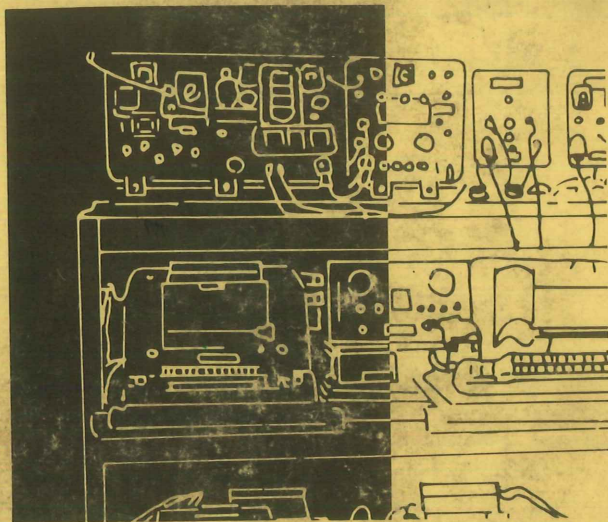
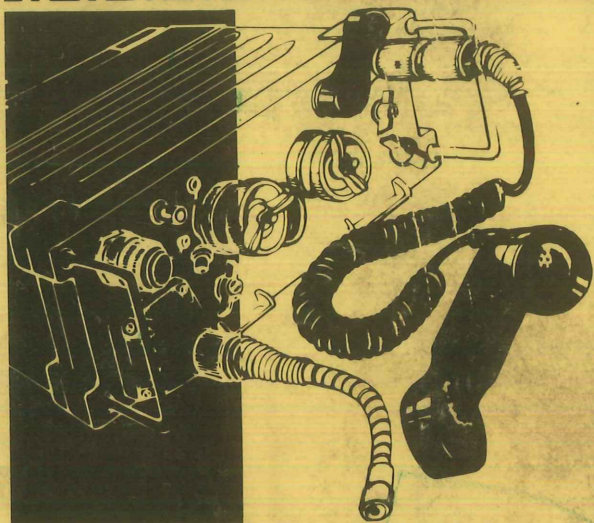


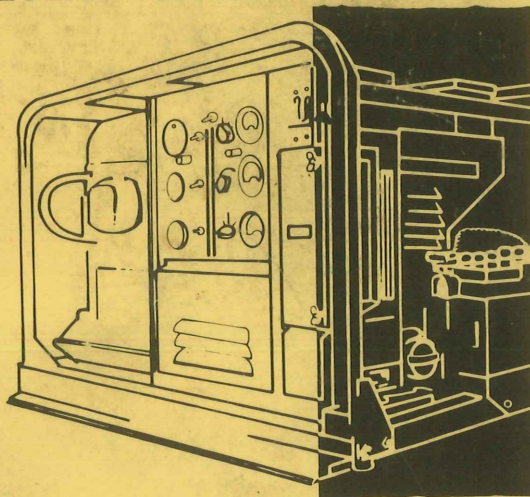
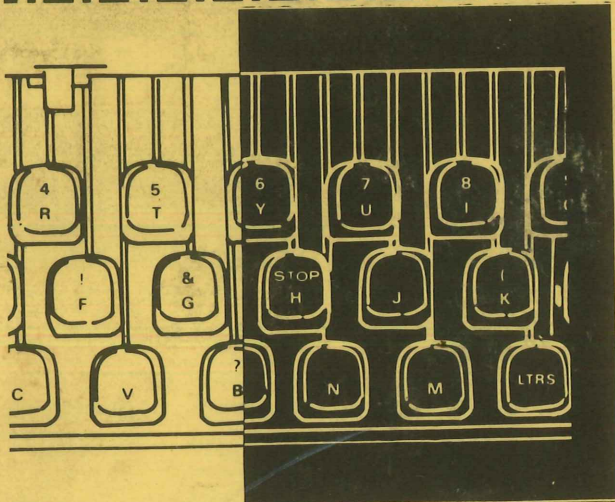
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FM 11-05C1/2
HEADQUARTERS
DEPARTMENT OF THE ARMY

SOLDIER'S MANUAL



RADIO TELETYPE OPERATOR MOS 05C SKILL LEVELS ONE AND TWO



NOVEMBER 1982

Soldier's Manual

MOS 05C, RADIO TELETYPE OPERATOR SKILL LEVELS 1 AND 2

Table of Contents

	PAGE
COMMANDER'S/TRAINER'S ATTENTION	iii
RESERVE COMPONENT ATTENTION	iv
CHAPTER 1. INTRODUCTION	1-1
The Soldier's Manual and You	1-1
The Soldier's Manuals of Common Tasks	1-2
Military Occupational Specialty	1-2
Skill Levels	1-2
Contents of Your Soldier's Manual	1-4
Your Manual and Your Leaders	1-7
How to Use Your Soldier's Manual	1-8
Enlisted Personnel Management	1-8
System (EPMS)	
Skill Qualification Test (SQT)	1-9
Enlisted Evaluation System	1-11
Typing Requirements	1-12
Summary	1-12
CHAPTER 2. SKILL LEVEL TASKS	2-1
Task List	2-1
Task Summaries for Skill Level 1	2-1
Task Summaries for Skill Level 2	2-5

*This publication supersedes FM 11-05C1/2, 15 July 1980.

	PAGE
APPENDIX A. REFERENCES	A-1
APPENDIX B. TIPS FOR PLANNING YOUR TRAINING PROGRAM	B-1
QUESTIONNAIRE	QUESTIONNAIRE-1

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/TRAINER'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 obtain the next higher skill level soldier's manual through his/her unit.

This soldier's manual was prepared by the US Army Signal Center.


C. E. McKnight, Jr.
Major General, USA
Commanding

RESERVE COMPONENT ATTENTION

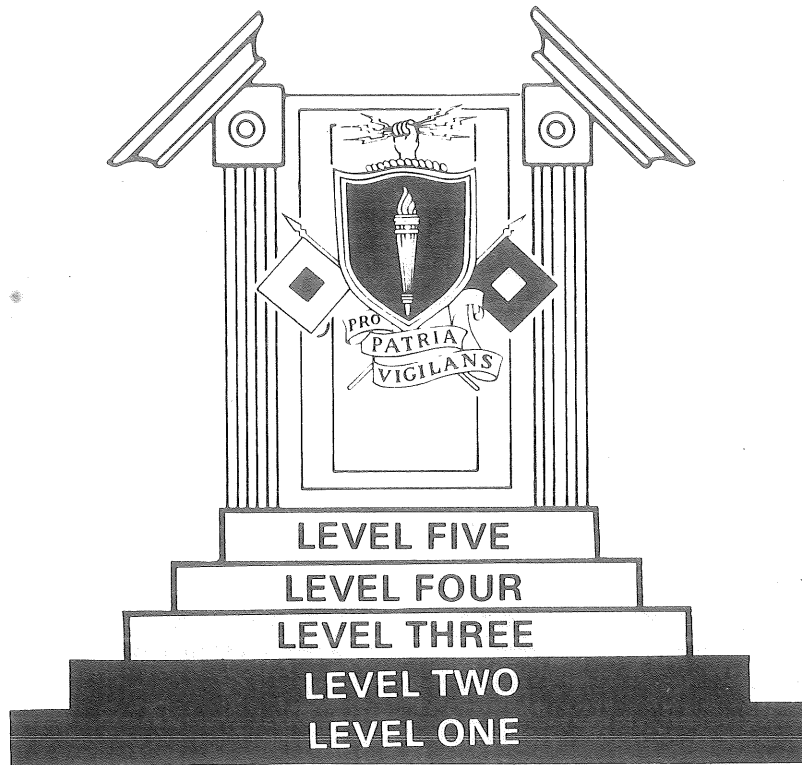
You will be using this soldier's manual along with your Active Army counterpart.

This manual contains the critical tasks to be performed by soldiers in MOS 05C1/2. 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.

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 Teletype Operator, MOS 05C1/2. 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 help 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.

THE SOLDIER'S MANUALS OF COMMON TASKS

FM 21-2, Soldier's Manual of Common Tasks, Skill Level 1; and FM 21-3, Soldier's Manual of Common Tasks, Skill Levels 2, 3, and 4, contain tasks that are common to every soldier in the Army, regardless of MOS. You are responsible for mastering all the common tasks in your present skill level as well as all of those in the lower skill levels.

FM 21-2 and FM 21-3 are available to you through your unit. Be sure to get them and use them so that you will be able to complete your training.

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 05C in your MOS identifies the Radio Teletype Operator portion of the Communications-Electronics Operations Career Management Field.

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

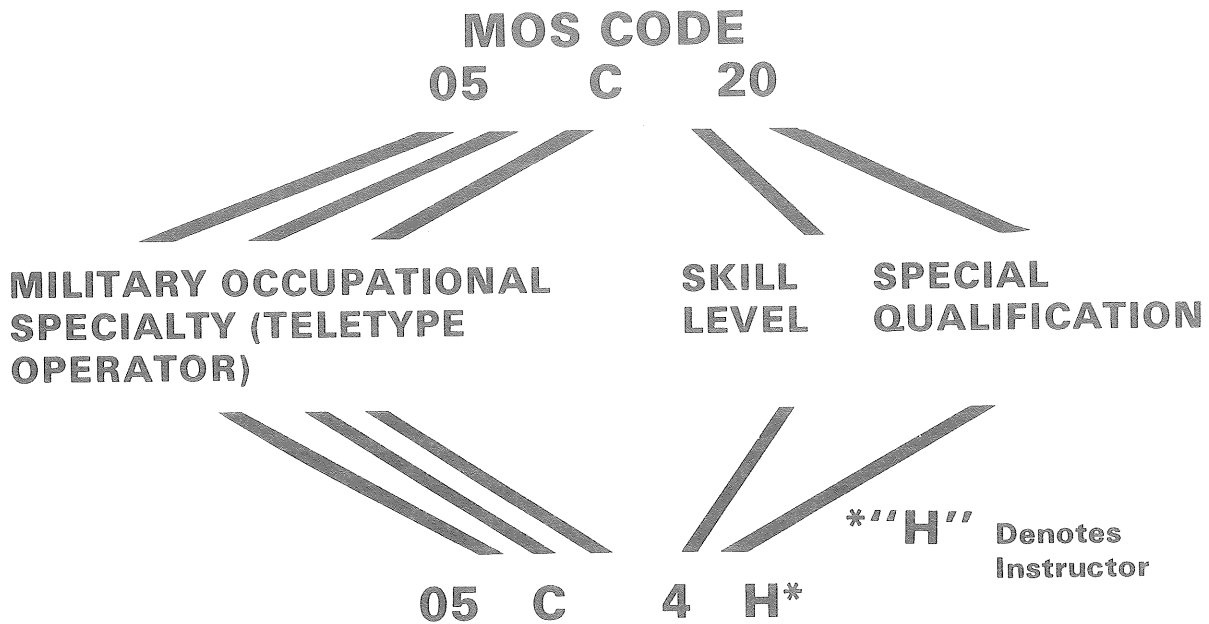
Fifth Character: This is a letter which identifies a special qualification in the MOS. The letter "O" will always be inserted as the MOS code if the individual has no additional special qualifications. Here are two examples of fifth character usage:

05CH, Radio Teletype Operator - Qualified as an instructor.

05C10, Radio Teletype Operator - No special qualifications.

SKILL LEVELS

The skill level is a way 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. 05C10 indicates MOS 05C Skill Level 1 (E1 through E4). 05C20 indicates MOS 05C 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 hard 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 easy now. Only the harder tasks will be performed under the general supervision of your NCO.

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

Skill Level 1 (AR 611-201):

1. Installs and operates:
 - a. Field radio and radio teletypewriter 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, and 2 1/2-ton military vehicles.
3. Transmits and receives messages in radiotelephone and radiotelegraph, and radio teletypewriter 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 the installation and operation of radio and radio teletypewriter 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.

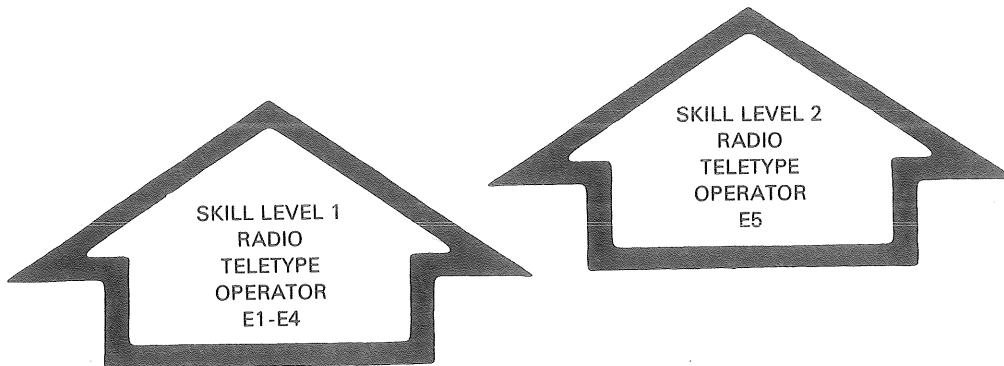
Common Task: A task common to every soldier in the Army at a given skill level, regardless of MOS. These tasks are contained in FM 21-2, Soldier's Manual of Common Tasks, Skill Level 1; and FM 21-3, Soldier's Manual of Common Tasks, Skill Levels 2, 3, and 4.

Shared Task: A task which is not specifically designed for your branch of service (that is, the task is not a Signal designed task) but which you are still responsible to do as part of your MOS. Not all soldiers are required to do these tasks as they are not common tasks. These tasks are "shared" among the different branches of service. For Signal soldiers, these tasks begin with a number other than 113. For example, Task Number 101-530-3008, Prepare DA Form 2404 (Equipment and Maintenance Worksheet), is a task many signal soldiers must do, but the task is not written by the Signal Center.

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	E1-E4
2	E5

At the beginning of chapter 2 in your soldier's manual, there is a list of critical tasks and their titles. These tasks are the most important parts of your job.

Each task is split into these parts:

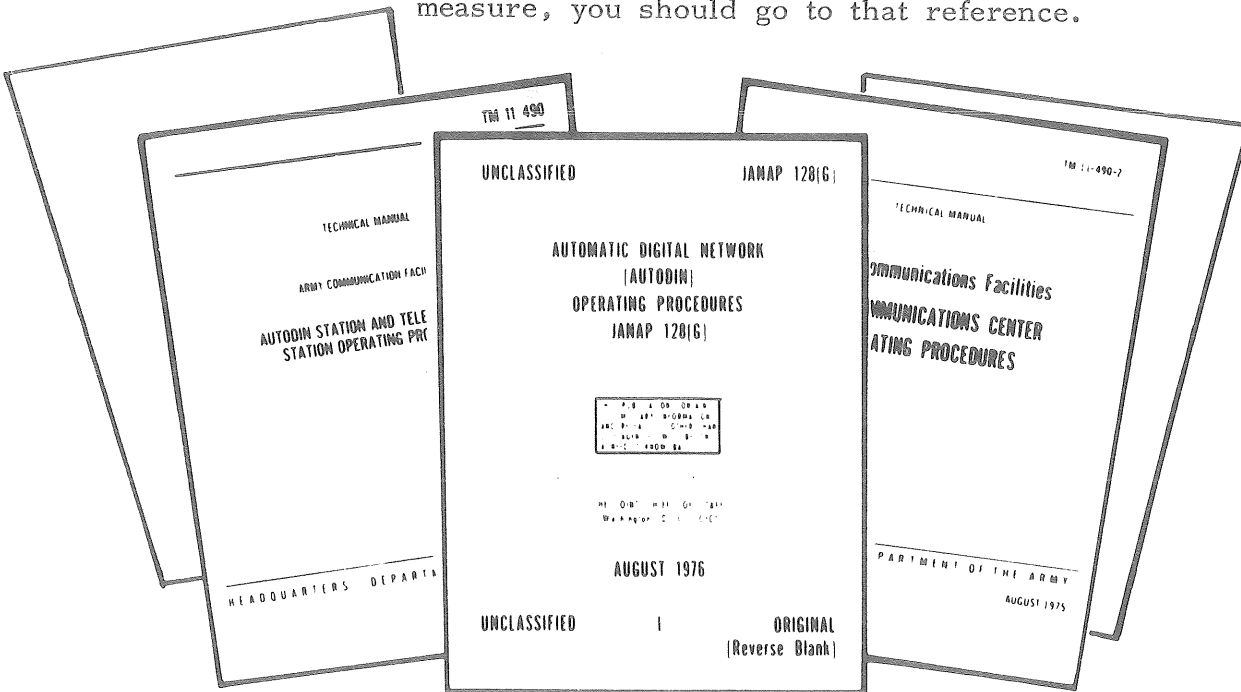
TASK: A statement of what you must be able to do; for example: Operate in Radio Nets.

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.

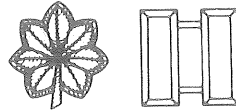


YOUR MANUAL AND YOUR LEADERS

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 planing of your training.

**FIRST SERGEANT**

Participates in the planning of your training.

**PLATOON SERGEANT**

Participates in your actual training.

**MAINTENANCE SUPERVISOR**

Participates in your actual training.



Your training managers and trainers have a guide book, in addition to the soldier's manual, which lists the critical tasks you are required to perform and the methods of training that can help you learn those tasks. It is called the trainer's guide. The trainer's guide provides your training managers and trainers with a means to help you with a training program. The soldier's manual and the trainer's guide are also designed to assist them 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.

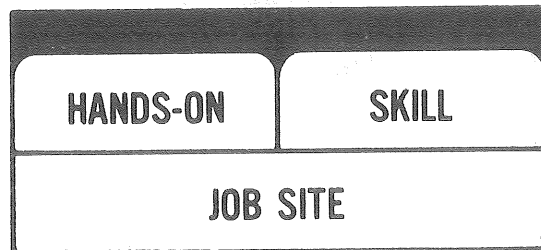
EPMS provides you with a fair and reasonable promotion system. Under EPMS, you must receive a passing score on your skill qualification test (SQT) before you can be considered for promotion. However, a passing score on your SQT does not guarantee promotion. You must be

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:



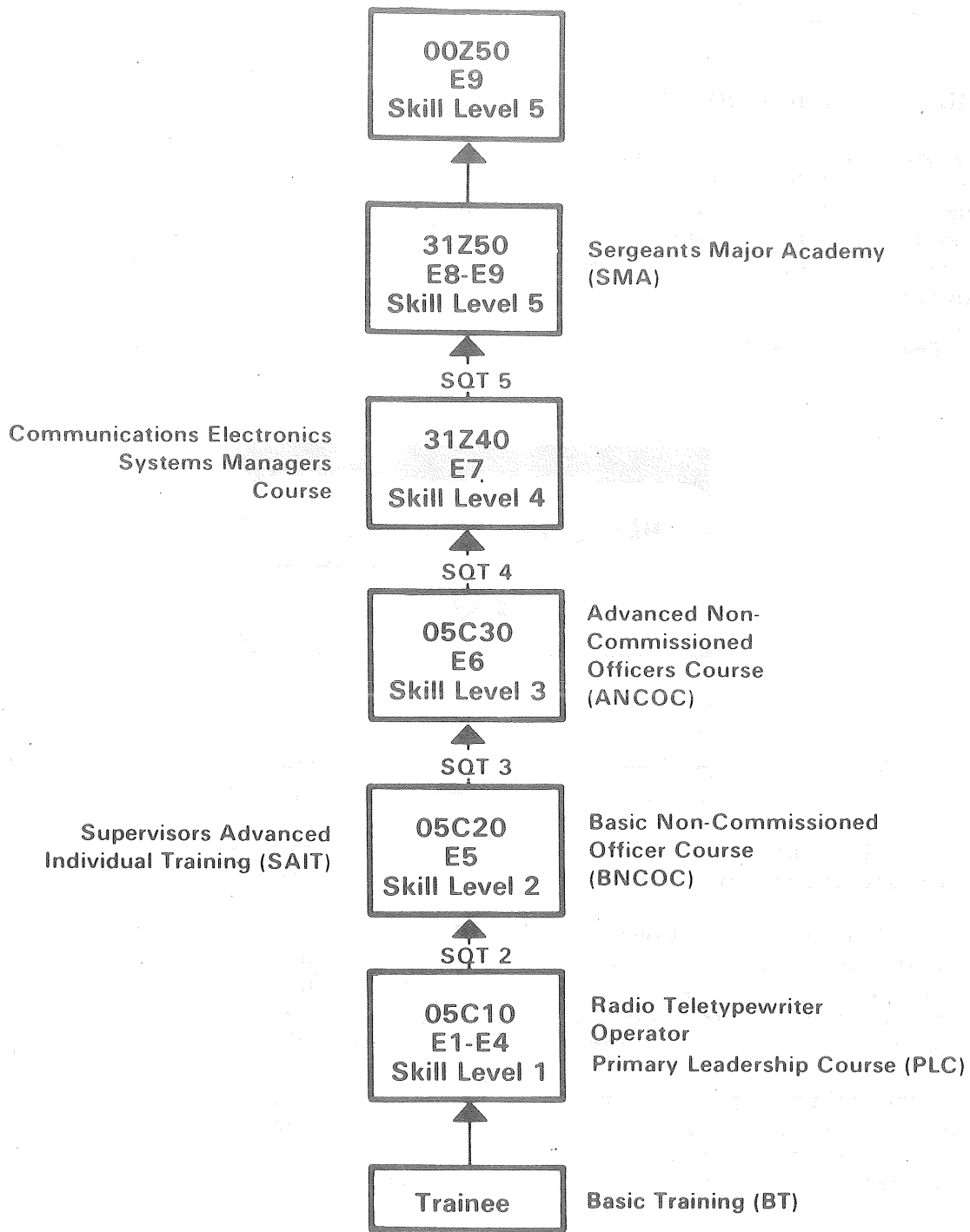
The Hands-On Component (HOC) is designed to test your ability to perform certain critical tasks using real equipment or training aids.

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

The Job Site Component (JSC) is an evaluation, made by your training manager, trainer, 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, or those which cannot be tested by the HOC or SC.

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 05C



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. The evaluation 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, 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:

- 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 Enlisted Evaluation Report (EER). The EER 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 EERs will be good.

Your SQT and EER 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.

TYPING REQUIREMENTS

For MOS 05C typing skills deteriorate rapidly. To overcome this deterioration the USASC&FG will test this skill on the SQT. To assist you in training and maintaining this skill ETV are available from the Signal Center.

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.

STEP SIX: When you are promoted, obtain your next higher soldier's manual from your training manager.

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: ATZH-TDA
Fort Gordon, Georgia 30905

Chapter 2

SKILL LEVEL TASKS

There are many tasks or jobs which you must do in your MOS. This chapter deals with those technical tasks and certain nontechnical tasks which have been identified as critical to Radio Teletype 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>
113-571-1003	Establish, Enter or Leave a Radio Net	2-6
113-572-1002	Prepare a Message for Transmission in 16-Line Format	2-9
113-573-4003	Encode and Decode Messages Using KTC 600 D Tactical Operations Code	2-12
113-573-4006	Use the KTC 1400 D Numeral Cipher/Authentication System	2-18
113-573-6001	Recognize Electronic Countermeasures (ECM) and Implement Electronic Counter-Countermeasures (ECCM)	2-27
113-573-7017	Prepare/Submit Operator's (MIJI) Report	2-33
113-587-1001	Install Radio Set AN/PRC-77 or AN/PRC-25	2-39
113-587-1002	Install Radio Set AN/VRC-12	2-41
113-587-1003	Install Radio Set AN/VRC-64	2-47
113-587-1005	Install Radio Set AN/VRC-49	2-57
113-587-1050	Mount Radio Set AN/VRC-46	2-63
113-587-2001	Operate Radio Set AN/PRC-77 or AN/PRC-25	2-69

<u>TASK NO</u>	<u>TITLE</u>	<u>PAGE</u>
113-587-2002	Operate Radio Set AN/VRC-64	2-71
✓ 113-587-2003	Operate Radio Set AN/VRC-46 (AN/VRC-12 Series)	2-74
113-587-2004	Troubleshoot AN/VRC-46 (AN/VRC-12 Series)	2-76
113-587-3001	Perform Operator's Preventive Maintenance on Radio Set AN/PRC-77 or AN/PRC-25	2-78
113-596-1070	Construct a Doublet Antenna	2-80
113-598-1023	Install Terminal Communications AN/UGC-74A(V)3	2-84
113-598-2010	Operate Terminal Communications AN/UGC-74A(V)3	2-90
113-598-2024	Perform Operator's Preventive Maintenance Checks and Services on Terminal Communications AN/UGC-74A(V)3	2-101
113-599-1001	Install Radio Teletypewriter Set AN/GRC-46	2-109
113-599-1002	Install Radio Teletypewriter Set AN/GRC-142(*) or AN/GRC-122(*)	2-111
113-599-1003	Install Radio Teletypewriter Set AN/VSC-2	2-123
113-599-1004	Install Radio Set AN/GRC-26D	2-125
113-599-1020	Prepare Radio Teletypewriter Set AN/VSC-3 for Operation	2-127
✓ 113-599-2001	Operate Radio Teletypewriter Set AN/GRC-46	2-132
113-599-2002	Operate Radio Teletypewriter Set AN/GRC-142(*) or AN/GRC-122(*)	2-140
113-599-2003	Troubleshoot Radio Teletypewriter Set AN/GRC-142(*) or AN/GRC-122(*)	2-147
113-599-2004	Operate Radio Teletypewriter Set AN/VSC-2	2-153
113-599-2005	Operate Radio Set AN/GRC-26D	2-156

<u>TASK NO</u>	<u>TITLE</u>	<u>PAGE</u>
113-599-2008	Operate Radio Teletypewriter Set AN/VSC-3	2-159
113-599-3001	Perform Weekly Preventive Maintenance on Radio Teletypewriter Set AN/GRC-46	2-169
113-601-1001	Install Generator Set 5 KW	2-171
113-601-1002	Install Generator Set 10 KW	2-175
113-601-1003	Install Generator Set 3 KW 28 V DC	2-180
113-601-2001	Operate Generator Set 5 KW	2-183
113-601-2002	Perform Operator's Troubleshooting Procedures on Generator Set 5 KW	2-191
113-601-2003	Operate Generator Set 10 KW	2-198
113-601-2004	Perform Operator's Troubleshooting Procedures on Generator Set 10 KW	2-206
113-601-2005	Operate Generator Set 3 KW 28 V DC	2-208
113-601-3001	Perform Daily Preventive Maintenance Checks and Services on Generator Set 5 KW	2-214
113-601-3002	Perform Daily Preventive Maintenance Checks and Services on Generator Set 10 KW	2-217
113-609-1001	Install and Operate Communications Security Equipment TSEC/KY-8	2-219
113-609-1003	Install and Operate Communications Security Equipment HYL-3/TSEC	2-222
113-609-2013	Prepare/Operate Communications Security Equipment TSEC/KY-57 with VRC-12 Series Radio Sets	2-225
113-609-2032	Prepare/Operate Communications Security Equipment TSEC/KY-38, Mounted with Radio Sets AN/GRC-160 or AN/VRC-64	2-229
113-609-2033	Prepare/Operate Communications Security Equipment TSEC/KY-38 with AN/VRC-12 Series Radio Sets	2-236

FM 11-05C1/2

<u>TASK NO</u>	<u>TITLE</u>	<u>PAGE</u>
113-609-2034	Prepare/Operate Communications Security Equipment TSEC/KY-38 with Radio Set AN/PRC-77 (Manpack Operation)	2-244
113-618-1001	Install Radio Wire Integration (RWI) System	2-252
113-618-2001	Operate Radio Wire Integration (RWI) System	2-260
113-620-1001	Install Radio Set AN/GRC-106(*)	2-263
113-620-1003	Install Radio Set AN/FRC-93	2-266
113-620-1004	Install Radio Set AN/PRC-74B	2-274
113-620-2001	Operate Radio Set AN/GRC-106(*)	2-281
113-620-2002	Perform Operator Troubleshooting Procedures on Radio Set AN/GRC-106(*)	2-288
113-620-2005	Operate Radio Set AN/FRC-93	2-292
113-620-2006	Operate Radio Set AN/PRC-74B	2-304
113-620-3001	Perform Daily Preventive Maintenance Checks and Services on Radio Set AN/GRC-106(*)	2-306
113-622-1001	Install Radio Set Control Group AN/GRA-6	2-309
113-622-1006	Install Radio Set Control Group AN/GRA-39(*)	2-313
113-622-2001	Operate Radio Set Control Group AN/GRA-6	2-319
113-622-2004	Operate Radio Set Control Group AN/GRA-39(*)	2-323

TASK LIST

SKILL LEVEL 2

<u>TASK NO</u>	<u>TITLE</u>	<u>PAGE</u>
113-571-7001	Perform Station/Net Duties	2-328
113-571-7002	Inspect Station/Net Operations	2-331
113-574-1004	Operate in Radio Nets	2-335
113-587-7001	Inspect Installed Operational Radio Sets	2-338
113-596-7056	Direct Installation of a Doublet Antenna	2-341
113-601-7001	Inspect Installed Operational Generator Sets	2-346
113-611-1001	Select Team Radio Site	2-348
113-618-7001	Inspect Installed Operational Radio Wire Integration System	2-351
113-622-7001	Inspect Installed Operational Radio Set Control Groups	2-357
113-623-7002	Inspect Performance of Preventive Main- tenance at Team Level	2-360

TASK

113-571-1003

Establish, Enter or Leave a Radio Net

CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. Your team chief will provide you with:

1. CEOI.
2. ACP 124(C).
3. ACP 125(D).
4. ACP 126(B).

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), para 101 thru 110; ACP 126(B), para 201 thru 206; and FM 24-1, app N, para 1 thru 3.)
 - 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).

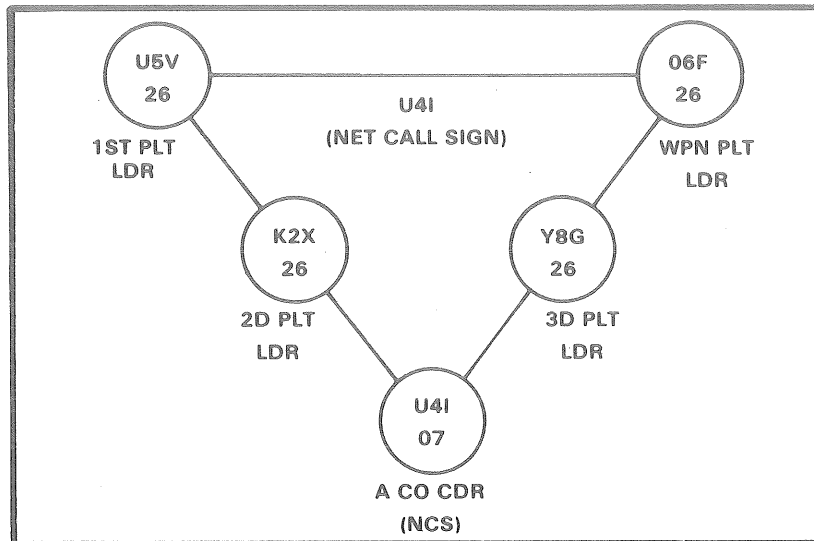


Figure 1. Simple radio net diagram.

2. Enter a radio net. (Refer to ACP 124(C), para 101 thru 110; ACP 126(B), para 201 thru 205; and FM 24-1, app N, para 1 thru 3.)
 - 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.
3. To leave a radio net. (Refer to ACP 124(C), para 301 thru 321.)
 - 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.

SKILL LEVEL 1

REFERENCES

ACP 124(C)

ACP 125(D)

ACP 126(B)

FM 24-1

TASK**113-572-1002**

Prepare a Message for Transmission in 16-Line Format

CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. Your team chief will provide you with:

1. ACP 124(C).
2. ACP 125(D).
3. ACP 126(B).
4. DA Form 173, Joint Messageform.

Supervision and assistance will 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), para 112; ACP 125(D), para 208 thru 219; and ACP 126(B), para 103 thru 112.)
2. Insure correct 16-line message format has been used for mode of transmission. (Refer to fig 1; ACP 124(C), para 111; ACP 125(D), para 207; and ACP 126(B), para 111.)

SKILL LEVEL 1

- 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.
- b. Each message prepared in either PLAINDRESS, ABBREVIATED PLAINDRESS or CODRESS will have three parts:
 - (1) Heading.
 - (2) Text.
 - (3) Ending.
- c. Each message part has certain COMPONENTS which are broken down into ELEMENTS and CONTENTS.
 - (1) All message parts and a majority of the COMPONENTS and ELEMENTS have a standard arrangement or sequential order of appearance.
 - (2) The basic MESSAGE FORMAT is the basis for the 16-line format contained in figure 1.
 - (3) In figure 1, format lines 2, 3, 4, 14, 15, and 16 identify the procedural portion of the 16-line message format as designed for radiotelegraph, radiotelephone, and radio teletypewriter operations. Format lines 5 through 13 are the nonchangeable components of the 16-line message format. All format lines do not necessarily appear in every message; however, when used they will be in the order prescribed by the appropriate ACP.

REFERENCES

- ACP 124(C)
- ACP 125(D)
- ACP 126(B)

TASK

113-573-4003

Encode and Decode Messages Using KTC 600 D Tactical Operations Code

CONDITIONS

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

1. CEOI extract with KTC 600 D (OPCODE).
2. Plaintext message to be encoded.
3. Encoded message to be decoded.

Supervision and assistance will be available.

STANDARDS

Task standard has been met when KTC 600 D has been used to encode and decode a message in accordance with the performance measures within 30 seconds per code group or word/phrase.

PERFORMANCE MEASURES

SECURITY PRECAUTIONS 1: Use of code sets. Each set of the KTC 600 D Tactical Operations Code is effective for 48 hours unless otherwise directed by the C-E office. (Refer to CEOI, KTC 600 D Operating Instructions.)

SECURITY PRECAUTIONS 2: Never mix plain language with encoded messages.

SECURITY PRECAUTIONS 3: Spelling and punctuation must be kept to an absolute minimum.

PARTS	HEADING													T
	COMPO- NENTS	PROCEDURE			PREAMBLE	ADDRESS				PREFIX	SEPARATION	TEXTUAL	SEPARATION	
ELEMENT		Called Station	Calling Station	Transmission instructions	Precedence, date time group; message instructions	Operator's prosign, Originators sign	Action addressee prosign, sign	Information addressees prosign, sign and information addressee.	Exempted addressee prosign, sign; Exemp- ted addressee.	Accounting information, group count		Subject matter		
LINE NO	1	2	3	4	5	6	7	8	9	10	11	12	13	
RADIOTELEGRAPH ACP-124(C)	Not used	Station called, prosign XMT and exempted call-signs	Prosign DE and call sign of station calling; Serial number (Trans- mission identifica- tion). Prosign NR followed by a number or a combination of letters and numbers.	Prosign F, G, T; operating signals; call signs, address groups, plain language address designators, AIGs, routing in- dicators.	Precedence prosign. Date and time expressed in digits and zone suffix followed by month indicated by first 3 letters, and if required by National instruc- tions, the year indicated by the last 2 digits. Operating signals and prosign IX.	Prosign FM. Origin- ator's designator (Call sign, address group, plain language address designator, routing indicator).	Prosign TO followed by action addressees designators (call signs, address groups, plain language address designators, AIGs, routing indic- ators.)	Prosign INFO followed by information ad- dressees designators (call signs, address groups, plain lan- guage address desig- nators, AIGs, routing indicators.)	Prosign XMT followed by exempted address- ees designators (call signs, address groups, plain language address designators.)	Accounting symbol, prosign GR (No. of groups), GRNC.	Prosign BT	UNCLAS or appro- priate classification, SVC, internal instruc- tions and appropriate textual matter.	Prosign BT	Hours a express and zon Prosign by confi of the m necessa
RADIOTELEPHONE ACP-125(D)	Not used	Stations called, proword EXEMPT, exempted calls	Proword THIS IS- station calling. Pro- word MESSAGE. Proword NUMBER and station serial number.	Prowords RELAY TO; READ BACK; DO NOT ANSWER; WORDS TWICE; Operating signals; Address groups; Call signs; Plain language designators.	Precedence desig- nation; Proword TIME: date and time expressed in digits, and zone suffix followed by month indicated by the first three letters, and if required by national authorities, the year indicated by the last two digits; operating signals and proword EXECUTE TO FOLLOW.	Proword FROM. Originator's address designator.	Proword TO followed by action addressee designator.	Proword INFO fol- lowed by information addressees desig- nators.	Proword EXEMPT followed by exempted addressee desig- nators.	Accounting symbol; group count; Proword GROUPS (GROUP NO COUNT).	Proword BREAK	CLEAR, UNCLAS- SIFIED, proword SERVIC. and or internal instructions as appropriate; thoughts or ideas as expressed by the originator.	Proword BREAK	Proword and min sed in d suffix, w priate
RADIO TELETYPEWRITER ACP-126(B)	Not used in teletype- writer procedure except when working with tape relay units.	Contains designation of the station(s) called; the prosign XMT and designation of exempted sta- tion(s). Line 2 & 3 may appear as a single typed line. It may also contain the repeated precedence prosign.	The prosign DE; the designation of the calling station and the transmission identi- fication (station serial number). Line 2 & 3 may appear as a single typed line.	Contains the trans- mission instructions and will be identified by the appearance of the prosign T, operating signals, address designations; routing indicators as required.	Will contain the appropriate prece- dence prosign once and in the case of dual precedence both will be shown separated by a space, the originator's date- time group and message instructions in the form of operating signals as necessary.	Is identified by the appearance of the prosign FM and contains the designa- tion of the originator which may be indicated by plain language, call sign or address group.	Identified by the appearance of the prosign TO and contains the designa- tion of the action addressee(s) in the form of plain language address group(s), call sign(s); or routing indicators.	Is identified by the appearance of the prosign INFO and contains the designa- tion of the informa- tion addressee(s) in the form of plain language, address group(s), call sign(s); or routing indicators. A collective designa- tion or an Address Indicating Group (AIG) in format line 7 may include information addressees.	Is identified by the prosign XMT and contains the designa- tion of the address- ee(s) who is exempted from the collective address designation, when such designation is employed in lines 7 & 8 or an AIG is used in format line 7.	Is identified by the appearance of the group count prosign and contains account- ing symbols (as required) which precede the group count prosign.	Separates the head- ing of the message from the text by use of the prosign BT.	Is the text of the message and may contain internal instructions as well as the thought or idea expressed by the originator.	Separates the text from the ending of the message by use of the prosign BT.	May con group e digits p suffix. M the pros followe portions messag necessa

Figure 1. 16-Line Message Format for Radiotelegraph, Radio Telephone, and Radio Teletypewriter.

HEADING								T	ENDING				
PREAMBLE		ADDRESS				PREFIX	SEPARATION	TEXTUAL	SEPARATION	PROCEDURE			
4	5	6	7	8	9	10	11	12	13	14	15	16	
Transmission instructions	Precedence; date time group; message instructions	Operator's prosign, Originators sign	Action addressee prosign, sign	Information addressees prosign, sign and information addressee.	Exempted addressee prosign, sign; Exempted addressee.	Accounting information, group count		Subject matter		Time group, Confirmation (as required)	Final instructions, corrections, filing time	Ending sign	
Prosign F, G, T; operating signals; call signs, address groups, plain language address designators, AIGs, routing indicators.	Precedence prosign. Date and time expressed in digits and zone suffix followed by month indicated by first 3 letters, and if required by National instructions, the year indicated by the last 2 digits. Operating signals and prosign IX.	Prosign FM. Originator's designator (Call sign, address group, plain language address designator, routing indicator).	Prosign TO followed by action addressees designators (call signs, address groups, plain language address designators, AIGs, routing indicators.)	Prosign INFO followed by information addressees designators (call signs, address groups, plain language address designators, AIGs, routing indicators.)	Prosign XMT followed by exempted addressees designators (call signs, address groups, plain language address designators.)	Accounting symbol, prosign GR (No. of groups), GRNC.	Prosign BT	UNCLAS or appropriate classification, SVC, internal instructions and appropriate textual matter.	Prosign BT	Hours and minutes expressed in digits and zone suffix. Prosign CFN followed by confirmed portions of the message as necessary.	Prosigns AS, B, C, IMI, IX (5 sec dash) operating signals, station designators.	Prosign K or AR	
Prowords RELAY TO; READ BACK; DO NOT ANSWER; WORDS TWICE; Operating signals; Address groups; Call signs; Plain language designators.	Precedence designation; Proword TIME: date and time expressed in digits, and zone suffix followed by month indicated by the first three letters, and if required by national authorities, the year indicated by the last two digits; operating signals and proword EXECUTE TO FOLLOW	Proword FROM. Originator's address designator.	Proword TO followed by action addressee designator.	Proword INFO followed by information addressees designators.	Proword EXEMPT followed by exempted addressee designators.	Accounting symbol; group count; Proword GROUPS (GROUP NO COUNT).	Proword BREAK	CLEAR, UNCLASSIFIED, proword SERVICE and or internal instructions as appropriate; thoughts or ideas as expressed by the originator.	Proword BREAK	Proword TIME. Hours and minutes expressed in digits and zone suffix, when appropriate.	Prowords WAIT, CORRECTION, AUTHENTICATION IS, MORE TO FOLLOW, station designators.	Prowords OVER or OUT.	
Contains the transmission instructions and will be identified by the appearance of the prosign T, operating signals, address designations; routing indicators as required.	Will contain the appropriate precedence prosign once and in the case of dual precedence both will be shown separated by a space, the originator's date-time group and message instructions in the form of operating signals as necessary.	Is identified by the appearance of the prosign FM and contains the designation of the originator which may be indicated by plain language, call sign or address group.	Identified by the appearance of the prosign TO and contains the designation of the action addressee(s) in the form of plain language address group(s), call sign(s); or routing indicators.	Is identified by the appearance of the prosign INFO and contains the designation of the information addressee(s) in the form of plain language, address group(s), call sign(s); or routing indicators. A collective designation or an Address Indicating Group (AIG) in format line 7 may include information addressees.	Is identified by the prosign XMT and contains the designation of the addressee(s) who is exempted from the collective address designation, when such designation is employed in lines 7 & 8 or an AIG is used in format line 7.	Is identified by the appearance of the group count prosign and contains accounting symbols (as required) which precede the group count prosign.	Separates the heading of the message from the text by use of the prosign BT.	Is the text of the message and may contain internal instructions as well as the thought or idea expressed by the originator.	Separates the text from the ending of the message by use of the prosign BT.	May contain a time group expressed in digits plus the zone suffix. May contain the prosign CFN followed by confirmed portions of the message as necessary.	Is identified by the appearance of prosign C, operating signals and corrections as required; may contain date and time message was filed with the communication center; final instructions in form of prosigns B; AS and station designation(s).	Is identified by the prosign K or AR as appropriate.	

Figure 1. 16-Line Message Format for Radiotelegraph, Radio Telephone, and Radio Teletypewriter.

113-573-1002

SECURITY PRECAUTIONS 4: Variant code groups are provided for more commonly used phrases. These should be used impartially and at random.

SECURITY PRECAUTIONS 5: Spare groups are provided to assign additional variants to plaintext phrases in the code, or to assign new plaintext values as required.

1. To encode.
 - a. Write the plaintext message on a piece of paper, leaving sufficient space above each line to write the code values (fig 1).
 - b. Turn to the code set to be used for the time period (TIME PERIOD 5 - 6 SET 3 is used).

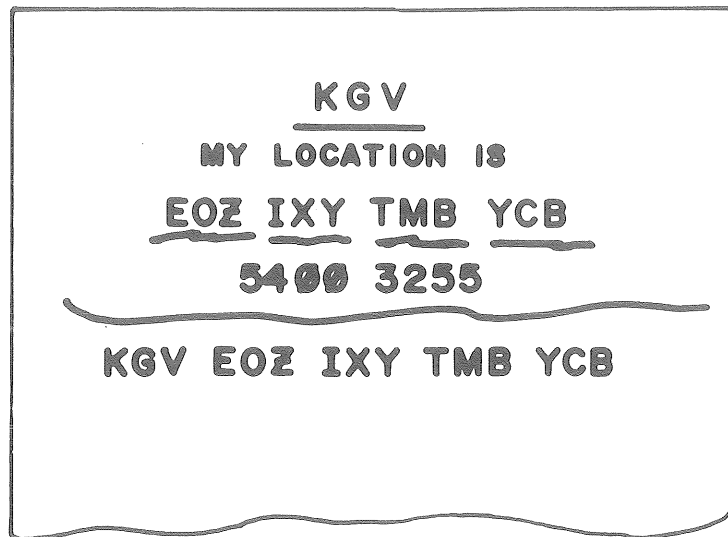


Figure 1. Sample message encoding.

- c. Find the word, phrase, or number to be encoded (fig 2 and 3) and write the three-letter code group on the message.

SET 3 TIME PERIOD 5-6		ENCODE 8	
L	UDP Listen-ed-ing	JNH Maneuver element	CGG Mission-s
GDW Labor-ed-ing	UHH Litter-s	IDF Man-ned-ning	LNW Mission-s
RRZ Land-ed-ing	EIT Litter evac need at (coord)	UMS Many	OFT Mobile-ity
HXE Large	KXO Load-s-ud	AHR Map-ping-s	RFF Moon
WPG Last	FZL Local-ize-d	BGX March-ed-s	FGR Morale
LWW Lateral	NIJ Locate-d-ing	VHD March-ing	EMT Morning
XIH Launch-ed	JGS Locate-s	HVR Market	OWK More
PLG Launch-er	BBZ Locate-ion(fof)	CNO Max (range)	OZT Most
RJE Launch-ing	FSX Logistic-al-s	XZR Means	RBX Mountain-ous
KDI Laid	LUX Look (for)	WEI Measure-d	VWI Mount-ed-ing
HSO Lay	TJM Loss-es/lost	GAM Measure-ment	BBO Move-d-ing
IRM Lead-er-ing	PQY Loudspeaker	EHN Mechanic-al	IBO Move-ment
HUZ Leaflet-s	FFC Low-er-est	NMW Mechanize-d	LUB MRD
JSN Leave	TVB LRRP	IWH Medical	MPJ MRR
RSY Leave	NGC LZ	PIJ MEDEVAC	MFY Multiple
JWV Left	KZG LZ loc is ()	needed	VAS My
BHO Left	BJN LZ not secure	LMQ Medium	ADB My lead ele is at (coord)
RXP Left (of)	OKR LZ secure	UYF Meet-ing	KGV My loc is
XOY Leg		MDW Meet-me at	WRH My loc is
VPJ Level	M	YZP Message-s	
YDG Liaison (off)	OPA Magnetic	AAB Messenger	N
FCC Life	TNR Main	AMV Meter-s	OHN Narrow
SSX Lift Spt fires	SSA Main body	HGV Meter-s	IWP NBC
YLR Light-er-ing	DMW Main supply rt	WJM Mil(s)	ELD NCO
UIZ Light-ed-s	XXN Maintain-ing	LLW Mile-s	PIO Need-ed-ing
RLM Limit-ed-ing	YUH Maintain-s	RPB Minimum	LUY Net-ted-ting
KPC Limit-s	YCY Maintain-ed	OMK Minimize-d	SAK Neutral-ize
NOP Line-s	YLF Maintenance	KFC Minor	UOU Neutralize-d-g
DTL Line-s	LZK Make-g/made	JMN Minute-s	AUV New
AMC Line-s	EXA Male	UMT Minute-s	NAW Night-s
VPP Line-d-s (of)	UBT Maneuver-ing	XEP Miss-ed-ing	RLZ No/non/neg
UPG Line-d-s (of)	JMO Maneuver-s	ORM Missing in act	OTQ No/non/neg
PROTECTIVE MARKING		KTC 600 D	

Figure 2. Operation code extract.

- (1) The encode section of the operations code is made up of words and phrases commonly used in tactical operations which are arranged in alphabetical order, like a dictionary.
- (2) The numeral section of the code provides two types of code groups for each number.

- (a) The numbers which are not followed by the symbol (+) will be used when the numerals are used singularly or as the final number of a group of numbers.
- (b) The numbers with the (+) ending will be used with all but the final number of a group of numbers.

