, operated efficiently, and operator personnel are complying with prescribed station maintenance procedures according to performance measures 1 through 7.

## PERFORMANCE MEASURES

1. Obtain and review appropriate references. (Refer to DA PAM 310-4.)
  - a. Operator's and Organizational Maintenance Manual.
  - b. Equipment Log Book.
2. Check radio set. (Refer to TM 11-5820-401-12, chap 2, sec II, para 2-5 thru 2-13, pp 2-3 thru 2-43.)
  - a. Insure radio set is properly installed.
  - b. Insure radio set controls are properly preset.
  - c. Check operating frequency of radio set against current CEOI.
3. Check Radio Set Controls or Radio Set Control Group. (Refer to TM 11-5820-401-12, chap 6, sec II, para 6-8 thru 6-10, pp 6-6 thru 6-18.)
  - a. Check controls of Radio Set Control AN/GSA-7.
  - b. Check controls of Radio Set Control Group AN/GRA-39.
  - c. Check controls of Radio Set Control Group AN/GRA-6.
4. Check wire terminating equipment. (Refer to TM 11-5820-401-12, chap 6, sec II, para 6-8b(1), 6-9b and 6-10a(1), pp 6-6, 6-9, and 6-15.)
  - a. Check interconnection of Radio Set Control AN/GSA-7 and Switchboard, Manual SB-22 or SB-22A/PT.
  - b. Check interconnection of Radio Set Control Group AN/GRA-6 or AN/GRA-39 and Switchboard, Manual SB-22 or SB-22A/PT.
  - c. Check installation of Switchboard, Manual SB-22 or SB-22A/PT.
5. Check all connections. (Refer to TM 11-5820-401-12, chap 6, sec II, para 6-8b(1), 6-9b and 6-10a(1), pp 6-6, 6-9, and 6-15.)
  - a. Check to insure that Radio Set Control AN/GSA-7 and SB-22 or SB-22A/PT are connected as shown in figure 1 of Task 113-618-1001.

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- b. Check to insure that Radio Set Control Group AN/GRA-6 and SB-22 or SB-22A/PT are connected as shown in figure 4 of task 113-618-1001.
  - c. Check to insure that Radio Set Control Group AN/GRA-39 and SB-22 or SB-22A/PT are connected as shown in figure 5 of task 113-618-1001.
6. Check processing of traffic. (Refer to TM 11-5820-401-12, chap 6, sec II, para 6-8b(2), 6-9c thru d and 6-10b, pp 6-6 thru 6-8, 6-9 thru 6-14, and 6-15 thru 6-17, and task 113-618-2001.)
- a. Check to insure that switchboard subscriber is using radio procedures and call signs when using the RWI system.
  - b. Check processing of traffic with an operator present at AN/GSA-7.
  - c. Check processing of traffic with no operator present at AN/GSA-7.
  - d. Check processing of traffic when Radio Set Control Group AN/GRA-6 is used in RWI system.
  - e. Check processing of traffic when Radio Set Control Group AN/GRA-39 is used in RWI system.
7. Submit required reports. (Refer to FM 24-18, chap 10, sec IV and V, para 172 thru 177, pp 135 thru 137.)
- a. Check to insure that DA Form 2404 (Equipment Inspection and Maintenance Worksheet) is being maintained by operator personnel as a daily maintenance form.
  - b. Check to insure that all uncorrected faults that do not affect station operation have been reported to the unit TAMMS section or support maintenance.
  - c. Check to insure that required reports, i.e., station status, substation status, and signal reports, are being submitted to higher headquarters.
  - d. Check to insure that all uncorrectable faults found, which affect station operation, have been reported to support maintenance, and needed parts or equipment have been requisitioned or replaced.

## REFERENCES

TM 11-5820-401-12, w/C1 thru 3, Operator's and Organizational Maintenance Manual, Including Repair Parts and Special Tool Lists for AN/VRC-12 Series Radio Sets, Sep 72.

TM 11-5135-15, w/C3 thru 6, 8, and 9, Radio Set Control AN/GSA-7, May 58.

TM 11-5805-262-12, w/C2 and 4 thru 7, Operator's and Organizational Maintenance Manual: Switchboards, Telephone Manual, SB-22/PT and SB-22A/PT, Dec 60.

TM 38-750, w/C1 thru 3, The Army Maintenance Management System (TAMMS).

FM 24-18, Field Radio Techniques, Jul 65.