SET 3 TIME PERIOD 5-6					ENCODE 14	
-00-	TKB 6(+)	FKG 28(+)	-50-	-70-	VGI 85(+)	
	YFB 6	VAY 28			TXQ 85	
IXY 00(+)			MMW 50(+)	TEE 70(+)		
OBO 00	OCI 7(+)	PTC 29(+)	DAT 50(+)	MZJ 70(+)	SWZ 86(+)	
	EUB 7	UYK 29	FTE 50	RKJ 70	DKE 86	
CEX 01(+)			FDT 50	OGU 70		
VDS 01(+)	BXE 8(+)		-30-		YGX 87(+)	
RYE 01	EMX 8	XUT 30(+)	KHV 51(+)	DUW 71(+)	TCD 87	
JTZ 01		HUL 30(+)	HZU 51	UIV 71		
	JVY 9(+)	JWE 30			MMB 88(+)	
RTX 02(+)	LSH 9	THV 30	FLG 52(+)	YNE 72(+)	TCB 88	
WNS 02(+)			YKX 52	PEZ 72		
MNE 02	-10-	JFU 31(+)			AHI 89(+)	
NQY 02	WWD 10(+)	KMH 31	PQQ 53(+)	WQB 73(+)	TSF 89	
	ITK 10(+)		ELY 53	PRN 73		
OGA 03(+)	EUJ 10	TMB 32(+)			-90-	
WVO 03(+)	XON 10	LLO 32	EOZ 54(+)	KDY 74(+)		
XQU 03			PHP 54	FUD 74	ERZ 90(+)	
TND 03	IIW 11(+)	EXW 33(+)			DWN 90(+)	
	CNT 11	DXV 33	CLG 55(+)	RQB 75(+)	OJM 90	
SJF 04(+)			YCB 55	AEX 75	KXG 90	
CZM 04(+)	ILK 12(+)	NTK 34(+)				
LNS 04	SMK 12	WQJ 34	XOI 56(+)	MFW 76(+)	BIO 91(+)	
PDO 04			XSI 56	WNF 76	JGT 91	
BCZ 05(+)	XEB 13(+)	TON 35(+)				
MGA 05(+)	FOT 13	CKR 35	CKP 57(+)	HTK 77(+)	GPP 92(+)	
LEX 05	EPU 14(+)	DWM 36(+)	RUA 57	VSE 77	GMT 92	
GTR 05	XZJ 14	PSU 36	ELG 58(+)	FIF 78(+)	EWX 93(+)	
			UUN 58	INR 78	NLF 93	
HUQ 06(+)	XDB 15(+)	BDQ 37(+)				
KRH 06(+)	LHU 15	OUB 37	LQP 59(+)	SSB 79(+)	NQR 94(+)	
EHZ 06			LEP 59	FVD 79	JPN 94	
MVR 06	PQW 16(+)	CYD 38(+)				
	GRQ 16	SWD 38				
PROTECTIVE MARKING					KTC 000 D	

Figure 3. Operations code extract.

SKILL LEVEL 1

2. To decode.

- a. After receiving and writing down the encoded message (fig 4), turn to the code set to be used for the time period (TIME PERIOD 5 - 6 SET 3 is used).

CGV CGK BSK BYY
DAT CYD BUG CHG

Figure 4. Sample received message.

PROTECTIVE MARKING		KTC 600 D	
BQB Oil (OE - #)	BYF Keep - s - ing	CHB Pound - s	CPK Vertical
BQG d	BYY 00(+)	CHG Today	CPU Search - ing
BQQ te	BZK Increase - d - s	CHZ Interrogate - ion	CQU Fail - ed - ing
BQS Not	BZN DEFCON	CIE ti	CRB Stop - ped - ping
BRA 40mm	BZS Building material (Class IV)	CIN 105mm	CRG Amphibious
BRT Stay - ed - ing		CIR Approve - d - g	CRH ly
BSK Vicinity (of)		CIS Very	CSM Depart - d - g
BSU 65		CJB Resist - ing	CTH Your
BSV k	C	CJD Initial - ed - ly	CTM Permit - ed - ing
BSX Check - ing	CAJ Execute - s	CJM Axis(of)	CTQ Barrage - s
BSZ Final	CAQ Blood	CKP 57(+)	CTS Expects
BTH Age	CBX 99(+)	CKQ Depot (supply)	CUJ Over run
BTI Fied	CCI Occupy - ed	CKR 35	CVV If
BTU Assist - ed - ing	CCL Yellow	CLC Stand - ing (by)	CWE Extend ed
BTZ Guard - ing	CCN Surround - ing	CLD Halt - ed	CWZ Safe - r ty
BUC 98	CCU Capture - d - ing	CLG 55(+)	CYD 38(+)
BUG 40	CDB Employ - ing	CLL ___Sig	CYJ HAWK
BUN Install - d - ation	CDH Separate - ing	CLV ing	CYU Destination
BUP ent	CDM Chief of Staff	CLW Contaminate - d	CYX Strafe - d - ing
BUQ Wood - s - ed - ing	CDS Get - ting	CME Other	CZF Guide - ed - s
	CEK 90mm	CMH ___Bn/___Inf	CZM 04(+)
BUU Entrench - ed	CEQ AH - 1S	CMY Officer - s	
BVD Collect - ed - ion	CEX 01(+)	CNG s	D
BVH un	CFJ Warn - ing	CNO Max (range)	DAB Demonstrate - d - s - ion
BWD Spare 17	CFN 63	CNQ Secret	DAT 50(+)
BWF ine	CFU Establish - ing	CNT 11	DBC Release - ing
BWG Fuse	CGG Mission - s	COC All	DBG Restore - d - s
BWP Will	CGJ Act - ive - s	COI TOT	DBK Question - ing
BWS Employ - ed	CGK Hour - s - ly	COT Improve - ment	DBW APC
BXE 8(+)	CGR Hostile	COU Battle position	DCH Before
BXO Accomplish - ed	CGV Patrol - ed - ing	COW e	DCR Honest John
BXP Sunset	CGW Tentative	CPD 83(+)	
BXW Grid (coord)	CHA Contact - ed - s		

SET 3 TIME PERIOD 5-6

DECODE 2

Figure 5. Operations code extract.

- b. The decode section of the operations code is made up of three-letter code groups in alphabetical order, with a word, phrase, or number to the right of each group (fig 5).
- c. Find the code group and write the word, phrase, or number under that group in the encoded message (fig 6).

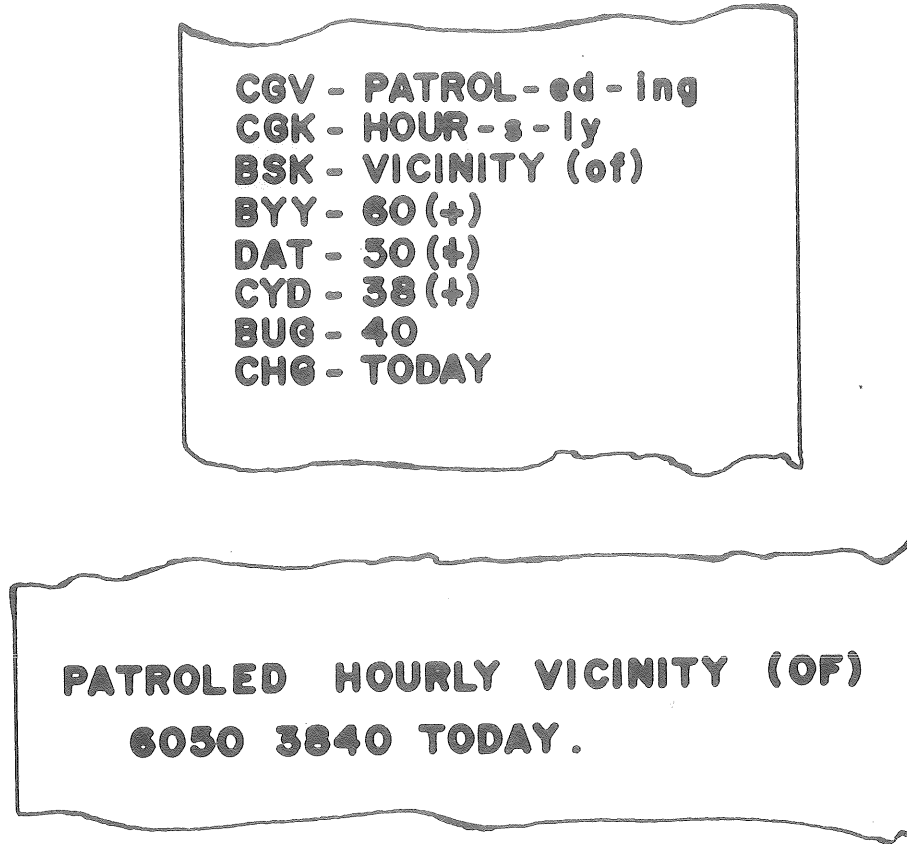


Figure 6. Sample message decoded.

NOTE: Often multiple endings are given to root words in the code's vocabulary. When decoding a message, the operator should ignore word endings in conflict with the context of the message.

REFERENCES

CEOI, KTC 600 D Tactical Operations Code

TASK

113-573-4006

Use the KTC 1400 D Numeral Cipher/Authentication System

CONDITIONS

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

1. CEOI extract with KTC 1400 D Numeral Cipher/Authentication System.
2. Map coordinates to be encoded.
3. Encoded numerical information to be decoded.
4. Authentication challenge for reply.
5. Pencil and paper.

STANDARDS

Task standard has been met when the KTC 1400 D Numeral Cipher/Authentication System has been used to encode and decode; and a correct reply has been provided for a challenge to authenticate in accordance with the performance measures.

PERFORMANCE MEASURES

SECURITY PRECAUTION 1: Use of code sets. Each set of the KTC 1400 D is effective for 24 hours unless otherwise directed by the C-E office. (Refer to CEOI Supplemental Instructions, Items 102, 113, 114, and 117.)

SECURITY PRECAUTION 2: Encrypt no more than 15 characters with a single SET INDICATOR. If an entire message must be encrypted, use the operations code KTC 600 D.

SECURITY PRECAUTION 3: Use only random letter combinations as SET INDICATORS.

SECURITY PRECAUTION 4: Variant letters are provided for each numeral. These should be used impartially and at random.

SECURITY PRECAUTION 5: Each table has plaintext numbers and letters after the 6th, 12th, and 18th lines. These are to ease operation when the KAL 61 device is not available. Do NOT use these as cipher values.

SECURITY PRECAUTION 6: In challenge and reply authentication, only the station responding is verified. Do NOT accept a challenge as an authentication. To verify both stations, both stations should be challenge and reply. (Refer to CEOI Item 113, When to Authenticate.)

SECURITY PRECAUTION 7: Another challenge should be made if an incorrect reply is received, if a "stand-by" is requested, or if an unusual delay occurs between challenge and reply.

SECURITY PRECAUTION 8: Never give the challenge and reply in the same transmission (self authentication).

1. Find the line for encryption. (Refer to fig 1 and CEOI Item 117.)
 - a. Randomly select any two letters (except Z) for the SET INDICATOR (SI).

EXAMPLE: "C P" (fig 1).

- b. Find the first letter of the SI ("C") in the LINE INDICATOR column.
 - c. Read to the right on that line to find the second SI letter "P." The letter to the right of the second SI letter is the SET LETTER "Q."

NOTE: If the second SI letter is the last letter on the line, go to the first letter in the same line for the SET LETTER.

- d. Find the SET LETTER ("Q") in the LINE INDICATOR column. This line will be used to encrypt up to 15 characters.

		SET 01 PERIOD 01 (PROTECTIVE MARKING)										KTC 1400 D		
		ABC 0	DEF 1	GHJ 2	KL 3	MN 4	PQR 5	ST 6	UV 7	WX 8	YZ 9			
LINE INDICATOR COLUMN	A	IMKY	QOC	PAU	WH	LX	FSD	RB	VN	EG	JT			
	B	MYNJ	RDH	OBA	WP	CI	ETG	SQ	UF	KV	XL			
FIRST LETTER OF SET INDICATOR	C	SWLN	VJM	HXB	KO	UA	RYD	TE	FI	PO	GG	SET LETTER		
	D	BJYM	GFP	LIT	KC	SR	DOV	XE	UA	QH	NW			
	E	WAHY	CUR	KMQ	XO	TS	EIG	JP	FN	BL	DV			
	F	VKLY	BQA	FEX	HR	JN	CUS	DM	GT	PI	WO			
		ABC 0	DEF 1	GHJ 2	KL 3	MN 4	PQR 5	ST 6	UV 7	WX 8	YZ 9	PLAIN TEXT LETTERS		
	G	MYRL	NEP	WSC	HX	IF	BDJ	KQ	OG	TA	VU			
	H	UWXG	CQR	OMT	YB	HP	VES	FJ	LN	AD	KI			
	I	RILN	HVB	WGD	PE	MS	ATQ	CK	XU	YO	JF			
	J	LEGX	SWY	MNR	DC	KF	VUH	JO	TB	QI	AP			
	K	WTOD	SRF	VEQ	LU	GK	HNA	YJ	PX	BC	MI			
	L	OHXL	SJI	QNK	GC	YF	TUD	WE	RA	BV	PM	PLAIN TEXT NUMBERS		
		ABC 0	DEF 1	GHJ 2	KL 3	MN 4	PQR 5	ST 6	UV 7	WX 8	YZ 9			
SET LETTER	M	CVGB	YIM	SHE	TU	JL	ODQ	KN	PX	RF	AW			
	N	SEDL	AFT	WJG	NR	XB	UHP	MV	YI	KO	QC			
	O	DGVK	ASM	RUY	JQ	HT	BPN	CL	EX	IF	OW			
	P	EPQW	GTR	HJK	YS	IF	UBC	DX	MN	OL	AV			
SET LINE	Q	EUOM	PXD	SQG	TA	NF	WHJ	VR	BI	CK	LY			
	R	LESV	JWX	HOR	YF	QC	ATU	BP	MN	DG	KI			
		ABC 0	DEF 1	GHJ 2	KL 3	MN 4	PQR 5	ST 6	UV 7	WX 8	YZ 9			
	S	BQMO	NTI	XSG	CL	WY	AHV	JU	FR	ED	KP			
	T	UNYT	GOV	EAS	PJ	QL	DHX	FW	CI	MR	KB			
	U	BSFP	MKT	QWL	IJ	UO	HCR	VD	GX	AE	NY			
	V	EYHX	OID	VMN	AC	FU	KPS	TB	WG	RL	JQ			
	W	EBLA	SQU	POV	IW	GN	CJX	YD	RF	TM	HK			
	X	PXVN	KLS	WCD	YO	FB	REI	UM	TJ	AH	QG			
	Y	MTXO	JGD	FPH	VU	QR	LKS	CY	EA	BW	IN			

Figure 1. KTC 1400 D, Encrypting.

2. Encrypt grid zone letters. (Refer to fig 1 and CEOI Item 117.)

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.

- a. Locate the grid zone designator letters in the plaintext letters (fig 1) above or below the SET LINE.

NOTE: For example purposes, the coordinates "AL 630 005" will be encrypted.

- b. The cipher letter found in the SET LINE directly above or below the plaintext letter is the cipher for the grid zone designator.

EXAMPLE: GRID ZONE "AL" is encrypted as "U A," using SET LINE "Q."

3. Encrypt numbers. (Refer to fig 1 and CEOI Item 117.)

NOTE: Numbers are encrypted in the order they appear in the message. Variants are to be used for repeated numbers.

- a. Find the number to be encrypted in the plaintext numbers above or below the SET LINE (fig 1).

EXAMPLE: Coordinates AL 630 005 are to be encrypted.

- b. For each number, substitute one of the cipher letters from the SET LINE.

EXAMPLE: The first coordinate number, "6," can be encrypted as either "V" or "R." We select "R."

- c. Continue to substitute letters from the same SET LINE until all numbers for that group are encrypted.

EXAMPLE: R T E O M H is one possibility. By using variants, others are possible.

4. Prepare for transmission. (Refer to performance measures 1 thru 3, fig 1; and CEOI Item 117.)

SKILL LEVEL 1

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

- a. The first two letters will be the SET INDICATOR. (NEVER TRANSMIT THE SET LETTERS.)

EXAMPLE: "I SET CHARLIE PAPA..."

- b. If grid zone letters are included, the third and fourth letters of the transmission will be encrypted grid zone letters.

EXAMPLE: "... UNIFORM ALFA ..."

- c. The remaining letters (including the third and fourth if grid zone letters are not included) will be encrypted numbers.

EXAMPLE: "... ROMEO, TANGO, ECHO, OSCAR, MIKE, HOTEL."

- d. An encrypted six-digit coordinate which includes grid zone letters will consist of ten letters, including the SET INDICATOR, which is always the first two letters.

EXAMPLE: The entire encrypted location would be transmitted as: "I SET CHARLIE PAPA (pause) UNIFORM ALFA (pause) ROMEO, TANGO, ECHO, OSCAR, MIKE, HOTEL."

5. Decrypt grid zone letters and numbers. (Refer to fig 2 and CEOI Item 117.)

- a. Upon receipt of the SET INDICATOR, find the SET LETTER, as described in performance measure 1.

SAMPLE RECEIVED MESSAGE: "I SET GOLF UNIFORM (pause) UNIFORM SIERRA (pause) QUEBEC, YANKEE, BRAVO, KILO, JULIETT, LIMA."

- b. Decipher the message beginning with the third letter "U" by substituting plaintext letters/numbers for the cipher letters.

SAMPLE MESSAGE DECRYPTED: LG 510644

SET 01 PERIOD 01

(PROTECTIVE MARKING) KTC 1400 D

	ABC 0	DEF 1	GHJ 2	KL 3	MN 4	PQR 5	ST 6	UV 7	WX 8	YZ 9
A	IMKY	QOC	PAU	WH	LX	FSD	RB	VN	EG	JT
B	MYNJ	RDH	OBA	WP	CI	ETG	SQ	UF	KV	XL
C	SWLN	VJM	HXB	KO	UA	RYD	TE	FI	PQ	CG
D	BJYM	GFP	LIT	KC	SR	DOV	XE	UA	QH	NW
E	WAHY	CUR	KMQ	XO	TS	EIG	JP	FN	BL	DV
F	VKLY	BQA	FEX	HR	JN	CUS	DM	GT	PI	WO
G	MYRL	NEP	WSC	HX	IF	BDJ	KQ	OG	TA	VU
H	UWXG	CQR	OMT	YB	HP	VES	FJ	LN	AD	KI
I	RILN	HVB	WGD	PE	MS	ATQ	CK	XU	YO	JF
J	LEGX	SWY	MNR	DC	KF	VUH	JO	TB	QI	AP
K	WTOD	SRF	VEQ	LU	GK	HNA	YJ	PX	BC	MI
L	OHXL	SJI	QNK	GC	YF	TUD	WE	RA	BV	PM
M	CVGB	YIM	SHE	TU	JL	ODQ	KN	PX	RF	AW
N	SEDL	AFT	WJG	NR	XB	UHP	MV	YI	KO	QC
O	DGVK	ASM	RUY	JQ	HT	BPN	CL	EX	IF	OW
P	EPQW	GTR	HJK	YS	IF	UBC	DX	MN	OL	AV
Q	EUOM	PXD	SQG	TA	NF	WHJ	VR	BI	CK	LY
R	LESV	JWX	HOR	YF	QC	ATU	BP	MN	DG	KI
S	BQMO	NTI	XSG	CL	WY	AHV	JU	FR	ED	KP
T	UNYT	GOV	EAS	PJ	QL	DHX	FW	CI	MR	KB
U	BSFP	MKT	QWL	IJ	UO	HCR	VD	GX	AE	NY
V	EYHX	OID	VMN	AC	FU	KPS	TB	WG	RL	JQ
W	EBLA	SQU	POV	IW	GN	CJX	YD	RF	TM	HK
X	PXVN	KLS	WCD	YO	FB	REI	UM	TJ	AH	QG
Y	MTXO	JGD	FPH	VU	QR	LKS	CY	EA	BW	IN

Annotations:

- FIRST LETTER OF SET INDICATOR: points to the circled letter 'G' in the first column.
- SET LETTER: points to the circled letter 'M' in the first column.
- SET LETTER SET LINE: points to the circled letter 'M' in the first column.
- SECOND LETTER OF SET INDICATOR: points to the circled letter 'U' in the first column.

Figure 2. KTC 1400 D, Decrypting.

SET 01 PERIOD 01 (PROTECTIVE MARKING)											KTC 1400 D		
LINE INDICATOR COLUMN	ABC 0	DEF 1	GHJ 2	KL 3	MN 4	PQR 5	ST 6	UV 7	WX 8	YZ 9			
A	IMKY	QOC	PAU	WH	LX	FSD	RB	VN	EG	JT			REPLY FOR EXAMPLE 2
B	MYNJ	RDH	OBA	WP	CI	ETG	SQ	UF	KV	XL			
C	SWLN	VJM	HXB	KO	UA	RYD	TE	FI	PQ	CG			
D	BJYM	GFP	LIT	KC	SR	DOV	XE	UA	QH	NW			SECOND LETTER OF CHALLENGE
E	WAHY	CUR	KMQ	XO	TS	FIG	JP	FN	BI	DV			
F	VKLY	BQA	FEX	HR	JN	CVS	DM	GT	PI	WO			REPLY FOR EXAMPLE 1
G	MYRL	NEP	WSC	HX	IF	BDJ	KO	OG	TA	VU			
H	UWXG	CQR	OMT	YB	HP	VES	FJ	LN	AD	KI			
I	RILN	HVB	WGD	PE	MS	ATQ	CK	XU	YO	JF			
J	LEGX	SWY	MNR	DC	KF	VUH	JO	TB	QI	AP			
K	WTOD	SRF	VEQ	LU	GK	HNA	YJ	PX	BC	MI			
L	OHXL	SJI	QNK	GC	YF	TUD	WE	RA	BV	PM			
M	CVGB	YIM	SHE	TU	JL	ODQ	KN	PX	RF	AW			
N	SEDL	AFT	WJG	NR	XB	UHP	MV	YI	KO	QC			
O	DGVK	ASM	RUY	JQ	HT	BPN	CL	EX	IF	OW			
P	EPQW	GTR	HJK	YS	IF	UBC	DX	MN	OL	AV			
Q	EUOM	PXD	SQG	TA	NF	WHJ	VR	BI	CK	LY			
R	LESV	JWX	HOR	YF	QC	ATU	BP	MN	DG	KI			
S	BQMO	NTI	XSG	CL	WY	AHV	JU	FR	ED	KP			
T	UNYT	GOV	EAS	PJ	QL	DHX	FW	CI	MR	KB			
U	BSFP	MKT	QWL	IJ	UO	HCR	VD	GX	AE	NY			
V	EYHX	OID	VMN	AC	FU	KPS	TB	WG	RL	JQ			
W	EBLA	SQU	POV	IW	GN	CJX	YD	RF	TM	HK			SECOND LETTER OF CHALLENGE
X	PXVN	KLS	WCD	YO	FB	REI	UM	TJ	AH	QG			
Y	MTXO	JGD	FPH	VU	QR	LKS	QY	EA	BW	IN			

GO TO THE TOP

Figure 3. KTC 1400 D, Challenge and reply authentication.

6. Perform challenge and reply authentication. (Refer to fig 3 and CEOI Items 113 and 117.)

a. Select any two letters (except Z) at random for challenge.

EXAMPLE: "F C."

b. Find the first letter of the challenge ("F") in the LINE INDICATOR column.

c. Read to the right on that line to find the second letter ("C").

d. Read the letter directly under the second letter ("B"). This is the correct reply to the challenge.

NOTE: If the first letter of the challenge is "Y," go to the top of the sheet in the same column to find the reply. EXAMPLE: For challenge "YY," the reply is "B."

7. Perform Transmission Authentication. (Refer to fig 4 and CEOI Item 114.)

a. Transmission authentication will be used ONLY in cases where authentication is required and it is NOT possible or desirable for the receiving station to reply.

b. Transmission authentication column assignments are indicated in CEOI Item 114.

c. Authenticators from the numbered columns of the Transmission Authentication Table should be used only once.

d. When necessary to use Transmission Authentication, the first unused authenticator in the assigned column will be used and a line will be drawn through that authenticator to preclude its reuse.

TRANSMISSION AUTHENTICATION TABLE									
01	02	03	04	05	06	07	08	09	10
HZ	RV	SX	RS	GN	CT	AV	UT	RZ	VO
VX	FO	MM	BN	JT	QA	PB	WQ	EC	MP
RD	ZH	PE	EN	FR	NM	YJ	HF	XT	BO
KP	TR	DY	PR	II	OT	LP	ZZ	PC	KI
BV	TF	YF	KR	NA	DU	HX	JG	LI	ZL
11	12	13	14	15	16	17	18	19	20
AG	UJ	YM	HK	AF	RH	PI	DQ	NN	OC
QD	AI	QF	XI	VF	PY	XL	OL	UK	QO
SR	BF	SN	PU	FG	MD	BK	EK	WB	FU
RP	EW	QN	HB	CF	GU	SP	WM	ZY	CJ
UC	CE	PL	XM	DT	ML	QE	JA	HV	IP
21	22	23	24	25	26	27	28	29	30
HO	PK	VI	YU	LE	SF	JI	FZ	LY	ZE
FK	ZW	GD	AX	AW	YX	XK	TU	NJ	SC
GJ	FA	IZ	TJ	OM	LW	TK	OO	XW	JQ
NV	OA	VJ	NS	TY	WO	GY	OW	CN	RU
BE	VY	OJ	QM	MT	ZS	RN	AQ	HE	MN
31	32	33	34	35	36	37	38	39	40
SJ	TN	KV	YI	AR	YS	WW	IK	DI	WX
HQ	SM	MC	XY	NY	HC	ZP	HY	PM	DM
IC	EE	UD	IF	UI	NQ	KA	MO	KO	XF
CU	UW	ZF	WN	ZI	VA	LA	VL	JR	IB
AC	GH	DS	AN	ZV	NU	XA	GQ	KD	NW

SET 01 PERIOD 01
 (PROTECTIVE MARKING) KTC 1400 D

Figure 4. KTC 1400 D, Transmission Authentication.

REFERENCES

CEOI

TASK**113-573-6001**

**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 and assistance will be 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.

SKILL LEVEL 1

- (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 (HFT), 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.

SKILL LEVEL 1

- *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.
- 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 similiar 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 (HTF), 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.

SKILL LEVEL 1

REFERENCES

FM 24-1 (HTF)

FM 32-30

TASK**113-573-7017**

Prepare/Submit Operator's (MIJI) Report

CONDITIONS

This task is performed in a tactical or nontactical situation and may be performed in an NBC environment. Given a requirement to operate in a radio net, an interfering signal of undesignated origin, and--

1. KTC 1400D Numeral Cipher/Authentication System.
2. CEOI extract, including supplemental instructions.
3. Pencil and paper.
4. Homing Loop Antenna AT-784/PRC (if available).
5. Compass or terrain oriented map (if available).
6. Watch or other method of determining time.

STANDARDS

Task standards have been met when the operator's initial MIJI report has been prepared and submitted through the net control station (NCS) by the best available means and the supplemental information assembled for the follow-up MIJI Report.

PERFORMANCE MEASURES

1. Prepare the initial MIJI report. (Refer to fig 1 and CEOI item 112.)

SKILL LEVEL 1

NOTE 1: If the initial MIJI report is submitted over nonsecure radio, items 1, 2, 4, and 5 must be encrypted using the KTC-1400D Numeral Cipher/Authentication System.

NOTE 2: Write the report on a separate sheet of paper (not the CEOI).

- a. Item 1 - Type report. (Encrypt) The numeral 22 will be used as the first item of the report. This informs the NCS that the message is a MIJI report.
- b. Item 2 - Frequency or channel affected. (Encrypt) The frequency only needs to be sent if it is different than the frequency being used for transmission of the MIJI report.
- c. Item 3 - Victim designation and call sign. Only the abbreviated call sign and suffix of the affected station, and then only if it is different than the reporting station.
- d. Item 4 - Type emission or audio characteristic of MIJI. Encrypt appropriate number.)
 1. Babbled voice.
 2. Constant tone.
 3. Random keyed Morse Code.
 4. Pulse (monotonous rumble of rotating machinery).
 5. Gulls (cry of sea gull).
 6. Stepped tones (bagpipes).
 7. Random noise.
 8. Random pulse.
 9. Spark.
 10. Wobbler (howling).
 11. Rotary (grunting sound).
 12. Music, screams, random machinery noise.
 13. Unidentified English voice, chatter, traffic.

14. Unidentified foreign voice, chatter, traffic.
 15. Deliberate attempt by unauthorized station to enter net and/or pass traffic.
 16. Meaconing (false navigational signals).
- e. Item 5 - Coordinates of affected station. (Encrypt) The coordinates need to be included only if unknown to the net control station.
2. Submit the initial MIJI report.
 - a. Initial MIJI reports are submitted to the NCS by the best available means as soon as the tactical and/or operating conditions permit.
 - b. Regardless of the reporting means chosen, every effort must be made to conceal the fact that a MIJI report is being submitted.
 - c. The NCS will immediately report all MIJI to the unit C-E Officer, Intelligence Officer, or Electronic Warfare Officer, as available.
 3. Assemble additional information for the follow-up MIJI report. (Refer to fig 2 and CEOI item 112.)

NOTE 1: A follow-up report is required within 12 hours of the initial report. In many instances, the operator who submitted the initial report will be the only source of information for the follow-up report.

NOTE 2: The item numbers listed below relate to the item numbers of the follow-up report. Do not confuse these items with the initial MIJI report.

- a. Item 4 - weather conditions. (Encrypt appropriate number.)
 1. Clear.
 2. Scattered clouds.
 3. Overcast.
 4. Heavy overcast.

(PROTECTIVE MARKING)

KAV SUP Series **FOLLOW-UP MIMI REPORT** 112

For instructions regarding the preparation of this report refer to pages 8 thru 11 of this CEOI Item.

ITEM 1G.-Victim designation and call sign. _____

ITEM 1H.-Victim functions (Surveillance, GCI, Communications, etc.): _____

ITEM 1L.-Parent organization (when applicable): _____

ITEM 2.-Type incident: _____

ITEM 3.-Operator's name and function: _____

ITEM 4.-Weather conditions: _____

ITEM 5.-Nomenclature of equipment affected: _____

ITEM 6.-Scope photos/drawings or signal recordings: _____

ITEM 7.-Date/time (Z)/Coordinates MIJI began: _____

FOLLOW-UP MIJI REPORT 112

(PROTECTIVE MARKING)

KAV SUP Series **FOLLOW-UP MIJI REPORT** 112

ITEM 8.-Date/time (Z)/Coordinates MIJI most effective: _____

ITEM 9.-Date/Time (Z)/Coordinates MIJI ended: _____

ITEM 10.-Bearing(s) to MIJI source with corresponding time (Z) and victim coordinates: _____

ITEM 11.-Frequency or channel affected: _____

ITEM 12D.-Type emission or audio characteristics of MIJI: _____

ITEM 4F.-SUMMARIZATION-Effects of MIJI, ECCM action, and any other comments: _____

FOLLOW-UP MIJI REPORT 112

Figure 2. Organizational follow-up MIJI report.

SKILL LEVEL 1

- b. Item 5 - Nomenclature of equipment affected. (Encrypt numerical portion of equipment designation.)
- c. Item 6 - Scape photos/drawings or signal recordings. If made, drawings should include azimuth, heading, range mark values, and other orientation data, along with identification of scape used to obtain the photos/drawings. Signal (tape) recording containers should be annotated to show recording speed, date/time of incident, unit affected, etc.

NOTE: For electrically transmitted reports, the operator will simply state that item 6 information is being "passed separately," or is "not applicable."

- d. Item 7 - Date/time (Zulu)/coordinates MIJI began. (Encrypt)

NOTE: Grid zone letters need to be included in messages only when they are necessary to the positive location of the reporting element.

- e. Item 8 - Date/time (Zulu)/coordinates MIJI most effective. (Encrypt) Include as appropriate. If omitted, the report recipient may assume that the information is the same as item 7.
- f. Item 9 - Date/time (Zulu)/coordinates MIJI ended. (Encrypt) Include as appropriate. If omitted, the report recipient may conclude that the MIJI is ongoing or that the affected station has changed to another frequency.
- g. Item 10 - Bearing(s) to MIJI source with corresponding time and victim coordinates.

NOTE: Use AT-784/PRC with FM radio systems (if available). If a directional homing loop antenna is not available, hold the radio whip antenna horizontally and walk it in a circle around the radio. The loudest signal will be broadside to the antenna. Determine the azimuth using the compass or map.

REFERENCES

CEOI

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 BA-4386/PRC25.

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 according to performance measures 1 through 4.

PERFORMANCE MEASURES

1. Insert battery. (Refer to fig 1 and TM 11-5820-667-12, para 2-4.)
 - 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, para 2-6a.)
3. Erect Antenna AT-271A/PRC. (Refer to TM 11-5820-667-12, para 2-6b.)

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.

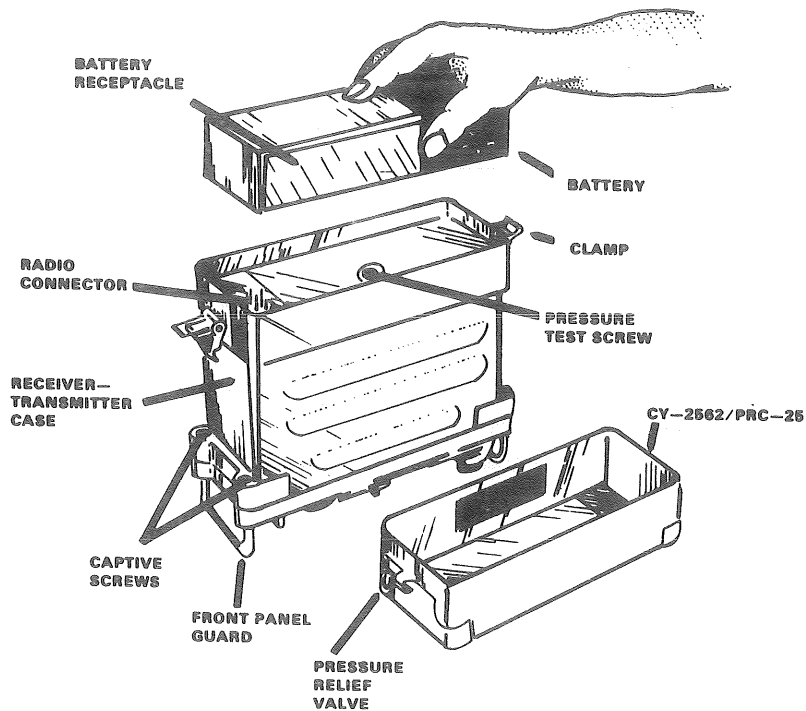


Figure 1. Installing battery in receiver-transmitter.

REFERENCES

TM 11-5820-667-12

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 11-5820-401-10-1 or TM 11-5820-401-10-2.

Supervision and assistance will be available.

STANDARDS

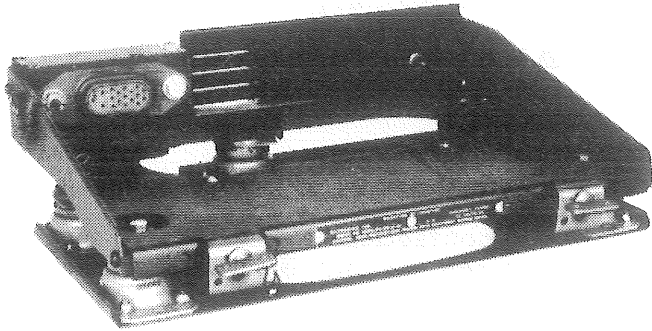
This task has been performed correctly when, in 10 minutes, the components of the radio are installed in their mounts without causing damage to the components or mounts, the antennas are erected, all cable connections are made and the radio is ready to be aligned and operated according to performance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

PERFORMANCE MEASURES

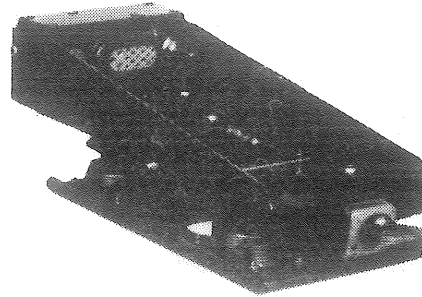
1. Insure POWER switches of Receiver-Transmitter RT-246/VRC and Receiver R-442/VRC are in the OFF position. (Refer to TM 11-5820-401-10-1 or TM 11-5820-401-10-2, chap 2.)

SKILL LEVEL 1

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 11-5820-401-10-1 or TM 11-5820-401-10-2, chap 2.)



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



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

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 11-5820-401-10-1, page 58.)
 - a. Insure all cables are present.
 - b. Cable radio set major components.
4. Insure RETRANS switch of Control Radio Set C-2299/VRC is in the OFF position. (Refer to fig 2 and TM 11-5820-401-10-1 or TM 11-5820-401-10-2, chap 2.)
5. Insert receiver-transmitter and receiver into mounts. (Refer to fig 3 and 4, and TM 11-5820-401-10-1 or TM 11-5820-401-10-2, chap 2.)

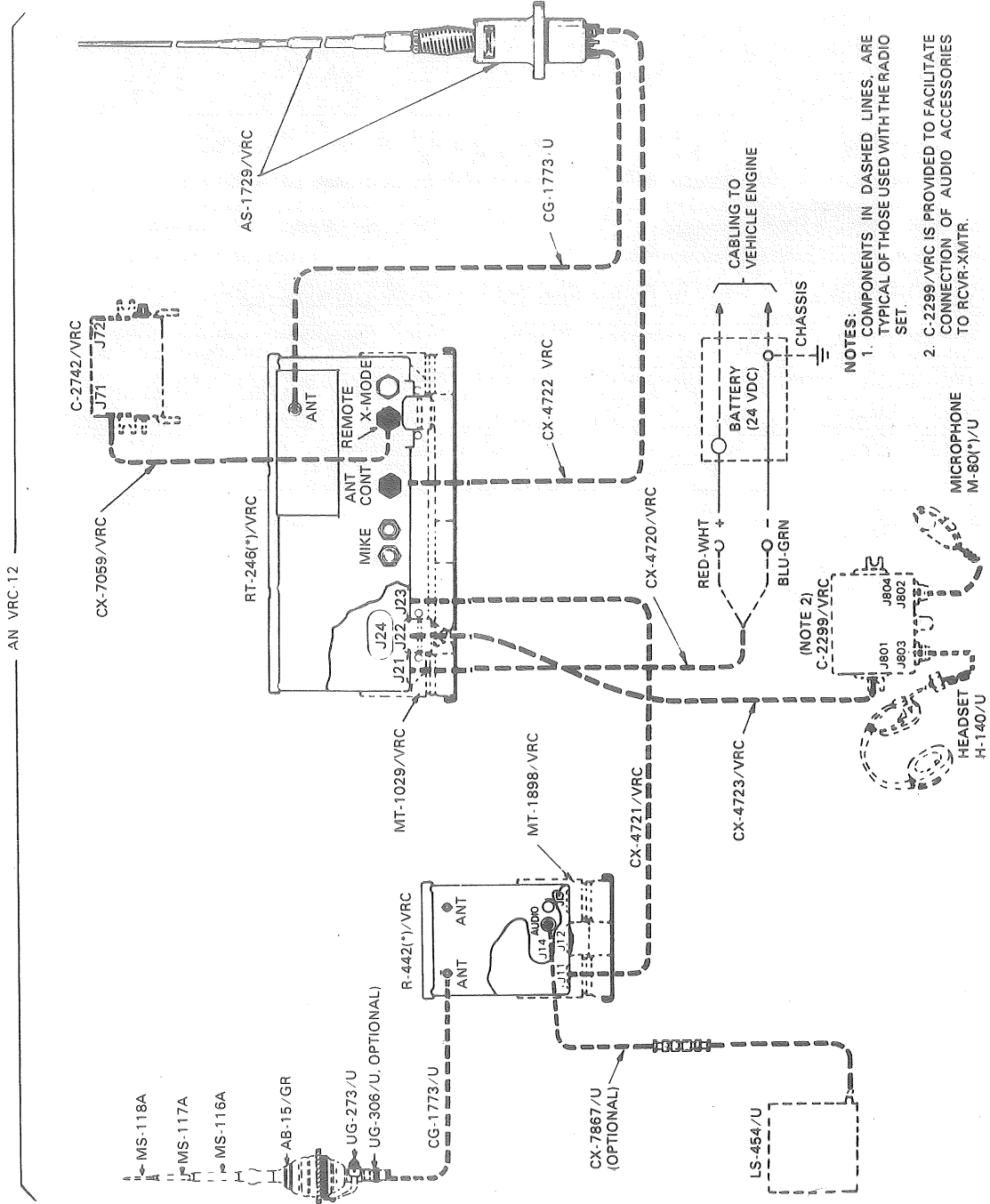


Figure 2. Typical cabling diagram for AN/VRC-12.



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

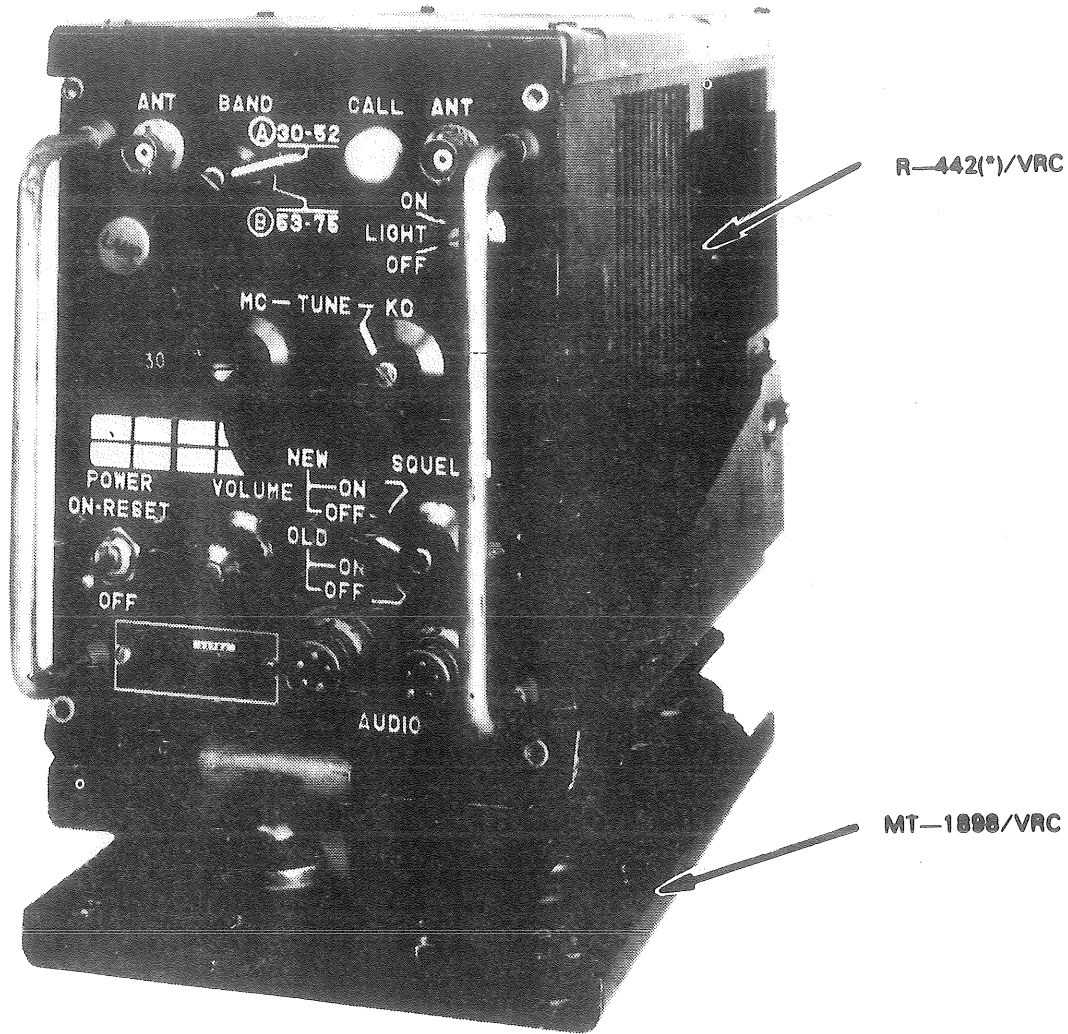


Figure 4. Receiver R-442(*)/VRC, installed on Mounting MT-1898/VRC.

SKILL LEVEL 1

- 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 11-5820-401-10-1 or TM 11-5820-401-10-2, chap 2.)
7. Erect Antenna AS-1729/VRC. (Refer to fig 2 and TM 11-5820-401-10-1 or TM 11-5820-401-10-2, chap 2.)
 - 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 11-5820-401-10-1

TM 11-5820-401-10-2

TASK**113-587-1003**

Install Radio Set AN/VRC-64

CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. Given--

1. Radio Set AN/VRC-64.
2. Antenna AS-1729/VRC or AT-912/VRC.
3. Long Wire Antenna AT-984A/G.
4. Antenna tie down kit.
5. M151A2 jeep with mount.
6. MT-1029/VRC and antenna matching unit base installed.
7. Generator Set 3 KW 28 V DC.
8. TM 11-5820-498-12.
9. TM 11-6115-271-14.
10. 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.

SKILL LEVEL 1

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, para 2-5d.)

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.

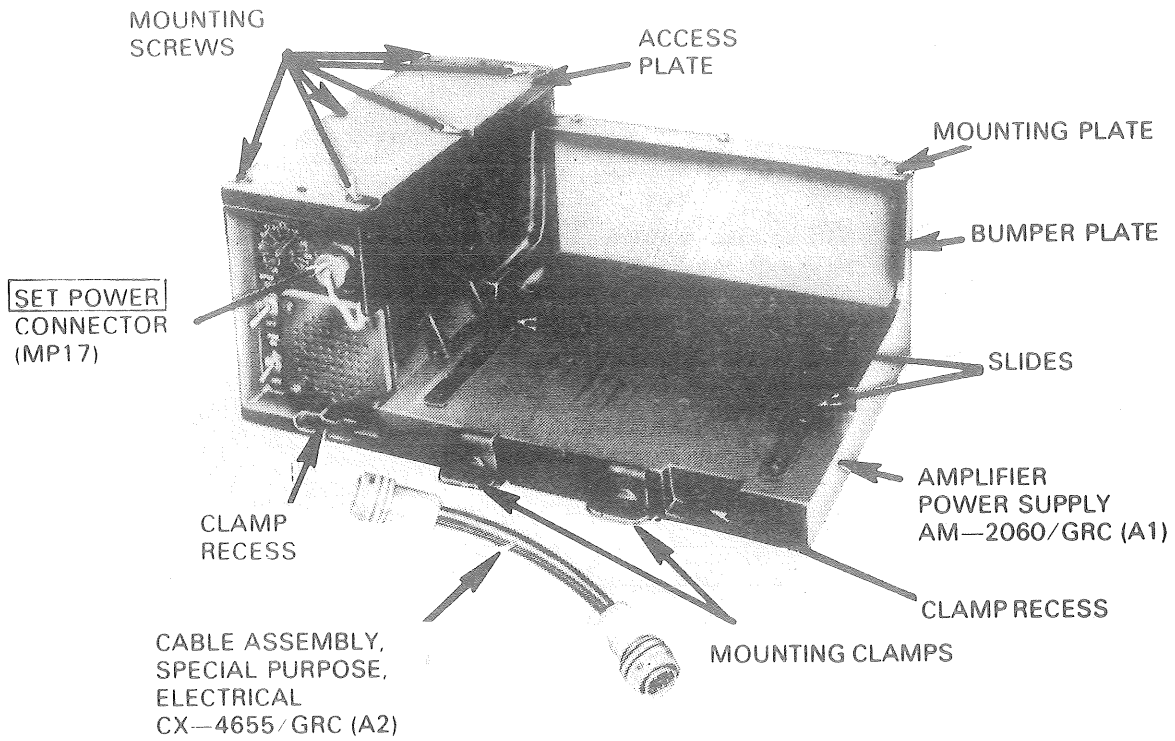


Figure 1a. Front view of Amplifier-Power Supply OA-3633/GRC or OA-3633A/GRC.

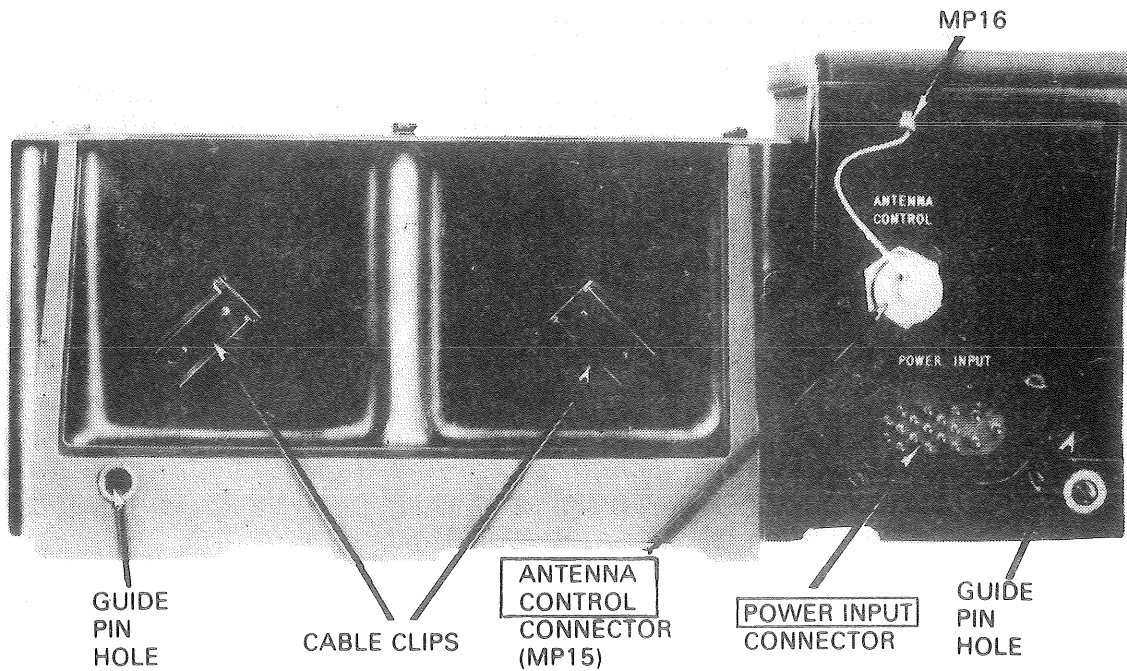


Figure 1b. Rear view of Amplifier-Power Supply OA-3633/GRC or OA-3633A/GRC.