ACP 125(D), Communication Instructions Radiotelephone Procedure, Jul 70, w/US Suppl-2, Radiotelephone Procedures for the Conduct of Artillery and Naval Gunfire, Sep 64 (U).

DA PAM 310-4, Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8, and 9), Supply Bulletins and Lubrication Orders, Dec 79. (Available in microfiche only.)



# TASK

## 113-622-7001

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### Inspect Installed Operational Radio Set Control Groups

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#### CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. You will insure that you have in your possession the Operator's and Organizational Maintenance Manual for the Radio Set Control Group you will inspect, DA Form 2404, and any other pertinent publications. Supervision and assistance will normally be available.

#### STANDARDS

This task has been performed correctly when you have inspected the installation of selected Radio Set Control Groups, insured all components have been properly installed without damage to any component, all cable, wire and electrical connections have been inspected, all deficiencies have been corrected or reported, and all required reports have been submitted according to performance measures 1 through 7.

#### PERFORMANCE MEASURES

1. Select Radio Set Control Group to be inspected. (Refer to applicable TM.)
2. Obtain appropriate references.
  - a. Radio Set Control Group AN/GRA-39 (TM 11-5820-477-12, TM 11-5820-401-12, task 113-622-1002, and task 113-622-2002).
  - b. Radio Set Control Group AN/GRA-6 (TM 11-5038, TM 11-5820-401-12, task 113-622-2001, and task 113-622-1001).
3. Check electrical connections. (Refer to TM 11-5820-477-12, chap 2, sec II, para 2-1 thru 2-5, pp 2-1 thru 2-5, and TM 11-5820-401-12, chap 6, sec II, para 6-8 thru 6-10, pp 6-6 thru 6-17, fig 6-3 and 6-10.)

- a. When checking Radio Set Control Group AN/GRA-39 insure the following:
    - (1) Field Wire WD-1/TT has no open breaks or frayed insulation between remote and local unit.
    - (2) Batteries are properly installed in both remote and local unit.
    - (3) Radio Set Control Group AN/GRA-39 is properly installed.
  - b. When checking Radio Set Control Group AN/GRA-6 insure the following:
    - (1) Field Wire WD-1/TT has no open breaks or frayed insulation between remote and local unit.
    - (2) Cable Assembly, Special Purpose, Electrical CX-7474/U is properly connected between local unit and receiver-transmitter.
    - (3) Batteries are properly installed in both remote and local unit.
    - (4) Handsets are properly connected.
4. Check PUSH-TO-TALK operations. (Refer to TM 11-5820-401-12, chap 6, sec II, para 6-8 and 6-10, pp 6-6 thru 6-8 and pp 6-15 thru 6-17.)
- a. Check PUSH-TO-TALK operation of Radio Set Control Group AN/GRA-39 by insuring the following:
    - (1) Starting procedures for local unit have been performed.
    - (2) Starting procedures for remote unit have been performed.
    - (3) Radio set can be keyed from local unit.
    - (4) Radio set can be keyed from remote unit.
  - b. Check PUSH-TO-TALK operation of Radio Set Control Group AN/GRA-6 by insuring the following:
    - (1) Starting procedures for local unit have been performed.

- (2) Starting procedures for remote unit have been performed.
- (3) Radio set can be keyed from local unit.
- (4) Radio set can be keyed from remote unit.
5. Check monitoring operations. (Refer to TM 11-5820-401-12, chap 6, sec II, para 6-8 and 6-10, pp 6-6 thru 6-8 and pp 6-15 thru 6-17.)
6. Correct deficiencies. (Refer to appropriate TM.)
  - a. Correct those deficiencies that you, as a team chief, are authorized to correct.
  - b. Consult the applicable TM for the equipment you have inspected to determine your level of maintenance.
  - c. Inspect those deficiencies reported by operator personnel to insure they have been properly corrected.
7. Submit required reports. (Refer to TM 38-750, chap 3, para 3-4c, pp 3-5 thru 3-7.)
  - a. Check completed Operator's Daily Preventive Maintenance Checks and Services as recorded on DA Form 2404 (Equipment Inspection and Maintenance Worksheet).
  - b. Submit required reports to your supervisor, TAMMS section, as required.

#### REFERENCES

TM 11-5038, w/C3, 4, 6 thru 9, Control Group AN/GRA-6, Apr 51.

TM 11-5820-401-12, w/C1 thru 3, Operator's and Organizational Maintenance Manual, Including Repair Parts and Special Tool Lists for AN/VRC-12 Series Radio Sets, Sep 72.