SKILL LEVEL 1

- b. Loosen CLAMPS on Mount MT-1029/VRC as shown in figure 2.

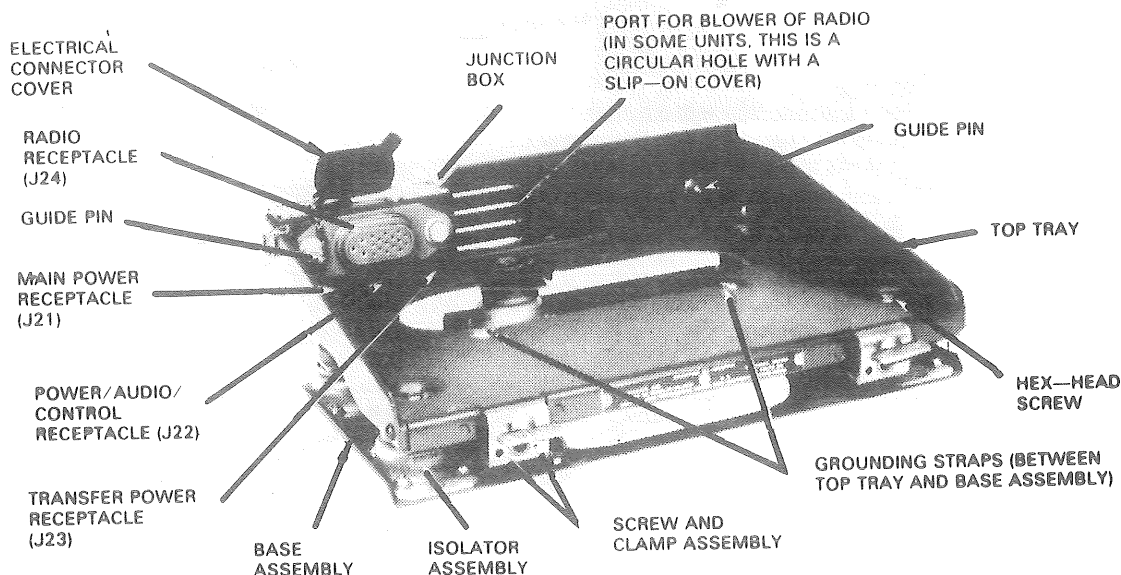


Figure 2. Mounting MT-1029/VRC.

- c. Place amplifier-power supply on the MT-1029/VRC.
- 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/VRC.
- f. Engages CLAMPS (fig 2) on MT-1029/VRC 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.

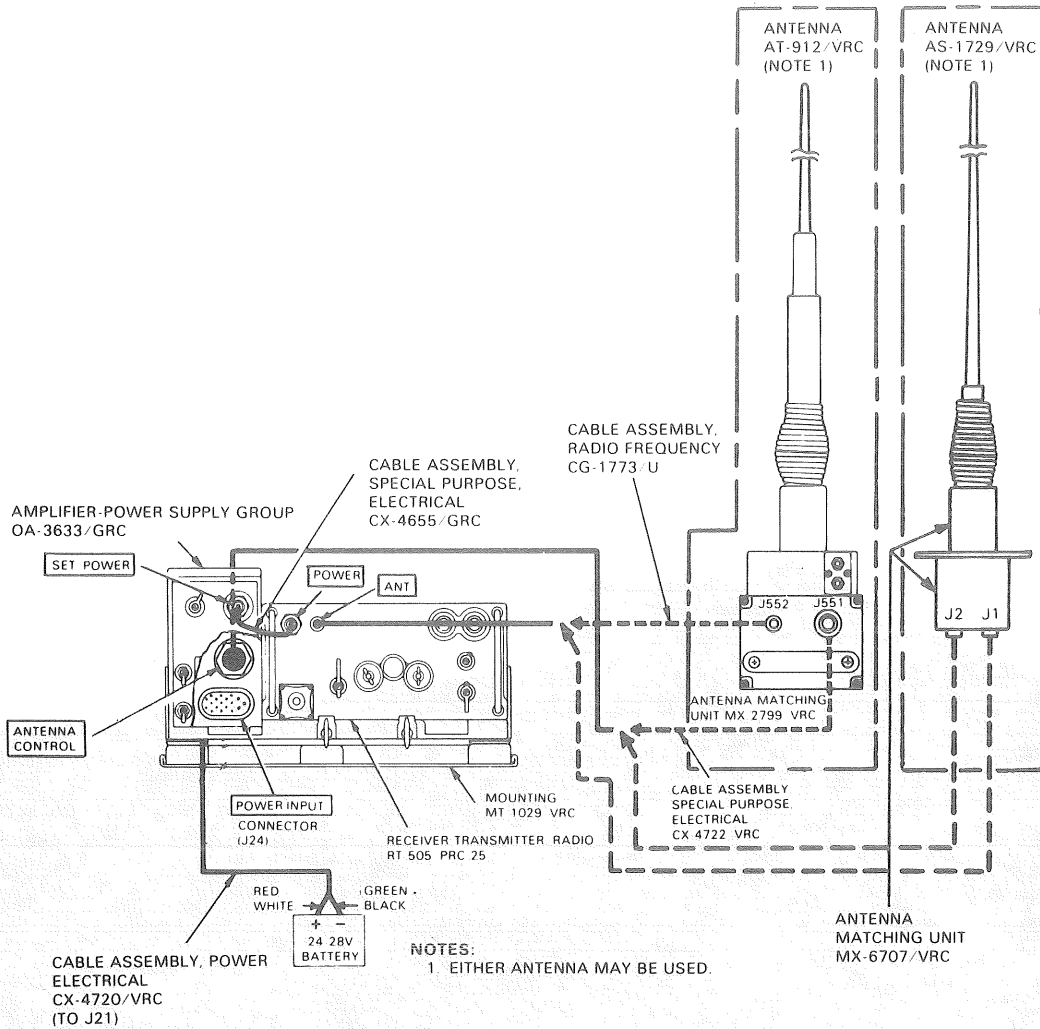


Figure 3. Cabling Diagram of Radio Set (Receiver-Transmitter OA-3633/GRC, and Antenna).

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, para 2-5e.)

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.

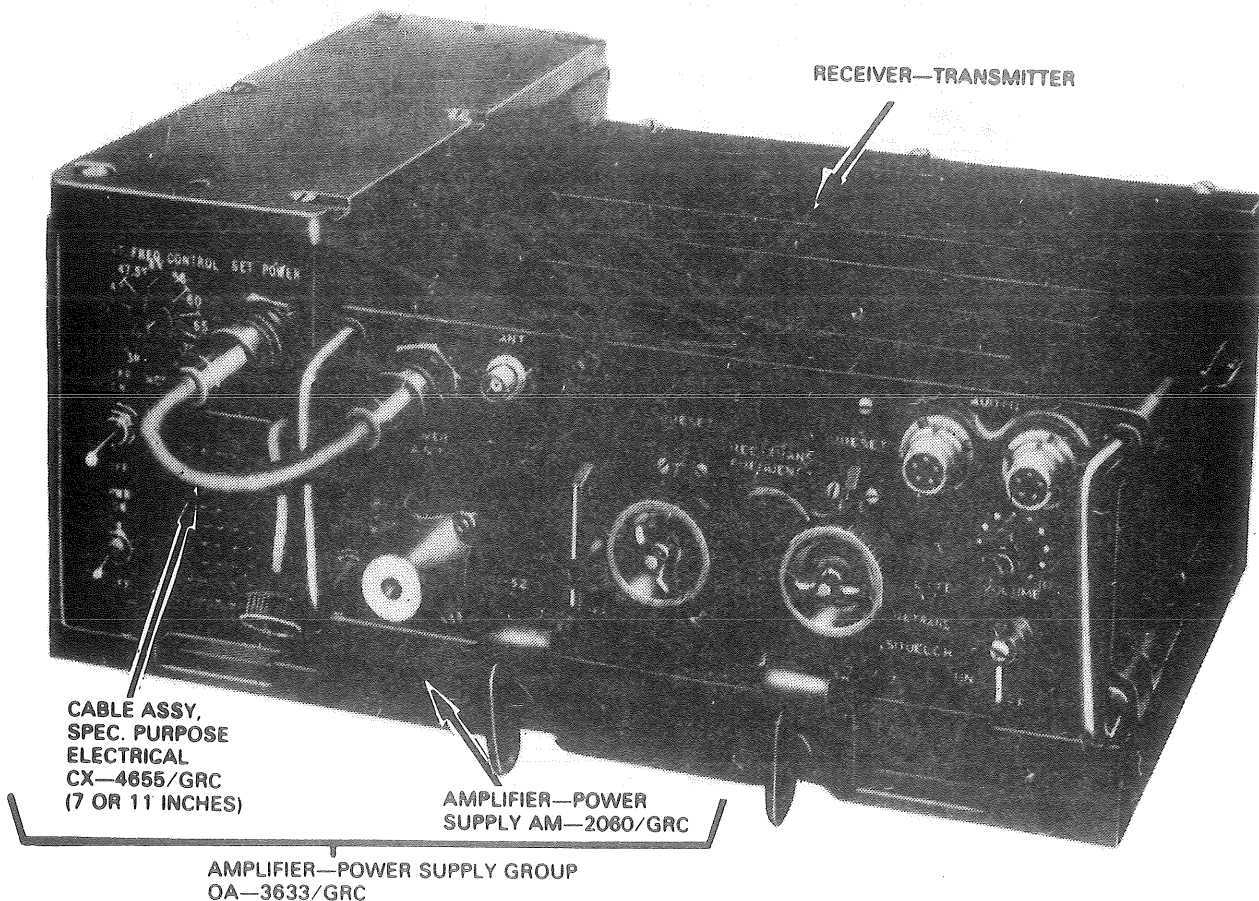


Figure 4. Amplifier-Power Supply OA-3633/GRC or OA-3633A/GRC with receiver-transmitter installed.

- 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, para 3-8.)
 - 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, para 2-5f.)

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.

SKILL LEVEL 1

- (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.

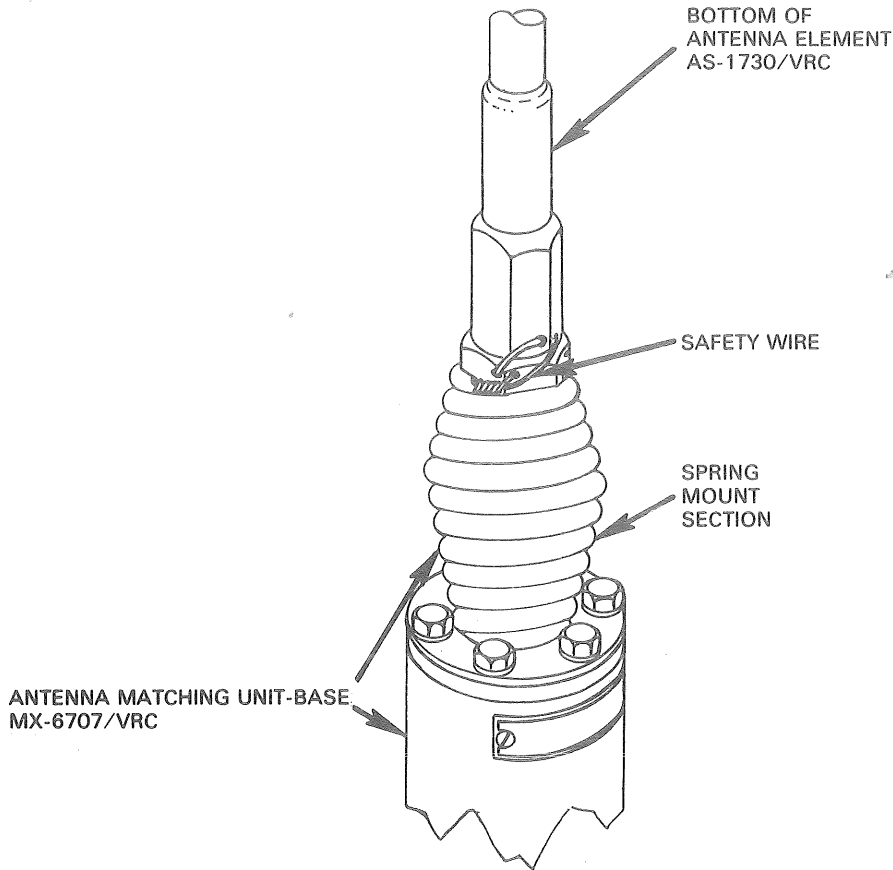


Figure 5. Tying safety wire between AS-1730/VRC and MX-6707/VRC of AS-1729/VRC.

- 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, para 6-16.)
- 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.

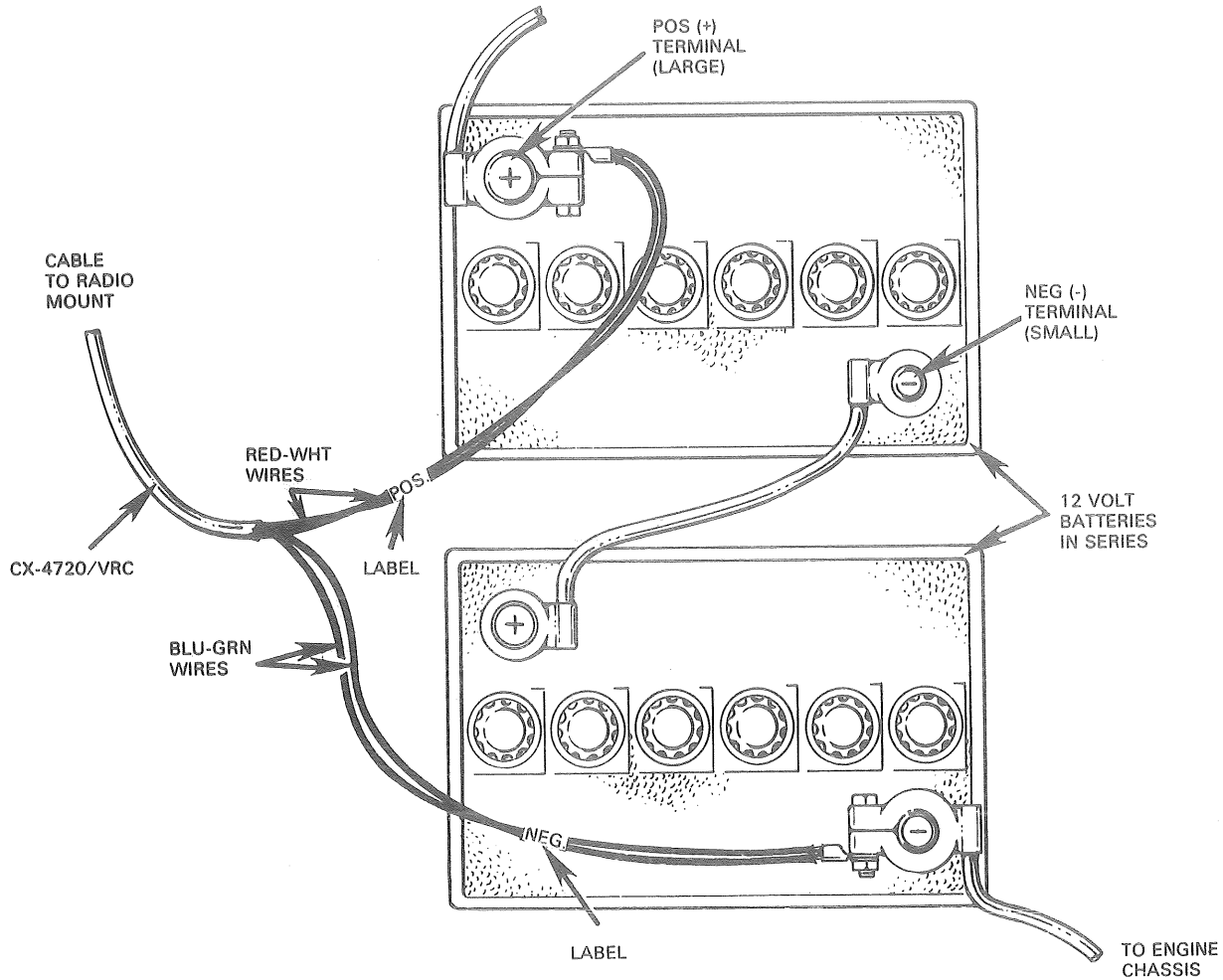


Figure 6. Connection of 28 V DC Power Cable.

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.)

REFERENCES

TM 11-5820-498-12

TM 5-6115-271-14

TASK**113-587-1005**

Install 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--

1. AN/VRC-49.
2. Vehicle with mounting facilities installed.
3. 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

CAUTION: Before installing the radios or removing them from the radio mounts, 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.

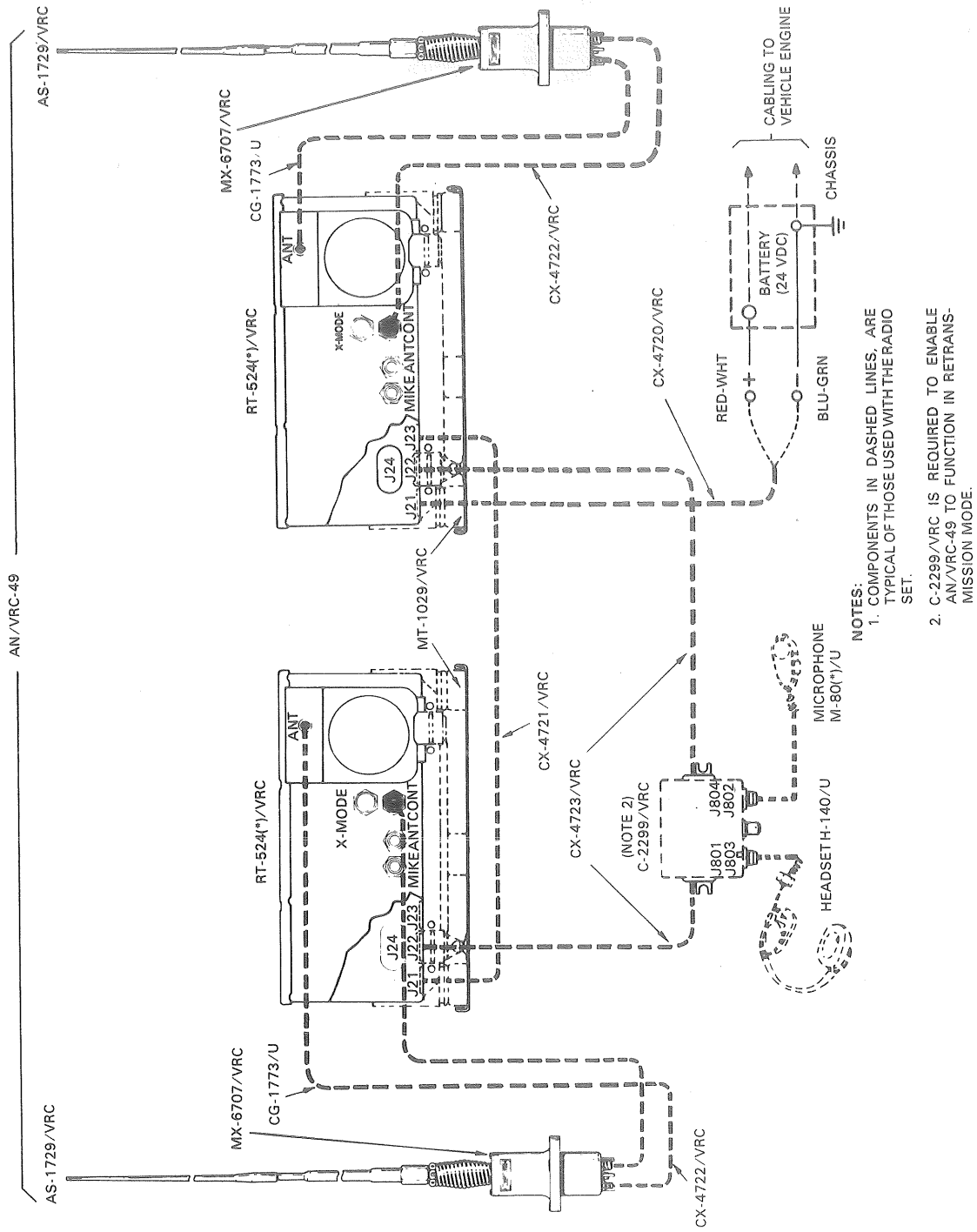


Figure 1. Typical cabling diagram for AN/VRC-49.

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

CAUTION: 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, or TM 11-5820-401-10-2, chap 2, sec III.)
 - 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, or TM 11-5820-401-10-2, chap 2, sec III.)

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.

SKILL LEVEL 1

- 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.

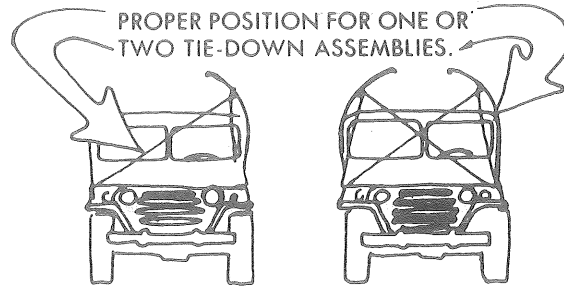
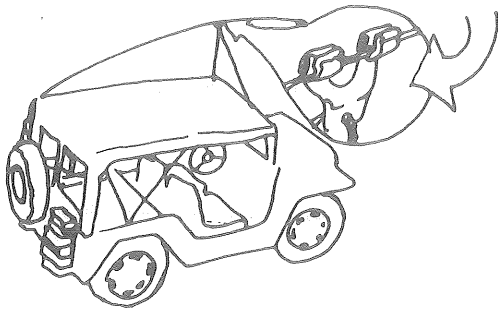
CAUTION: Insure that the male end of the cable is connected to the receiver-transmitter.

- 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).)
- f. Tie down antennas. (Refer to TM 11-5820-401-10-1, chap 2, sec III, or TM 11-5820-401-10-2, chap 2, sec III.)

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.



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.

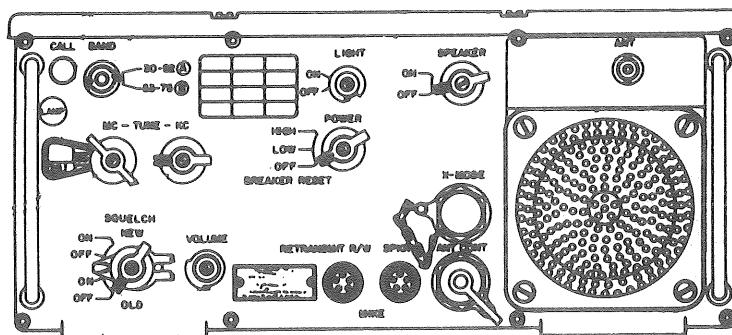
CAUTION 2: Do not cross the antennas during tie-down.

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

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.



SKILL LEVEL 1

- a. Set POWER switches to LOW.
 - b. Set BAND switches to band of operating frequency(cies).
 - c. Set SQUELCH switches to authorized 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, or TM 11-5820-401-10-2, chap 2, sec III.)
- 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, para 3-4.)

REFERENCES

TM 11-5820-401-10-1

TM 11-5820-401-10-2

TM 11-5820-401-12

TM 38-750

TASK**113-587-1050**

Mount 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. Vehicle with mounting facilities installed.
3. Initiated DA Form 2404.

STANDARDS

Task standard has been met when the AN/VRC-46 has been correctly mounted, connected, and checked in accordance with the performance measures within 5 minutes.

PERFORMANCE MEASURES

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: Before installing the radio in, or removing it from the radio mount, make sure that the POWER switch is at OFF.

WARNING: The receiver-transmitter is compact and heavy (over 50 pounds). Use care in handling it in order to protect personnel from serious injury and the equipment from damage.

SKILL LEVEL 1

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

CAUTION: When pulling the 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).

AN/VRC-46

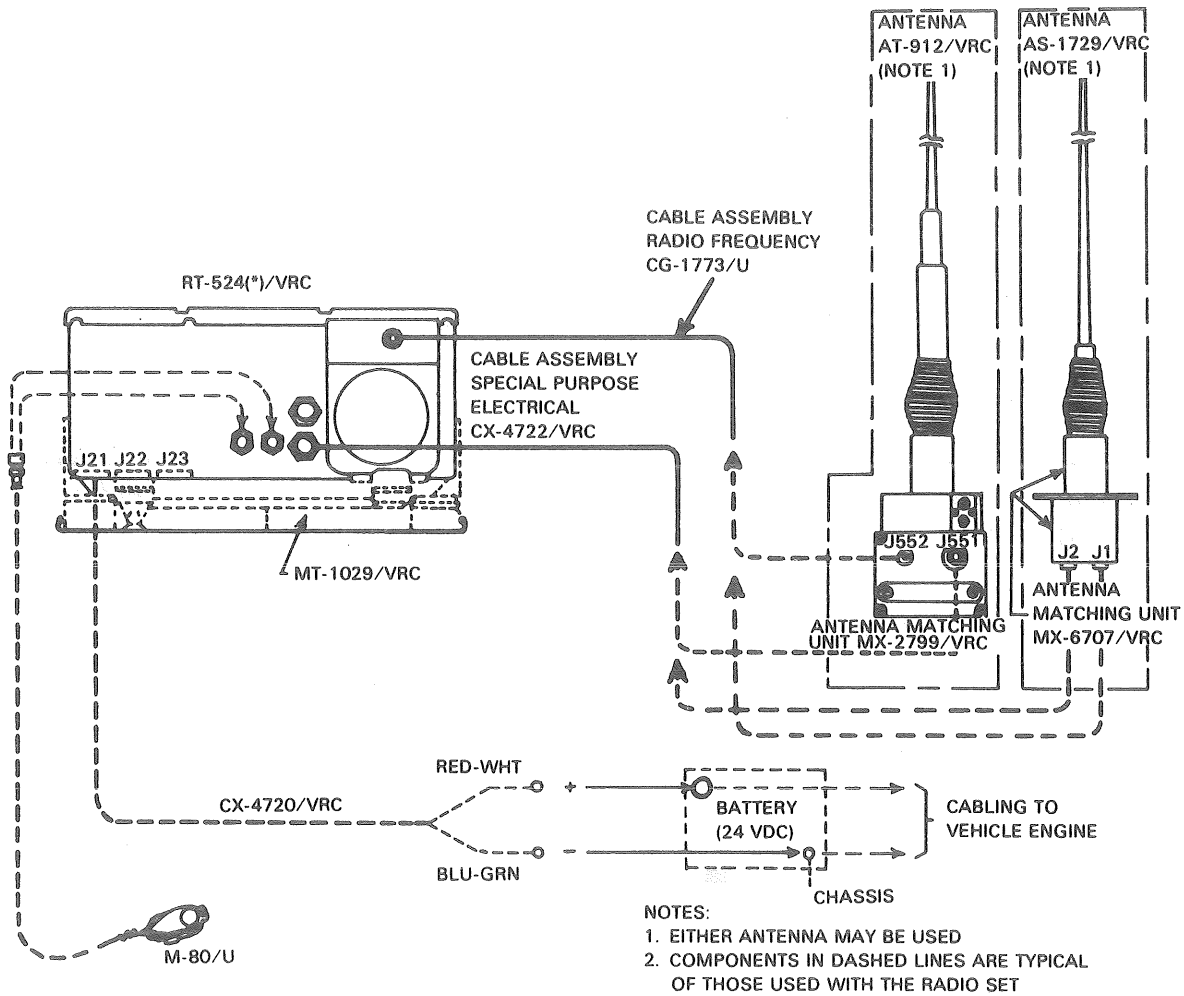
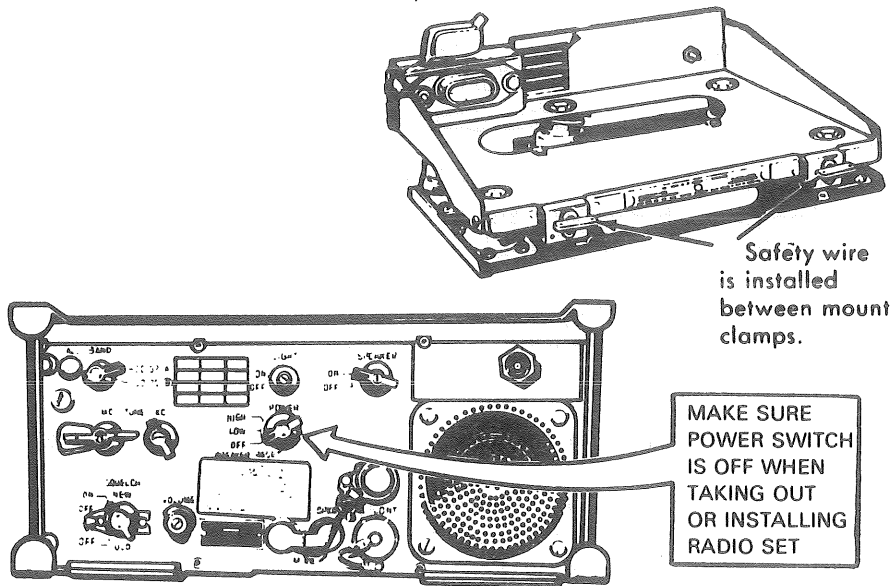


Figure 1. Typical cabling diagram for AN/VRC-46

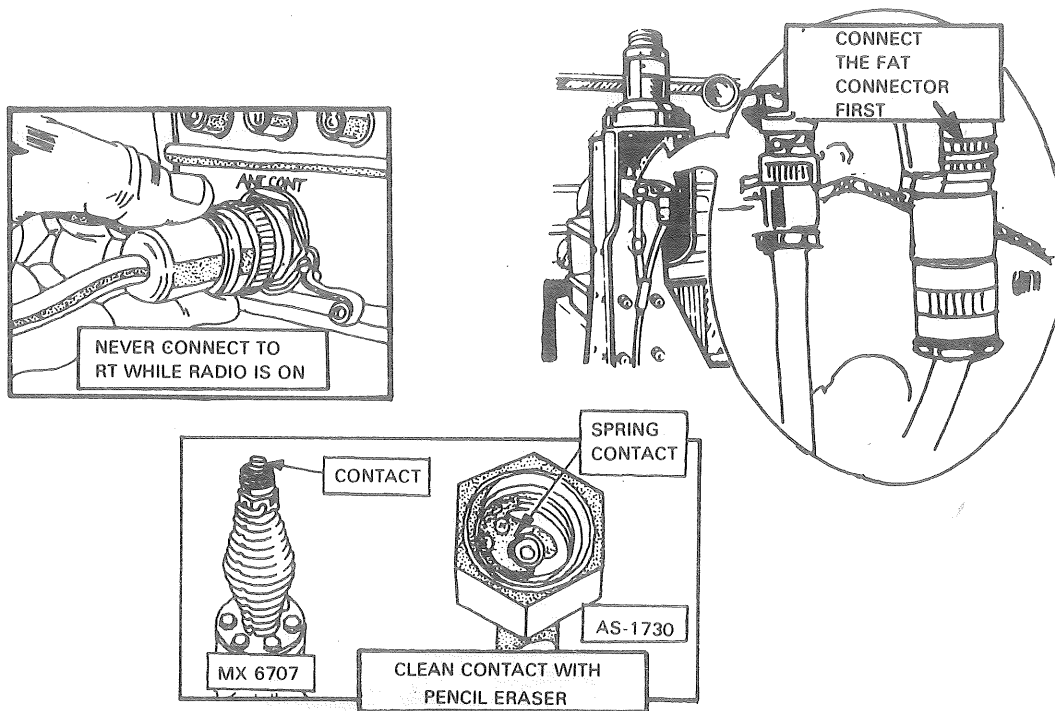
1. Mount the receiver-transmitter. (Refer to fig 1 and TM 11-5820-401-10-1, chap 2, sec III, step 1.)
 - a. Make sure the mount is clean and that the grounding straps are securely connected between the top tray and the mount base.
 - b. Remove the rubber receptacle cover and make sure that the chain is clear of the guide pins and the receptacle.
 - c. Make sure that the vent port is free of obstructions.

CAUTION: On early model mounts, a special vent cover is provided. This vent cover must be in place when the set is in operation.

- d. Lift and position the R-T on the mount and carefully slide it back to seat the plug in the mount receptacle.



- e. Raise the clamps and tighten the clamping screws to lock the R-T on the mount.
 - f. Use safety wire or the security chain to secure the mounting clamps.
2. Assemble and connect the antenna. (Refer to fig 1 and TM 11-5820-401-10-1, chap 2, sec III, step 4, or step 7.)



CAUTION 1: Make sure that a ground strap is firmly connected between the MX-6707/VRC (compact antenna matching unit) and a ground point on the vehicle.

CAUTION 2: Inspect the contacts inside the base of the lower antenna section. Make sure they are not corroded, bent, or broken.

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

NOTE: Apply graphite grease to the threads of the antenna sections to make removal easier. This also helps to 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. (If the red O-ring can be seen when the lower section is screwed down tight, notify your unit radio repairman.)

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

- 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: Make sure 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 of the receiver-transmitter and the small (BNC) connector of the matching unit.
 - e. Route the cables between the receiver-transmitter and the matching unit so that the cables are not endangered by the movement of equipment or personnel.
3. Tie down the antenna. (Refer to fig 2 and TM 11-5820-401-10-1, chap 2, sec III, step 5.)

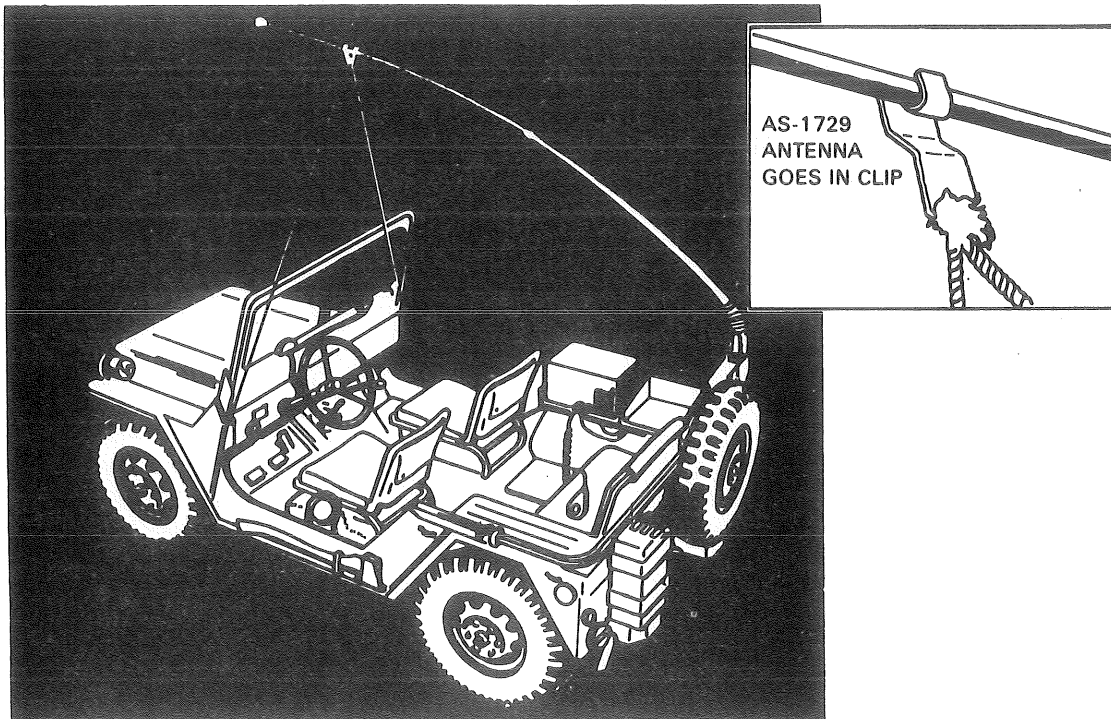


Figure 2. Antenna tie-down

SKILL LEVEL 1

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

- a. Clip the V-shaped clamp to the middle of the upper antenna section. DO NOT put the antenna beneath the clamp; it cannot spring out of this position.
- b. Make sure that the clamp does not cut into the fiberglass on the antenna section.
- c. Pull the antenna to approximately 60 degrees above the ground level and tie to the vehicle.

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. If more than one radio set is mounted on the vehicle, do not cross the antennas during tie-down.

4. Update DA Form 2404. (Refer to TM 38-750, para 3-4, and TM 11-5820-401-10-1, chap 2, sec II.)

TRAINING NOTE: To dismount the radio set, reverse the procedures outlined in performance measures 1 through 3, observing all applicable WARNINGS, CAUTIONS, and NOTES.

REFERENCES

TM 11-5820-401-10-1

TM 38-750

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.
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, para 3-2.)
3. Perform stopping procedures. (Refer to fig 1 and TM 11-5820-667-12, para 3-5.)

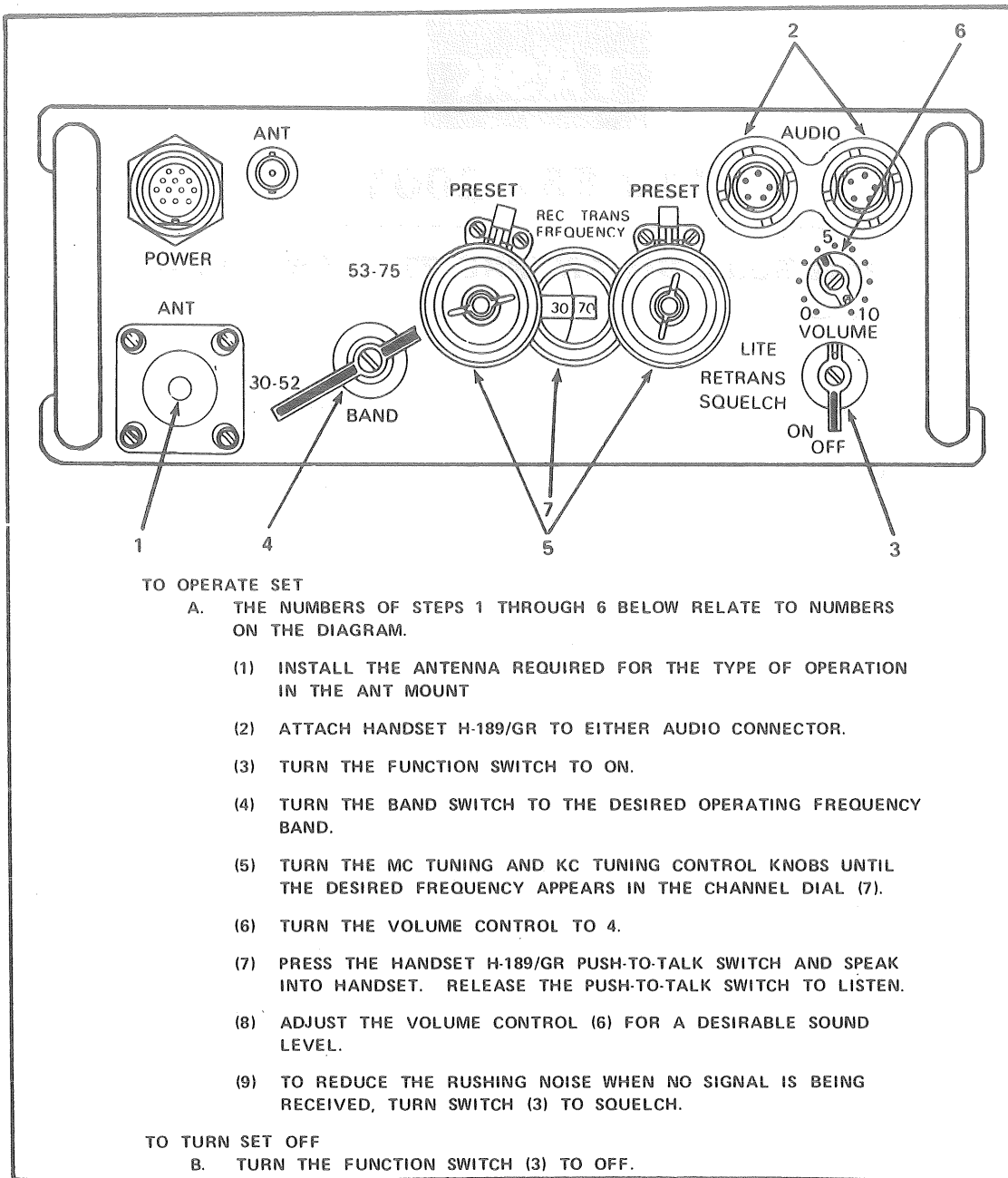


Figure 1. Condensed operating instructions for Radio Set AN/PRC-77.

REFERENCES

TM 11-5820-667-12

CEOI

TASK**113-587-2002**

Operate Radio Set AN/VRC-64

CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. Your team chief will provide you with the following:

1. Installed Radio Set AN/VRC-64.
2. CEOI.
3. SB 11-624.
4. 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.

SKILL LEVEL 1

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 POWER 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, para 3-11.)
3. Conduct alignment procedures for RT-841/PRC-77. (Refer to TM 11-5820-498-12, para 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, para 3-14.)
 - a. Turn amplifier-power supply POWER switch to ON. (Refer to fig 1.)
 - b. Set amplifier-power supply SPEAKER switch to ON.
 - c. Adjust receiver-transmitter VOLUME control until background noise is heard.

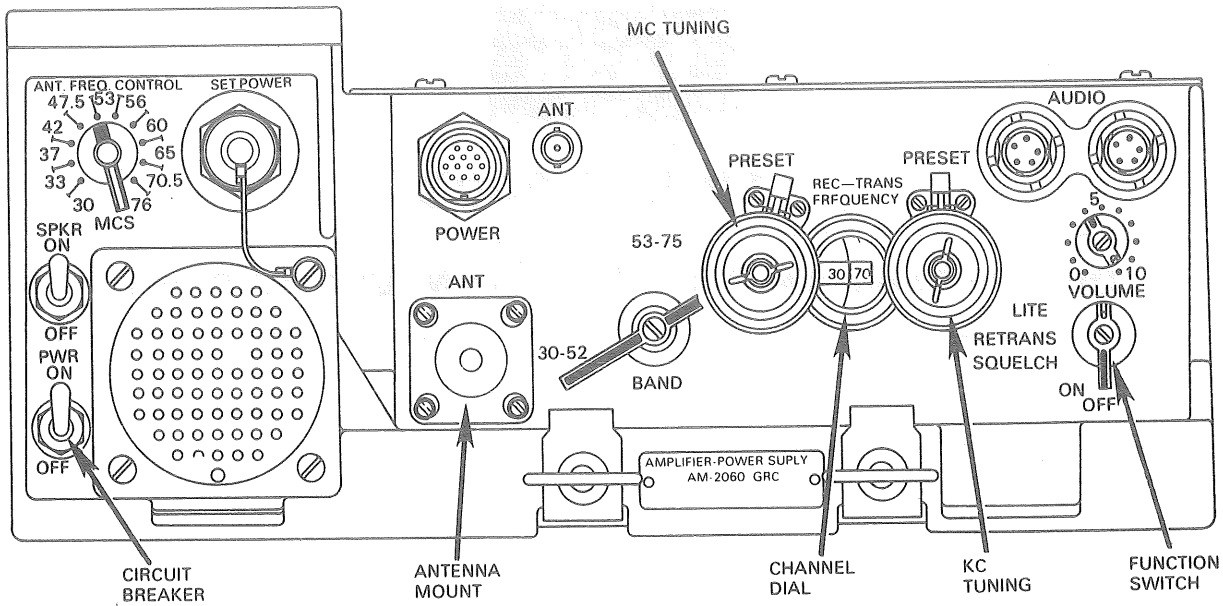


Figure 1. Amplifier-Power Supply and Receiver-Transmitter, Controls, Indicators, and Connectors.

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, para 3-14k(1) and (2).)
 - a. Set the AM-2060/GRC POWER switch to OFF.
 - b. Turn the receiver-transmitter FUNCTION switch to OFF.

REFERENCES

- TM 11-5820-498-12
- TC 32-11
- SB 11-624
- CEOI

TASK

113-587-2003

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.

Given--

1. Operational AN/VRC-46.
2. TM 11-5820-401-10-1.
3. CEOI.
4. Radio station to communicate with.

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 accordance with 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.)

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.)
- 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

CEOI

TASK

113-587-2004

Troubleshoot AN/VRC-46 (AN/VRC-12 Series)

CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. Your team chief will provide you with the following:

1. Radio Set AN/VRC-46.
2. TM 11-5820-401-12.
3. TM 38-750.
4. DA Form 2404.

Supervision and assistance are normally available.

STANDARDS

This task has been performed correctly when any discovered faults are corrected in accordance with paragraph 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 below.

PERFORMANCE MEASURES

1. Conduct troubleshooting procedures by visual inspection procedures. (Refer to TM 11-5820-401-12, para 4-4.)
 - a. Power failure.
 - (1) Insure radio set is seated in mount.
 - (2) Check power cable connections to battery.

- 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, para 4-5a thru e.)
- 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 4-5c and d.)

REFERENCES

TM 11-5820-401-12

TM 38-750

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 the following:

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

Supervision and assistance will be 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. (Refer to TM 11-5820-667-12, para 4-4.)
 - 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. (Refer to TM 11-5820-667-12, para 4-5.)
 - 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. (Refer to TM 38-750, para 4-5.)
 - 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

TM 38-750

TASK

113-596-1070

Construct a Doublet Antenna

CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. Given--

1. Three each Mast AB-155(*)/U.
2. TM 11-5820-256-10.
3. TM 11-5820-467-15.
4. Antenna Group AN/GRA-50.
5. TM 11-5815-334-12.
6. 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 of this task.

PERFORMANCE MEASURES

1. Construct antenna using W-1 Antenna Wire. (Refer to TM 11-5820-256-10, para 2-6, and TM 11-5815-334-12, para 2-8.)

- a. Use formula
$$\frac{468}{F} = \text{length}$$

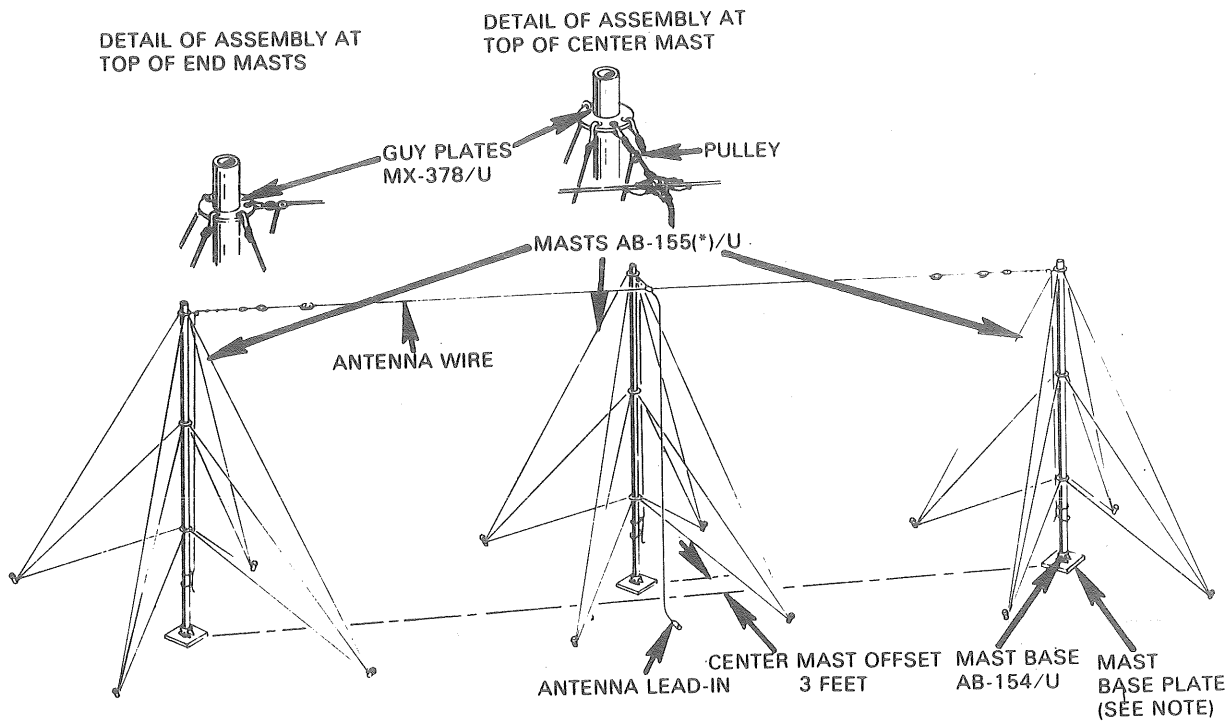
b. Frequency 2.600 MHz

EXAMPLE: $\frac{468}{F} = \text{length}$

$$2.6 \frac{180 \text{ Ft.}}{468}$$

180 Ft. half wave 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.)



NOTE:
THE MAST BASE PLATE IS
USED ONLY WHEN GROUND
IS SOFT OR SANDY.