TM 11-5820-477-12, w/C1, Operator's and Organizational Maintenance Manual: Radio Set Control Groups AN/GRA-39, AN/GRA-39A, and AN/GRA-39B, Jul 75.

TM 38-750, w/C1 thru 3, The Army Maintenance Management System (TAMMS), May 78.

**TASK****113-623-7002**

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**Inspect Performance of Preventive Maintenance at  
Team Level**

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**CONDITIONS**

This task is performed under all weather conditions in a field or a garrison location. You will insure that you have the correct Operator's and Organizational Maintenance Manual for the equipment you will inspect.

1. Equipment Log Book (if applicable).
2. DA PAM 310-7.
3. DA Form 2404.
4. DA Form 2407.
5. TM 38-750.
6. Unit SOP.

Supervision and assistance will be available.

**STANDARDS**

This task has been performed correctly when you have inspected the performance of preventive maintenance at your team level, have insured that operators are utilizing appropriate references, correcting all correctable faults found during maintenance periods, are properly recording all uncorrectable faults on DA Form 2404, and are submitting maintenance reports as required by unit SOP according to performance measures 1 through 5.

PERFORMANCE MEASURES

1. Obtain appropriate references. (Refer to applicable TM.)
2. Check performance of maintenance. (Refer to applicable TM's.)
  - a. Insure operators are performing Daily Preventive Maintenance Checks and Services.
    - (1) Check Equipment Log Book for completed DA Form 2404 (Equipment Inspection and Maintenance Worksheet) used to record daily maintenance checks.
    - (2) Check applicable operator's TM for Daily Preventive Maintenance Checks and Services table/chart and insure services are being performed by visual spotcheck of equipment.
  - b. Insure operators are performing Weekly Preventive Maintenance Checks and Services.
    - (1) Check Equipment Log Book for completed DA Form 2404 used to record weekly maintenance checks.
    - (2) Check applicable operator's TM for Weekly Preventive Maintenance Checks and Services table/chart and insure services are being performed by visual spot check of equipment.
  - c. Insure operators are performing Monthly Preventive Maintenance Checks and Services.
    - (1) Check Equipment Log Book for completed DA Form 2404 used to record monthly maintenance checks.
    - (2) Check applicable operator's TM for Monthly Preventive Maintenance Checks and Services table/chart and insure services are being performed by visual spot check of equipment.

3. Insure that faults found during maintenance performance are corrected. (Refer to applicable TM.)
  - a. Insure all MWOs have been applied to the equipment being inspected.
  - b. Insure all applicable MWOs, having been applied, are correctly entered on DA Form 2408-5 (Equipment Modification Record) of the Equipment Log Book.
  - c. Check that all correctable faults found on the equipment being inspected have been corrected at the operator's level (if applicable).
  - d. Check that all uncorrectable faults found on the equipment being inspected have been properly recorded and reported.
4. Check completed TAMMS Forms. (Refer to TM 38-750, chap 3, para 3-4c, pp 3-5 thru 3-7.)
  - a. Check that heading of DA Form 2404 has been properly filled out.
  - b. Check that DA Form 2408-5 has been properly filled out and maintained in the Equipment Log Book (when applicable). (Refer to TM 38-750, chap 4, para 4-8, pp 4-10 thru 4-12.)
  - c. Check DA Form 2407 (Maintenance Request Form) to insure it has been properly filled out to request support maintenance. (Refer to TM 38-750, chap 3, para 3-8, pp 3-21 thru 3-23.)
5. Submit required reports.
  - a. Submit completed operator's Daily, Weekly, or Monthly Preventive Maintenance Checks and Services reports (as recorded on DA Form 2404) to your supervisor, TAMMS section or support maintenance facility.
  - b. Prepare and submit after action inspection reports as required.

#### REFERENCES

TM 38-750, w/C1 thru 3, The Army Maintenance Management System (TAMMS), May 78.

DA PAM 310-7, Military Publications: US Army Equipment Index of Modification Work Orders, Nov 79.



# Appendix A

## REFERENCES

### ARMY REGULATIONS (AR)

105-31	Record Communications
108-2	Army Training and Audiovisual Support
380-5	Department of the Army Supplement to DOD 5200.1-R
380-40	Policy for Safeguarding and Controlling COMSEC Information
600-9	The Army Physical Fitness and Weight Control Program
600-200	Enlisted Personnel Management Systems

### DEPARTMENT OF ARMY PAMPHLETS (DA PAM)

310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals, (Types 7, 8, and 9), Supply Bulletins and Lubrication Orders
310-7	Military Publications US Army Equipment Index of Modification Work Orders
310-12	Index and Description of Army Training Devices

### STATUS OF NONCRYPTOGRAPHIC JANAPs AND ACPs

ACP 124(C)	Communication Instructions Radiotelegraph Procedure, (U)
ACP 125(D)	Communication Instructions Radiotelephone Procedure w/US Suppl-2, Radiotelephone Procedures for the Conduct of Artillery and Naval Gunfire (U)
(C)ACP 126(B)	Communication Instructions Teletypewriter (Teleprinter) Procedure, (U)

### FIELD MANUALS (FM)

5-20	Camouflage
7-7	The Mechanized Infantry Platoon and Squad
20-22	Vehicle Recovery Operations
21-6	How to Prepare and Conduct Military Training
21-11	First Aid for Soldiers
21-20	Physical Readiness Training
21-26	Map Reading
21-40	NBC (Nuclear, Biological, and Chemical Defense)
21-60	Visual Signals
21-41	Individual NBC Defense: Nuclear, Biological, Chemical
21-75	Combat Training of the Individual Soldier and Patrolling
21-305	Manual for Wheeled Vehicle Driver



22-5	Drill and Ceremonies
22-6	Guard Duty
23-9	M16A1 Rifle and Rifle Marksmanship
24-1	Combat Communications
24-16	Communication-Electronics Operations, Orders, Records and Reports
24-18	Field Radio Techniques
32-30	Electronic Warfare Tactics of Defense
35-20	Physical Fitness Training for Women
55-15	Transportation Reference Data
55-31	Army Motor Transport Units

## TRAINING CIRCULARS (TC)

11-4	Handbook for AN/VRC-12 Series of Radio Sets
11-6	Grounding Techniques
24-3	Radio Wire Integration Installation and Operation Tips
30-22	Battlefield Survival and Radioelectronic Combat
32-11	How to Get Out of a Jam

## TECHNICAL MANUALS (TM)

3-4240-279-10	Operator's Manual, Mask Chemical-Biological Field ABC M17/M17A1 and 71
3-4240-279-20&P	Organizational Maintenance Manual Including Repair Parts and Special Tools Lists: Mask, Chemical-Biological; Field, ABC M17/M17A1 and Accessories
5-6115-271-14	Operator/Crew, Organizational, DS and GS Maintenance Manual 3 KW, 28 V DC Generator
5-6115-275-14	Operator, Organizational, DS and GS Maintenance 10 KW Generator
5-6115-323-14	Operator/Crew, Organizational, DS, and Depot Maintenance Manual 1.5 KW Generator
5-6115-332-14	Operator, Organizational Maintenance Manual 5 KW Generator
5-6115-365-15	Operator's Organizational, DS, GS, and Depot Maintenance Manual Including Repair Parts and Special Tools List, Generator Sets
9-1005-249-10	Operator's Manual M16A1 Rifle
9-2320-209-10	Operator's Manual for 2½-Ton, 6x6: Chassis, Truck
9-2320-211-10	Operator's Manual for Truck, Chassis: 5-Ton 6x6
9-2320-218-10	Operator's Manual for Truck, Utility: ¼-Ton 4x4
9-2320-260-10	Operator's Manual for Truck, 5-Ton 6x6, M809 Series (Diesel)
11-5038	Control Group AN/GRA-6
11-5135-15	Radio Set Control AN/GSA-7
11-5805-262-12	Operator's and Organizational Maintenance Manual Switchboards, Telephone, Manual SB-22 PT and SB-22A/PT