Figure 1. Doublet antenna, erection completed.

NOTE: Mast base plates are used in sandy soil

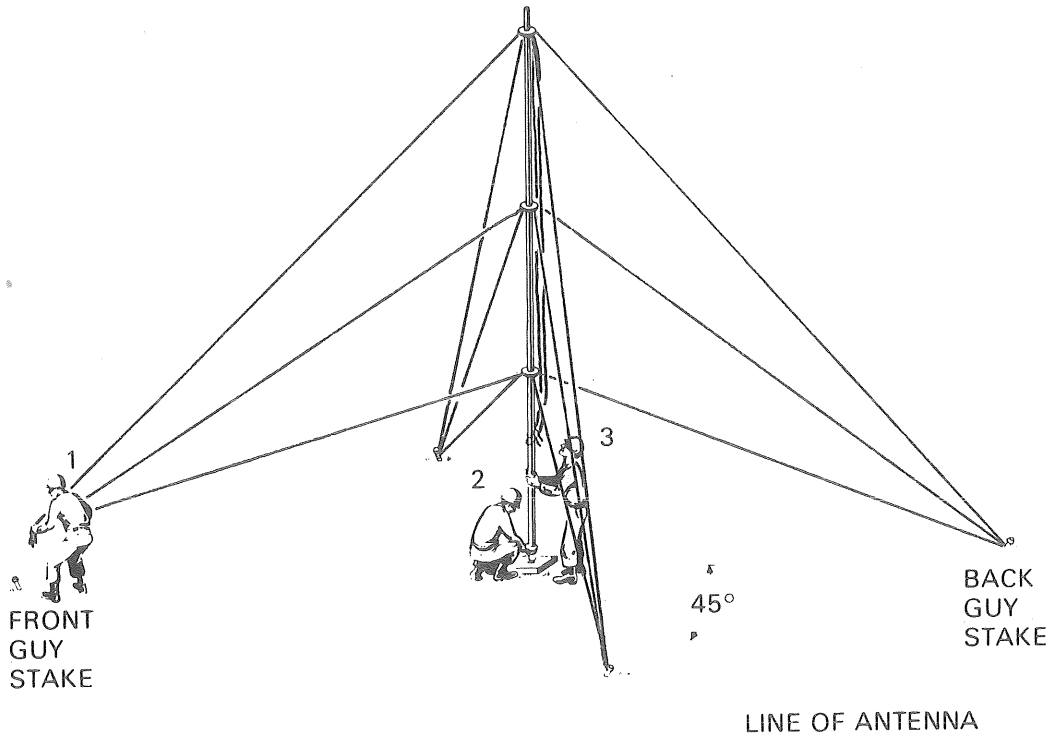
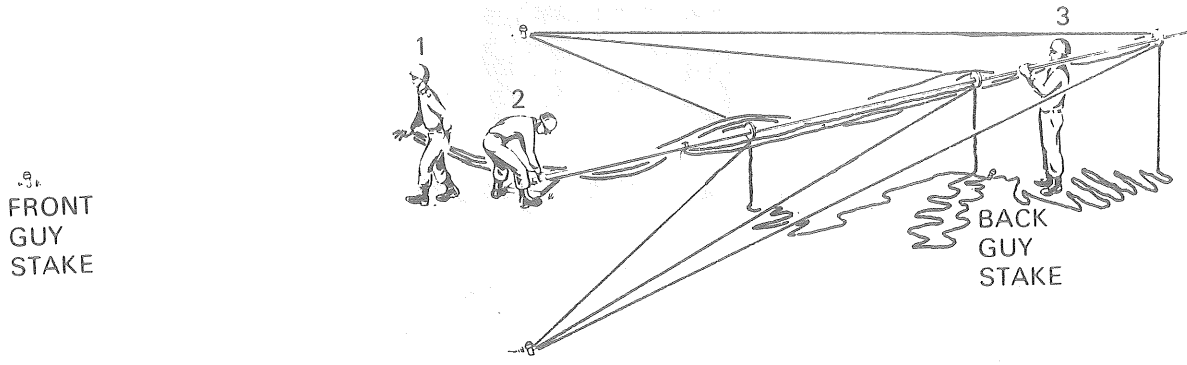


Figure 3. Raising assembled Mast AB-155(*)/U.

REFERENCES

- TM 11-5820-256-10
- TM 11-5820-467-15
- TM 11-5815-334-12

TASK

113-598-1023

Install Terminal Communications AN/UGC-74A(V)3

CONDITIONS

This task is performed under all weather conditions in a tactical or nontactical situation, and is performed with associated radio equipment. Your team chief will provide you with the following:

1. Terminal Communications AN/UGC-74A(V)3.
2. Associated radio sets.
3. TM 11-5815-602-12

Supervision and assistance will be available.

STANDARDS

The standards for this task have been met when Terminal Communications AN/UGC-74A(V)3 has been installed in the mount without damage; cable connections made, and the AN/UGC-74A(V)3 is ready to be aligned and a local test of the system conducted, according to performance measures 1 through 3 below within a 30 minute time limit.

PERFORMANCE MEASURES

1. Install the terminal AN/UGC-74 in the mount. (Refer to TM 11-5815-602-12, para 2-5, 2-6, and 2-7.)

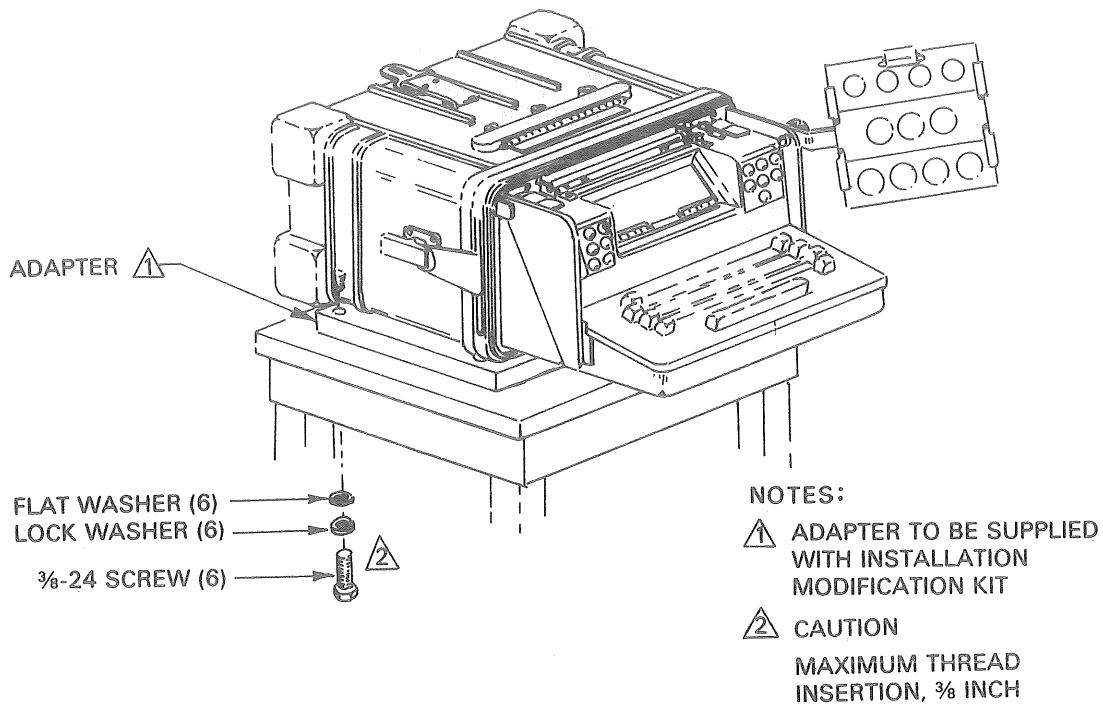


Figure 1. Terminal table mounted.

NOTE: The following procedure is for both table or shelf mounting.

- a. Insure that the mount is clean and the POWER switch on the terminal is in the OFF position.
 - b. Align the terminal combination case mounting holes with the holes in the table or shelf top.
 - c. Secure the terminal to the table as specified in figure 1.
 - d. Open the four case latches, and remove the front outer cover.
 - e. Latch the terminal package on the left and right sides to its case.
2. Install the plug-in items to the terminal connectors. (Refer to fig 2 and 3, and TM 11-5815-602-12, para 2-7 and 2-9.)

SKILL LEVEL 1

NOTE: The terminal connectors are located at the rear of the case and identified as shown in figure 2. Access to the connectors is gained through the rear panel door. Open the door by pulling the door handle down into the horizontal position and rotating it 1/4 turn to the right. Secure the door in the open (raised) position by unsnapping the retaining strap from the outer case cover and inserting the rear panel door handle into the retaining strap slot as shown in figure 3.

- a. Connect the clock and data cable.
 - (1) Connect one end of the clock and data cable to the designated data and clock source.
 - (2) Match the other end of the cable to the J1 connector; press the cable plug firmly against the matching connector and, with a 1/2 right-hand twist of the twist-lock collar, lock it securely into place.
- b. Connect the power cable to its mating terminal, terminal (J2), by pressing them firmly together. Then with a 1/2 right-hand turn on the twist-lock collar of the power cable connector, lock it securely into place.
- c. Connect the 12-volt DC backup cable to its mating connector (J3) by pressing them firmly together. Using a 1/2 right-hand turn on the twist-lock collar of the cable, lock it securely into place.
- d. Connect the chassis ground by attaching a grounding strap between the chassis ground stud on the connector panel to an earth ground rod or any low resistance ground connection.

NOTE: Insure that sufficient slack remains in the cables after they are connected to allow for the extension of the machine from its case.

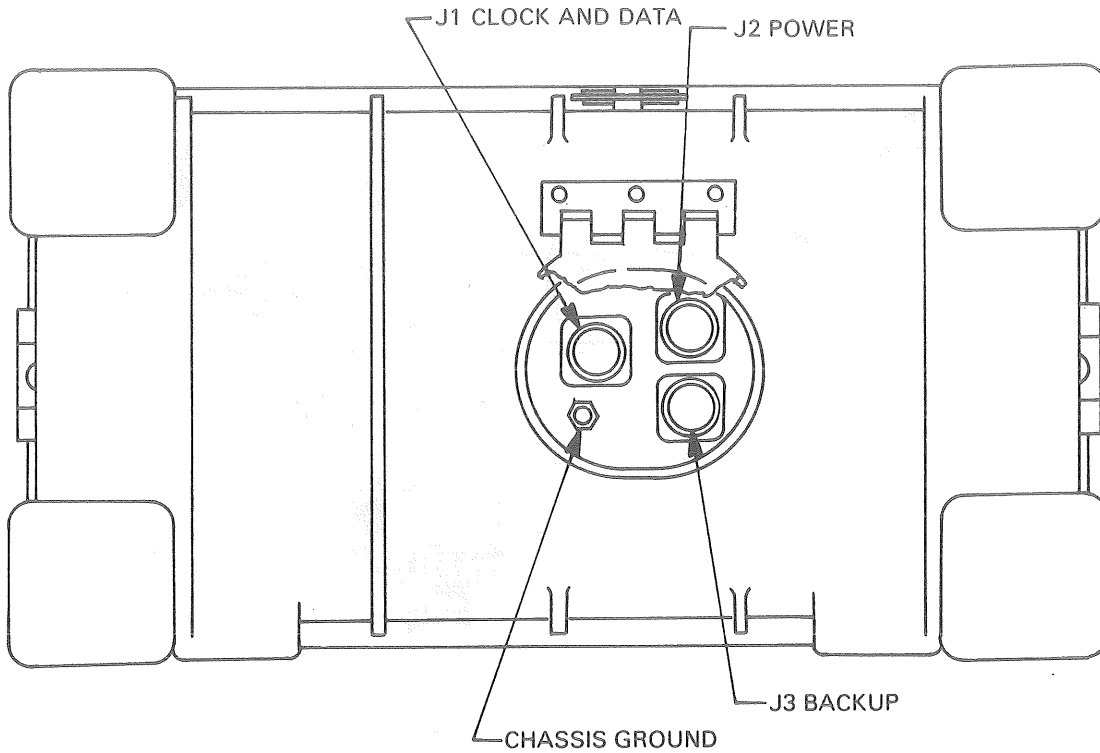


Figure 2. Terminal connectors.

NOTE: Insure that sufficient slack remains in the cables after they are connected to allow for the extension of the machine from its case.

SKILL LEVEL 1

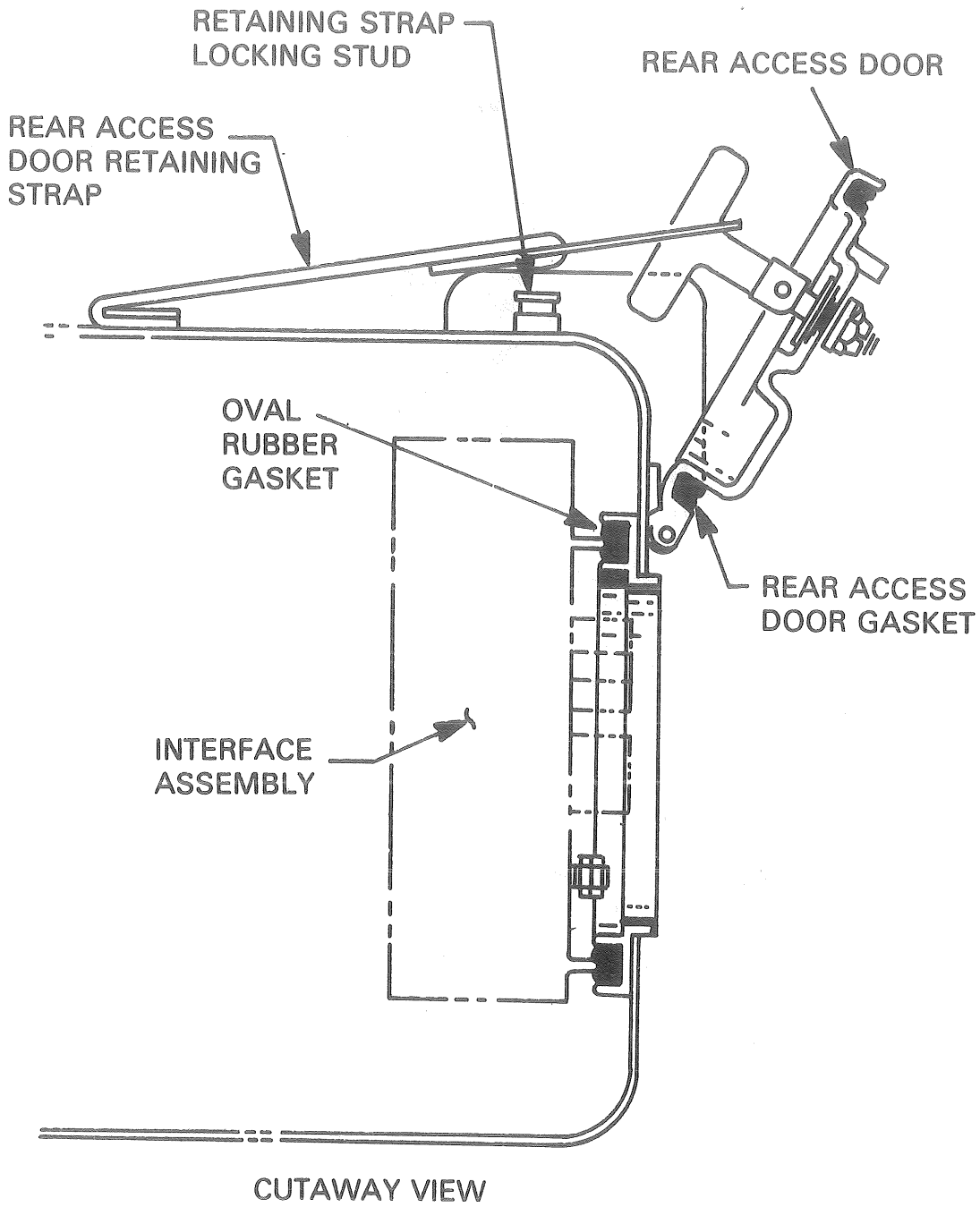


Figure 3. Rear access door open and held in place by strap.

3. Conduct a local test of the terminal. (Refer to TM 11-5810-602-12, chap 3, para 3-2.)
 - a. Set the internal switches and controls.
 - b. Place the POWER switch to the ON position.
 - c. Check and verify the terminals operation validation/state determination message.
 - d. SELF-TEST switch to START position.
 - e. Check the functions of the following system assemblies:
 - (1) CPU PWA.
 - (2) Printer PWA.
 - (3) Memory PWA.
 - (4) Communication PWA.
 - (5) Keyboard.
 - f. Terminate self-test.
 - (1) Depress PARITY RESET switch.
 - (2) POWER switch to OFF position.
 - (3) Return the terminal inside its case and secure with its latches.

REFERENCES

TM 11-5815-602-12

TASK

113-598-2010

Operate Terminal Communications AN/UGC-74A(V)3

CONDITIONS

This task is performed under all weather conditions in a tactical or nontactical situation and is performed with associated radio equipment. Your supervisor will provide you with the following:

1. Terminal Communications AN/UGC-74A(V)3.
2. Associated radio equipment.
3. TM 11-5815-602-12.

Supervision and assistance will be available.

STANDARDS

The task standards have been met when the terminal has been prepared for the selected operating state according to performance measure 1, and has been placed in operation and taken out of operation according to performance measures 1 through 3 below, within a 20 minute time limit.

PERFORMANCE MEASURES

1. Perform preliminary starting procedures. (Refer to TM 11-5815-602-12, para 3-4 and 3-5.)
 - a. Check the paper supply; if it is low, replenish it.
 - b. Check the ribbon; if it is frayed, dry, or torn, replace it.
2. Perform initial adjustment. (Refer to TM 11-5815-602-12, para 3-5.)

- a. In the following example, the terminal is installed in a link having the following requirements:
- (1) Parity: Odd.
 - (2) State: RO, KSR, or ICT, depending on the requirement.
 - (3) Communications interface: LO DATA.
 - (4) Data format: NRZ.
 - (5) Transmission speed: 1200 Baud.
 - (6) Communication clock source: Internal.
 - (7) Clock edge: Positive (+).
 - (8) Figure S/J: Not applicable in ASCII.
 - (9) Data input: Noninverted data.
 - (10) No. of stop bits in data format: Two.
 - (11) Data character set: ASCII.
- b. With the terminal fully extended on its slides, perform the following initialization setup procedures:
- (1) Set internal switches as follows:
 - (a) PARITY to ODD.
 - (b) STATE to RO, KSR, or ICT, depending on the requirement.
 - (c) REC MODE to LO DATA.
 - (d) XMIT MODE to LO DATA.
 - (e) BAUD RATE to 1200.
 - (f) CLOCK INT/EXT/KG-30 to INT.
 - (g) CLOCK +/- to +.
 - (h) FIG S/J not applicable to ASCII.
 - (i) SIGNAL NRZ/DIPHASE to NRZ.

SKILL LEVEL 1

- (j) STOP BITS to 2.
 - (k) ASCII/BAUDOT MODE to ASCII.
- (2) Set front panel (external) switches as follows:
- (a) TRANSFER to OFF.
 - (b) AUDIO CONTROL to midpoint.
 - (c) ILLUM CONTROL to midpoint.

NOTE: The terminal may be operated in either the Receive Only (RO) state. The Keyboard Send/Receive (KSR) state, or in the Intelligent Communications Terminal (ICT) state. The procedures and system controls available to the operator vary, because of the capabilities of each state. The switches that must be set for each of these states are shown in figure 1.

Control Switches	RO	State KSR	ICT
------------------	----	-----------	-----

Front PanelControl

POWER	OFF	OFF	OFF
TRANSFER	OFF	ON - if required	ON - if required
ILLUM	Midpoint	Midpoint	Midpoint
AUDIO	Midpoint	Midpoint	Midpoint

InternalControl

PARITY	Select one	Select one	Select one
STATE	RO	KSR	ICT
REC MODE	Select one	Select one	Select one
XMIT MODE	Not applicable	Select one	Select one
BAUD RATE	Select one	Select one	Select one
CLOCK	Select one	Select one	Select one
CLOCK +/-	Select one	Select one	Select one
FIGURES	Select one	Select one	Select one
SIGNAL	Select one	Select one	Select one
STOP BITS	Select one	Select one	Select one
MODE	Select one	Select one	Select one

Figure 1. Operational state initial switch settings.

SKILL LEVEL 1

3. Prepare the terminal for operation in the Receive Only (RO) state. (Refer to TM 11-5815-602-12, para 3-7.)
 - a. Set the INITIAL switch to place the system in the RO state.
 - b. Place the POWER switch to the ON position.

NOTE 1: Based on the initial adjustments made in figures 1 and 2, the terminal will print out the operation validations/state determination message for the RO state shown in figure 2 below.

NOTE 2: After the state determination/validation state message has been printed, the terminal is ready to receive data.

SYSTEM INITIALIZED
SWITCH STATE RO
OPERATIONAL STATE - RO
OPERATING CAPACITY - FULL
MODE - ASCII
BAUD RATE - 1200
STOP BITS - 2
END OF LINE OPTION - OD OD OA
SPACE OPTION - OFF
LINE LENGTH - 80
LINE FEEDS - 1
RECEIVE ENVELOPE OPTION =
56 5A 43 5A 43 : 4E 4E 4E 4E
TRANSMIT ENVELOPE OPTION =
56 5A 43 5A 43 : 4E 4E 4E 4E 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F
PARITY OPTION ODD
CAPITAL LETTER OPTION = ON

Figure 2. Typical RO operation validation/state determination printout.

SKILL LEVEL 1

CAUTION: If a self-test is to be performed, it should be initiated after the state determination/validation state message has printed out and before message data is stored in memory.

4. Prepare the terminal for operation in the Keyboard Send/Receive (KSR) state. (Refer to TM 11-5815-602-12, para 3-8.)

NOTE: The KSR state expands the capability of the terminal from the Receive Only state by making the keyboard available to the operator. Messages are composed in the conventional manner. However, the terminal provides the operator with the capability of sending messages one print-line at a time, as opposed to the usual character-by-character technique. This allows the operator to compose, edit, and review a full 80-character line of message before transmission.

- a. Set the INITIAL switch to place the system in the KSR state.
- b. Place the POWER switch to the ON position.

NOTE 1: Based on the initial adjustments made in figures 1 and 2, the terminal will print out the operation validation/state determination for the KSR state shown in figure 3.

NOTE 2: After the printout, the machine is in the KSR state and ready for message reception or transmission.

SYSTEM INITIALIZED
SWITCH STATE - KSR
OPERATIONAL STATE - KSR
OPERATING CAPACITY - FULL
MODE - ASCII
BAUD RATE - 1200
STOP BITS - 2
END OF LINE OPTION - OD OD OA
SPACE OPTION - OFF
LINE LENGTH - 80
LINE FEEDS - 1
RECEIVE ENVELOPE OPTION =
56 5A 43 5A 43 : 4E 4E 4E 4E
TRANSMIT ENVELOPE OPTION =
56 5A 43 5A 43 : 4E 4E 4E 4E 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F
PARITY OPTION = ODD
CAPITAL LETTER OPTION = ON

Figure 3. Typical KSR operation validation/determination printout.

CAUTION: If the self-test is to be corrected, it should be performed immediately after the operation validation/state determination message has printed.

5. Prepare the terminal for operation in the Intelligent Communication Terminal state. (Refer to TM 11-5815-602-12, para 3-9.)

SKILL LEVEL 1

NOTE: The Intelligent Communication Terminal (ICT) state provides the operator with composing, editing, and formatting capabilities. These capabilities are gained by using the system structure shown in figure 4.

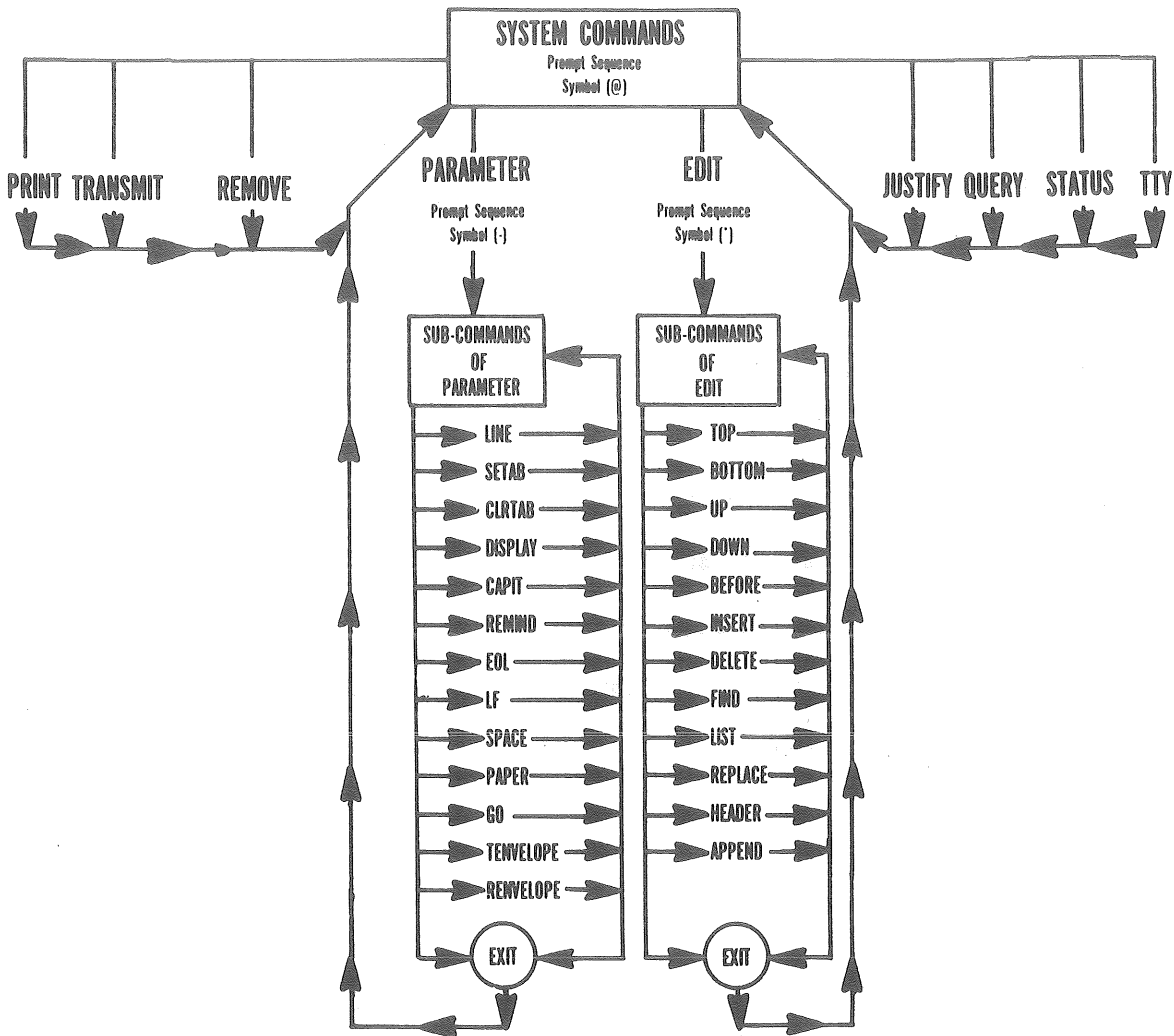


Figure 4. The system commands of the Intelligent Communication Terminal state.

- a. Set the INITIAL switch to place the system in the ICT state.

NOTE: Operation in the ICT state should be performed in accordance with the same procedures as the RO and KSR state except that the system is powered down. The STATE switch is placed in the ICT state, and then powered up.

- b. Place the POWER switch in the ON position.

NOTE: Based on the initial adjustments made in figures 1 and 2, the terminal will print out the operation validation/state determination message for the ICT state shown in figure 5.

```
SYSTEM INITIALIZED
SWITCH STATE ICT
OPERATIONAL STATE - ICT
OPERATING CAPACITY - FULL
MODE - ASCII
BAUD RATE - 1200
STOP BITS - 2
END OF LINE OPTION - OD OD OA
SPACE OPTION - OFF
LINE LENGTH - 80
LINE FEEDS - 1
RECEIVE ENVELOPE OPTION =
  56 5A 43 5A 43 : 4E 4E 4E 4E
TRANSMIT ENVELOPE OPTION =
  56 5A 43 5A 43 : 4E 4E 4E 4E 7F 7F 7F 7F 7F 7F 7F 7F 7F 7F
PARITY OPTION = ODD
CAPITAL LETTER OPTION = ON
```

Figure 5. Typical ICT operation validation/state determination printout.

TASK**113-598-2024**

**Perform Operator's Preventive Maintenance Checks
and Services on Terminal Communications AN/UGC-74A(V)3**

CONDITIONS

This task is performed in a tactical or nontactical situation under all weather conditions. To prevent the occurrence of trouble, reduce downtime, maintain the equipment in serviceable condition, and perform operator's preventive maintenance. Given a requirement and--

1. Equipment Log Book.
2. DA Form 2404.
3. TM 11-5815-602-12.
4. TM 38-750.
5. Materials for maintaining AN/UGC-74A(V)3.

Your team chief will be available for assistance.

STANDARDS

Job standards are met when you have performed the operator's preventive maintenance performance checks and services and completed all required forms. Report all defective items that cannot be corrected to the team chief. You have 15 minutes to complete this task.

PERFORMANCE MEASURES

1. Perform preventive maintenance checks and services on Terminal Communications AN/UGC-74A(V)3 as required for the following types of maintenance: (Refer to fig 1, and TM 11-5815-602-12, para 4-1 thru 4-3.)

SKILL LEVEL 1

- a. Before Operations Checks (B).
- b. During Operations Checks (D).
- c. Weekly Maintenance Checks (W).
- e. Monthly Maintenance Checks (M).

Item No.	Interval	Items to be inspected	Procedures	For readiness reporting equipment is not ready/available if...
1	* * * * *	Terminal	Using the TM, check the terminal for completeness and satisfactory condition of its component parts, spare parts, and accessories.	Missing parts prevent the equipment from satisfactorily operating in all states.
2	* * * * *	Mounting	Check the mounting of the terminal to insure it is secure.	The set is not mounted, or is so insecurely mounted as to cause damage to the terminal during movement.
3	* * * * *	Exterior	<p>a. Inspect the exterior of the terminal. It should be free of dirt, dust, grease, moisture, rust, corrosion, and fungus.</p> <p>b. With the front outer cover removed, inspect the keyboard and dust cover for cleanliness; freedom from dirt, dust, grease, moisture, rust, corrosion, and fungus.</p> <p>c. Inspect all painted surfaces for bare spots; rust, and corrosion.</p>	Excessive dirt, dust, grease, moisture, rust, corrosion, or fungus would prevent the terminal from operating properly; or, if operated, would cause possible damage or malfunctioning of the terminal.

Figure 1. Operator's preventive maintenance checks and services.

SKILL LEVEL 1

Item No.	Interval B D A W M	Items to be inspected	Procedures	For readiness reporting equipment is not ready/available if...
			<p>d. Use a clean, dry, lint-free cloth for general cleaning purposes.</p> <p>e. Clean panels and control knobs with a soft, clean cloth (dry or dampened; not wet).</p> <p>f. Clean all glass with a soft, clean cloth (dry or damp; not wet).</p>	
4	* * *	Dust cover	<p>a. Inspect the dust cover alignment against the chassis assembly. Check the condition of the four combination case latches. They should open with resistance, but smoothly.</p> <p>b. With the dust cover lowered, inspect the rubber seal on the chassis assembly for wear, gouges, tears, or missing sections.</p>	The dust cover cannot be opened or closed tightly. Latches are broken or missing.
5	* * * *	Primary power source cables and connectors	a. Inspect the primary source cables and connectors for cleanliness.	Unserviceable cables or connectors preventing the terminal from being operated.

Figure 1. Operator's preventive maintenance checks and services (Continued).

Item No.	Interval B D A W M inspected	Procedures	For readiness reporting equipment is not ready/ available if...
b.		Inspect for undue strain caused by twisting or tangling which would cause damage to the cables or connectors as the terminal is being extended from or returned into the outer case.	
c.		Inspect the cables for nicks, cracks, frays, cuts or deteriorated insulation.	
d.		Inspect the cable connectors for loose or broken connectors and for cleanliness.	
		(1) Clean cables and connectors with a clean, dry, lint-free cloth.	
		(2) Remove dust and dirt from plugs and jacks with a brush.	
6	*****	Case interior	Excessive dirt, dust, grease, moisture, or fungus would prevent the terminal from operating properly, or, if operated, would cause possible damage or malfunctioning of the terminal.
		a. Release the combination case latches and carefully extend the terminal from the outer case.	
		<p style="text-align: center;"><u>CAUTION</u></p> Use extreme care to insure connector cables in the rear of the terminal are carefully pulled through the back panel to prevent damage to the cables or connectors.	

Figure 1. Operator's Preventive Maintenance Checks and Services (Continued)

SKILL LEVEL 1

Item No.	Interval	Items to be inspected	Procedures	For readiness reporting equipment is not ready/available if...
			<p>(1) The terminal should slide smoothly out from the outer case to the stop locks.</p> <p>(2) If the terminal hangs or fails to slide smoothly, check for dirt, burrs, or other obstructions.</p> <p>b. Clean the case interior of oil, dust, grease, moisture or fungus.</p> <p>c. Clean the interior of the terminal with a long handle sash or camel's hair brush.</p>	
7	* * * * *	Print drum printing	Check the quality of the print drum printing by inspecting the message copy for readability.	Message copy is unreadable.
8	* * *	Visible wiring	With the terminal extended as described in TM, check all visible wiring for nicks, cuts, frays or deteriorated insulation.	Unserviceable wiring prevents the terminal from operating properly or, if operated, would cause possible damage or malfunctioning of the terminal.

Figure 1. Operator's Preventive Maintenance Checks and Services (Continued)

SKILL LEVEL 1

Item No.	Interval	Items to be inspected	Procedures	For readiness reporting equipment is not ready/available if...
9	* * * * *	Paper supply	Inspect for the adequacy of the paper supply. Replenish in accordance with instructions contained in the technical manual.	Paper is not available.
10	* * * * *	Inking ribbon	Inspect the inking ribbon for signs of fraying, wear, dryness or unserviceability. Replace if necessary in accordance with instructions contained in the technical manual.	Inking ribbon is not available.
11	* * *	Terminal operation	<p>a. Prepare the terminal for operation using the operator instructions contained in chapter 3, section II, of the TM and command guidance.</p> <p>b. Observe the mechanical action of each knob, key, and switch. Insure that each moves smoothly.</p> <p>c. Turn the POWER switch to the ON position; check that the terminal performs properly as applicable.</p>	Terminal fails to operate properly.

Figure 1. Operator's Preventive Maintenance Checks and Services (Continued)

SKILL LEVEL 1

Item No.	Interval	Items to be inspected	Procedures	For readiness reporting equipment is not ready/available if...
			d. Press and hold PARITY RESET and observe all lamps. Replace all defective indicator lamps (excluding the PARITY RESET lamp) as required.	
12	*	Elapsed time meters	Check the operational hour readings on the elapsed time meters. Notify organizational maintenance when the meters exceed their prescribed limits of either 1,000 or 10,000 hours.	Elapsed time meters have exceeded their limits.

Figure 1. Operator's Preventive Maintenance Checks and Services (Continued)

2. Complete DA Form 2404 (Equipment Inspection and Maintenance Worksheet). (Refer to TM 38-750, para 4-5.)
3. Report all uncorrectable defects. (Refer to TM 38-750, chap 3, pp 3-6 thru 3-13.)
 - a. Notify your immediate supervisor of any uncorrectable fault that is found.
 - b. Submit DA Form 2404 to your supervisor or support maintenance personnel.

REFERENCES

TM 11-5815-602-12

TM 38-750

TASK**113-599-1001**

Install Radio Teletypewriter Set AN/GRC-46

CONDITIONS

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

1. AN/GRC-46 installed on a vehicle.
2. TM 11-5815-204-10, and FM 24-18.
3. 5 pound sledgehammer.
4. Ground rod and ground strap.
5. 8-inch adjustable wrench and 8-inch flat-tip screwdriver.

Supervision and assistance will normally be available.

STANDARDS

This task has been performed correctly when, in 30 minutes, the radio teletypewriter set has been sited and grounded, the whip antenna has been erected, the power cable has been connected (if applicable), the security equipment has been installed and the radio teletypewriter set is ready to be tuned and operated according to performance measures 1 through 5.

PERFORMANCE MEASURES

1. Check equipment for completeness. (Refer to TM 11-5815-204-10, chap 1, sec II, para 5 thru 5.1.)
2. Site radio teletypewriter set. (Refer to FM 24-18, chap 6, sec II, para 75 thru 77.)

SKILL LEVEL 1

3. Erect whip antenna. (Refer to TM 11-5815-204-10, chap 2, sec II, para 26.)
4. Ground shelter. (Refer to TM 11-5815-204-10, chap 2, sec II, para 26a(3).)
 - a. Install rod to maximum depth.
 - b. Moisten area around ground rod with water to insure a good ground.
 - c. Attach ground strap between ground and ground stud of radio teletypewriter set.

NOTE: Normal operation of Radio Teletypewriter Set AN/GRC-46 is 27.5 volts DC, supplied by the vehicular power system. Power Supply PP-4763/GRC must be obtained and installed before operation from an external 110 volt AC, 60 Hz power source can be accomplished.

5. Place TSEC/KW-7 in rack provided and connect signal cables to TSEC/KW-7. (Refer to TM 11-5815-204-10, chap 1, sec II, para 7.)

REFERENCES

TM 11-5815-204-10

FM 24-18

TASK**113-599-1002**

**Install Radio Teletypewriter Set AN/GRC-142(*) or
AN/GRC-122(*)**

CONDITIONS

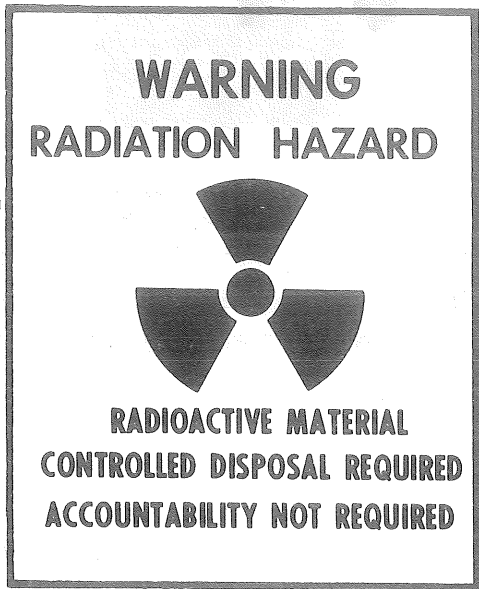
This task is performed in a tactical or nontactical situation, under all weather conditions, and may be performed in an NBC environment. Given a requirement and--

1. Shelter mounted Radio Teletypewriter Set AN/GRC-142(*) or AN/GRC-122(*) installed on a vehicle.
2. TM 11-5815-334-12 and FM 24-18.
3. 5-pound sledgehammer.
4. Ground rod, ground strap and pliers.
5. 8-inch adjustable wrench and 8-inch flat-tip screwdriver.

Supervision and assistance will be available.

STANDARDS

This task has been performed correctly when, in 30 minutes, the radio teletypewriter set has been sited, the whip antenna has been erected, the security equipment has been installed, and the radio teletypewriter set is ready to be tuned and operated according to performance measures 1 through 8.



Meter	Ra 226	1.0uCi	6625-00-257-1103
Meter	Ra 226	0.6uCi	6625-00-226-5680
Meter arbitrary scale	Ra 226	1.0uCi	6625-00-226-5679
Meter, arbitrary scale	Ra 226	1.0uCi	6625-00-226-5681

Radiation Hazard Information: The following radiation hazard information must be read and understood by all personnel operating or repairing Radio Teletypewriter Sets AN/GRC-142, AN/GRC-142A, AN/GRC-142B, AN/GRC-122, AN/GRC-122A, and AN/GRC-122B. Hazardous radioactive materials are present in the above listed components of the MD-522/GRC, RT-662/GRC, RT-824/GRC, and the AM-3349/GRC. 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.

NEVER place radioactive components in your pocket.
Use extreme care NOT to break radioactive components while handling them.

NEVER remove radioactive components from cartons until you are ready to use them.

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.

The above listed radioactive components *will not* be repaired or disassembled.

Disposal of broken, unserviceable, or unwanted radioactive components will be accomplished in accordance with the instructions in AR 755-15.

PERFORMANCE MEASURES

1. Check equipment for completeness. (Refer to TM 11-5815-334-12, para 1-4 thru 1-12.)
2. Site radio teletypewriter set. (Refer to FM 24-18, chap 6, sec II, para 75 thru 77.)
3. Erect whip antenna. (Refer to TM 11-5815-334-12, para 2-8.)

NOTE: Procedure for erection of whip antenna, as explained in this task is for erection of the OWR-DX SEND antenna only.

- a. Insure whip antenna mast base is in the horizontal position for antenna erection.
- b. Screw one antenna Mast Section MS-116-A into the antenna mast base. Screw a second MS-116-A into the one just installed.
- c. Slip the antenna cover clamp and the antenna cover onto the MS-116-A installed as instructed in b above.
- d. Slide the antenna cover down onto the antenna mast base as far as it will go.
- e. Push the antenna clamp down to the top of the antenna cover and tighten it.
- f. Add one MS-116-A, one MS-117-A, and one MS-118-A to the two MS-116-A's already installed.
- g. Fasten one antenna tie-down clamp at the middle and one at the upper end of the antenna.
- h. Tie the cord to the antenna tie-down clamps for mobile operation.
- i. Fasten the antenna tip cap to the free end of the antenna.
- j. Raise the antenna to the vertical position and insert the antenna bracket pins into the antenna bracket to hold it in place.
- k. If needed, connect the antenna lead-in wire to the antenna mast base by inserting the lead-in wire into the antenna base knob and turning it clockwise.

SKILL LEVEL 1

4. Ground shelter. (Refer to TM 11-5815-334-12, para 2-7.)
 - a. The shelter is provided with two grounding rods; one for the shelter and one for a portable generator if used.
 - b. Select a ground site that will not interfere with the entrance door, field wires, power cables, or antenna transmission cables.
 - c. Remove the ground rods and sledgehammer from their mountings. Remove any paint or grease from the ground rods.
 - d. Connect one end of the ground strap to the shelter ground terminal, select one site within reach of the other end of the ground strap and another within 10 feet of the portable generator (if used). Scoop out a small hole about 6 inches deep at each site.
 - e. Drive the ground rods into the holes at each site until the tops of the ground rods are approximately 3 inches above ground level.
 - f. Saturate the ground around the ground rods with water to keep them moist.
 - g. Remove the ground strap from the storage drawer of the radio teletypewriter set.
 - h. Connect the ground strap between the shelter ground terminal and the ground rod.
 - i. Connect another ground strap between the ground terminal of the portable generator and its ground rod (if used).
5. Connect appropriate power cable. (Refer to fig 1 thru 6, and TM 11-5815-334-12, para 2-9.)

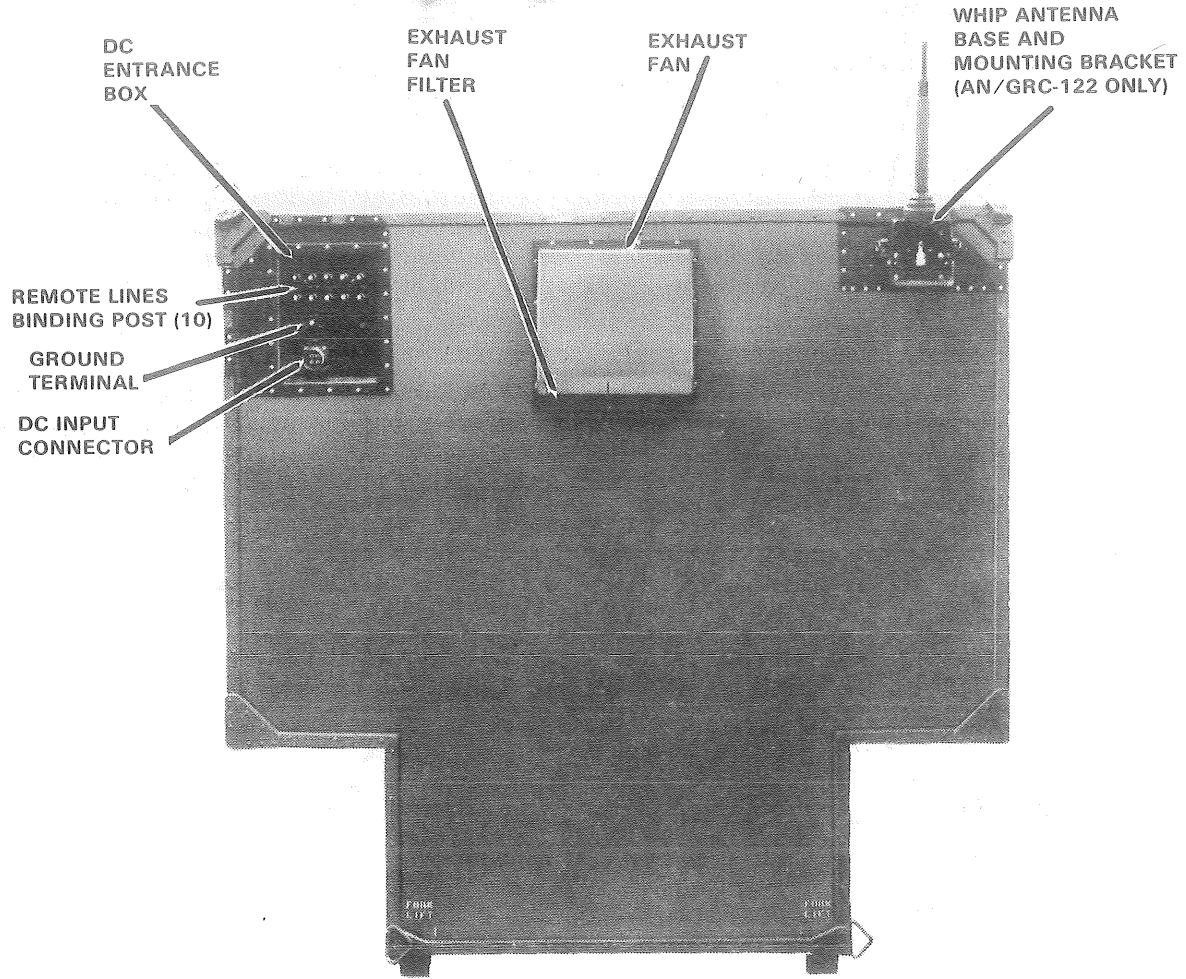
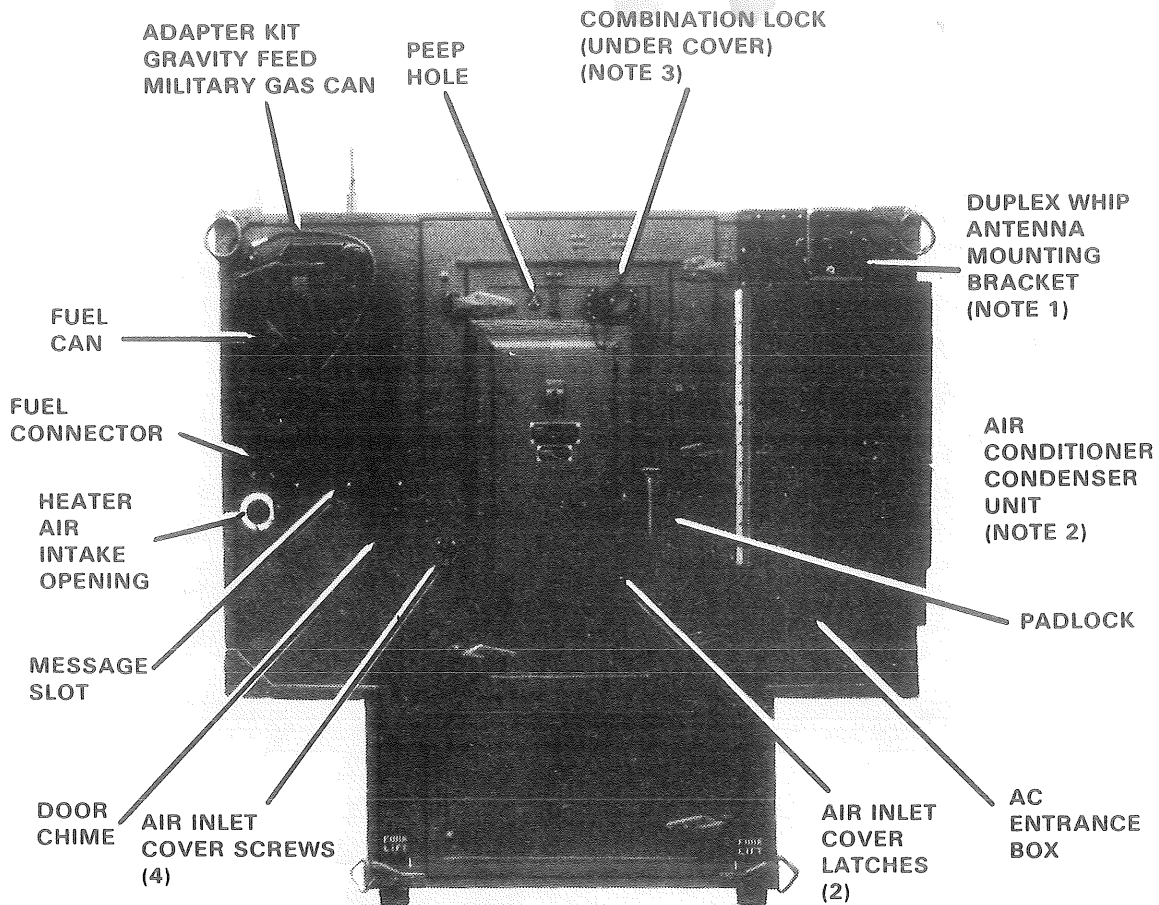


Figure 1

SKILL LEVEL 1



NOTES:

- 1 THE AN/GRC-122 IS DELIVERED WITH DUPLEX WHIP ANTENNA BASE INSTALLED IN MOUNTING BRACKET.
2. SUPPLIED WITH AN/GRC-142 SERIAL NUMBERS 1 THROUGH 697 ONLY.
3. SUPPLIED WITH AN/GRC-142 SERIAL NUMBERS 1 THROUGH 293 ONLY.

Figure 2. Radio Teletypewriter Set AN/GRC-142 or AN/GRC-122 Shelter Exterior, Rear Wall.

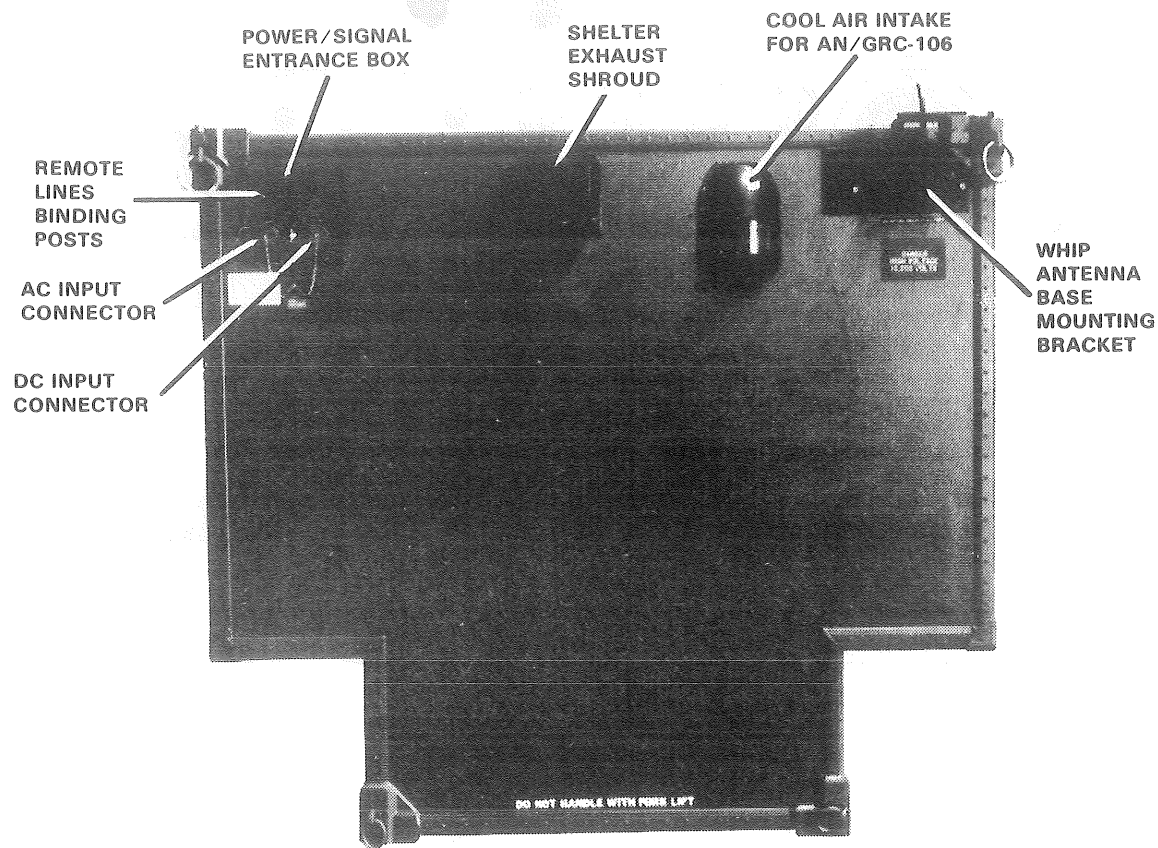


Figure 3

- a. Prior to connecting the AC or DC power cable perform the following for Radio Teletypewriter Set AN/GRC-142 or AN/GRC-122:
 - (1) Place all circuit breaker switches and equipment switches to OFF.
 - (2) Insure shelter and portable generator (if used) are properly grounded.
 - (3) Insure PUSH-ON PULL-OFF circuit breaker of AN/GRC-142 or AN/GRC-122 is in the PULL-OFF position as shown in figure 4.

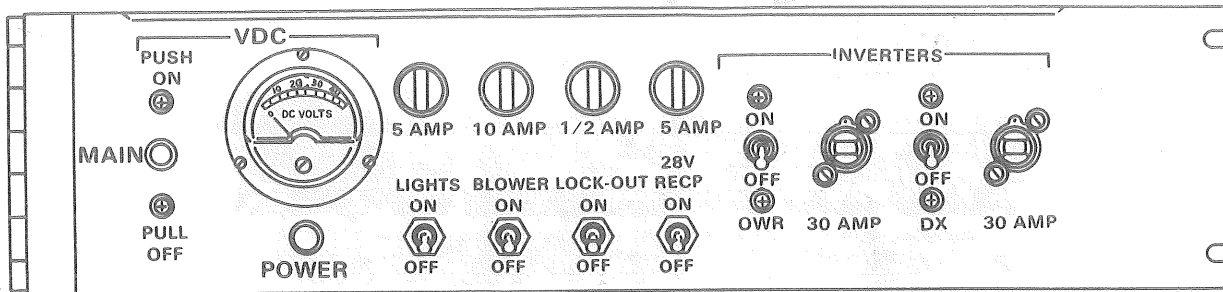


Figure 4

- (4) Insure AC POWER - DC POWER switch of AN/GRC-142 or AN/GRC-122 is in the AC POWER position as shown in figure 5.

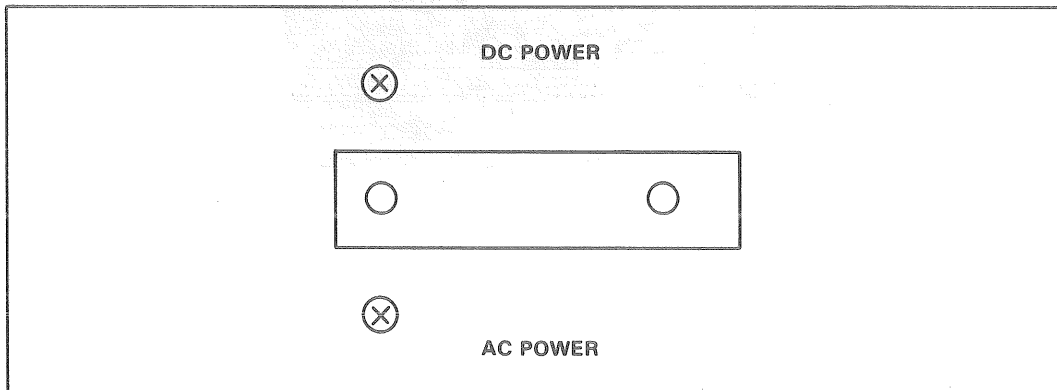


Figure 5

- (5) Insure AC ENTRANCE BOX controls of the AN/GRC-142 or AN/GRC-122 are in the OFF position as shown in figure 6.
- b. Prior to connecting the AC or DC power cable perform the following for Radio Teletypewriter Set AN/GRC-142 or AN/GRC-122 (A or B modes).
- (1) Place all circuit breaker switches and equipment switches to OFF.

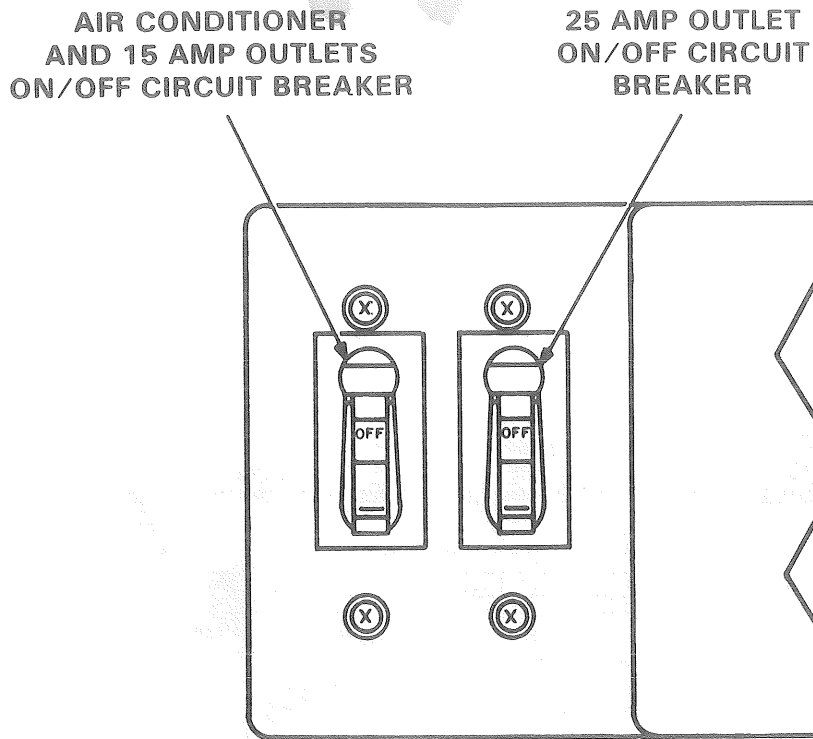


Figure 6

- (2) Insure shelter and portable generator (if used) are properly grounded.
- (3) Insure PUSH-ON PULL-OFF circuit breaker of AN/GRC-142A-142B or AN/GRC-122A-122B is in PULL-OFF position as shown in figure 7.

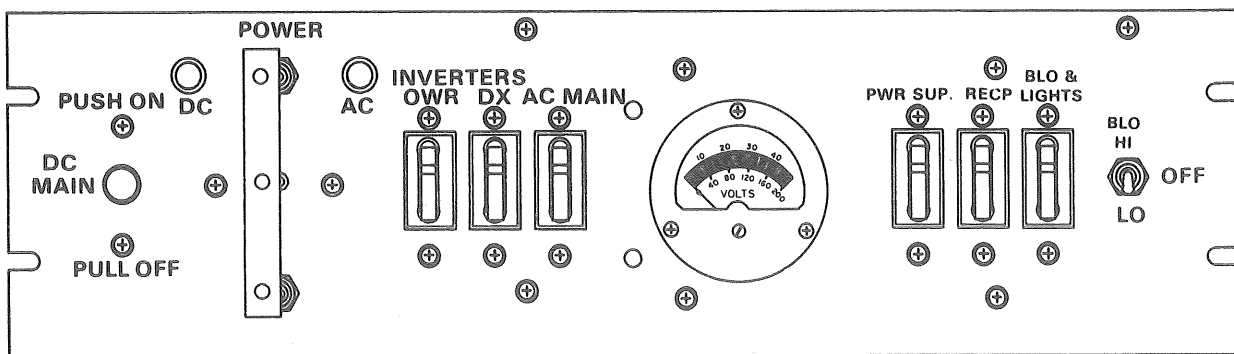


Figure 7

SKILL LEVEL 1

- (4) Insure POWER selector switch of AN/GRC-142A-142B or AN/GRC-122A-122B is in the AC position as shown in figure 7.
- (5) Insure the AC MAIN circuit breaker of the AN/GRC-142A-142B or AN/GRC-122A-122B is in the OFF position.
6. Erect shade tarpaulin. (Refer to fig 8, and TM 11-5815-334-12, para 2-10 and 2-11.)

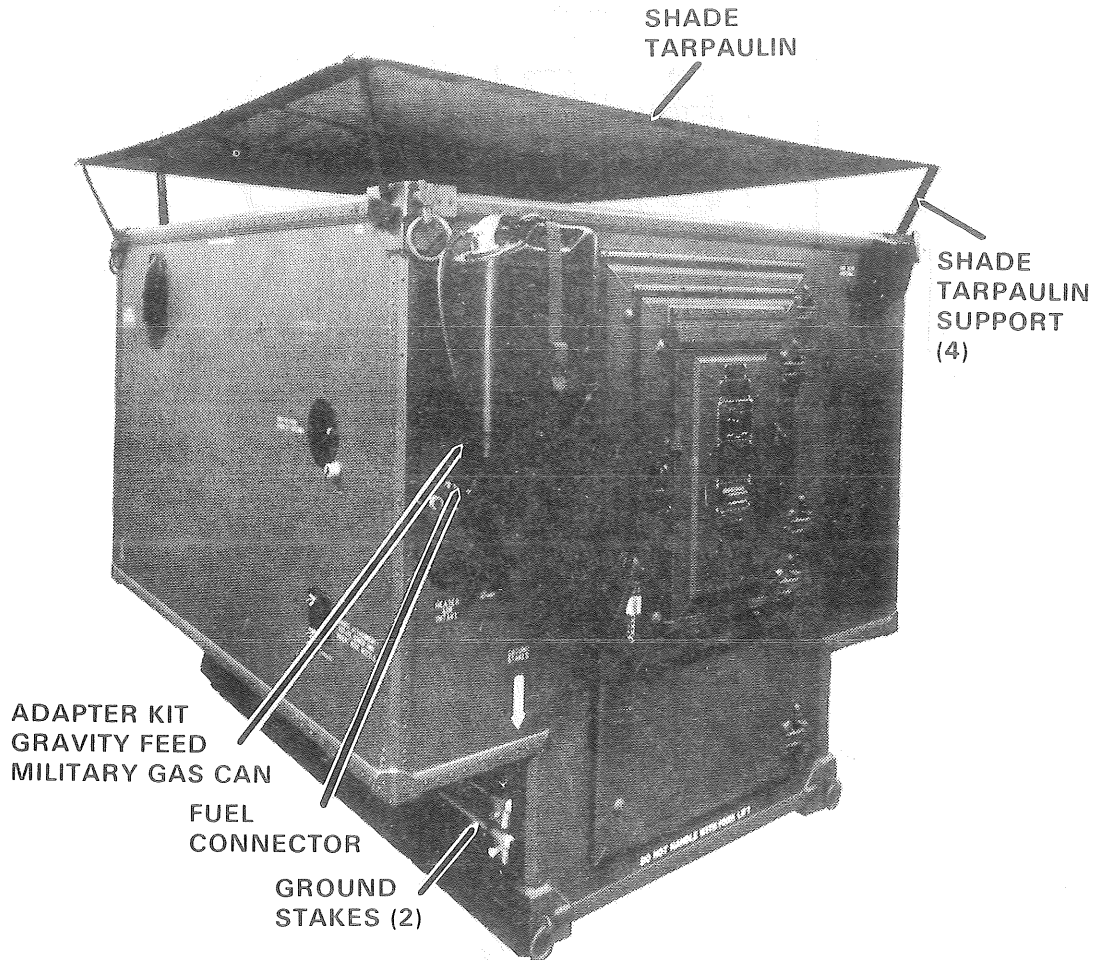


Figure 8

7. Place TSEC/KW-7 in rack(s) and connect signal cables. (Refer to TM 11-5815-334-12, para 2-13.)
 - a. To install the TSEC/KW-7, it is necessary to remove the dummy boxes. Two dummy boxes are provided in the AN/GRC-142-142A-142B and AN/GRC-122-122A-122B.

- (1) AN/GRC-142 or AN/GRC-122: Lower dummy box is for the OWR DX-SEND TTY loop and the upper one is for the DX-RECEIVE pony loop.
 - (2) AN/GRC-142A-142B or AN/GRC-122A-122B: Upper right (curbside) dummy box is for the OWR DX-SEND TTY loop and the lower left (roadside) dummy box is for the DX-RECEIVE pony loop.
- b. Remove each dummy box as follows:
- (1) Disconnect banana plugs E1, E2, and E3 and connectors J1 and J2 from the dummy box.
 - (2) Unclamp the 28-volt DC connector W28P1 or W30P1.
 - (3) Loosen the captive screws on both sides of the dummy box and remove the dummy box.
- c. Position the TSEC/KW-7 in the mount provided and perform the following on the equipment rear panel:
- (1) Connect a jumper wire between E2 and E4.
 - (2) Connect shorting plugs to LOOP IN-2 and LOOP OUT-2 receptacles.
 - (3) Connect the WHITE banana plug to E1, BLACK banana plug to E3, and BLUE banana plug to E5.
 - (4) Connect the plug removed from the LOOP IN receptacle of the dummy box to J3.
 - (5) Connect the plug removed from the LOOP OUT receptacle of the dummy box to J7.
 - (6) Connect the free end of W28 or W30 (duplex) to the 24 VDC input receptacle.
 - (7) If AC only is used, AC power must be used to power the security equipment. A cable is necessary to connect the security equipment to the AC outlet.
 - (8) Set TT-98 OWR DX-SEND BLACK RED switch as shown in figure 9 for the AN/GRC-142 or AN/GRC-122 to the RED position.

SKILL LEVEL 1

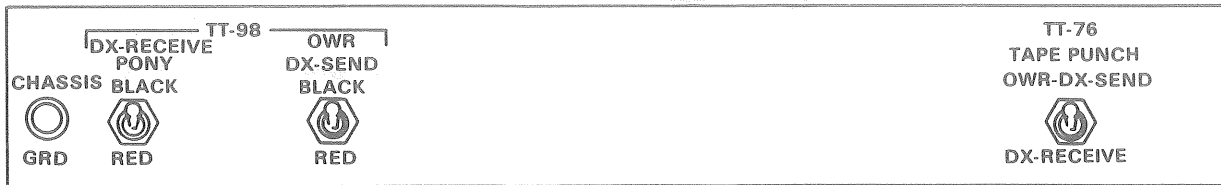


Figure 9. Radio Teletypewriter Set AN/GRC-142 or AN/GRC-122, Switchbox, Front Panel Controls.

- (9) Set TT-98 OWR DX-SEND BLACK RED switch as shown in figure 10 for the AN/GRC-142A-142B or AN/GRC-122A-122B to the RED position.

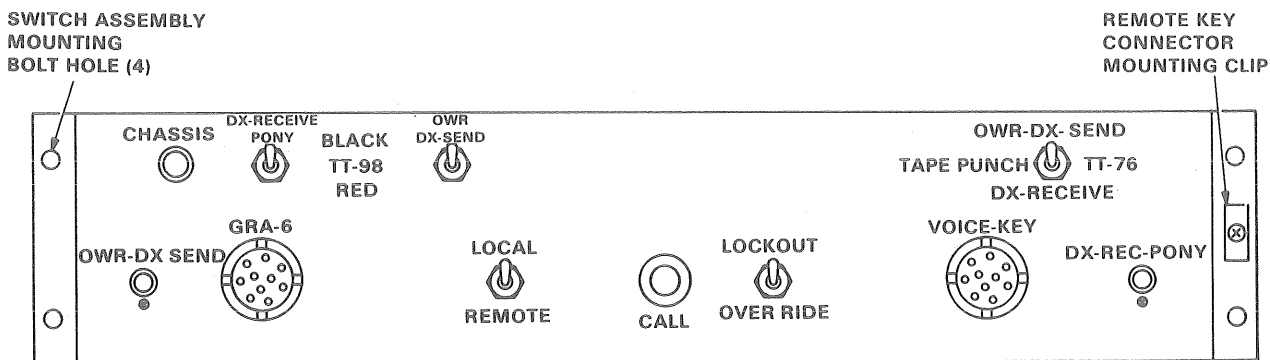


Figure 10. Radio Teletypewriter Set AN/GRC-142A, -142B, or AN/GRC-122A, -122B, Switch Assembly, Controls, Indicators, and Connectors.

- (10) Perform modification and switch settings on TT-76A/GGC as outlined in reference a.
 - (11) With the security equipment installed, readjust the teletypewriter range control, if necessary, to obtain clearly printed copy.
8. Position vehicle boarding ladder. (Refer to TM 11-5815-334-12, fig 6-6.)

REFERENCES

TM 11-5815-334-12

FM 24-18

TASK**113-599-1003**

Install Radio Teletypewriter Set AN/VSC-2

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 Teletypewriter Set AN/VSC-2 installed in a vehicle.
2. TM 11-5815-331-14.
3. 5-pound sledgehammer.
4. Ground rod, ground strap, and pliers.
5. 8-inch adjustable wrench and 8-inch flat-tip screwdriver.

Supervision and assistance will be available.

STANDARDS

This task has been performed correctly when, in 20 minutes, the radio teletypewriter set has been sited, grounded (if applicable), the whip antenna has been erected, the security equipment has been installed, and the radio teletypewriter set is ready to be tuned and operated according to performance measures 1 through 5 below.

PERFORMANCE MEASURES

1. Check equipment for completeness. (Refer to TM 11-5815-331-14, para 1-8 thru 1-10.)
2. Site radio teletypewriter set. (Refer to TM 11-5815-331-14, para 2-3.)
3. Erect whip antenna. (Refer to TM 11-5815-331-14, para 2-4.)

SKILL LEVEL 1

4. Ground vehicle.
 - a. When at the halt for extended periods of time, your team chief will provide equipment and tools necessary for grounding of vehicle.
 - b. Install ground rod a minimum of 8 feet into the ground.
 - c. Moisten area around ground rod with water to insure a good ground.
 - d. Make sure that all ground leads of equipment are CONNECTED and TIGHT.
5. Install secure equipment. (Refer to TM 11-5815-331-14, para 2-5.)

REFERENCES

TM 11-5815-331-14

TASK**113-599-1004**

Install Radio Set AN/GRC-26D

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. Operational Radio Set AN/GRC-26D.
2. TM 11-5820-256-10.
3. 5-pound sledgehammer.
4. Ground rod, ground strap and pliers.
5. 8-inch adjustable wrench and 8-inch flat-tip screwdriver.

Supervision and assistance will be available.

STANDARDS

This task has been performed correctly when, in 30 minutes, the radio set has been sited, grounded, the whip antennas have been erected, the power cable has been connected, the security equipment has been installed and the radio set is ready to be tuned and operated according to performance measures 1 through 6.

PERFORMANCE MEASURES

1. Check equipment for completeness. (Refer to TM 11-5820-256-10, para 2-2 and 2-3.)
2. Site radio set. (Refer to TM 11-5820-256-10, para 2-1.)
3. Erect whip antenna. (Refer to TM 11-5820-256-10, para 2-5.)

SKILL LEVEL 1

4. Ground shelter. (Refer to TM 11-5820-256-10, para 2-9(b).)
 - a. Install ground rod a minimum of 8 feet into the ground.
 - b. Moisten area around ground rod with water to insure a good ground.
 - c. Attach ground strap between ground and ground stud on radio set.
5. Connect power cable. (Refer to TM 11-5820-256-10, para 2-9(a).)
6. Place TSEC/KW-7 in space provided and connect signal cables to TSEC/KW-7. (Refer to TM 11-5820-256-10, para 3-4e.)

REFERENCES

TM 11-5820-256-10

TASK**113-599-1020**

Prepare Radio Teletypewriter Set AN/VSC-3 for Operation

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 Teletypewriter Set AN/VSC-3.
2. TM 11-5815-332-15.
3. TM 11-5820-467-15.
4. TM 11-5820-520-12.

STANDARDS

This task has been performed correctly when, in 30 minutes, the radio teletypewriter set has been sited, the whip antenna has been erected, the security equipment has been installed, and the radio teletypewriter set is ready to be tuned and operated according to performance measures 1 through 4.

PERFORMANCE MEASURES

1. Check equipment for completeness. (Refer to TM 11-5815-332-15, para 1-1.)
 - a. Inspect the equipment for damage.
 - b. Check that all equipment is firmly mounted.
 - c. Check that all ground straps are securely connected.

SKILL LEVEL 1

2. Site radio teletypewriter set. (Refer to TM 11-5815-332-15, para 2-3.)
 - a. Select the highest accessible point within the designated area.
 - b. Avoid a location near sources of electrical interference such as: Power lines, radar equipment, and field hospitals.
 - c. If enemy jamming is probable, select a site which places near-by obstructions such as hills, metal buildings, or bridges between the probable sites of enemy jamming transmitters and the M577A1.
3. Erect whip antenna. (Refer to TM 11-5815-332-15, para 2-4.)
 - a. Assemble the five section whip antenna (TM 11-5820-520-12) by screwing the three Mast Sections MS-116A together, Mast Section MS-117A on to the top Mast Section MS-116A, and Mast Section MS-118A on the Mast Section MS-117A.
 - b. Place the plastic antenna sheath over MS-118A with the large opening pointing toward Mast Section MS-116A and slide it down the assembled whip antenna.
 - c. Screw Mast Section MS-116A of the assembled whip antenna into the AB-652/GR Mast Base.
 - d. Slide the plastic antenna sheath down over the AB-652/GR as far as it will go.
 - e. Bend the whip antenna and slide the tie-down clamp, with rope attached, down the antenna to the top of Mast Section MS-117A.
 - f. The whip antenna may be placed in a tied-down position by pulling on the free end of the tie-down ropes until the top of the whip antenna is 8 or 9 feet from the ground and then tying the tie-down rope to any convenient point on the rear of the M577A1.

NOTE: When Antenna AN/GRA-50 is used, install it in accordance with the procedures outlined in TM 11-5820-467-15.
4. Place TSEC/KW-7 in rack and connect signal cables. (Refer to TM 11-5815-332-15, para 2-5.)

CAUTION: Be sure the MD-522(*)/GRC is turned off before disconnecting wires or cables from the dummy box or security equipment.

- a. Set the On-Off switch on the MD-522(*)/GRC to the OFF position, and set the BLACK-RED switch on the AN/VSC-3 control box to the RED position.
- b. Connect a jumper cable between binding posts E2 and E4 at the rear of the security equipment.
- c. Connect shorting plugs (stored in the security device carrying case) to LOOP IN-2 and LOOP OUT-2 receptacles on the rear panel of the security equipment.
- d. Place the security equipment on its mountings base (fig 1).
- e. Disconnect the three color-coded banana plugs from the dummy box (fig 2). Connect them to the security equipment as follows:
 - (1) White banana plug to E1.
 - (2) Black banana plug to E3.
 - (3) Blue banana plug to E5.
- f. Disconnect W-7 from the dummy box LOOP IN receptacle and reconnect it to J3 of the security equipment.
- g. Disconnect W-6 from the dummy box LOOP OUT receptacle and reconnect it to J7 of the security equipment.
- h. Connect the free end of cable W-5 to the 24 VDC INPUT receptacle on the rear panel of the security equipment.
- i. Clamp the equipment to the mounting base.
- j. Install TT-523(*)/GGC and 5,600-OHM resistor on TT-76(*)/GGC.

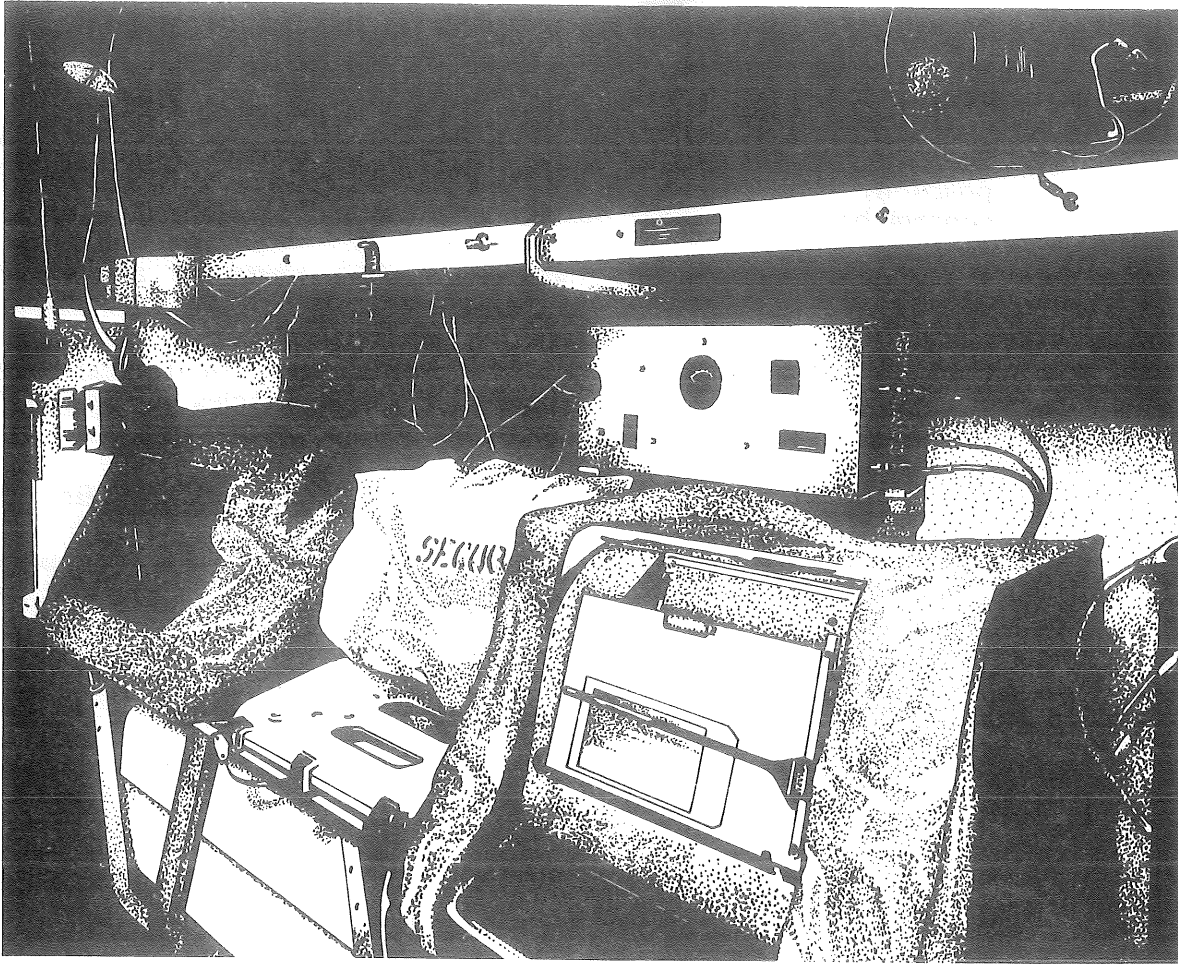
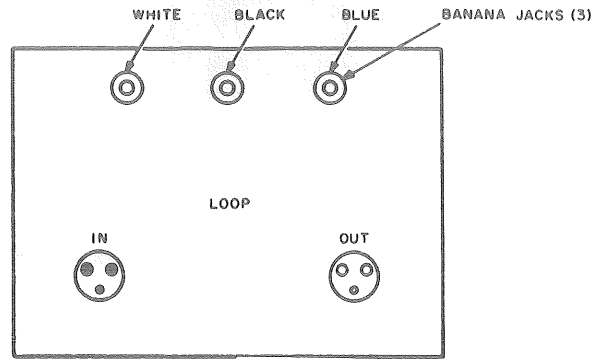


Figure 1. Roadside view of dust covers installed in TT-76(*)/GGC and TT-98(*)/FG and secure equipment mount.



EL5815-332-15-TM-15

Figure 2. Radio Teletypewriter Set AN/VSC-3 dummy box, front panel connectors.

REFERENCES

TM 11-5815-332-15

TM 11-5820-467-15

TM 11-5820-520-12

TASK

113-599-2001

Operate Radio Teletypewriter Set AN/GRC-46

CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. You will be provided with an installed, operational Radio Teletypewriter Set AN/GRC-46, TM 11-5815-204-10, and CEOI. One other station will be prepared to work in a net with you. Supervision and assistance will normally be available.

STANDARDS

This task has been performed correctly when, in 30 minutes, the radio teletypewriter set has been prepared for the selected mode of operation according to performance measure 4, and the radio teletypewriter 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.
2. Perform preliminary starting procedures. (Refer to fig 1, and TM 11-5815-204-10, chap 2, sec II, para 26.)
 - a. Start the vehicle and adjust the throttle for a reading of 28 V DC on the DC VOLTS meter of the J-688/GR.
 - b. Release the antenna tie-down rope.
 - c. Check to see that the braided ground strap, located on the outside rear of the shelter, is connected to the vehicle frame. Set the function box lights switch to ON.
 - d. Set the junction box light and blower switch to ON. The blower motor will start, and the damper flap will swing open freely.

CAUTION: Prior to the preliminary setting of controls, be sure that the transmitter BAND SELECTOR and TUNING controls are locked.

COMPONENT	CONTROL	POSITION	
Radio Transmitter T-195(*)/GRC-19	SERVICE SELECTOR switch	OFF.	
	DIAL DIM switch	DIM or FULL, as desired.	
	RELAY-NORMAL-DUPLEX switch	NORMAL.	
	TEST METER	PA CATHODE.	
	LINE LEVEL	+12.	
	Radio Receiver R-392/URR	PRESET CHANNELS switch	Desired channel.
		Function switch	OFF.
		BFO switch	OFF.
		BFO PITCH	0.
		AGC switch	ON.
ANT TRIM		0.	
AF GAIN control		Center range.	
BAND WIDTH switch		4KC.	
DIAL DIM switch		DIM or ON, as desired.	
RF GAIN SQUELCH THRESH control		Extreme clockwise.	
Modulator, Radio Transmitter MD-203/GR Converter, Frequency Shift CV-278/GR	DIAL LOCK	Unlocked.	
	POWER switch	OFF.	
Interconnecting Box J-668/GR	POWER switch	OFF	
	SERVICE switch	MARK HOLD.	
	MAIN POWER circuit breaker	OFF.	
	TTY power switch	OFF.	
	CRYPT switch	OFF.	
Teletypewriter Set AN/UGC-4	Function selector switch	BIAS 30MA.	
	POWER switch (located inside cover, right side rear)	OFF.	
	MOTOR switch	OFF.	
	LIGHT switch	OFF.	
Reperforator-Transmitter Teletypewriter TT-76(*)/ GGC	SEND-LOCK switch	SEND.	
	Distributor level	FEED-RETRACK.	
	SELECTOR switch	3.	
	POWER switch	OFF.	
Teletypewriter Shelf	LIGHT SWITCH	OFF.	
	MOTOR switch	OFF.	
	SEND-REC-MARK HOLD switch	MARK HOLD.	

Figure 1. Preliminary starting procedures for Radio Teletypewriter Set AN/GRC-46.

SKILL LEVEL 1

3. Perform starting procedures. (Refer to fig 2, and TM 11-5815-204-10, chap 2, sec II, para 27.)

UNIT	CONTROL	ACTION
J-668/GR.....	MAIN POWER switch	Place at ON. The DC VOLTS meter should indicate between 27.5 and 28 volts.
T-195(*)/GRC-19....	SERVICE SELECTOR switch	Place at STANDBY.
R-392/URR	Function switch	Place at NORMAL.
CV-278/GR	POWER switch	Place at ON.
MD-203/GR	POWER switch	Place at ON. Allow the equipment to warm up for 5 minutes.
J-668/GR.....	TTY switch.....	Place at ON, for teletypewriter and reperforator operation.
	BIAS 30MA adjustment control	Loosen the locknut, and adjust for a meter reading of 30 milliamperes on the DC MILLIAMPERES meter. Tighten the locknut.

Figure 2. Starting procedures for Radio Teletypewriter Set AN/GRC-46

4. Adjust for mode of operation. (Refer to TM 11-5815-204-10, chap 2, sec II, para 29a.)
 - a. Voice or CW operation. (Refer to TM 11-5815-204-10, chap 2, sec II, para 28.)
 - b. Frequency Shift Keying (FSK).
 - (1) For FSK reception refer to figure 3.
 - (2) For FSK transmission refer to figure 4.

UNIT	CONTROL	ACTION
R-392/URR	Function switch DIAL LOCK control BFO switch Frequency selector controls (MEGA-CYCLES and KILOCYCLES). BAND WIDTH switch BFO PITCH control AF GAIN control CARRIER LEVEL meter KILOCYCLES control and ANT TRIM control. AF GAIN control	Operate to NORMAL. Turn DIAL LOCK to the left (counter-clockwise). Turn to ON. Adjust until desired frequency is indicated on frequency indicator. Turn to 4 kc. Adjust until desired tone of the beat note is heard. If signal is being received, adjust until level of signal is loud and clear. Observe; it may or may not show a reading. Adjust to obtain maximum loudness. If reading was observed on CARRIER LEVEL meter, adjust controls to obtain peak reading on meter. If signal is now too loud, turn control to obtain desired level.
CV-278/GR	POWER switch	Place at ON.
R-392/URR	ANT TRIM RF GAIN	Adjust to obtain maximum indication on SIGNAL INPUT meter of CV-278/GR. Adjust until SIGNAL INPUT meter of CV-278/GR indicates 5. If 5 cannot be obtained, set RF GAIN control to obtain highest possible indication on meter.
CV-278/GR	DISCRIMINATOR meter	Meter needle should oscillate around zero when fsk signal from distant transmitter is properly tuned. When no fsk signal is received from distant transmitter, meter should indicate zero.
AN/UGC-4	POWER, LIGHT, and MOTOR switches.	Place at ON.
	SEND-LOCK switch	Place at SEND.
TT-76(*)/GGC	POWER, LIGHTS, and MOTOR switches.	Place at ON.
	SELECTOR switch	Turn to position 1.
J-668/GR	Function selector switch	Place at LINE 60MA. The DC MILLIAMPERES meter should indicate 60 milliamperes. If the value is not obtained, loosen the LINE 60MA adjustment control locknut, and adjust the control until the meter indicates 60 milliamperes. Tighten the locknut.

Figure 3. FSK reception.

SKILL LEVEL 1

UNIT	CONTROL	ACTION
CV-278/GR	SERVICE switch	Turn to NOR.
Teletypewriter shelf ..	SEND-REC-MARK HOLD switch	Place at REC. If distant station is transmitting fsk, the page printer and reperforator will print clear copy.
CV-278/GR	SERVICE switch	If clear copy is not received, turn to REV.
R-392/URR	KILOCYCLES control	A slight readjustment may be necessary to obtain readable copy.
	DIAL LOCK control	Turn fully clockwise.
	RF GAIN SQUELCH control	Turn fully counterclockwise. Page printer and reperforator-transmitter will print garbled copy. Adjust control until they print legible. Note. Whenever the received signal goes off the air or is interrupted, the page printer and reperforator-transmitter will print garbled copy unless the SEND-REC-MARK HOLD switch is placed in the MARK HOLD position or the CV-278/GR SERVICE switch is placed in the MARK HOLD position. Under these conditions, the receiver must be monitored.
	Function switch	If noise or static interferes with received signal (voice or fsk operation), turn to LIMITER.
	BFO switch	Turn to OFF, if received signal is below a reading of 5 on CV-278/GR SIGNAL INPUT meter or if voice is expected along with fsk.

Figure 3. FSK reception (Cont).

UNIT	CONTROL	ACTION
T-195(*)/GRC-19	PRESET CHANNEL selector switch.	Turn to channel number assigned to desired frequency. Consult chart on transmitter front panel.
MD-203/GR	POWER switch BAND SELECTOR switch	Turn to ON. Turn to correspond to the operating frequency of the transmitter. This value (band) is indicated on the transmitter BAND indicator dial.
T-195(*)/GRC-19 Teletypewriter shelf . .	SERVICE SELECTOR switch SEND-REC-MARK HOLD switch	Place at VOICE/FSK. Place at SEND. The TUNING INDICATOR on the transmitter will light. Dynamotor in transmitter will start (Unlettered model).
T-195(*)/GRC-19	TEST METER switch	Place at PA CATH. The test meter pointer should be in the shaded area of the meter marked PA CATHODE.
TT-76(*)/GGC or	SEND LOCK switch	Place at SEND. The page printer may now be operated as indicated in para 29c of TM 11-5815-204-10.
AN/UGC-4	SEND LOCK switch	Place at SEND. The reperforator-transmitter may now be operated as indicated in para 29c of TM 11-5815-204-10.

Figure 4. FSK transmission.

5. Page Printer and Reperforator-Transmitter Operation. (Refer to fig 5, and TM 11-5815-204-10, chap 2, sec II, para 29c.)

(1) Transmission on Teletypewriter Set AN/UGC-4.		
UNIT	CONTROL	ACTION
Teletypewriter shelf . . .	SEND-REC-MARK HOLD switch	Place at SEND. The page printer is now ready to transmit radioteletype messages.
(2) Punching tape using Teletypewriter Set AN/UGC-4 (no transmission).		
UNIT	CONTROL	ACTION
T-195(*)/GRC-19 TT-76(*)/GGC	SERVICE SELECTOR switch MOTOR switch LIGHT switch POWER switch SEND-LOCK switch SELECTOR switch	Turn to STAND BY. Place at ON. Place at ON. Place at ON. Place at SEND. Turn to position 1.
Typewriter shelf Transmitter-distributor	SEND-REC-MARK-HOLD switch START-STOP lever	Place at SEND Place at STOP. The AN/UGC-4 is now ready for operation. The reperforator-transmitter will automatically punch the tape, which will feed out of the left-hand side of the machine.
(3) Punching tape using reperforator-transmitter keyboard (no transmission).		
UNIT	CONTROL	ACTION
TT-76(*)/GGC	MOTOR switch LIGHT switch Power switch SEND-LOCK switch SELECTOR switch	Place at ON. Place at ON. Place at ON. Place at SEND. Turn to position 3.
Typewriter shelf	SEND-REC-MARK HOLD switch	Place at MARK HOLD. The reperforator-transmitter is now ready for the operator to punch a new tape. Note. The END OF LINE INDICATOR will light after 65 characters have been typed on each line. This is a warning signal to press the CAR RET. LINE FEED and LTRS keys and continue typing.
(4) Transmitting messages by tape.		
UNIT	CONTROL	ACTION
T-195(*)/GRC-19 TT-76(*)/GGC	SERVICE SELECTOR switch MOTOR switch LIGHT switch POWER switch SEND-LOCK switch SELECTOR switch	TURN to VOICE/FSK Place at ON. Place at ON. Place at ON. Place at SEND. Turn to position 2.
Teletypewriter shelf . . .	SEND-REC-MARK HOLD switch	Place at SEND. Open the tape cover and insert the tape in the tape guide. Typed messages on the tape must be face up. The perforated holes in the tape must fit the cogs in the feed guide. The tape is now ready for transmission.
Transmitter-distributor	START-STOP lever	Place at START.

Figure 5. Page Printer and Reperforator-Transmitter Operation.

6. Perform stopping procedure. (Refer to fig 6, and TM 11-5815-204-10, chap 2, sec II, para 31.)

UNIT	CONTROL	ACTION
TT-76(*)/GGC	MOTOR switch	Place at OFF.
	LIGHTS switch	Place at OFF.
	POWER switch	Place at OFF.
AN/UGC-4	MOTOR switch	Place at OFF.
	LIGHTS switch	Place at OFF.
	POWER switch	Place at OFF.
J-668/GR	TTY switch	Place at OFF.
	CRYPT switch	If used, place at OFF.
CV-278/GR	POWER switch	Place at OFF.
R-392/URR	Function switch	Place at OFF.
T-195(*)/GGC	SERVICE SELECTOR switch	Place at OFF.
J-668/GR	MAIN POWER switch	Place at OFF; removes power from all components except the lights and blower.
	BLOWER switch	Place at OFF.
	LIGHTS switch	Place at OFF.

Figure 6. Stopping procedure.

NOTE: In an emergency, the entire RATT set may be shut down by placing the junction box MAIN POWER switch in the OFF position.

REFERENCES

TM 11-5815-204-10

CEOI

TASK

113-599-2002

Operate Radio Teletypewriter Set AN/GRC-142(*) or AN/GRC-122(*)

CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. You will be provided with an installed, operational Radio Teletypewriter Set AN/GRC-142(*) or AN/GRC-122(*), TM 11-5815-334-12, and CEOI. One other station will be prepared to work in a net with you. Supervision and assistance will normally be available.

STANDARDS

This task has been performed correctly when, in 30 minutes, the radio teletypewriter set has been prepared for the selected mode of operation according to performance measure 3, and the radio teletypewriter set has been placed into and taken out of operation according to performance measures 1 through 11.

PERFORMANCE MEASURES

1. Determine operating frequency from current CEOI.
2. Perform preliminary starting procedures. (Refer to TM 11-5815-334-12, para 3-6.)
 - a. Remove all exhaust covers during operation.
 - b. If the heater is to be used, remove and secure the heater exhaust and inlet covers.
 - c. Check fuel level in gasoline can.
 - d. Check to see that the whip antenna is in the operating position, properly connected, and free of obstruction.

3. Preset Radio Teletypewriter Set AN/GRC-142. (Refer to fig 1, and TM 11-5815-334-12, para 3-6.)

STEP	UNIT	CONTROL OR SWITCH POSITION
1	Power panel (fig. 3-1)	<p>MAIN PUSH ON-PULL OFF circuit breaker: Push.</p> <p>LIGHTS switch: ON. (In order for the lights to work with the shelter door open, the <i>blackout</i> switch (fig. 1-3 or 1-4) must be pulled out.)</p> <p>Meter: Adjust vehicle throttle for a 28-volt indication. This voltage must be maintained for all modes of operation. Energizing units of the AN/GRC-142 or AN/GRC-122 may cause this voltage to drop. If so, readjust the vehicle throttle as necessary to maintain the 28-volt indication. If operating in the ac only mode, a low 28-volt dc reading indicates a low ac input to the shelter. Check with ac power meter on curbside shelter wall for a 110-volt ac indication. Refer to applicable technical manual if an external power supply is used.</p> <p>BLOWER switch: Turn to ON as required. Blower does not operate in ac only mode.</p> <p>LOCK-OUT switch: ON</p> <p>INVERTERS OWR ON-OFF switch: OFF</p> <p>INVERTERS DX ON-OFF switch: OFF (used with AN/GRC-122 only).</p>
2	Control panel (fig. 3-2)	<p>LOOP ADJ OWR DX SEND control: Midrange.</p> <p>LOOP ADJ DX RCV PONY control: Midrange (AN/GRC-122 only).</p> <p>LOCAL-REMOTE switch: LOCAL</p> <p>LOCK-OUT-OVERRIDE switch: LOCK-OUT.</p> <p>AUDIO TEL REMOTE-CW switch (early models only): AUDIO TEL.</p>
3	Switchbox (fig. 3-3)	<p>TT-98 DX-RECEIVE PONY BLACK-RED switch: BLACK (AN/GRC-122 only).</p> <p>TT-98 OWR DX-SEND BLACK-RED switch: BLACK</p> <p>TT-76 TAPE PUNCH OWR-DX-SEND-DX-RECEIVE switch: OWR-DX-SEND.</p>
4	Remote box (fig. 3-4)	SEND-RECEIVE switch: RECEIVE.
5	TT-523/GGC (fig. 3-5)	TT-523/GGC switch: TD SEND-TR SEND/RCV.
6	RT-662/GRC and duplex RT-662/GRC (AN/GRC-122 only) (TM 11-5820-520-12). References to RT-662/GRC are also applicable to RT-834/GRC.	<p>SERVICE SELECTOR switch: OVEN ON. (Allow a minimum of 10 minutes warm-up time to stabilize equipment).</p> <p>Set VOX switch to PUSH-TO-TALK.</p> <p>Turn SQUELCH control to OFF.</p> <p>Set NOISE BLANKER switch to OFF. (Used on older RT-662/GRC only).</p> <p>Set BFO control to mid-range.</p> <p>Set MANUAL RF GAIN control fully clockwise.</p> <p>Set AUDIO GAIN control to mid-range.</p> <p>Set FREQUENCY VERNIER to OFF.</p>
7	AM-3349/GRC-106	<p>Set HV RESET switch to OPERATE.</p> <p>Set PRIM PWR switch to OFF.</p>

Figure 1. Preset Chart AN/GRC-142 or AN/GRC-122.