- 11-5810-224-10 Operator's Manual for Communications Security Equipment TSEL/KY-8
- 11-5810-245-10 Operator's Manual for Communications Security Equipment TSEL/KY-38
- 11-5810-247-10 Operator's Manual for Communications Security Equipment HYL-3/TSEC
- 11-5810-256-P-2 Operating Procedures for Communications Security Equipment TSEC/KY-57 in Manpack Operations
- 11-5810-256-OP-3 Operating Procedures for Communications Security Equipment TSEC/KY-57 in Wheeled Vehicles
- 11-5810-256-OP-4 Operating Procedure for Communication Security Equipment TSEC/KY-57 in Tracked Vehicles
- 11-5810-312-12 Operator's and Organizational Maintenance Manual Installation Kits for Communications Security Equipment TSEC/KY-57
- 11-5820-256-10 Operator's Manual Radio Set AN/GRC-26D
- 11-5820-295-10 Operator's Manual: Radio Set AN/GRC-19
- 11-5820-398-12 Operator's and Organizational Maintenance Manual (Including Repair Parts and Special Tool Lists): Radio Set AN/PRC-25 (Including Receiver-Transmitter Radio RT-505/PRC-25)
- 11-5820-401-10-1 Operator's Manual, Radio Sets: AN/VRC-12, AN/VRC-43, AN/VRC-44, AN/VRC-45, AN/VRC-46, AN/VRC-47, AN/VRC-48, AN/VRC-49, (without intercom systems)
- 11-5820-401-10-2 Operator's Manual, Radio Sets AN/VRC-12, AN/VRC-43, AN/VRC-44, AN/VRC-45, AN/VRC-46, AN/VRC-47, AN/VRC-48, AN/VRC-49 (with intercom system)
- 11-5820-401-12 Operator's and Organizational Maintenance Manual (Including Repair Parts and Special Tools Lists): Radio Set AN/VRC-12, AN/VRC-43, AN/VRC-47, AN/VRC-48, AN/VRC-49, AN/VRC-54 and AN/VRC-55; Mounting MT-1029/VRC and MT-1898/URC; Antenna AT-912/VRC; Control Frequency Selector C-2745/VRC and Control Radio Set C-2299/VRC.
- 11-5805-262-12 Operator's and Organizational Maintenance Manual: Switchboards, Telephone Manual, SB-22/PT and SB-22A/PT
- 11-5820-467-15 Operator's Organizational, Direct Support, General Support, and Depot Maintenance Manual: Antenna Group AN/GRA-50
- 11-5820-474-14 Operator's, Organizational, Direct Support and General Support Maintenance Manual Radio Set AN/GRC-109
- 11-5820-477-12 Organizational Maintenance Radio Set Control Group AN/GRA-39, AN/GRA-39A and AN/GRA-39B
- 11-5820-348-15 Organizational, Direct Support, General Support, and Depot Maintenance Manual: Antenna Equipment RC-292

- 11-5820-498-12 Operator's, Organizational Maintenance Manual  
Radio Sets AN/VRC-53, AN/VRC-64, AN/GRC-125  
and Amplifier Power-Supply Groups DA-3633/GRC  
and DA 3633/GRC
- 11-5820-520-12 Operator, Organizational Maintenance Manual  
Radio Set AN/GRC-106
- 11-5820-554-12 Operator's and Organizational Maintenance Manual:  
Radio Set AN/FRC-93(V)1, AN/FRC-93(V)2, AN/  
FRC-93(V)3, AN/FRC-93(V)4, AN/FRC-93(V)5,  
AN/FRC-93(V)6, and AN/FRC-93(V)7
- 11-5820-590-12-1 Operator's and Organizational Maintenance Manual  
(Including Repair Parts and Special Tools Lists):  
Radio Sets AN/PRC-74B and AN/PRC-74C and  
Power Supplies PP-4514/PRC-74 and PP-4514A/  
PRC-74 and Battery Boxes CY-6121/PRC-74, CY-  
6314/PRC-74 and CY-6314A/PRC-74
- 11-5820-667-12 Operator's and Organizational Maintenance Manual:  
Radio Set AN/PRC-77 (Including Receiver-  
Transmitter Radio RT-841/PRC-77)
- 11-5835-224-12 Operator and Organizational Maintenance Manual:  
Coder-Burst Transmission Group AN/GRA-71
- 38-750 The Army Maintenance Management System  
(TAMMS)
- 55-310 Motor Transport Operations
- 55-311 Motor Convoy Security in Stability Operations
- 55-450-15 Air Movement of Troops and Equipment (Nontacti-  
cal)

**TRAINING EXTENSION COURSES (TEC)**

**TEC LESSONS.** The letter(s) at the end of the number indicate the lesson media type. Order the type you prefer. A is a printed text, E is audio only, F is audiovisual and J is job performance aid.