SKILL LEVEL 1

STEP	UNIT	CONTROL OR SWITCH POSITION
8	TT-98/FG and duplex TT-98/FG (AN/GRC-122 only) (TM 11-5815-200-12).	MOTOR switch: OFF LIGHT switch: OFF LINE-BREAK switch: LINE. SEND-LOCK switch: SEND
9	TT-76A/GGC (TM 11-5815-238-12).....	POWER switch: OFF. MOTOR switch: OFF LIGHT switch: OFF. KEYBOARD switch: SEND. SELECTOR switch: 1. START-STOP-FEED RETRACT lever: FEED RETRACT. RCV-SEND switch: RCV.
10	MD-522(*)/GRC (TM 11-5805-387-15-1 or (TM 11-5805-387-15-2).	AUDIO GAIN control: Midrange. ONE WAY-DUPLEX switch: ONE WAY. MODE SELECTOR switch: VOICE RECEIVE-REV-NORM switch: NORM. METER FUNCTION switch: REGULATED DC. SCOPE INTENSITY control: Midrange. DC LOOP NO. 1 switch b: 20 MA. DC LOOP NO. 2 switch b: 20MA. AUTO MARK/HOLD switch b: ON. ON-OFF switch b: ON.
11	LS-166/U and duplex LS-166/U (AN/GRC-122 only).	VEHICLE-PACKSET switch: VEHICLE.
12	C-434/GRC (TM-11-5038).....	REMOTE switch (if operating remote): TEL ONLY.
13	TA-312/PT (TM 11-5805-201-12)	Selector switch: LB. INT-EXT switch: INT. LOUD control: Fully clockwise.
14	C-433/GRC (TM 11-5038).....	SELECTOR switch: TEL.
15	ME-165/G° (fig. 3-9).....	Function switch: POWER.
16	Heater.....	ON-OFF switch: OFF.
17	Air conditioner (fig. 1-2) (AN/GRC-142, serial numbers 1 through 697 only).	SW 1: 0, SW 2: OFF; SW 3: VENT; SW 4: Midrange
18	Ac entrance box a (fig. 3-6).....	Both circuit breakers OFF.

Figure 1. Preset Chart AN/GRC-142 or AN/GRC-122 (Cont).

(The figures referred to in this chart apply to TM 11-5815-334-12.)

4. Preset Radio Teletypewriter Set AN/GRC-142A-142B or AN/GRC-122A-122B. (Refer to fig 2, and TM 11-5815-334-12, para 3-17.)
5. Perform tuning procedures. (Refer to TM 11-5815-334-12, para 3-8.)

STEP	UNIT	CONTROL OR SWITCH POSITION
1	Power distribution panel (fig. 3-13)	<p>Set DC MAIN DC MODE OPERATION circuit breaker to PUSH ON.</p> <p>Set BLO & LIGHTS circuit breaker to ON. (For lights to work with shelter door open, blackout switch (fig. 1-4) must be pulled out).</p> <p>Adjust vehicle throttle for a power distribution panel meter indication of 28 volts. This voltage must be maintained for all modes of operation. Energizing units of radio teletypewriter set may cause voltage to drop. If so, readjust vehicle throttle as necessary to maintain 28-volt indication.</p> <p>Set BLO HI-OFF-LO switch as required.</p> <p>Set RECP circuit breaker to ON.</p> <p>Set DC MAIN AC ONLY OPERATION circuit breaker to PULL OFF.</p> <p>Set POWER switch to AC.</p> <p>Set AC MAIN circuit breaker to ON. Meter should indicate 115 volts ac \pm 10%.</p> <p>Set BLO & LIGHTS circuit breaker to ON. (For lights to work with shelter door open, blackout switch (fig. 1-4) must be pulled out.)</p> <p>Set BLO HI-OFF-LO switch as required.</p> <p>Set RECP circuit breaker to ON (if ac receptacles are to be used).</p> <p>Set PWR SUP circuit breaker to ON.</p>
2	Switch assembly (fig. 3-14)	<p>Insure that LOCKOUT-OVERRIDE switch is at LOCKOUT.</p> <p>Set LOCAL-REMOTE switch to LOCAL.</p> <p>Set TT-98 DX-RECEIVE PONY BLACK-RED switch to BLACK (AN/GRC-122A and AN/GRC-122B only).</p> <p>Set TT-98 OWR DX-SEND BLACK-RED switch to BLACK.</p> <p>Set TT-76/TAPE PUNCH/OWR-DX-SEND/DX-RECEIVE switch to OWR-DX-SEND.</p>
3	Remote box (fig. 3-4)	Set SEND-RECEIVE switch to RECEIVE (if operating remote).
4	TT-523(*)/GGC (fig. 3-5).....	Set TT-523(*)/GGC switch to TD SEND-TR SEND/RCV.
5	<p>RT-662/GRC and duplex RT-662/GRC (AN/GRC-122A and AN/GRC-122B only) (TM 11-5820-520-12).</p> <p>References to RT-662/GRC are also applicable to RT-834/GRC.</p>	<p>SERVICE SELECTOR switch: OVEN ON (Allow a minimum of 10 minutes warm-up time to stabilize equipment).</p> <p>Set the VOX switch to PUSH-TO-TALK.</p> <p>Turn SQUELCH control to OFF.</p> <p>Set the VOX switch to PUSH-TO-TALK.</p> <p>Turn SQUELCH control to OFF.</p> <p>Set NOISE BLANKER switch to OFF.</p> <p>Set BFO control to mid-range.</p> <p>Set MANUAL RF GAIN control fully clockwise.</p> <p>Set AUDIO GAIN control to mid-range.</p> <p>Set FREQUENCY VERNIER to OFF.</p>
6	AM-3349/GRC-106	<p>Set HV RESET switch to OPERATE.</p> <p>Set PRIM PWR switch to OFF.</p>
<p><i>Caution:</i> In duplex or ovr operation (AN/ GRC-122A and AN/GRC-122B only), the transmitting frequency (AN/GRC-106) must differ from the receiving (duplex RT-662/GRC) frequency by 10%, or 1 megahertz, whichever is greater. Tune Duplex Teletypewriter RT-662/GRC to the desired frequency before keying the AN/GRC-106. This must be done even if the RT-662/GRC is not turned on.</p>		

Figure 2. Preset Chart for Radio Teletypewriter Set AN/GRC-142 or AN/GRC-122 (A or B Models).

STEP	UNIT	CONTROL OR SWITCH POSITION
7	Teletypewriter TT-98/FG and Duplex Teletypewriter TT-98/FG (AN/GRC-122A and AN/GRC-122B only) (TM 11-5815-200-12).	Set MOTOR switch to OFF. Set LIGHT switch to OFF. Set LINE/BREAK switch to LINE. Set SEND-LOCK switch to SEND.
8	TT-76A/GGC (TM 11-5815-238-12)	Set POWER switch to OFF. Set MOTOR switch to OFF. Set LIGHT switch to OFF. Set KEYBOARD switch to SEND. SET selector SWITCH TO 1. Set START-STOP-FEED RETRACT lever to FEED RETRACT.
9	MD-522(*)/GRC (TM 11-5805-387-15-1 or TM 11-5805-387-15-2).	Set AUDIO GAIN control to Midrange. Set ONE WAY-DUPLEX switch to ONE WAY. Set MODE SELECTOR switch to VOICE. Set RECEIVE switch to NORM. Set METER FUNCTION switch to REGULATED DC. Set SCOPE INTENSITY control to Midrange. Set DC LOOP NO. 1 switch ² to 20 MA. Set DC LOOP NO. 2 switch ² to 20 MA. Set MARK/HOLD switch ² to OFF. Set ON/OFF switch ² to ON.
10	Loudspeaker, Dynamic LS-166/U and duplex Loudspeaker LS-166/U (AN/GRC-122A and AN/GRC-122B only).	Set VEHICLE-PACKSET switch to VEHICLE.
11	C-434/GRC (TM 11-5038)	Set REMOTE switch to TEL ONLY.
12	TA-312/PT (TM 11-5805-201-12)	Set selector switch to LB. Set INT-EXT switch to INT. Set LOUD control fully clockwise.
13	C-433/GRC (TM 11-5038)	Set SELECTOR switch to TEL ONLY (if operating remote).
14	ME-165/G ³ (fig. 3-9)	Set function switch to OPERATE.
15	Heater	Set ON-OFF switch to OFF.
16	PP-4763(*)/GRC	Set AC ON-OFF switch to ON (if in ac only mode).

¹ Some models of RT-662/GRC do not contain the NOISE BLANKER switch.
² These front panel controls exist only on the MD-522A/GRC model.
³ Do not key the AN/GRC-106 (with full power output) for more than 10 minutes at a time with the ME-165/G function switch at POWER.

Figure 2. Preset Chart for Radio Teletypewriter Set AN/GRC-142 or AN/GRC-122 (A or B Models).

(The figures referred to in this chart apply to TM 11-5815-334-12.)

- Adjust for local ONE-WAY REVERSIBLE 85 Hz Teletypewriter operation. (Refer to TM 11-5815-334-12, para 3-9.)

7. Adjust for local duplex 85 Hz Teletypewriter operation. (Refer to TM 11-5815-334-12, para 3-10 and para 3-21.)
8. Select a Precedence Message.
9. Transmit a Message. (25 wpm with no more than 5 errors.)
10. Perform stopping procedures. (Refer to TM 5815-334-12, para 3-14 and para 3-25.)
 - a. When the equipment is to be turned off for periods of 1 hour or less, it may be placed in a standby position.
 - b. If standby is desired, perform procedures in figure 3.

STEP	UNIT	CONTROL	POSITION
1	AM-3349/GRC-106	PRIM PWR switch	OFF.
2	RT-662/GRC	SERVICE SELECTOR switch	OVEN ON.
3	MD-552(*)/GRC	MODE SELECTOR switch	VOICE.
4	TT-98/FG	MOTOR switch	OFF.
5	TT-76A/GGC	POWER and MOTOR switches	OFF.
6	DUPLEX TT-98/FG (AN/GRC-122 only)	MOTOR switch	OFF.
7	Power panel	INVERTERS OWR ON-OFF switch (not required during ac only operation).	OFF.
		INVERTERS DX ON-OFF switch (not required during ac only operation).	OFF.
8	Duplex RT-662/GRC (AN/GRC-122 only)	SERVICE SELECTOR switch	STANDBY.

Figure 3

- c. When the equipment is to be turned off 1 hour or longer, or is to be shut down, perform procedures in figure 4.

STEP	UNIT	CONTROL	POSITION
1	AM-3349/GRC-106	PRIM PWR switch	OFF.
2	RT-662/GRC	SERVICE SELECTOR switch	OFF.
3	Duplex RT-662/GRC (AN/GRC-122 only)	SERVICE SELECTOR switch	OFF.
4	MD-552(*)/GRC	ON-OFF switch	OFF.
5	TT-98/FG	MOTOR and LIGHT switches	OFF.
6	TT-76/GGC	MOTOR, POWER, and LIGHT switches	OFF.
	Duplex TT-98/FG (AN/GRC-122 only)	MOTOR and LIGHT switches	OFF.
7	Gasoline heater	ON-OFF switch	OFF.
8	Air conditioner (AN/GRC-142, serial numbers 1 through 697 only)	ON-OFF switch (SW: 2)	OFF.
9	Power panel	INVERTERS OWR switch	OFF.
		INVERTERS DX switch	OFF.
		28V RECEP switch	OFF.
		LOCK-OUT switch	OFF.
		BLOWER switch	OFF.
		MAIN PUSH ON-PULL OFF circuit breaker	PULL OFF.
10	Ac entrance box	Circuit breakers(2)	OFF.

Figure 4

SKILL LEVEL 1

11. Emergency stopping. (Refer to TM 11-5815-334-12, para 3-14c, and para 3-25c.)
 - a. To turn off the AN/GRC-142(*) or AN/GRC-122(*) in an emergency pull out the DC MAIN PUSH ON-PULL OFF circuit breaker.
 - b. If operating off AC power, set all AC entrance box and power distribution panel circuit breakers to OFF.

REFERENCES

TM 11-5815-334-12

CEOI

TASK**113-599-2003**

**Troubleshoot Radio Teletypewriter Set AN/GRC-142(*)
or AN/GRC-122(*)**

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 Teletypewriter Set AN/GRC-142(*) or AN/GRC-122(*).
2. TM 11-5815-334-12 and TM 38-750.
3. DA Form 2404.
4. Clean, dry, lint-free cloth.
5. Mild detergent solution and cleaning fluid trichloroethane.
6. 8-inch flat-tip screwdriver, 8-inch adjustable wrench and replacement fuses as required.

Supervision and assistance will be available.

STANDARDS

This task has been performed correctly when any discovered faults have been 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 4.

PERFORMANCE MEASURES

1. Perform operator's troubleshooting procedures on Radio Teletypewriter Set AN/GRC-142(*) or AN/GRC-122(*). (Refer to fig 1, and TM 11-5815-334-12, para 4-8 and 4-9.)

ITEM	TROUBLE SYMPTOM	PROBABLE CAUSE	CHECK AND CORRECTIVE MEASURES
1	<p>Power panel (AN/GRC-142 or AN/GRC-122 only):</p> <p>a. MAIN circuit breaker kicks out</p> <p>b. Power panel meter does not indicate any voltage, and POWER lamp does not light.</p> <p>c. Power panel meter does not indicate, but POWER lamp is lighted.</p> <p>d. POWER lamp does not light ...</p> <p>e. Fuse holder lights</p>	<p>a. Extremely high starting current</p> <p>b. (1) Loose dc power cable</p> <p>(2) Defective dc power cable ...</p> <p>(3) Defective ac input cable or PP-4763(*)/GRC (ac mode of operation only).</p> <p>c. Defective meter</p> <p>d. Defective lamp</p> <p>e. Defective fuse</p>	<p>a. Refer to note, paragraph 3-6h.</p> <p>b. (1) Check for tight connection where dc power cable connects to dc entrance box at front of shelter. Check for tight connection at vehicle battery.</p> <p>(2) Check dc power cable.</p> <p>(3) Check for 110-volt ac indication on ac voltmeter. If voltage is not present, check ac power cable. If voltage is present, check seating at 25-ampere outlet (fig. 1-1).</p> <p>c. Higher category of maintenance required.</p> <p>d. Replace lamp (para 4-9f).</p> <p>e. Replace fuse (para 4-9c). If fuse continues to blow, higher category maintenance required. If 28 V RECP fuse blows, remove appliance plugged into 28-volt convenience outlet.</p>
2	<p>Power distribution panel (AN/GRC-142A, -142B, or AN/GRC-122A, -122B only):</p> <p>a. DC MAIN circuit breakers kick out.</p> <p>b. Power distribution panel meter does not indicate any voltage dc mode, and dc indicator lamp does not light.</p> <p>c. Dc indicator lamp does not light in dc mode of operation.</p> <p>d. Power distribution panel meter does not indicate any voltage in ac mode, and AC indicator lamp does not light.</p> <p>e. AC indicator lamp does not light in AC mode operation.</p> <p>f. Power distribution panel meter does not indicate any voltage in ac or dc mode of operation.</p> <p>g. AC MAIN, INVERTER OWR, INVERTER DX, PWR SUP, or BLO & LIGHTS circuit breakers kick out.</p> <p>h. RECP circuit breaker kicks out.</p>	<p>a. Extremely high starting current</p> <p>b. (1) Loose dc power cable</p> <p>(2) Defective dc power cable ...</p> <p>c. Defective lamp</p> <p>d. Defective ac input cable</p> <p>e. Defective lamp</p> <p>f. Defective meter</p> <p>g. Overload condition</p> <p>h. Overload condition</p>	<p>a. Refer to note, paragraph 3-17f.</p> <p>b. (1) Check for tight connection at applicable shelter entrance box.</p> <p>(2) Check dc power cable.</p> <p>c. Replace lamp (para 4-9g).</p> <p>d. Check for 115-volt indication on ac voltmeter. If voltage is not present, check ac power cable and cable connector seating.</p> <p>e. Replace lamp (para 4-9g).</p> <p>f. Higher category of maintenance required.</p> <p>g. Reset if circuit breaker continues to kick out higher category maintenance is required.</p> <p>h. Reset if circuit breaker continues to kick out, remove equipment plugged into associated outlet.</p>
3	<p>OWR or DX (AN/GRC-122A and AN/GRC-122B only) inverter does not energize. (Inverter will whine if energized.)</p>	<p>Loose cable connection</p>	<p>Check to see that cable connection at inverter is tight.</p>
4	<p>a. Shelter lamp does not light ...</p> <p>b. Both shelter lights inoperative</p>	<p>a. Defective lamp</p> <p>b. Blackout switch in wrong position.</p>	<p>a. Replace lamp (para 4-9a).</p> <p>b. Check position of blackout switch.</p>

Figure 1. Operator's Troubleshooting Chart.

ITEM	TROUBLE SYMPTOM	PROBABLE CAUSE	CHECK AND CORRECTIVE MEASURES
5 6	Blower inoperative No loop current	Defective blower a. MD-522A/GRC circuit breaker or MD-522/GRC fuse blown. b. Open circuit	Higher category maintenance required. a. Reset MD-552A/GRC circuit breaker by placing its ON-OFF switch at ON or check MD-522A/GRC fuse. b. For local operation, check to see that all cable connections are tight and properly connected. For remote operation, place control panel (AN/GRC-142 or AN/GRC-122, or Switch Assembly SA-1650/GRC, AN/GRC-142, -142B or AN/GRC-122A, -122B) LOCAL REMOTE switch at LOCAL. If loop current is restored, trouble is in remote installation. Check for broken field wires; check to see that all remote connections are tight and correct (fig. 2-5 or 2-6).
7	a. Radio tuning procedure cannot be accomplished. b. Vswr too high (ME-165/G meter indicates in red areas; doublet antenna only). c. Low power output	a. (1) Loose or improper connections. (2) Blown fuse in RT-622/GRC. (3) Improper antenna installation (4) Defect in AM-3349/GRC-106. b. Improper doublet antenna installation. c. Defect in AM-3349/GRC-106	a. (1) Check to see that all RF cables associated with AN/GRC-106 are tight and properly connected (fig. 6-2 or 6-3). (2) Check fuse in RT-662/GRC and replace if necessary (TM 11-5820-520-12). (3) Check whip antenna installation (para 2-8a). (4) Refer to TM 11-5820-520-12. b. Check doublet antenna installation (para 2-8b). c. Higher category of maintenance required.
8	a. No reception in any mode of operation. b. No reception, one mode of operation only. c. Teletypewriter motor does not operate (TT-76A GGC or TT-98 FG)	a (1) Loose or improper cable connection (2) H-33/PT, H-227 U, or speaker defective (3) RT-662 GRC defective ... (4) MD-522(*) GRC defective b (1) RT-662 GRC defective ... (2) MD-522(*) GRC defective c (1) Loose power cable (2) Defective teletypewriter ...	a (1) See that all cables are tight and properly connected (fig 6-2 or 6-3) (2) Replace H-33-PT, H-227 U, or speaker (3) Refer to TM 11-5820-520-12 (4) Refer to TM 11-5805-387-15-1 or TM 11-5805-387-15-2 b (1) Refer to TM 11-5820-520-12. (2) Refer to TM 11-5805-387-15-1 or TM 11-5805-387-15-2 c (1) Check to see that teletypewriter power cable is tight and properly connected (2) Refer to TM 11-5815-200-12 or TM 11-5815-238-12

Figure 1. Operator's Troubleshooting Chart (Cont).

SKILL LEVEL 1

2. Correct defects if necessary. Replacement parts or materials can be obtained from your team chief. (Refer to fig 1, and TM 11-5815-334-12, para 4-9.)
3. Complete DA Form 2404 (Equipment Inspection and Maintenance Worksheet) as a daily maintenance form. (Refer to TM 38-750, para 3-4.)
4. Report all uncorrectable defects. (Refer to TM 38-750, para 3-4d.)
 - a. Notify your immediate supervisor of all uncorrectable faults found.
 - b. Submit DA Form 2404 to your supervisor or support maintenance personnel.

REFERENCES

TM 11-5815-334-12

TM 38-750

TASK**113-599-2004**

Operate Radio Teletypewriter Set AN/VSC-2

CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. You will be provided with an installed, operational Radio Teletypewriter Set AN/VSC-2, TM 11-5815-331-14, and CEOI. One other station will be prepared to work in a net with you. Supervision and assistance will normally be available.

STANDARDS

This task has been performed correctly when, in 30 minutes, the radio teletypewriter set has been prepared for the selected mode of operation according to performance measure 3, and the radio teletypewriter set has been placed into and taken out of operation according to performance measures 1 through 10.

PERFORMANCE MEASURES

1. Determine operating frequency from current CEOI.
2. Perform preliminary starting procedures. (Refer to TM 11-5815-331-14, para 3-3.)
3. Preset Radio Teletypewriter Set AN/VSC-2. (Refer to fig 1, and TM 11-5815-331-14, para 3-3.)
4. Start the vehicle engine and adjust the throttle until the vehicle battery indicator indicates in the green area. (Refer to TM 11-5815-331-14, para 3-3.)
 - a. Set the power distribution box MAIN circuit breaker to ON.
 - b. Turn on the 106pa PRIM PWR switch to ON.

SKILL LEVEL 1

STEP	UNIT	CONTROL OR SWITCH POSITION
1	Power Distribution box (fig. 3-1) ..	BLOWER INVERTER circuit breaker: OFF MAIN circuit breaker: OFF
2	Control box (fig. 3-3)	LOCAL-REMOTE switch: LOCAL TTY-VOICE switch: VOICE LINE CURRENT control: Completely clockwise during <i>clear</i> operation.
3	Modem (TM 11-5805-387-15-1, or TM 11-5805-387-15-2	MODE SELECTOR switch: PWR OFF RECEIVE ONE/WAY DUPLEX switch: ONE WAY METER FUNCTION switch: REC LEVEL SCOPE INTENSITY control: Fully clockwise BFO control: Midrange RECEIVE-REVERSE-NORMAL switch: NORMAL AUDIO GAIN: Fully clockwise SEND-RCV switch: RCV
4	Loudspeaker (fig. 1-3)	FIELD OR PACK SET USE-VEHICULAR SET USE switch: VEHICULAR SET USE
5	TT-4C/TG (fig. 1-2)	MOTOR switch: OFF LINE INCREASE control: Completely counter clockwise.
6	106rt (TM 11-5820-520-12)	SERVICE SELECTOR switch: OFF
7	106pa (TM 11-5820-520-12)	HV RESET switch: OPERATE PRIM. PWR switch: OFF

**The HV RESET switch must be in OPERATE position, whenever the AN/GRC-106 or AN/GRC-106A is turned OFF or ON.*

Figure 1. Operator's Preset Chart for Radio Teletypewriter Set AN/VSC-2.

(The paragraphs referred to in this figure apply to TM 11-5815-331-14.)

- c. Turn the 106rt SERVICE SELECTOR switch to SSB NSK.
5. Perform tuning procedures. (Refer to TM 11-5815-331-14, para 3-3c thru d(13).)
6. Adjust for local 85 Hz teletypewriter operation. (Refer to TM 11-5815-331-14, para 3-4b(1) thru (14).)
7. Select a precedence message.
8. Transmit a message (25 wpm with no more than 5 errors).
9. Perform stopping procedure. (Refer to TM 11-5815-331-14, para 3-5.)

- a. When the equipment is to be turned off for periods of one hour or less, place it in a STANDBY position by following these procedures.
 - (1) Turn the TT-4C/TG MOTOR switch to OFF.
 - (2) Set the power distribution box BLOWER INVERTER circuit breaker to OFF.
 - (3) Turn the 106rt SERVICE SELECTOR switch to STANDBY.
 - (4) Turn the modem MODE SELECTOR switch to PWR OFF.
 - (5) If operating in secure mode, turn off the security equipment.
 - b. When the equipment is to be turned off one hour or longer, follow these procedures.
 - (1) Set the TT-4C/TG MOTOR switch to OFF.
 - (2) Set the power distribution box inverter circuit breaker to OFF.
 - (3) Turn the 106rt SERVICE SELECTOR switch to STANDBY. Allow the 106pa to cool for two minutes.
 - (4) Turn the 106pa PRIM PWR switch to OFF.
 - (5) Turn the 106rt SERVICE SELECTOR switch to OFF.
 - (6) Turn the modem MODE SELECTOR switch to PWR OFF.
 - (7) Set the power distribution box MAIN circuit breaker to OFF.
 - (8) Turn the M151A1 ignition switch to OFF.
10. Emergency stopping. (Refer to TM 11-5815-331-14, para 3-5.) To turn off the AN/VSC-2 in an emergency, set the power distribution box MAIN circuit breaker to OFF.

REFERENCES

TM 11-5815-331-14

TASK

113-599-2005

Operate Radio Set AN/GRC-26D

CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. You will be provided with an installed, operational Radio Set AN/GRC-26D, TM 11-5820-256-10, and CEOI. One other station will be prepared to work in a net with you.

Supervision and assistance will normally be available.

STANDARDS

This task has been performed correctly when, in 30 minutes, the radio set has been prepared for the selected mode of operation according to performance measure 2, and the radio set is placed into and taken out of operation according to performance measures 1 through 6.

PERFORMANCE MEASURES

1. Determine operating frequency from current CEOI.
2. Perform preliminary starting procedures. (Refer to fig 1 and TM 11-5820-256-10, para 3-6.)
3. Perform starting procedures. (Refer to fig 2 and TM 11-5820-256-10, para 3-7.)
4. Tune Radio Set AN/GRC-26D. (Refer to TM 11-5820-256-10, para 3-8 and 3-9.)
5. Adjust for mode of operation. (Refer to TM 11-5820-256-10, para 3-10 thru 3-13.)
 - a. For FSK operation, refer to paragraph 3-10.
 - b. For voice operation, refer to paragraph 3-11.

c. For CW operation, refer to paragraph 3-13.

COMPONENT	CONTROL	POSITION	
Power unit	Circuit breakers	OFF	
Shelter	Circuit breakers	OFF	
Transmitter	FILAMENT POWER circuit breaker	OFF	
	PLATE POWER circuit breaker	OFF	
	TUNE-OPERATE switch (TUNE-NORMAL switch on some models).	TUNE	
	PLATE RELAY switch	Off (down)	
	KEYING switch (EXCITER PLATE POWER switch on some models).	NORMAL (OFF on some models).	
Matching unit	Control switch	POWER	
Fsk-modulator	POWER switch	OFF	
	BAND SELECTOR switch	Band within which transmitter will be tuned.	
Control unit	Power switch	OFF	
	SIDETONE switch	OFF	
	TELETYPE switch	NORMAL DX	
	REMOTE TEL switch	LOCAL TEL	
Converter	POWER switch	OFF	
	AFC switch	OFF	
	AFC SHIFT ADJUSTMENT controls	0	
	AFC THRESHOLD LEVEL controls	OFF	
	CHANNEL SELECTOR switch	A	
	MARK HOLD-XTAL-AFC switches	MARK HOLD	
	DRIFT INDICATOR controls	0	
	FUNCTION switch	OFF	
Each receiver	LINE METER switch	OFF	
	LINE GAIN control	0	
	LIMITER switch	OFF	
	BREAK IN switch	OFF	
	BFO PITCH control	0	
	ANT. TRIM control	0	
	BFO switch	OFF	
	LOCAL GAIN control	0	
	RF GAIN control	0	
	AGC switch	FAST	
	AUDIO RESPONSE switch	WIDE	
	Speaker assembly	ON CHANNEL A switch	Off (down)
		ON CHANNEL B switch	Off (down)
Blower Assembly, Electrical HD-223/G.	Power switch	OFF	
Reperforator	POWER switch	OFF	
	LIGHT switch	OFF	
	MOTOR switch	OFF	
	SEND-LOCK switch	LOCK	
	START-STOP-FEED RETRACT switch	STOP	
	SELECTOR switch	3	
Each page printer	MOTOR switch	OFF	
	LIGHT switch	OFF	
	SEND-LOCK switch	LOCK	

Figure 1. Preliminary starting procedures for Radio Set AN/GRC-26D.

SKILL LEVEL 1

COMPONENT	CONTROL	POSITION
Power unit	START button	Press until engine starts.
Switch Box SA-331/U	POWER SUPPLY switch	No. 1 or No. 2, depending on operating generator.
Power unit	Circuit breaker	ON
Shelter	Circuit breakers	ON
Transmitter	FILAMENT POWER circuit breaker	ON
Fsk-modulator	POWER switch	ON
Control unit	Power switch	ON
Converter	POWER switch	ON
Each receiver	FUNCTION switch	AGC
Speaker assembly	ON CHANNEL A switch	ON (up)
	ON CHANNEL B switch	ON (up)
Blower Assembly, Electrical HD-223/G.	Power switch	ON

Figure 2. Starting procedures for Radio Set AN/GRC-26(D).

6. Perform stopping procedures. (Refer to fig 3 and TM 11-5820-256-10, para 3-16.) In an emergency the RTT may be turned off by setting the shelter main circuit breakers to OFF or by pressing the STOP BUTTON on the power unit.

Component	Control	Position
Each page printer	LIGHT switch	OFF
	MOTOR switch	OFF
	POWER switch	OFF
Reperforator	LIGHT switch	OFF
	MOTOR switch	OFF
	POWER switch	OFF
Converter	POWER switch	OFF
Control unit	Power switch	OFF
Speaker assembly	ON CHANNEL A switch	Off (down)
	ON CHANNEL B switch	Off (down)
Each receiver	FUNCTION switch	OFF
FSK-modulator	POWER switch	OFF
Blower Assembly, Electrical HD-223/G.	Power switch	OFF
Transmitter	PLATE RELAY switch	Off (down)
	PLATE POWER circuit breaker	OFF
	FILAMENT POWER circuit breaker	OFF
Shelter	Circuit breakers	OFF
Power unit	Circuit breaker	OFF
	STOP button	Press until engine stops.

Figure 3. Stopping procedures for Radio Set AN/GRC-26(D).

REFERENCES

TM 11-5820-256-10

CEOI

TASK**113-599-2008**

Operate Radio Teletypewriter Set AN/VSC-3

CONDITIONS

This task is performed under all weather conditions in a fixed or garrison location, and may be performed in an NBC environment. Given a requirement and--

1. Radio Teletypewriter Set AN/VSC-3.
2. TM 11-5815-332-15.
3. TM 11-5820-520-12.
4. CEOI.

STANDARDS

This task has been performed correctly when in 30 minutes the radio teletypewriter set has been prepared for the selected mode of operation according to paragraph 3, and the radio teletypewriter set has been placed into and taken out of operation according to performance measures 1 through 9, below.

PERFORMANCE MEASURES

1. Determine operating frequency from current CEOI.
2. Perform preliminary starting procedures. (Refer to TM 11-5815-332-15, chap 3, sec II.)
 - a. Remove all exhaust covers during operations.
 - b. Check to insure that the antenna is in the operating position, properly connected, and free of obstruction.

SKILL LEVEL 1

- c. Select power source.

CAUTION 1: Before applying primary power to the AN/VSC-3, start the M577A1 engine or auxiliary power unit (TM 9-2300-224-10/3/2). Failure to do the above can cause serious damage to the radio equipment.

CAUTION 2: When teletypewriter transmission is not taking place, the auxiliary RCV/SEND switch, the MD-522(*)/GRC SEND-RCV switch, and the remote control RCV-SEND switch must be set to RCV to prevent transmitter from being continuously keyed.

3. Preset Radio Teletypewriter Set AN/VSC-3. (Refer to TM 11-5815-332-15, para 3-8.)
 - a. Control Box.
 - (1) Set MAIN circuit breaker to OFF.
 - (2) Set INVERTER circuit breaker to OFF.
 - b. MX-7778/GRC. Set circuit breakers to OFF.
 - c. Radio Set AN/GRC-106(*). Set PRIM PWR switch on the AM-3349/GRC-106 to OFF. Set SERVICE SELECTOR switch on RT-662/GRC or RT-834/GRC to OFF.
 - d. Radio Teletypewriter Modem MD-522(*)/GRC Set ON-OFF switch to OFF.
 - e. Teletypewriter Set TT-98(*)/FG.
 - (1) Set MOTOR switch to OFF.
 - (2) Set LIGHT switch to OFF.
 - (3) Adjust TT-98(*)/FG LINE CURRENT control fully clockwise (for minimum resistance).
 - (4) Set LINE selector switch to 20 MA position.
 - f. Teletypewriter. Reperforator-Transmitter TT-76(*)/GGC.
 - (1) Set POWER switch to OFF.
 - (2) Set MOTOR switch to OFF.

- (3) Set LIGHT switch to OFF.
 - (4) Check the current in the bias circuit by following the instructions in TM 11-5815-238-12.
 - (5) Open the TT-76(*)/GGC cover and insure that the following has been performed, if TTY security equipment is to be installed. If not, skip (5), (6), and (7).
 - (a) A 5600-ohm resistor is connected to the power supply and terminal unit BIAS TEST MA terminals, in place of the shorting strap.
 - (b) The SIGNAL/BIAS switch on the power supply and terminal unit is in the 60 MA position (60 MA is the correct position when using the 5600-ohm resistor in (a) above, even though the system is set for 20 MA).
 - (c) The plug from the selector magnet cable is in the socket marked 20 MA.
 - (6) Close the set cover.
 - (7) Insure that Device, Low Level Signalling TT-523(*)/GGC is correctly installed on the set, behind the transmitter distributor. Insure that the plugs are connected and the bracket is secured under the binding post on the side of the set cover.
4. Perform Teletypewriter Starting Procedures. (Refer to fig 1 and TM 11-5815-332-15, para 3-9.)

NOTE: Start the M577A1 engine or auxiliary power used and then perform the procedures below.

- a. Control Box (fig 1). Perform the following:
 - (1) Set the MAIN circuit breakers to ON and observe that the 27.5 VDC indicator lights and the DC voltmeter indicates 37.5 VDC.
 - (2) Set the INVERTER breaker to ON and observe that the inverter is operating.
 - (3) Set the VOICE-CW/TTY switch to TTY.

SKILL LEVEL 1

- (4) If the AN/VSC-3 is to be operated in a nonsecure mode, set the BLACK/RED switch to BLACK. If the AN/VSC-3 is to be operated in a secure mode, set the BLACK/RED switch to RED.
 - (5) Set the LOCAL/REMOTE switch to LOCAL.
- b. MD-522(*)/GRC. Open the control cover to expose additional controls and complete the following:
- (1) Set the ONE WAY-DUPLEX switch to ONE WAY.
 - (2) Set the RECEIVE switch to NORM.
 - (3) Set the METER FUNCTION switch to DC LOOP NO. 1.
 - (4) Set the DC LOOP NO. 1 switch to 20 MA.
 - (5) Set the SCOPE INTENSITY control fully counterclockwise.
 - (6) Set the BFO control to its midscale position.
 - (7) Set the AUDIO GAIN control fully counterclockwise.
 - (8) Set the MODE SELECTOR switch to VOICE.
 - (9) Set the SEND-RCV switch to RCV.
 - (10) Set the AUTO MARK HOLD switch to ON.
 - (11) Set the SQUELCH SENS control to the fully clockwise position.
 - (12) Set the ON-OFF switch to ON.
- c. Set the MX-7778/GRC circuit breakers to ON.
- d. Set the auxiliary RCV/SEND switch (on the shelf) to RCV.
- e. On the TT-98(*)/FG, set the MOTOR switch to ON, LIGHT switch to ON, and SEND-LOCK switch to SEND.
- f. On the TT-76(*)/GGC, set the POWER ON/OFF switch to ON, MOTOR ON/OFF switch to ON, LIGHT ON/OFF switch to ON, KEYBOARD SEND/LOCK switch to SEND, and SELECTOR switch to position 1.

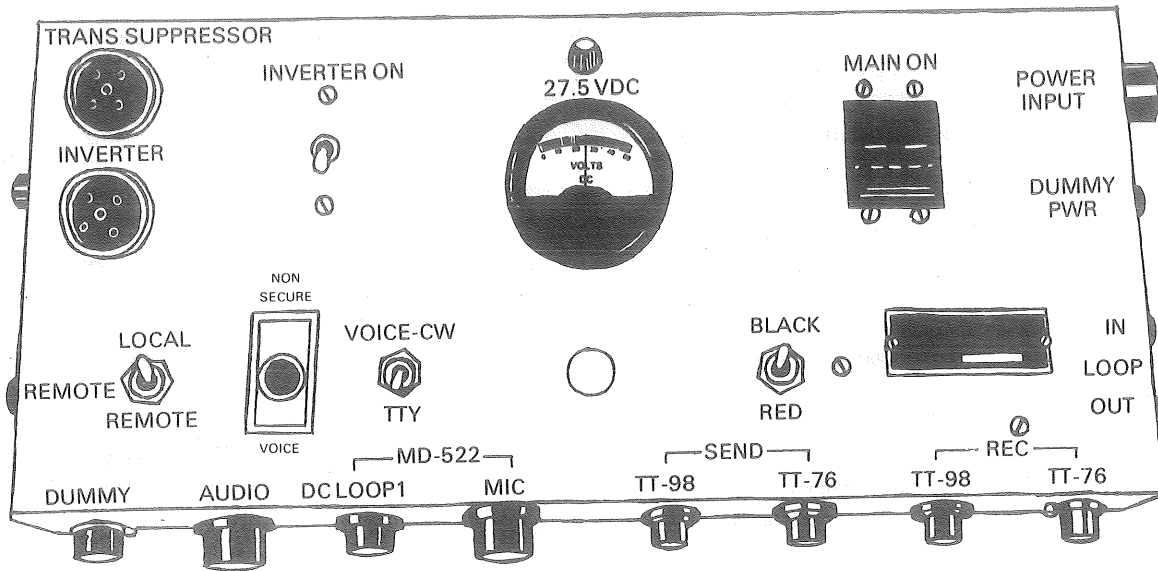


Figure 1. Control Box AN/VSC-3

- g. Send a line of RYs on the TT-98(*)/FG keyboard and check that the TT-98(*)/FG is printing and that the TT-76(*)/GGC is printing and perforating tape in response.
- h. Send a line of RYs on the TT-76(*)/GGC keyboard and check that the TT-76(*)/GGC is printing and perforating tape and that the TT-98(*)/FG is printing in response.
- i. Insert a prepunched tape into the TT-76(*)/GGC transmitter-distributor and set the transmitter-distributor START-STOP lever to START. Check that the TT-76(*)/GGC is printing and perforating tape and that the TT-98(*)/FG is printing in response. Set the transmitter-distributor START-STOP lever to STOP.
- j. Set the TT-76(*)/GGC SELECTOR switch to position 2. Set the transmitter-distributor START-STOP switch to START. Check that the TT-76(*)/GGC is not printing and perforating and that the TT-98(*)/FG is receiving the tape message. Check that the TT-76(*)/GGC keyboard can be used to punch and print local OFF LINE TAPE.

SKILL LEVEL 1

5. Perform tuning procedures. (Refer to TM 11-5815-332-15, chap 3, sec II.)

NOTE: The AM-3349/GRC-106 HV RESET switch must be in operate position, whenever the AN/GRC-106(*) is turned OFF or ON. References to RT-662/GRC are applicable to RT-834/GRC.

a. Initial Preparation for Operation.

- (1) Check to see that the whip antenna is in the operating position, properly connected, and free of obstructions.
- (2) Make sure that there are no obstructions blocking the AM-3349/GRC-106 air inlet and outlet vents.
- (3) Connect the desired audio accessory (handset, microphone, or telegraph key) to the control box AUDIO connector.
- (4) Turn the RT-662/GRC SERVICE SELECTOR switch to OVEN ON. (Allow a minimum of 10 minutes warm-up time to stabilize equipment.)
- (5) Set the RT-662/GRC VOX switch to PUSH-TO-TALK.
- (6) Set the RT-662/GRC SQUELCH control to OFF.
- (7) Set the NOISE BLANKER switch to OFF. (Used on older RT-662/GRC only.)
- (8) Set the RT-662/GRC BFO control to mid-range.
- (9) Set the RT-662/GRC MANUAL RF GAIN control fully clockwise.
- (10) Set the RT-662/GRC AUDIO GAIN control to mid-range.
- (11) Set the RT-662/GRC FREQUENCY VERNIER SWITCH TO OFF.
- (12) Set the AM-3349/GRC-106 HV RESET switch to OPERATE.

b. AN/GRC-106(*) Starting Procedure.

- (1) Set the RT-662/GRC SERVICE SELECTOR switch to STANDBY and the AM-3349/GRC-106 PRIM POWER switch to ON, and allow 90 seconds for warm-up of the AM-3349/GRC-106. Observe that the AM-3349/GRC-106 blowers are energized and that the signal level meter on the RT-662/GRC indicates in the extreme right portion of the meter scale. (If above indications are abnormal, refer to table 4-2, items 1 and 2, TM 11-5820-520-12.)
- (2) Set the RT-662/GRC SERVICE SELECTOR switch to SSB NSK (or any operate mode FSK, AM or CW). Signal level meter will return to extreme left portion of meter scale.
- (3) 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. (If above indication is abnormal, refer to table 4-2, item 3, TM 11-5820-520-12.)

c. Final Tuning Procedure for AN/GRC-106(*).

- (1) Set the RT-662/GRC MHz and kHz controls to assigned operating frequency. The frequency digits are displayed in the windows directly above the controls.
- (2) Note the AM-3349/GRC-106 ANT TUNE and ANT LOAD predetermined setting on the antenna tuning and loading chart, or the LOGGING CHART.
- (3) Adjust the AM-3349/GRC-106. ANT TUNE control to match the numbers on the chart used.
- (4) Adjust the AM-3349/GRC-106 ANT LOAD control to match the numbers on the chart used.

CAUTION: The HV RESET switch should not stay in TUNE position for more than two minutes. If more than two minutes are required, move the AM-3349/GRC-106 HV RESET switch to OPERATE and the RT-662/GRC SERVICE SELECTOR switch to STANDBY for 5 minutes cooling. After 5 minutes cooling set the SERVICE SELECTOR SWITCH TO THE PREVIOUS POSITION AND THE HV RESET switch to TUNE, and proceed with the tuning procedure. ANT TUNE and ANT LOAD controls will interact with each other. To center their respective

SKILL LEVEL 1

meter pointers, rotate them slowly in the direction opposite to that of the indicated error ((6)(a) and (b) below). Be sure the antenna is attached for proper loading to prevent damage to the equipment while performing (5) through (12) below.

- (5) Set the AM-3349/GRC-106 HV RESET switch to TUNE. Wait for a deflection on the ANT TUNE and ANT LOAD meters.
- (6) Adjust the AM-3349/GRC-106 ANT LOAD control for a center scale reading on the ANT LOAD meter.
 - (a) Rotate control in the direction that the meter pointer is to move. Adjust the ANT TUNE control for a center scale reading on the ANT TUNE meter.
 - (b) Rotate control in the direction that the meter pointer is to move, keeping the ANT LOAD meter as close to center scale as possible.
 - (c) Tuning of the AM-3349/GRC-106 is complete when simultaneous center scale readings are obtained on the ANT TUNE and ANT LOAD meters. (If indication is abnormal, refer to table 4-2, item 6, TM 11-5820-520-12.)
 - (d) Place the HV RESET switch of the AM-3349/GRC-106 to the OPERATE position.
 - (e) Place the TEST METER function switch of the AM-3349/GRC-106 to the PRIM VOLT position.
 - (f) Place the HV RESET switch on the AM-3349/GRC-106 to the TUNE position and observe that the test meter pointer indicates within the area of the two dark green wedges (top scale) of the test meter.
- (7) Set the AM-3349/GRC-106 TEST METER switch to LOW VOLT. TEST METER pointer indicates within green portion area of top scale. (If indication is abnormal for (7) thru (12), refer to table 4-2, items 4 thru 7, TM 11-5820-520-12.)
- (8) Set the AM-3349/GRC-106 TEST METER switch to HIGH VOLT. TEST METER pointer indicates within green portion area of top scale.

- (9) Set the AM-3349/GRC-106 TEST METER switch to DRIVE CUR. TEST METER pointer indicates within the two dark green wedges of top scale.
- (10) Set the AM-3349/GRC-106 TEST METER switch to GRID DRIVE. TEST METER pointer indicates just below (to the left of) gray portion of the bottom scale.
- (11) Set the AM-3349/GRC-106 TEST METER switch to PA CUR. TEST METER pointer indicates just below (to the left of) the gray portion of the bottom scale. (If indication is abnormal, refer to table.)
- (12) Set the AM-3349/GRC-106 TEST METER switch to POWER OUT. TEST METER pointer indicates just below (to the left of) gray area of scale.

CAUTION: The HV RESET switch should not stay in TUNE position for more than two minutes.

- (13) Turn the AM-3349/GRC-106 HV RESET switch to OPERATE.

NOTE: ANT TUNE and ANT LOAD counter settings should be logged in the logging chart with a pencil after (13) above has been completed. These settings may be used for future tuning references unless ANT TUNE and ANT LOAD meter pointers indicate in the red (left or right of center scale) portion of the scale during operation. If the setting cannot be used, repeat tuning procedure (1) through (13) above.

6. Perform Radio Teletypewriter Local Operation. (Refer to TM 11-5815-332-15, para 3-12.)
 - a. Adjust for radio teletypewriter reception.
 - b. Adjust for radio teletypewriter transmission.
7. Select a precedence message.
8. Transmit a message (25 wpm with no more than 5 errors).

SKILL LEVEL 1

9. Perform Stopping Procedures. (Refer to figure 1 and TM 11-5815-332-15, para 3-13.)
 - a. Set power switches on the AN/VIC-1(V), MD-522(*)/GRC, TT-76(*)/GGC, and TT-98(*)/FG to OFF.

NOTE: Set the RT-662/GRC or RT-834/GRC SERVICE SELECTOR switch to STANDBY. Allow 2 minutes for the AN/GRC-106(*) to cool. Keep the HV RESET switch on the AM-3349/GRC-106 to OPERATE position when AN/GRC-106(*) is turned OFF or ON. After the 2 minute cooling period set the AM-3349/GRC-106 PRIM PWR switch and the RT-662/GRC or RT-834/GRC SERVICE SELECTOR switch at OFF.

- b. Set the INVERTER and MAIN circuit breakers on the AN/VSC-3 control box (fig 1) to OFF.
- c. Perform the stopping procedures to shut down the M577A1 engine or auxiliary power unit (TM 9-2300-224-10/3/2).
- d. Place dust covers over the TT-76(*)/GGC and TT-98(*)/FG.
- e. Set the MX-7778/GRC CIRCUIT BREAKER switch to OFF.

REFERENCES

TM 11-5815-332-15

TM 11-5820-520-12

CEOI

TASK**113-599-3001**

**Perform Weekly Preventive Maintenance on Radio
Teletypewriter Set AN/GRC-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. Operational AN/GRC-46.
2. TM 11-5815-204-10 and TM 38-750.
3. DA Form 2404.
4. Clean, dry, lint-free cloth.
5. Mild detergent solution and cleaning fluid trichloroethane.

Supervision and assistance will be available.

STANDARDS

This task has been performed correctly when the exteriors of all components are clean and free of bare spots, rust and corrosion, all dials and knobs are securely mounted, 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 and reported to your immediate supervisor according to performance measures 1 through 4.

PERFORMANCE MEASURES

1. Perform weekly preventive maintenance checks and services on Radio Teletypewriter Set AN/GRC-46. (Refer to TM 11-5815-204-10, chap 3, para 32 thru 34.3.)

SKILL LEVEL 1

2. Correct defects if necessary. Replacement parts or materials can be obtained from your team chief. (Refer to TM 11-5815-204-10, chap 3, para 33 thru 34.3.)
3. Complete DA Form 2404, Equipment Inspection and Maintenance Worksheet, as a weekly maintenance form. (Refer to TM 38-750, para 3-4.)
4. Report all uncorrectable defects. (Refer to TM 38-750, para 3-4d.)
 - a. Notify your immediate supervisor of all uncorrectable faults found.
 - b. Submit DA Form 2404 to your immediate supervisor or support maintenance personnel.

REFERENCES

TM 11-5815-204-10

TM 38-750

TASK**113-601-1001**

Install Generator Set 5 KW

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 5 KW.
2. TM 5-6115-332-14.
3. TM 5-6115-365-15.
4. 5-pound sledgehammer.
5. Ground rod, ground strap and pliers.
6. 8-inch adjustable wrench and 8-inch flat-tip screwdriver.

Supervision and assistance will be available.

STANDARDS

This task has been performed correctly when, in 20 minutes, the generator set has been sited, grounded, power cable connected, fuel supply determined and connected without causing damage to any connectors or the generator set; and the generator is ready to be operated according to performance measures 1 through 5.

PERFORMANCE MEASURES

1. Site generator set. (Refer to TM 5-6115-365-15, para 4-3.)

SKILL LEVEL 1

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. (Refer to fig 1, and TM 5-6115-332-14, para 2-2c.)
- a. Secure ground strap to generator set GROUND STUD.
 - b. Drive ground rod a full 8 feet into the ground within the limit of the ground strap.

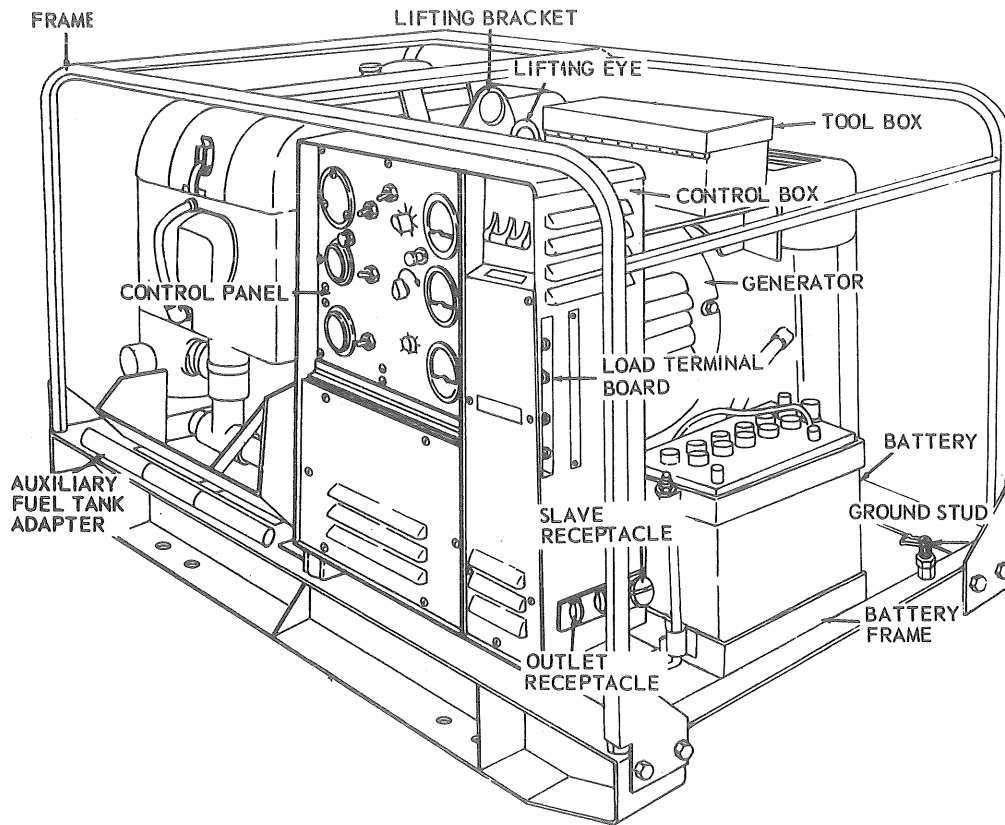


Figure 1. Front view Generator Set 5 KW.

WARNING: An improperly grounded generator can cause serious injury or death.

3. Connect power cable for 120 V, 1-phase, 2-wire to generator set load terminals L2 and L3. (Refer to fig 1, and TM 5-6115-332-14, para 2-2d, table 2-1.)

WARNING: Insure circuit breaker is in the OFF position when connecting power cable.

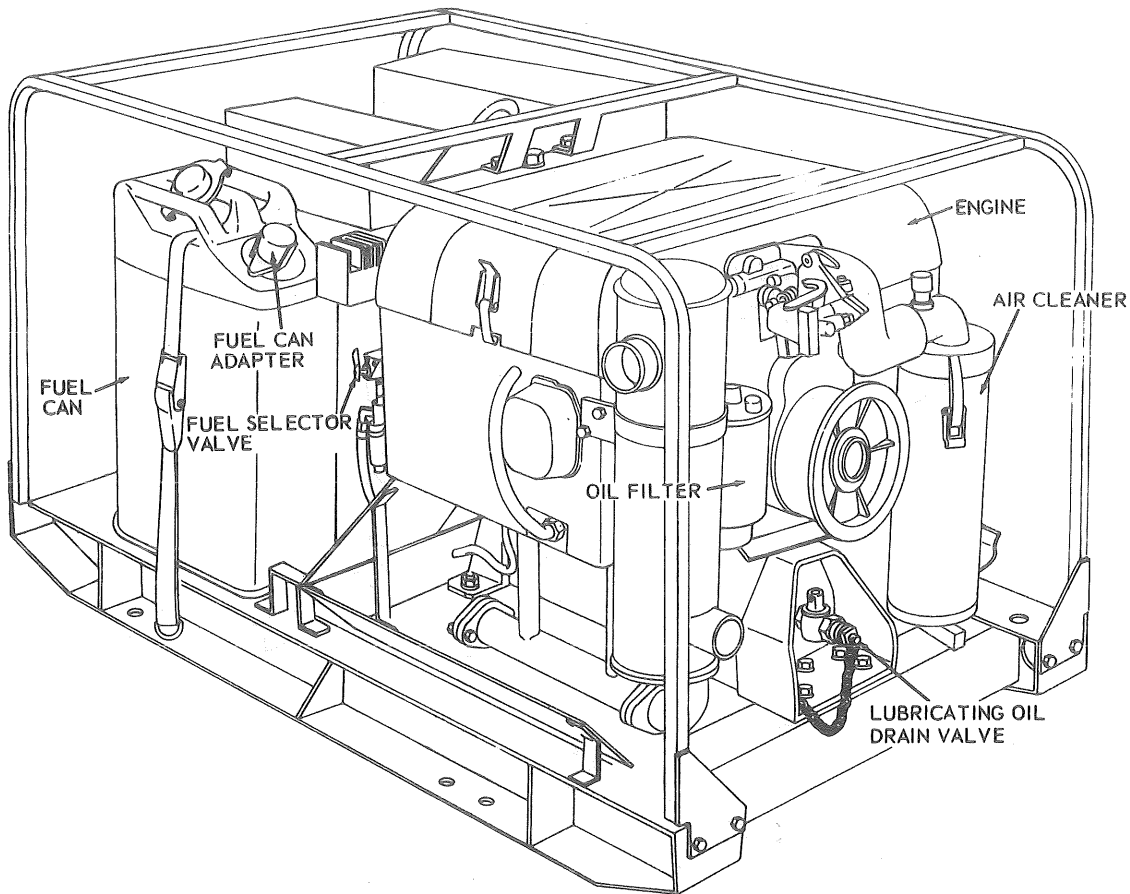


Figure 2. Rear view Generator Set 5 KW.

4. Connect auxiliary fuel hose. (Refer to fig 1, and TM 5-6115-332-14, para 2-2b.)
 - a. Connect fuel line to FUEL SELECTOR VALVE.

SKILL LEVEL 1

- b. Insure that bottom of auxiliary fuel tanks are not lower than 4 feet from the fuel pump.
- 5. Assure VOLTAGE/PHASE switch (OUTPUT SELECTOR switch) is set to the desired voltage/phase position. (Refer to fig 3, and TM 5-6115-332-14, para 2-1b(13).)

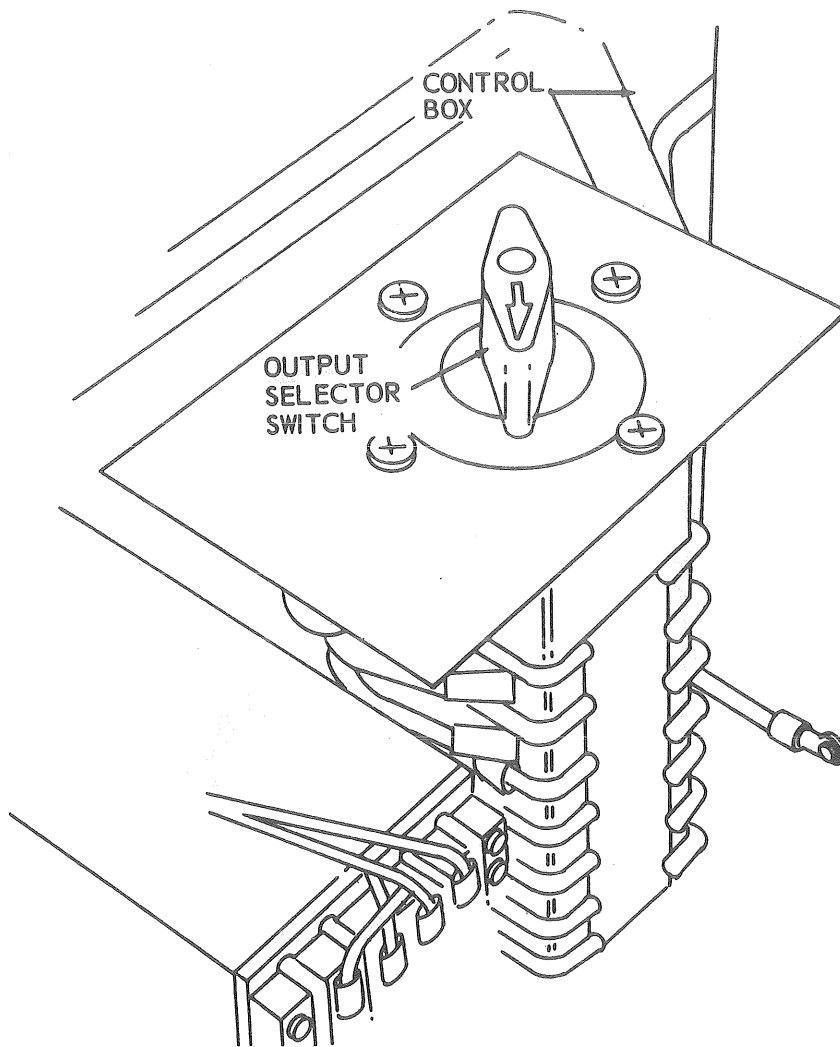


Figure 3. Voltage OUTPUT SELECTOR switch.

REFERENCES

TM 5-6115-332-14

TM 5-6115-365-15

TASK**113-601-1002**

Install Generator Set 10 KW

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 10 KW.
2. TM 5-6115-275-14.
3. TM 5-6115-365-15.
4. 5-pound sledgehammer.
5. Ground rod, ground strap, and pliers.
6. 8-inch adjustable wrench and 8-inch flat-tip screwdriver.

Supervision and assistance will be available.

STANDARDS

This task has been performed correctly when, in 20 minutes, the generator set has been sited, grounded, power cable connected, fuel supply determined and connected without causing damage to any connectors or the generator set; and the generator is ready to be operated according to performance measures 1 through 5.

PERFORMANCE MEASURES

1. Site generator set. (Refer to TM 5-6115-365-15, para 3-3.)

WARNING: If generator set is trailer mounted, complete these steps:

SKILL LEVEL 1

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. (Refer to fig 1 and TM 5-6115-275-14, para 2-2b(1)(c) and 4-4b(5).)

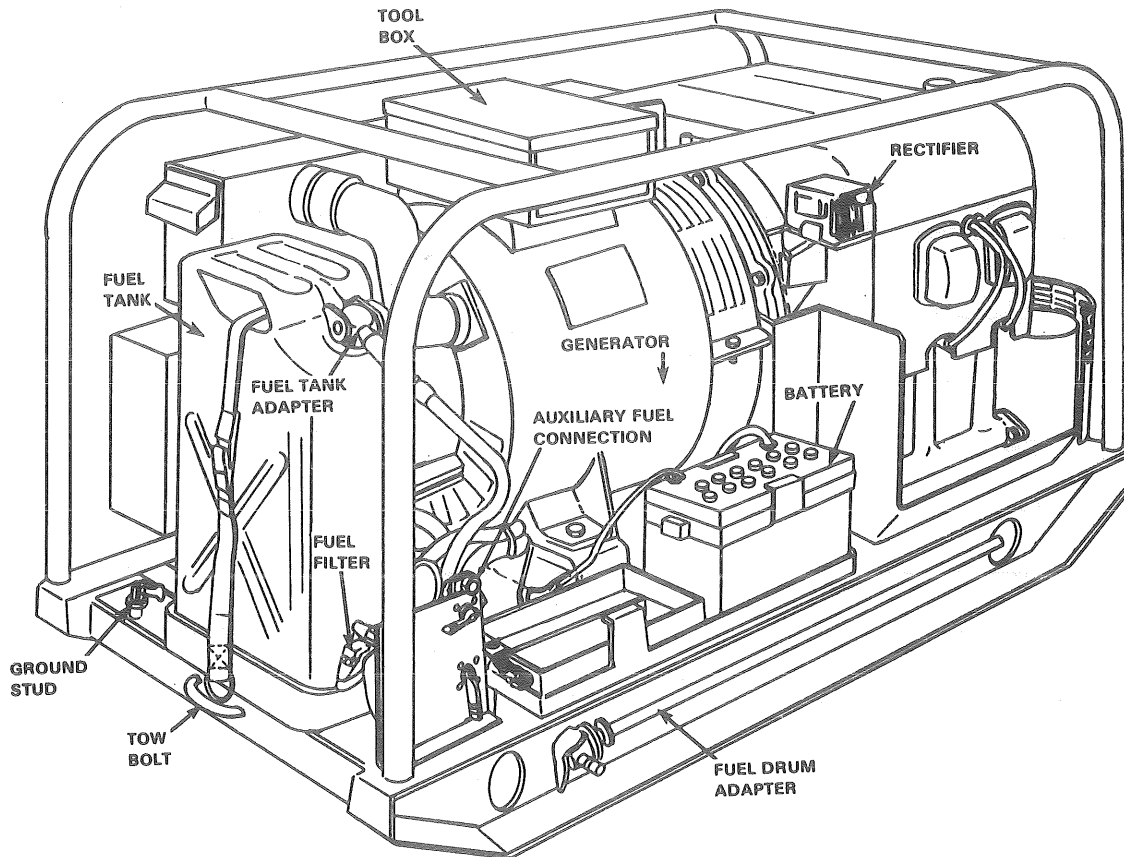


Figure 1. Generator Set 10 KW AC.

- a. Secure ground strap to generator set GROUND STUD.
- b. Drive ground rod a full 8 feet into the ground within the limit of the ground strap.

WARNING: An improperly grounded generator can cause serious injury or death.

3. Connect power cable for 120 V, 1-phase, 2-wire to generator set load terminals L2 and L3. (Refer to TM 5-6115-275-14, para 2-2b(1)(d).)

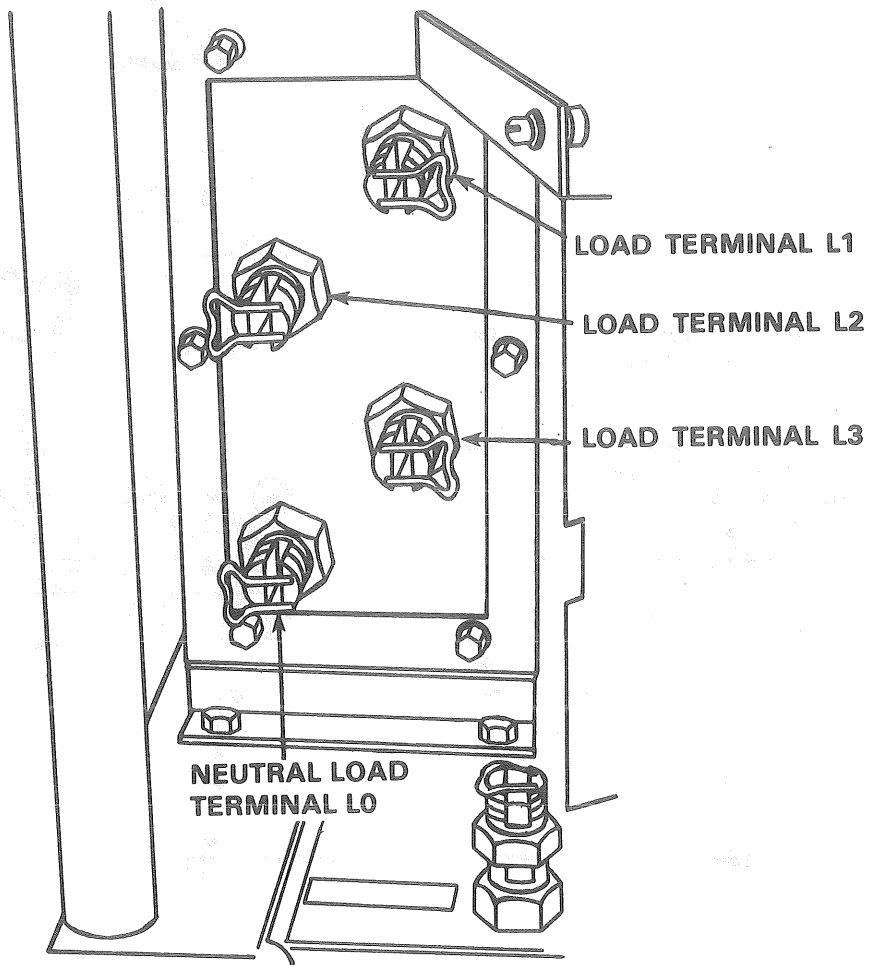


Figure 2. Load terminal board.

WARNING: Insure circuit breaker is in the OFF position when connecting power cable.

4. Connect auxiliary fuel hose. (Refer to TM 5-6115-275-14, para 4-2b(8).)

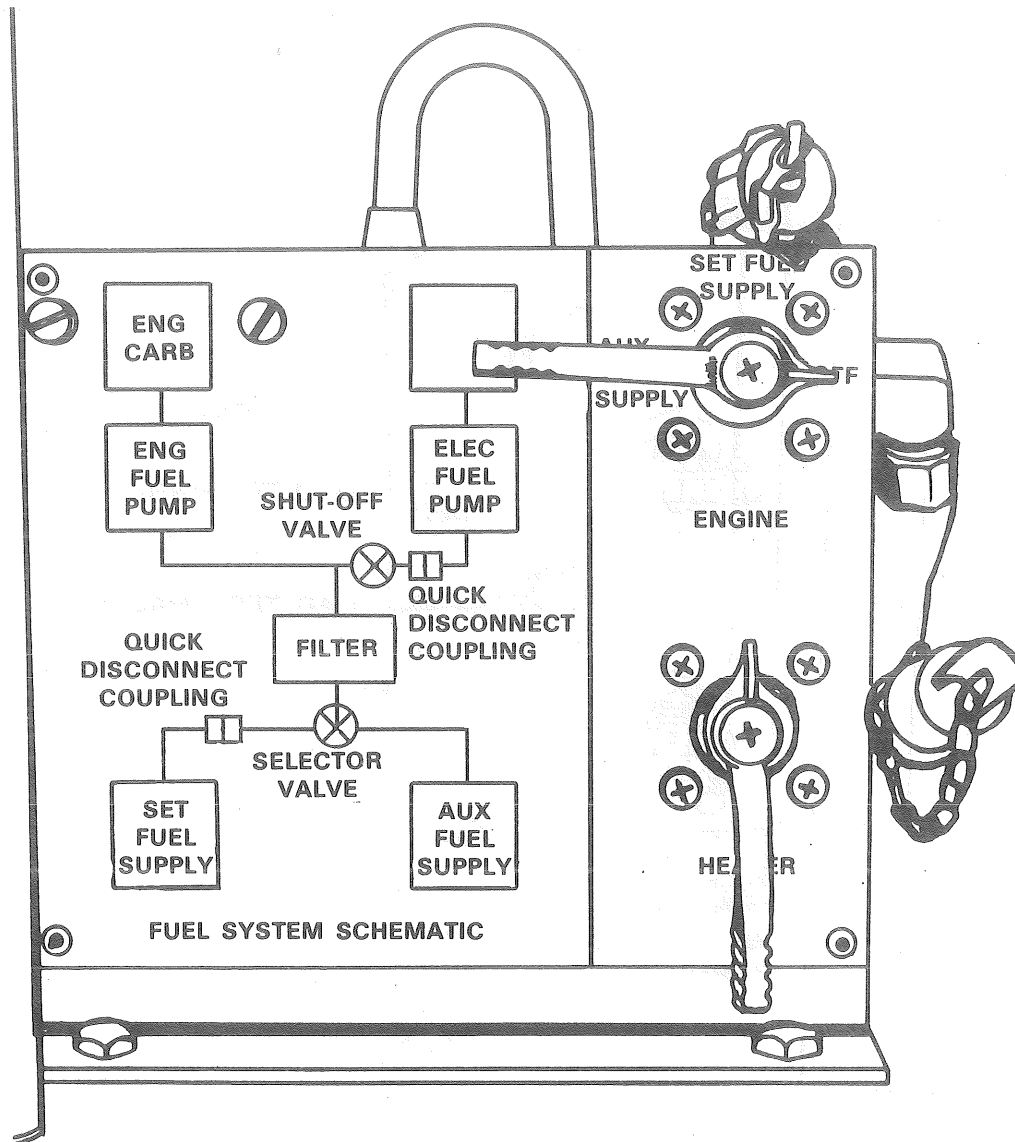


Figure 3. Three-way fuel valve.

- a. Connect fuel line to THREE-WAY FUEL valve.
 - b. Insure that bottoms of auxiliary fuel tanks are not lower than 4 feet from the fuel pump.
5. Assure VOLTAGE/PHASE switch (PHASE SWITCH SELECTOR knob) is set to the desired voltage/phase position. (Refer to TM 5-6115-275-14, para 4-3.)

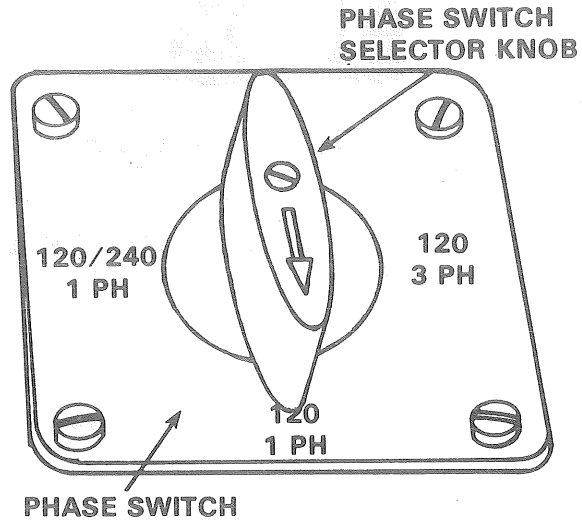


Figure 4. VOLTAGE PHASE switch for 10 KW Generator.

REFERENCES

TM 5-6115-275-14

TM 5-6115-365-15

TASK

113-601-1003

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 sledgehammer.
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 to equipment. Task is to be completed in 10 minutes in accordance with performance measures 1 through 3.

PERFORMANCE MEASURES

1. Site Generator Set 3 KW 28 V DC. (Refer to TM 5-6115-271-14, para 4-2a.)
 - 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° 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, para 4-2b.)
 - 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, within the limit of the ground strap.
 - c. Insure ground plate, if selected, is buried a minimum of 4 feet into the ground.
 - d. Attach ground strap to GROUND TERMINAL STUD of generator set and ground connector of selected ground.

SKILL LEVEL 1

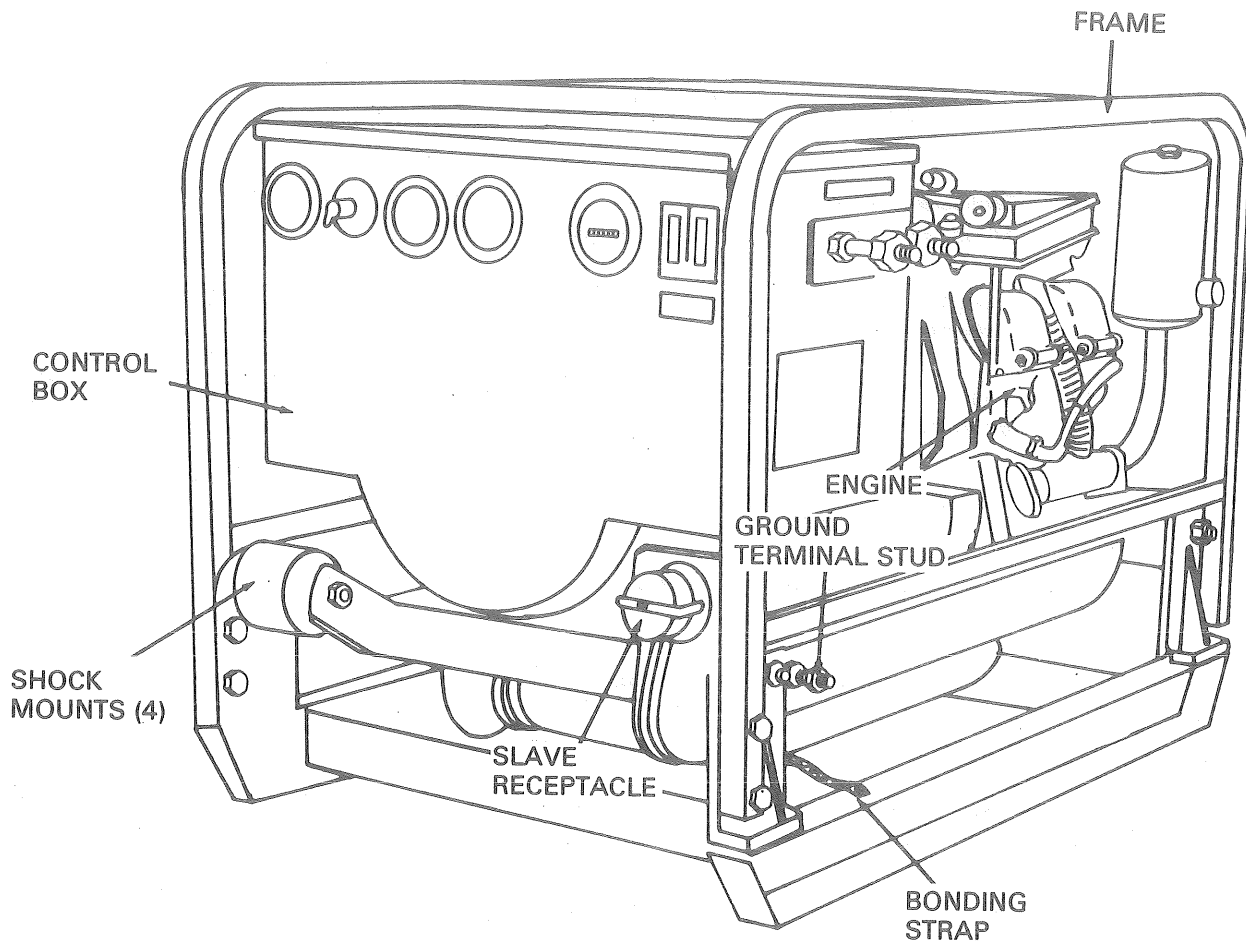


Figure 1. Generator Set 3 KW 28 V DC.

3. Connect DC power cable. (Refer to fig 1, and TM 5-6115-271-14, para 4-2c(2).)
 - 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

TASK**113-601-2001**

Operate Generator Set 5 KW

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 5 KW.
2. TM 5-6115-332-14.
3. Auxiliary fuel supply.

Supervision and assistance will normally be available.

STANDARDS

This task has been performed correctly when, in 20 minutes, the meters on the generator set conform to the requirements of figures 1 and 2 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 11.

PERFORMANCE MEASURES

1. Perform starting procedures. (Refer to TM 5-6115-332-14, para 2-2.)
 - a. Insure generator circuit breaker is in the OFF position.
 - b. Perform operator's daily preventive maintenance.
 - c. Connect auxiliary fuel supply.
 - d. Insure generator set is properly grounded.

SKILL LEVEL 1

- e. Set OUTPUT SELECTOR switch to 120 V, 1-phase, 2-wire.
- 2. Start generator set electrically. (Refer to fig 1, and TM 5-6115-332-14, para 2-2e(2).)

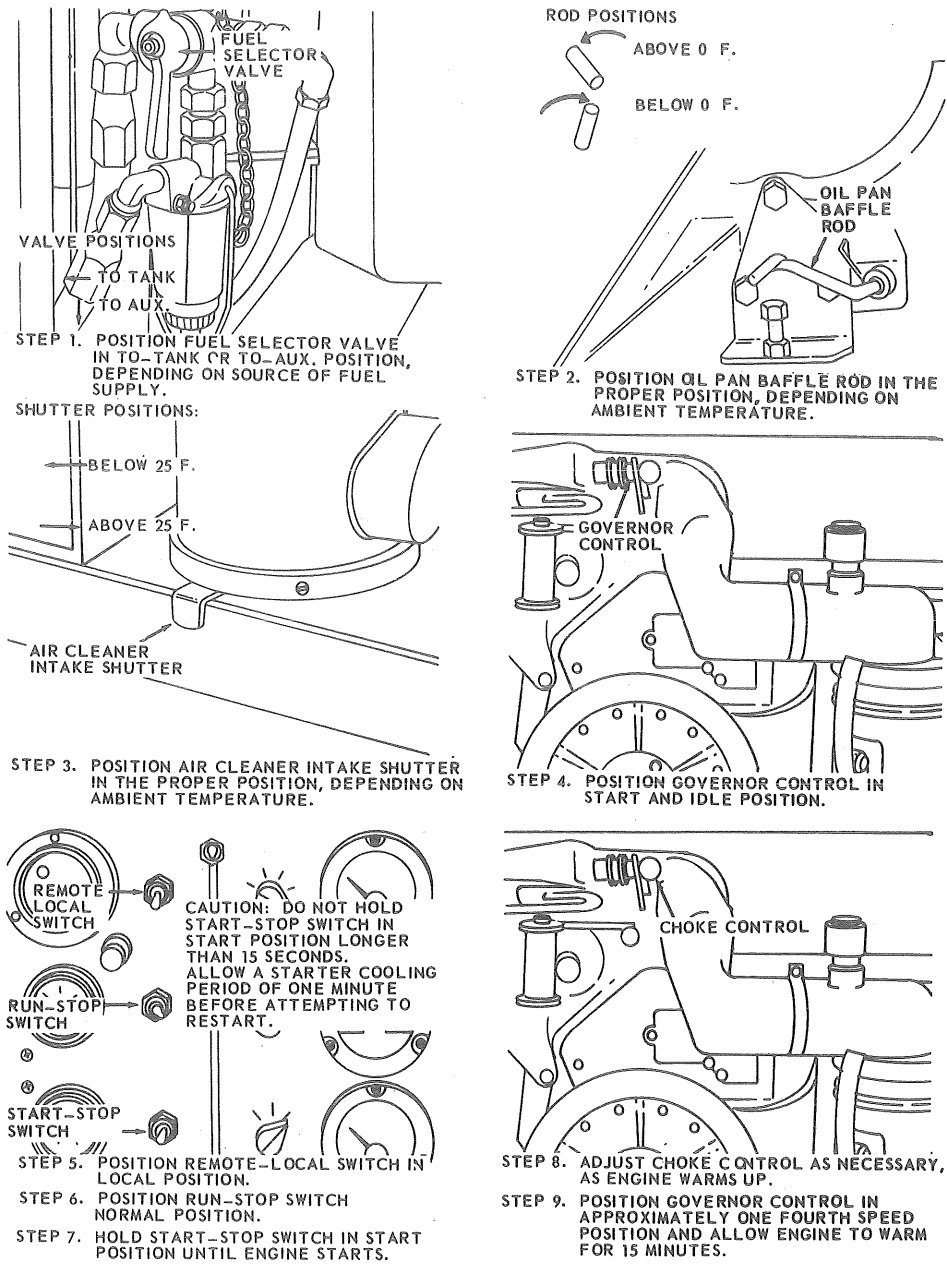
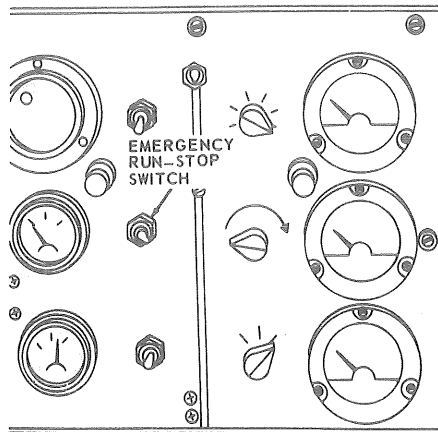
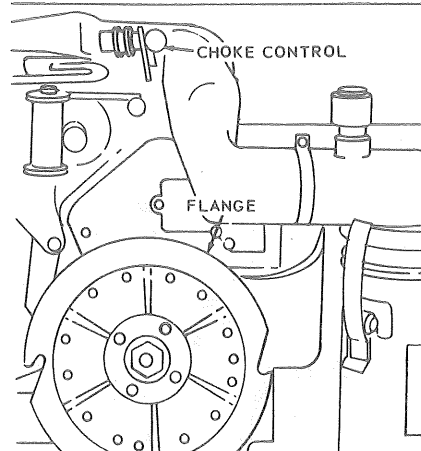


Figure 1. Electric starting instructions, local mode.

3. Start generator set manually. (Ref to fig 2, and TM 5-6115-332-14, para 2-2e(3).)

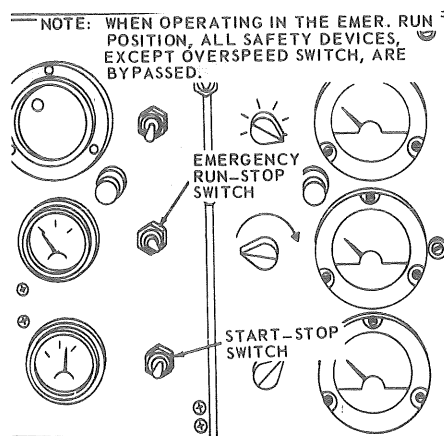


STEP 1. PLACE EMERGENCY RUN-STOP SWITCH EMERGENCY RUN POSITION.



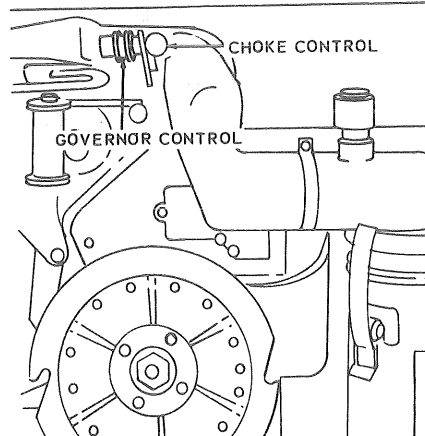
STEP 2. PULL CHOKE CONTROL OUT, IF ENGINE IS COLD.

STEP 3. WRAP STARTER ROPE ON FLANGE AND PULL WITH QUICK STEADY MOTION. REPEAT AS NECESSARY UNTIL ENGINE STARTS.



NOTE: WHEN OPERATING IN THE EMER. RUN POSITION, ALL SAFETY DEVICES, EXCEPT OVERSPEED SWITCH, ARE BYPASSED.

STEP 4. WHEN ENGINE OIL PRESSURE REACHES OPERATING PRESSURE, PLACE EMERGENCY RUN-STOP SWITCH IN NORMAL POSITION, AND AT THE SAME TIME MOMENTARILY PLACE START-STOP SWITCH IN START POSITION.



STEP 5. GRADUALLY PUSH CHOKE CONTROL IN AS ENGINE REACHES OPERATING TEMPERATURE.

STEP 6. POSITION GOVERNOR CONTROL IN APPROXIMATELY ONE FOURTH SPEED POSITION AND ALLOW ENGINE TO WARM FOR FIFTEEN MINUTES.

Figure 2. Manual starting instructions.

SKILL LEVEL 1

4. Perform operating procedures. (Refer to fig 3, and TM 5-6115-332-14, para 2-2b(5) and d(2).)

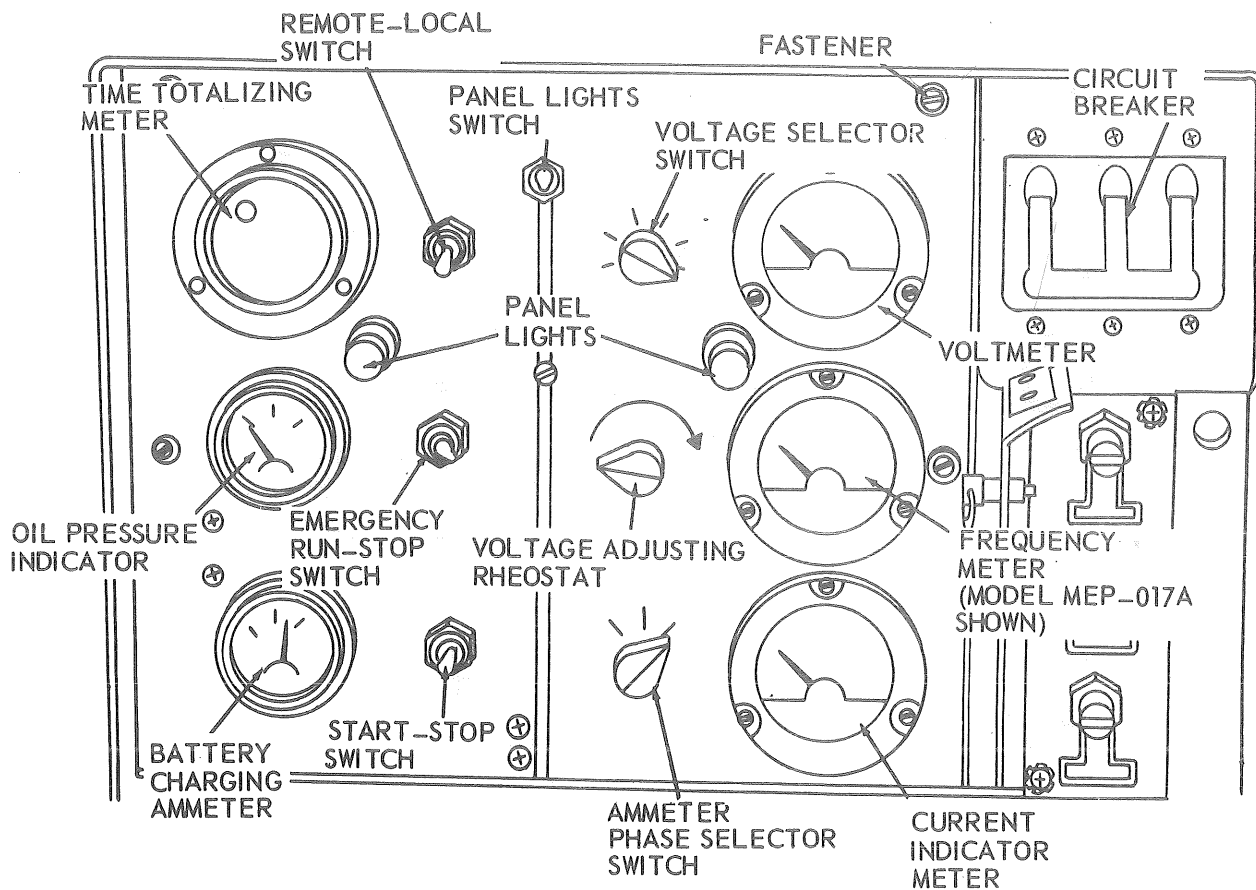


Figure 3. Generator control panel, controls, instructions, and panel lights.

CAUTION: Be sure to allow engine to warm up at rated RPM for 3 to 5 minutes before applying a load.

- a. Position GOVERNOR CONTROL as shown in figure 1 to obtain 60 Hz and lock the control.
- b. Adjust the VOLTAGE ADJUSTING RHEOSTAT knob for a reading of 120 V on the VOLTMETER.

NOTE: If voltage does not build up or will not adjust, lower the Generator Control Panel and momentarily depress the FIELD FLASH switch as shown in figure 4.

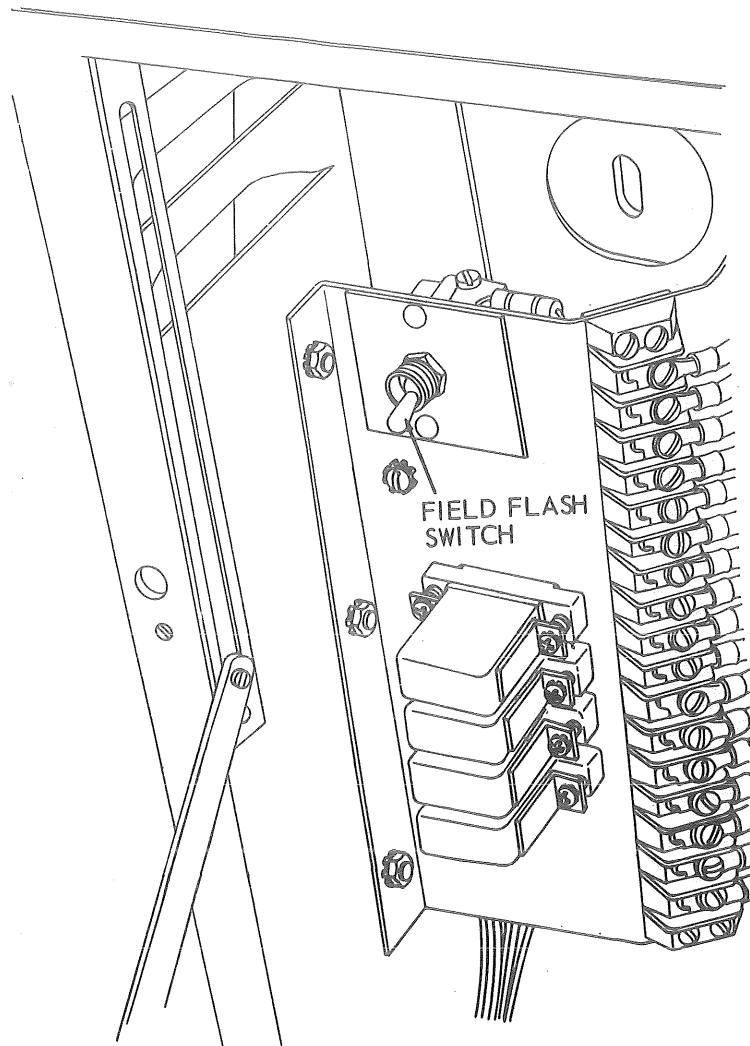


Figure 4. Generator FIELD FLASH switch.

- c. Turn circuit breaker to ON.
- d. Check VOLTMETER to insure reading of 120 V.
- e. Check readings in all three positions of the AMMETER PHASE SELECTOR switch to insure no operation in excess of 100 per cent.

CAUTION: If load exceeds 100 percent, it must be reduced. Seek immediate assistance from your supervisor.

SKILL LEVEL 1

5. Operate generator set in extreme cold (below 0°F (-17.8°C)). (Refer to TM 5-6115-332-14, para 2-5.)
 - a. Set AIR CLEANER INTAKE SHUTTER to WINTER position as shown in figure 1.
 - b. Set OIL PAN BAFFLE ROD toward front of engine as shown in figure 1.
 - c. Keep battery full of water.

NOTE: If water must be added to the battery, charge the battery by external means or by running the engine for a period of at least 1 hour. This will mix the water with the electrolyte and prevent freezing.

- d. Keep fuel cans full.
- e. Keep wiring free of snow and ice.

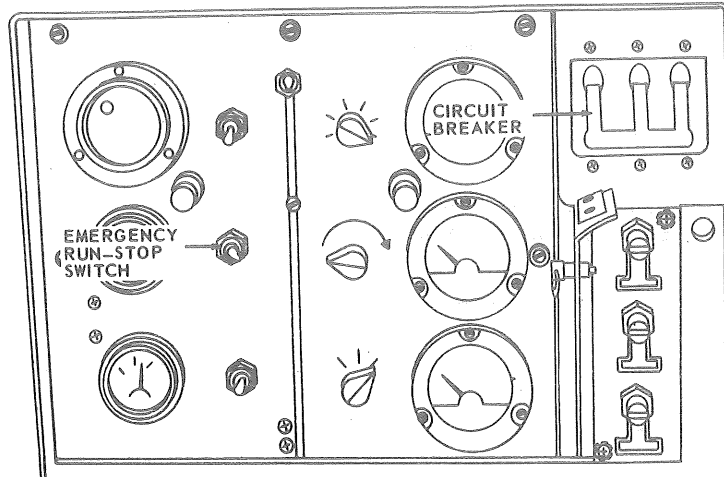
CAUTION: Do not disturb wiring if it can be avoided. Frozen insulation is brittle and will easily break.

- f. Allow engine to warm thoroughly before applying a load.
 - g. Provide the generator set with as much protection from the weather as possible.
 - h. Insure generator set is covered when not in use.
6. Operate generator set in extreme heat. (Refer to TM 5-6115-332-14, para 2-6.)
 - a. Provide maximum ventilation at all times.
 - b. Keep equipment clean, paying special attention to engine shrouds, cooling fins and the generator blower cover.
 - c. Keep air passages free of obstructions.
 - d. Set the OIL PAN BAFFLE ROD to the rear of the engine as shown in figure 1.
 - e. Set the AIR CLEANER INTAKE SHUTTER to the SUMMER position as shown in figure 1.

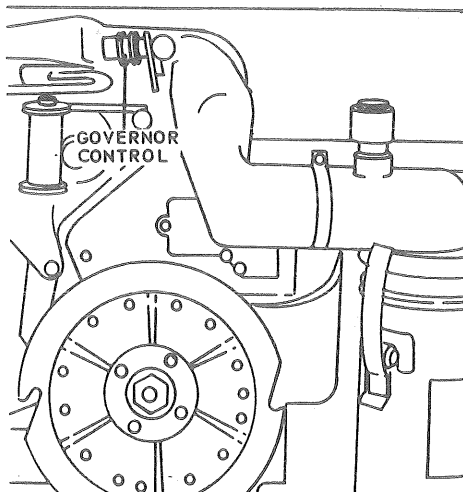
7. Operate generator set in dusty or sandy areas. (Refer to TM 5-6115-332-14, para 2-7.)
 - a. Operate those measures listed in paragraph 6 of this task.
 - b. Attempt to provide as much protection for the generator set as possible.
8. Operate generator set under rainy or humid conditions. (Refer to TM 5-6115-332-14, para 2-8.)
 - a. Prevent moisture from entering fuel system, fuel or lubricants.
 - b. Inspect fuel filter for moisture after each period of operation.
 - c. Keep electrical system clean and dry.
 - d. Cover equipment when it is not in use.
 - e. Provide as much protection for the equipment as is practical.
9. Operate generator set in salt water areas. (Refer to TM 5-6115-332-14, para 2-9.)
 - a. Wash unit frequently with fresh water.

CAUTION: Protect electrical components when washing.
 - b. Coat exposed metal parts with an approved protection material.
10. Operate generator set at high altitudes. (Refer to TM 5-6115-332-14, para 2-10.)
11. Perform stopping procedures. (Refer to fig 5, and TM 5-6115-332-14, para 2-2c.)

SKILL LEVEL 1

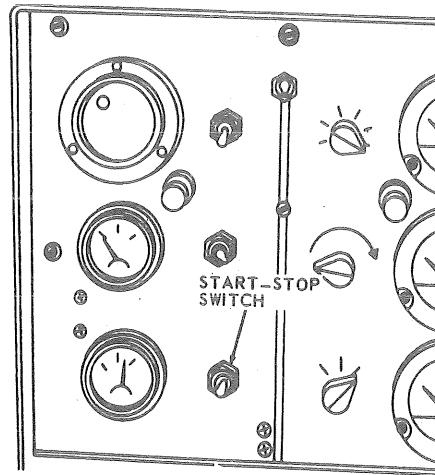


STEP 1. POSITION CIRCUIT BREAKER IN OFF POSITION.
NOTE: FOR EMERGENCY STOP, POSITION RUN-STOP SWITCH IN EMER. STOP POSITION.



STEP 2. POSITION GOVERNOR CONTROL IN APPROXIMATELY ONE FOURTH SPEED POSITION AND ALLOW ENGINE TO RUN FOR FIFTEEN MINUTES.

STEP 3. POSITION GOVERNOR CONTROL IN START AND IDLE POSITION.



STEP 4. POSITION START-STOP SWITCH IN STOP POSITION.

Figure 5. Stopping instructions, local mode.

REFERENCES

TM 5-6115-332-14

TASK**113-601-2002**

**Perform Operator's Troubleshooting Procedures on
Generator Set 5 KW**

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 5 KW.
2. TM 5-6115-332-14 and TM 38-750.
3. DA Form 2404.
4. 1 quart of oil and clean rags.
5. 8-inch adjustable wrench and 8-inch flat-tip screwdriver.
6. Fuses as required.

Supervision and assistance will be available.

STANDARDS

This task has been performed correctly when any discovered faults have been corrected in accordance with 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 Generator Set, 5 KW. (Refer to fig 1, and TM 5-6115-332-14, para 3-8.)