- 201-113-4501-F Preparation of Radio Set AN/PRC-77 for OP, PT. 1,  
Install
- 201-113-4502-F Preparation of Radio Set AN/PRC-77 for Op, PT. 2,  
OP Checks
- 201-113-4503-F Preparation of Radio Set AN/PRC-77 for Op, PT. 3,  
PRE-SETS
- 201-113-4506-F Install Radio Set AN/GRC-106 and Perform Preopera-  
tional Checks
- 201-113-4507-F Preliminary Start Proc and Start Proc for Radio AN/  
GRC-106
- 201-113-4508-F Radio Set AN/GRC-106 Tuning, Op and Stopping Pro-  
cedures

201-113-4509-F Radio Set AN/GRC-106 Op's Main and Troubleshoot-  
 ing Proc  
 201-113-4511-F Control Group AN/GRC-6, Part I (Installation)  
 201-113-4512-F Control Group AN/GRA-6, Part II (Operations)  
 201-113-4530-A Installation of Radio Wire Integration (RWI)  
 201-113-4531-A Installation Operation of Radio Wire Integration  
 (RWI)  
 201-113-4545-A Maintain Circuit Log and Operator's Number Sheet  
 201-113-4550-F Radiotelegraph Procedure, Part 1, Calling and An-  
 swering  
 201-113-4551-F Radiotelegraph Procedure, Part 2, Calling and An-  
 swering  
 201-113-4552-F Radiotelegraph Procedure, Establishing a Net  
 201-113-4553-A Authentication  
 201-113-4554-E/A Opening a Net  
 201-113-4555-F Free & Directed Net  
 201-113-4556-F Message Format, PT 1  
 201-113-4557-F Message Format, PT 2  
 201-113-4560-J Operating Instructions for TSEC/KY-8  
 201-113-4562-J Operating Instructions for TSEC/KY-38  
 201-113-4563-J Operating Instructions for HYL-3/TSEC  
 201-113-4572-A (FOUO) Operation of TSEC/KY-57 (Secure)  
 930-071-0018-F Navigating with Map and Compass  
 931-061-0060-F NBC: The Mask  
 931-061-0061-F NBC: Masking and When To Do It  
 931-061-0062-F NBC: First Aid, Part 1  
 931-061-0064-F NBC: Individual Protection and Decontamination  
 931-061-0065-A NBC: Maintenance of the M17 Series Mask (Job Aid)  
 935-071-1029-F Counterintelligence  
 936-061-0108-F Radiotelephone Procedures, Part 1, Initiating and  
 Responding to Radio Calls  
 936-061-0110-F Radiotelephone Procedures, Part 3, Responding to  
 Messages  
 936-061-0111-F Radiotelephone Procedures, Part 4, Preparing Mes-  
 sages to be Sent  
 936-061-0112-F Radiotelephone Procedures, Part 5, Sending and Re-  
 ceiving Messages  
 937-061-0030-F Cover, Camouflage, and Concealment, Part 1  
 939-071-0009-F Loading and Unloading the M16A1 Rifle  
 936-061-0120-F AN/GRA-39 Installation and Testing  
 936-061-0122-F AN/GRA-39 Operation  
 939-071-0010-F Disassembly and Assembly of the M16A1 Rifle  
 939-071-0011-F Maintaining the M16A1 Rifle  
 939-071-0012-F Preventing and Correcting Common Malfunctions

TRAINING FILM

55-2348	The Motor Vehicle Driver-Traction Aids and the Winch
55-4303	The Hardened Vehicle Concept in Convoy Defense
55-4247	Truck, Utility, $\frac{1}{4}$ Ton M15AA2 Characteristics and Handling

ARMY CORRESPONDENCE COURSE PROGRAM (ACCP)

SSO 450	Basic Communications Principles
SSO 470	The Automated Communications-Electronics Operation Instruction (CEOI)
SSO 712	Organizational Maintenance of Radio Set AN/VRC-12
SSO 730	Radio Set AN/GRC-106 Operation
SS9 712	Organizational Maintenance of Radio Set AN/VRC-12 (SOJT)
SS9 735	Operation of Radio Set AN/PRC-77 (SOJT)
SS9 740	Radio Set AN/GRC-106 Operation (SOJT)

MISCELLANEOUS TRAINING MATERIAL

SB 11-624	Warning Notice for Vehicles in which Radios are Mounted
CEOI	
KTC 600D	Tactical Operation's Code
Unit SOP	
C 21-1-3	M16 Maintenance Card
C 21-1-4	Rifle Shot Group Analysis Card: Semiautomatic, Automatic Fire--M14, M16A1 Rifles

TECHNICAL BULLETIN (TB)

TB Sig 291	Safety Measures to be Observed When Installing and Using Antenna
TB 380-41	Procedures for Safeguarding, Accounting, and Supply Control of COMSEC Material

TRADOC PAM

71-9	Catalog of TASO Training Devices
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