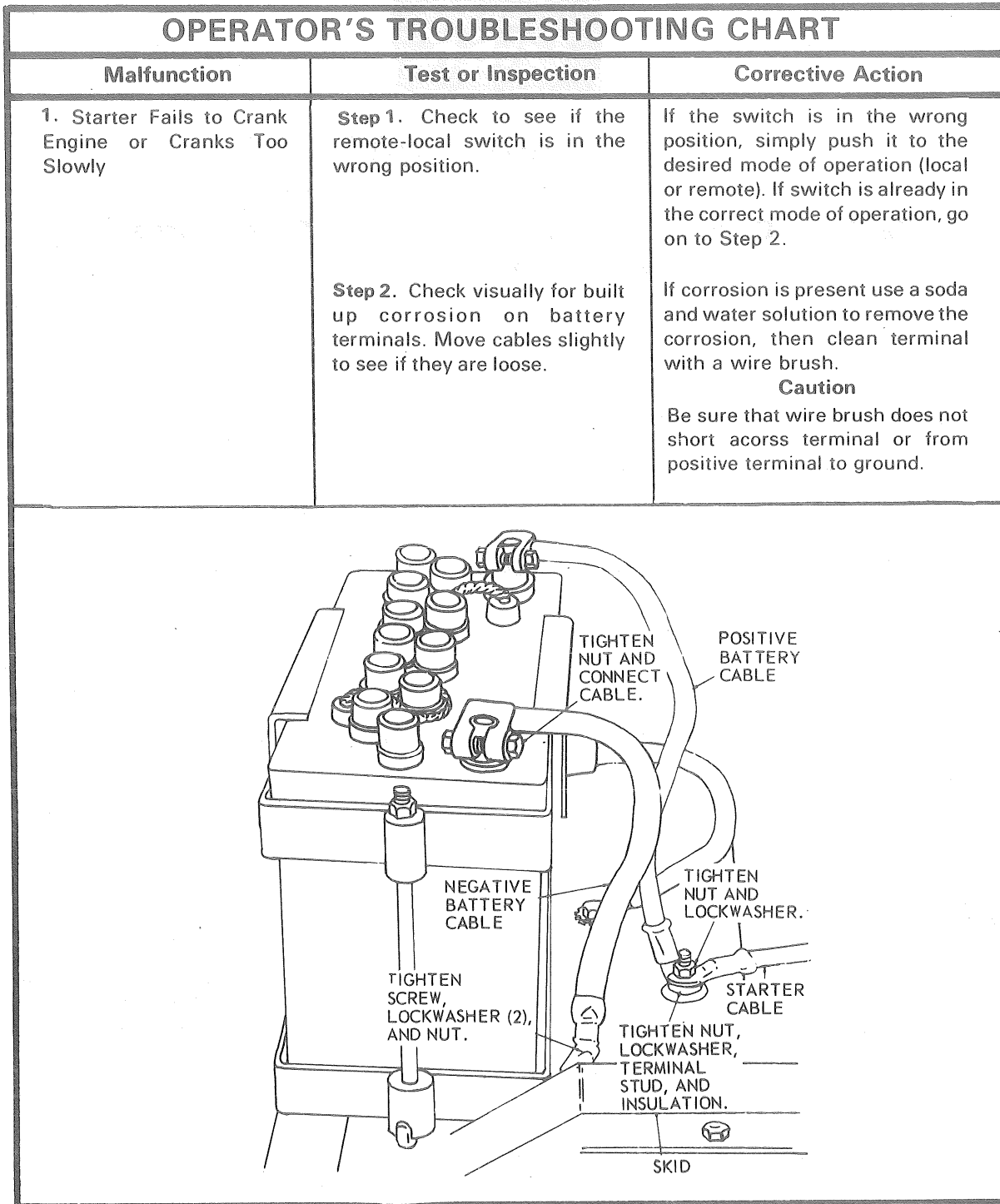


Figure 1. Operator's troubleshooting chart.

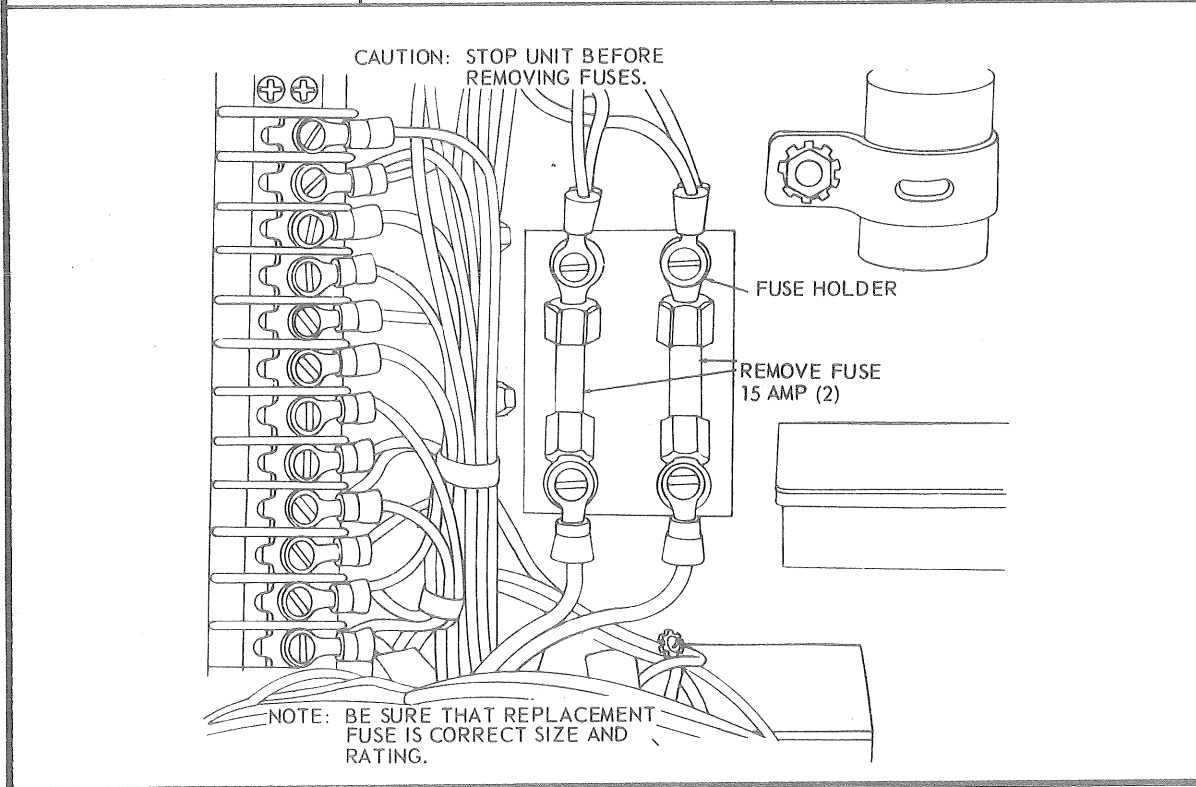
(The paragraphs referred to in this figure apply to TM 5-6115-332-14.)

Malfunction	Test or Inspection	Corrective Action
<p>2. Generator Fails to Supply Power to Load</p>	<p>Step 1. Check for low generator field by depressing and then releasing the field flash switch.</p> <p>Step 2. Check for a load cable that is burned, has broken strands, or has insulation worn away. Location will depend upon the external source it is connected to.</p>	<p>If the cause indicates that the generator field is not built up, depressing the switch could resolve the malfunction. Depressing the switch will flash the generator field momentarily with battery current. If this does not resolve the problem, go to Step 2.</p> <p>If cable is burned, broken, or has no insulation, report the deficiency to organizational maintenance.</p>
<p>3. Voltmeter Fails to Show Voltage</p>	<p>Step 1. Check for a broken dial and bent indicator.</p> <p>Step 2. If voltmeter is not visually damaged, check for an out-of-adjustment voltage adjusting rheostat which could indicate low or no voltage on the meter.</p> <p>Step 3. If the generator does not build up, check the field flash switch.</p>	<p>If the voltmeter has broken dial and bent indicator, refer to organizational maintenance for replacement. The operator, not knowing if the voltmeter is the cause of the malfunction, should go on to Step 2 and isolate another or the only cause of the malfunction.</p> <p>To correct the above, turn the knob on the rheostat until the proper voltage is attained, as indicated by the voltmeter. If voltage does not build up go on to Step 3.</p> <p>Momentarily depress the field flash switch. The action could correct the malfunction by flashing the generator field momentarily with battery current. If malfunction is still not corrected, the problem should be reported to organizational maintenance.</p>
<p>4. Generator Fails to Build Up Rated Voltage</p>	<p>Check the generator field build up by depressing the field flash switch.</p>	<p>This action could correct the problem by flashing the generator field with battery current. If depressing switch doesn't correct the problem, report to organizational maintenance.</p>

SKILL LEVEL 1

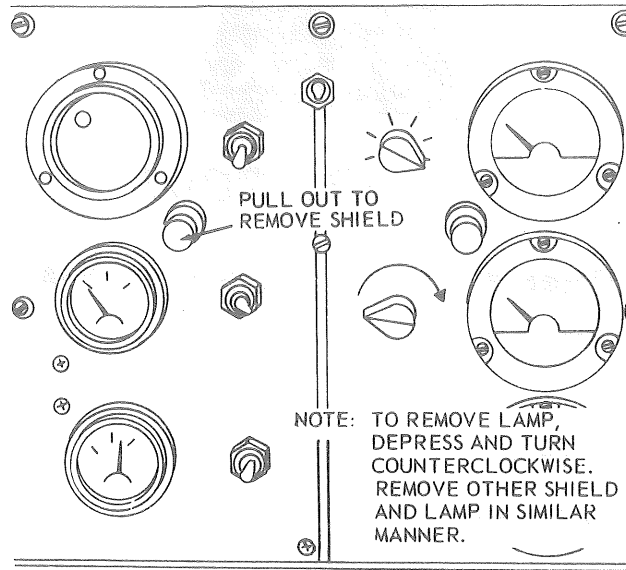
Malfunction	Test or Inspection	Corrective Action
<p>5. Voltmeter Reading Too High or Too Low</p>	<p>Step 1. Check the voltage adjusting rheostat by visually examining position of knob. The rheostat is located just to the right of the center of the control panel.</p> <p>Step 2. Observe the position of the voltage selector switch. The voltage selector switch is located slightly to the right of center in the upper part of the control panel.</p>	<p>If the rheostat appears to be in the wrong position, turn it one way first, then turn it the other way. The voltage should increase when the control is turned clockwise. If this does not correct the voltmeter reading, go on to Step 2.</p> <p>To correct the problem, move the switch to each position until the voltmeter reading is corrected.</p> <p>Note The switch may be bent, broken, rusted or immovable. If this is the case, report to organizational maintenance for replacement.</p>
<p>6. Generator Voltage Drops When Load is Applied or Increased; Voltage Fluctuates</p>	<p>Check to see if generator is overloaded. Position the ammeter phase selector switch in each of the three positions in turn, and at the same time observe the current indicator meter. The meter should not give an indication greater than 100% in any phase with any type load. With a straight resistive load, such as incandescent lighting, it should not exceed 80% (100% at 1.0 power factor).</p>	<p>If the meter indicates a load greater than these values in any phase, reduce the load. Balance the load on each of the three phases, if possible. Position the voltage selector switch in each of the six positions, in turn, and obtain a voltmeter reading in each of the six positions.</p> <p>Note If the voltage drops under load, the voltage regulator is defective. Report the condition to organizational maintenance.</p>
<p>7. No Power Available at Outlet Receptacle (Model MEP-017A)</p>	<p>Check to see if the fuse is burned, broken, or cracked. Open the front of the control box by unlocking the five fasteners located near the top and at the sides of the control panel.</p>	<p>If the fuse has any evidence of the above, replace fuse.</p>

Malfunction	Test or Inspection	Corrective Action
<p>8. Generator Overheats</p>	<p>Step 1. Check to see if the generator is overloaded. Position the ammeter phase selector switch. The meter should not give an indication greater than 100% in any phase with any type load. With a straight resistive load, such as incandescent lighting, it should not exceed 80% (100% at 1.0 power factor).</p>	<p>If the meter indicates a load greater than the above values in any phase, reduce the load. Balance the load on each of the three phases, if possible. Position the voltage selector switch, in each of the six positions, in turn, obtain a voltmeter reading in each of the six positions.</p> <p>Note If the voltage drops under load, the voltage regulator is defective. Report the condition to organizational maintenance.</p> <p>If this procedure does not correct the malfunction, go on to Step 2.</p>



SKILL LEVEL 1

Malfunction	Test or Inspection	Corrective Action
	<p>Step 2. Check the shelter where the generator set is located for obstructions that would disrupt air flow. See if there are outlets for heated air and exhaust fumes.</p>	<p>Even though the generator set is weather resistant, it should be located in an adequate shelter that will protect it from inclement weather. Provide a shelter that is ventilated to allow heated air and exhaust fumes to escape. Depending upon the ambient temperature range and upon whether the installation is to be temporary, semi-permanent, or permanent, provide facilities to maintain a reasonable temperature in the area around the unit. If the unit is used in a closed building or other closed shelter, pipe the exhaust gases to the outside.</p>
<p>9. Panel Lights Fail to Light</p>	<p>Check for a broken filament or corroded socket in the lamp.</p>	<p>If lamp is damaged, as above, replace the lamp.</p>
<p>10. Oil Pressure Indicator Fails to Register or Gives Low Reading</p>	<p>Step 1. Check the crankcase oil level. Refer to LO 5-2805-258-12 for location of crankcase oil fill and level cap.</p> <p>Step 2. Check the oil pressure indicator for broken dial, bent indicator hand, or bad connections. The oil pressure indicator (fig. 2-3) is calibrated from 0 to 60 psi (4.2 kg per sq cm). Located at the left center of the control panel, it indicates the engine oil pressure. The normal readings range from 20 psi (1.4 kg per sq cm) at approximately 1/4 rated governed speed.</p> <p>If the indicator is damaged, as stated above, report to organizational maintenance.</p>	<p>If oil is low, fill crankcase to full level as stated in LO 5-2805-258-12. If oil is not low, go on to Step 2.</p>



2. Correct defects if necessary. Replacement parts or materials can be obtained from your team chief. (Refer to fig 1, and TM 5-6115-332-14, para 3-8.)
3. Complete DA Form 2404, Equipment Inspection And Maintenance Worksheet, as a daily maintenance form. (Refer to TM 38-750, para 3-4.)
4. Report all uncorrectable defects. (Refer to TM 38-750, para 3-4d.)
 - a. Notify your immediate supervisor of all uncorrectable faults found.
 - b. Submit DA Form 2404 to your supervisor or support maintenance personnel.

REFERENCES

TM 5-6115-332-14

TM 38-750

TASK

113-601-2003

Operate Generator Set 10 KW

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 Generator Set 10 KW.
2. Auxiliary fuel supply.
3. TM 5-6115-275-14.

Supervision and assistance will be available.

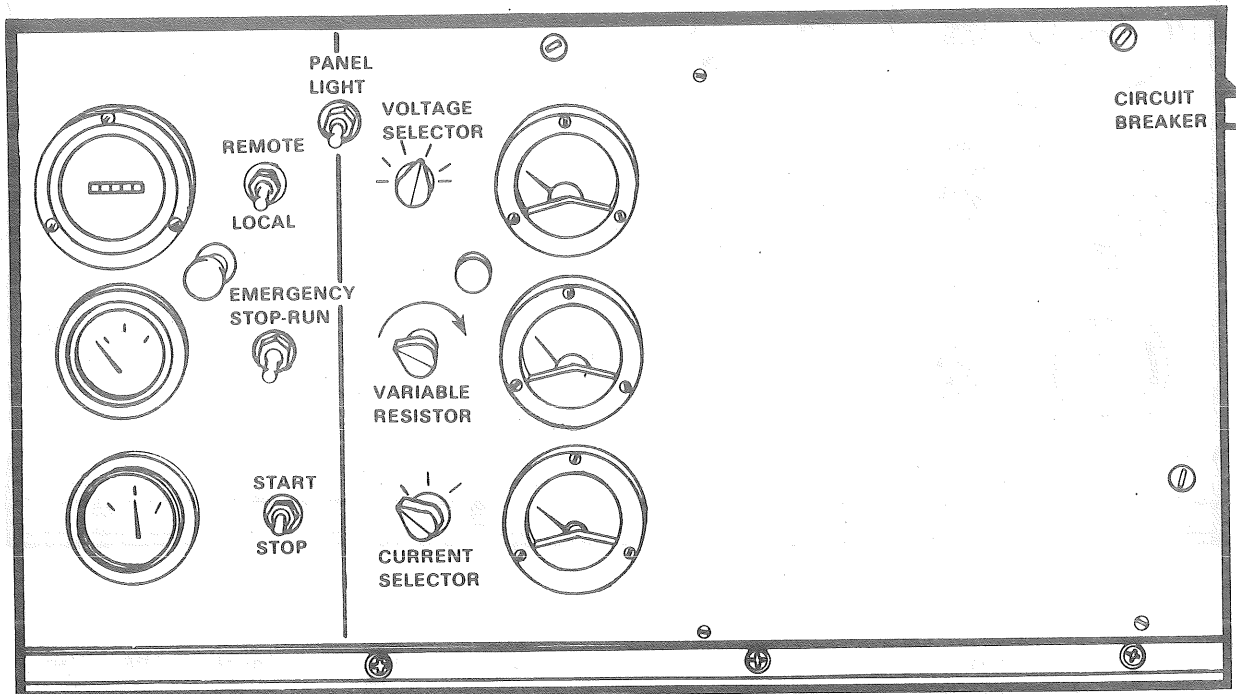
STANDARDS

This task has been performed correctly when, in 20 minutes, the meters on the generator set conform to the requirements of figures 1 through 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 11.

PERFORMANCE MEASURES

1. Perform starting procedures. (Refer to TM 5-6115-275-14, para 2-2b.)
 - a. Perform operator's daily preventive maintenance.
 - b. Place three-way fuel valve in the SET position when starting, then position the valve in the SET or AUX position, depending on the source of fuel.

- c. Insure generator set is properly grounded.
- d. Set PHASE SWITCH SELECTOR knob to 120 V, 1-phase, 2-wire.
2. Start generator set electrically. (Refer to fig 1 and TM 5-6115-275-14, para 2-2b(2).)

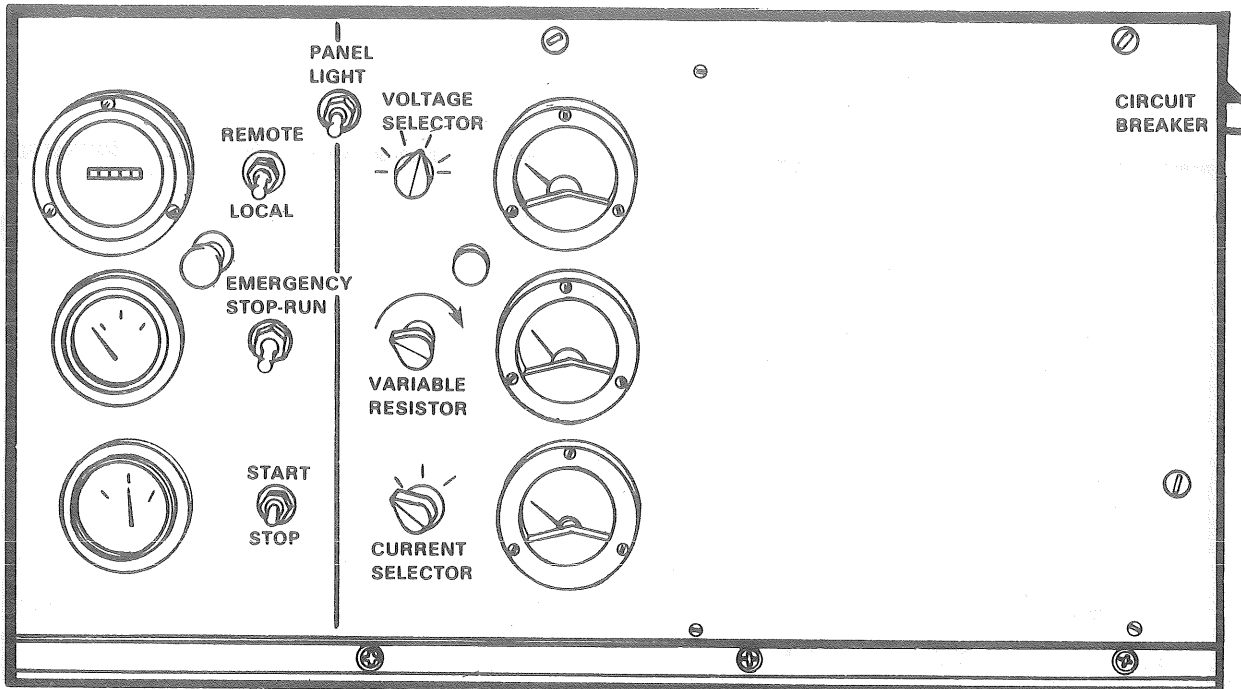


- STEP 1.** PLACE CIRCUIT BREAKER IN OFF POSITION.
- STEP 2.** PLACE REMOTE-LOCAL SWITCH IN LOCAL POSITION.
- STEP 3.** PLACE EMERGENCY STOP-RUN SWITCH IN NORMAL POSITION.
- STEP 4.** TURN VOLTAGE ADJUSTING KNOB FULLY COUNTERCLOCKWISE.
- STEP 5.** SET VOLTAGE SELECTOR SWITCH TO MONITOR DESIRED PHASE OR LINE VOLTAGE.
- STEP 6.** SET CURRENT SELECTOR SWITCH TO MONITOR DESIRED CURRENT
- STEP 7.** PLACE GOVERNOR CONTROL IN GOVERN POSITION.
- STEP 8.** PULL OUT CHOKE CONTROL, AFTER ENGINE STARTS SLOWLY RETURN TO IN POSITION.
- NOTE:** BEFORE STARTING ENGINE, CHECK LOAD TERMINALS FOR CORRECT OUTPUT CONNECTION AND VOLTAGE PHASE SWITCH POSITION.
- STEP 9.** PRESS THE START-STOP SWITCH TO THE START POSITION, RELEASE AFTER ENGINE STARTS.

Figure 1. 10 KW electrical starting instructions.

SKILL LEVEL 1

3. Start generator set manually. (Refer to fig 2 and TM 5-6115-275-14, para 2-2b(3).)

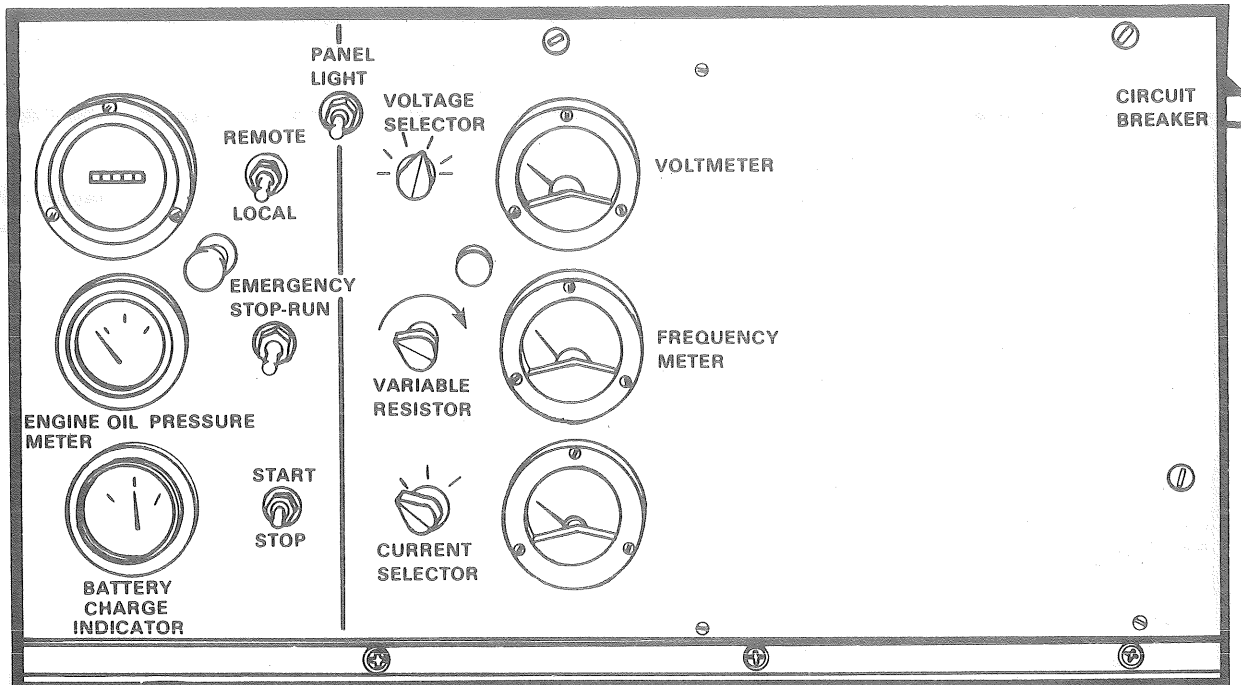


CAUTION: MAKE SURE CIRCUIT BREAKER IS IN OFF POSITION.

- | | |
|--|---|
| STEP 1. PLACE EMERGENCY STOP-RUN SWITCH IN EMERGENCY RUN POSITION. | STEP 4. WHEN ENGINE REACHES OPERATING PRESSURE, PLACE EMERGENCY STOPRUN SWITCH IN NORMAL POSITION AND AT THE SAME TIME, PRESS START-STOP SWITCH TO START POSITION AND RELEASE. |
| STEP 2. PLACE REMOTE-LOCAL SWITCH IN LOCAL POSITION. | |
| STEP 3. PULL OUT CHOKE CONTROL, AFTER ENGINE STARTS SLOWLY RETURN CHOKE CONTROL TO THE IN POSITION. | |

Figure 2. 10 KW manual starting instructions.

4. Perform operating procedures. (Refer to fig 3 and 4 and TM 5-6115-275-14, para 2-2d.)



WARNING: DO NOT INSTALL OR CHANGE LOAD CABLES OR CHANGE VOLTAGE PHASE SWITCH WHILE THE GENERATOR IS IN OPERATION

- STEP 1.** SET VOLTAGE PHASE SWITCH FOR DESIRED OUTPUT
- STEP 2.** PLACE CIRCUIT BREAKER IN THE OFF POSITION
- STEP 3.** INSURE THAT LOAD LINE IS CONNECTED TO THE PROPER TERMINALS
- STEP 4.** START THE GENERATOR SET
- STEP 5.** OBSERVE ENGINE OIL PRESSURE INDICATOR FOR PROPER OIL PRESSURE.
- STEP 6.** OBSERVE BATTERY-CHARGING METER FOR PROPER OPERATION.
- STEP 7.** CHECK FREQUENCY METER FOR PROPER READING. IF METER DOES NOT INDICATE 61 CYCLES, THE ENGINE GOVERNOR MUST BE ADJUSTED
- STEP 8.** CHECK GENERATOR OUTPUT VOLTAGE. OUTPUT VOLTAGE IS CONTROLLED BY "VOLT ADJ" KNOB ON THE FRONT PANEL
- NOTE:** IF NO OUTPUT IS INDICATED AND THE GENERATOR SET HAS BEEN IN STORAGE OR OUT OF OPERATION FOR A LONG PERIOD OF TIME, LOWER THE FRONT PANEL OF THE CONTROL CABINET AND MOMENTARILY PRESS THE FIELD FLASH SWITCH.
- STEP 9.** WHEN SET IS ADJUSTED TO PROPER LEVELS AND THE ENGINE HAS REACHED OPERATING TEMPERATURE (3 TO 5 MINUTES) PLACE CIRCUIT BREAKER IN ON POSITION.

Figure 3. 10 KW operating instructions.

SKILL LEVEL 1

CAUTION: Be sure to allow engine to warm-up at rated RPM for 3 to 5 minutes before applying a load.

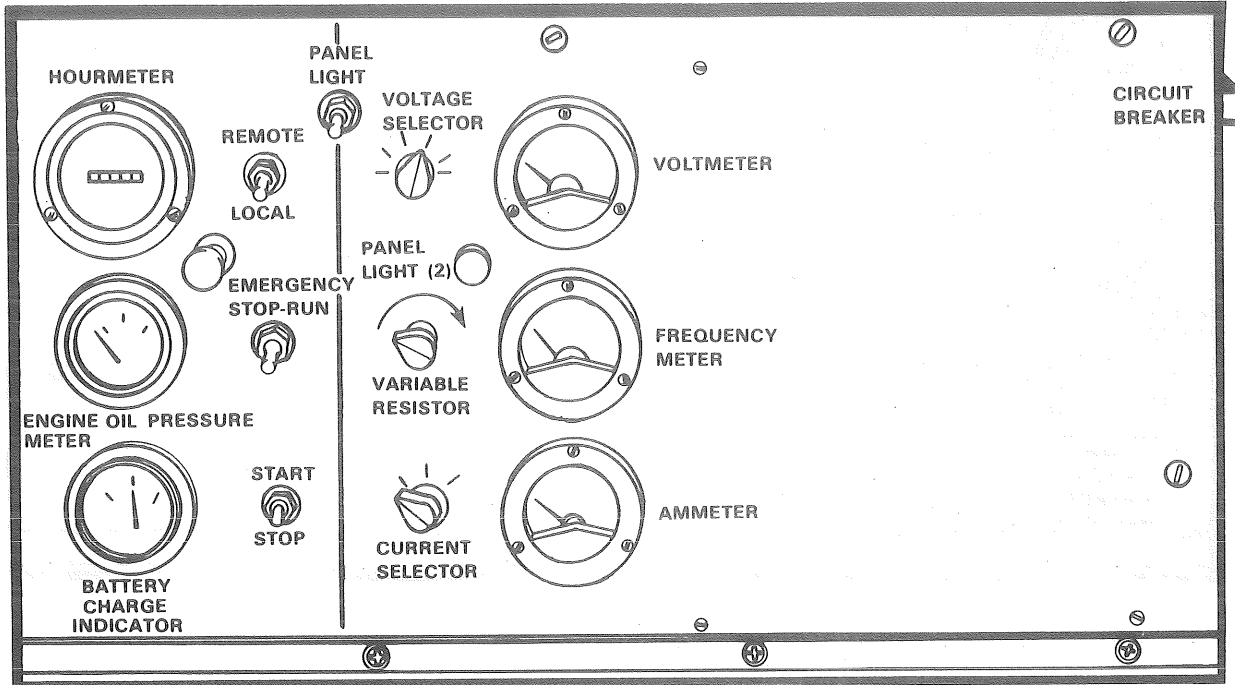


Figure 4. Engine and generator controls and instruments.

CAUTION: If load exceeds 100%, it must be reduced. Seek immediate assistance from your supervisor.

5. Operate generator set in extreme cold (below 0°F (-18°C)). (Refer to TM 5-6115-275-14, para 2-5.)
 - a. Keep fuel tank and auxiliary fuel cans full.
 - b. Drain and service fuel filter more frequently during cold weather.
 - c. Insure proper lubricants are maintained in accordance with lube order (LO) for engine.
 - d. Set OIL PAN BAFFLE ROD to front of engine for 0°F and below.

- e. Set AIR CLEANER INTAKE SHUTTER to WINTER.
- f. Keep batteries fully charged and free of dirt, moisture, and snow.

WARNING: Do not smoke or use an open flame in the vicinity when servicing the batteries. Batteries generate hydrogen, a highly explosive gas. Failure to observe this warning may result in serious injury to personnel.

- g. Insure battery cap vents are not clogged.

NOTE: If water must be added to the battery, charge the battery by external means or by running the engine for a period of at least 1 hour. This will mix the water with the electrolyte and prevent freezing.

- h. Keep wiring free of snow and ice.

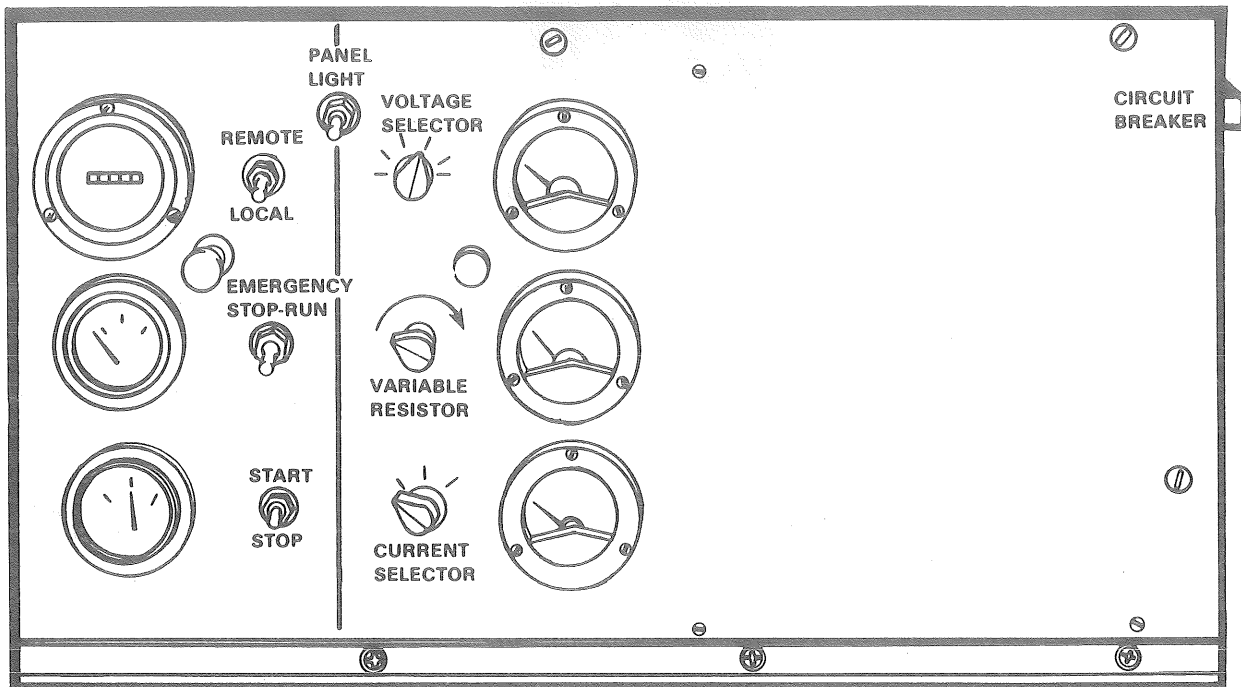
CAUTION: Do not disturb wiring if it can be avoided, frozen insulation is brittle and will easily break.

- i. Allow engine to warm thoroughly before applying a load.
 - j. Provide the generator set with as much protection from the weather as possible.
 - k. Insure generator set is covered when not in use.
6. Operate generator set in extreme heat. (Refer to TM 5-6115-275-14, para 2-6.)
- a. Inspect air baffles frequently to insure cleanliness.
 - b. Position OIL PAN BAFFLE ROD toward rear of engine for 0°F and above.
 - c. Inspect instrument frequently to insure generator is not overloaded.
 - d. Inspect generator ventilating screens frequently to insure cleanliness.
 - e. Set the AIR CLEANER INTAKE SHUTTER to SUMMER.

SKILL LEVEL 1

7. Operate generator set in dusty or sandy areas. (Refer to TM 5-6115-275-14, para 2-7.)
 - a. Perform those measures listed in performance measure 6.
 - b. Clean and replace oil filter element frequently.
 - c. Provide as much protection for the generator set as possible.
8. Operate generator set under rainy or humid conditions. (Refer to TM 5-6115-275-14, para 2-8.)
 - a. If possible, provide a shelter for the generator set.
 - b. Keep fuel tank and auxiliary fuel cans as full as possible.
 - c. Drain and service fuel filter more frequently than under normal conditions.
 - d. Keep wiring as clean and dry as possible.
9. Operate generator set in salt water areas. (Refer to TM 5-6115-275-14, para 2-9.)
 - a. Wash unit frequently with fresh water.

CAUTION: Protect electrical components when washing.
 - b. Paint all nonpolished surfaces.
 - c. Coat exposed parts of polished steel or other metals with standard issue, rust-proofing material, if available, or cover parts with a light coat of grease.
10. Operate generator set at high altitudes. (Refer to TM 5-6115-275-14, para 2-10.)
11. Perform stopping procedures. (Refer to fig 5 and TM 5-6115-275-14, para 2-2c.)



- STEP 1.** REMOVE THE LOAD BY PLACING THE CIRCUIT BREAKER IN THE *OFF* POSITION.
 - STEP 2.** ALLOW ENGINE TO RUN WITH NO LOAD 3 TO 5 MINUTES.
 - STEP 3.** PRESS THE START-STOP SWITCH TO THE *STOP* POSITION AND RELEASE.
 - STEP 4.** CLOSE THE FUEL SELECTOR VALVE.
 - STEP 5.** PLACE THE EMERGENCY STOP-RUN SWITCH IN THE *EMERGENCY STOP* POSITION.
- NOTE:** WHEN EMERGENCY STOPPING IS REQUIRED, PERFORM STEP 5 ONLY.

Figure 5. 10 KW normal and emergency stopping instructions.

REFERENCES

TM 5-6115-275-14

TASK

113-601-2004

Perform Operator's Troubleshooting Procedures on Generator Set 10 KW

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 10 KW.
2. TM 5-6115-275-14.
3. TM 38-750.
4. DA Form 2404.
5. 1 quart of oil and clean rags.
6. 8-inch adjustable wrench and 8-inch flat-tip screwdriver.
7. Fuses as required.

Supervision and assistance will be available.

STANDARDS

This task has been performed correctly when any discovered faults have been corrected in accordance with performance measure 2; 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 Generator Set 10 KW. (Refer to TM 5-6115-275-14, para 3-6 and 3-7, table 3-4.)
2. Correct defects if necessary. Replacement parts or materials can be obtained from your team chief. (Refer to TM 5-6115-275-14, para 3-6 and 3-7, table 3-4.)
3. Complete DA Form 2404, Equipment Inspection and Maintenance Worksheet, as a daily maintenance form. (Refer to TM 38-750, para 3-4.)
4. Report all uncorrectable defects. (Refer to TM 38-750, para 3-4d.)
 - a. Notify your immediate supervisor of all uncorrectable faults found.
 - b. Submit DA Form 2404 to your supervisor or support maintenance personnel.

REFERENCES

TM 5-6115-275-14

TM 38-750

TASK

113-601-2005

Operate 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. External 24/28 volt power cable.
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, para 4-9 and 4-10.)
2. Connect the auxiliary fuel line if an external fuel source is to be used. (Refer to TM 5-6115-271-14, para 2-2b(1) (b).)

3. Electrically start Generator Set 3 KW 28 V DC (when appropriate.) (Refer to fig 1 and 3, and TM 5-6115-271-14, para 2-2b(1) and (2).)
 - a. Connect the 24/28-volt external power cable to the EXTERNAL POWER SOURCE receptacle of the generator set.

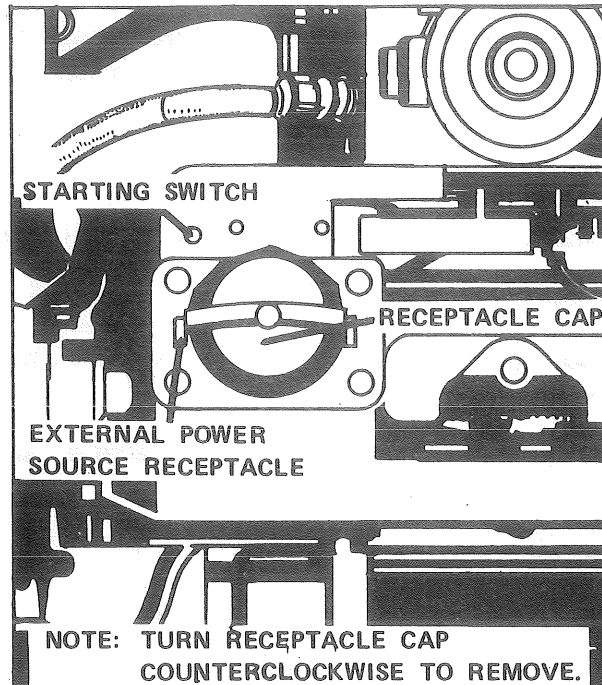
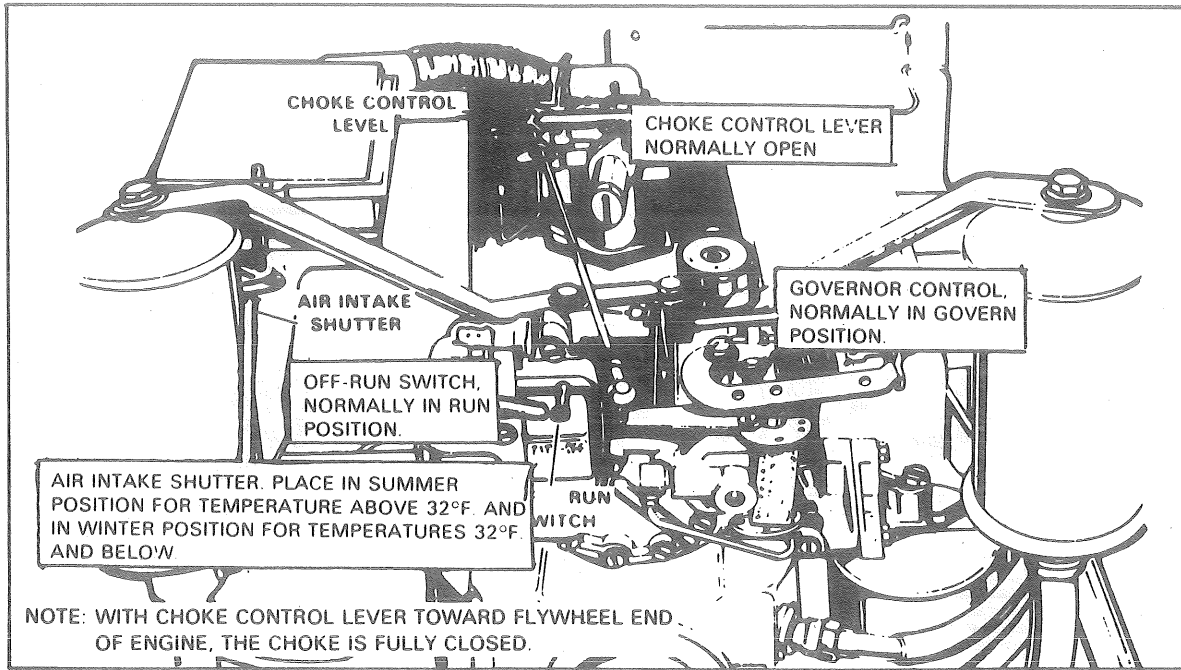


Figure 1. External Power Source Receptacle.

- 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° Fahrenheit or lower and to the SUMMER position when temperature is 32° Fahrenheit or above.
- f. Place GOVERNOR control in START AND IDLE position.

SKILL LEVEL 1

- 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, para 2-2b(3).)
- 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.

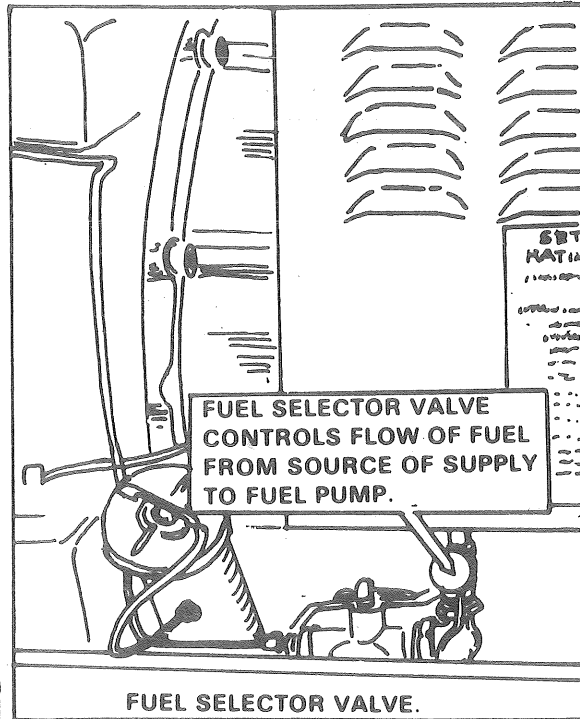
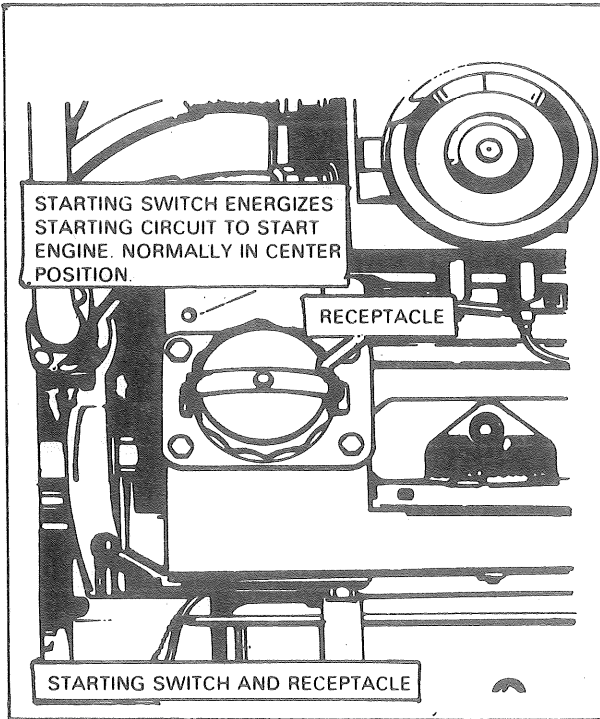


Figure 2. Engine Controls for Generator Set 3 KW.

SKILL LEVEL 1

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, para 2-2d.)

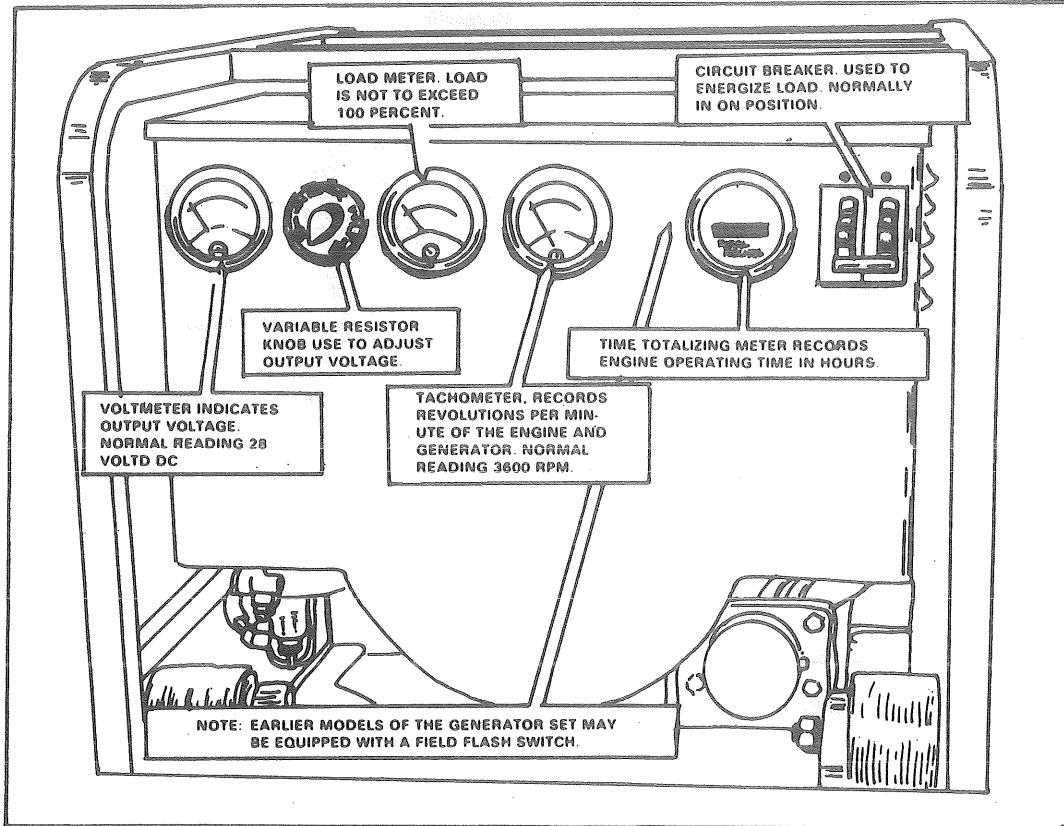


Figure 3. Controls and Instruments for a 3 KW Generator.

- 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.
- 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 percent 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, para 2-2c.)
- 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 to 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

TASK

113-601-3001

Perform Daily Preventive Maintenance Checks and Services on Generator Set 5 KW

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 5 KW.
2. TM 5-6115-332-14.
3. TM 38-750.
4. DA Form 2404.
5. Clean, dry, lint-free cloth and mild detergent solution.
6. 8-inch flat-tip screwdriver and 8-inch adjustable wrench.
7. Pliers and 1 quart of oil.

Supervision and assistance will normally be available.

STANDARDS

This task has been performed correctly when the exterior of the generator set is clean, all dials and knobs are tight, checks and services have been performed according to the requirements of figure 1; all cables are in good condition (no cracks or broken connectors); 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 daily preventive maintenance checks and services on Generator Set 5 KW. (Refer to fig 1, and TM 5-6115-332-14, para 3-6 and 3-7.)
2. Correct defects if necessary. Replacement parts or materials can be obtained from your team chief. (Refer to fig 1, and TM 5-6115-332-14, para 3-1 thru 3-6.)
3. Complete DA Form 2404, Equipment Inspection and Maintenance Worksheet, as a daily maintenance form. (Refer to TM 38-750, para 3-4.)
4. Report all uncorrectable defects. (Refer to TM 38-750, para 3-4d.)
 - a. Notify your immediate supervisor of all uncorrectable faults found.
 - b. Submit DA Form 2404 to your supervisor or support maintenance personnel.

INTERNAL		B-BEFORE OPERATION	A-AFTER OPERATION	M-MONTHLY			
OPERATOR	ORG.	D-DURING OPERATION	W-WEEKLY	Q-QUARTERLY			
DAILY		ITEM TO BE INSPECTED	PROCEDURE	REFERENCE			
B	D				A	W	
1	X	X			Oil level gage	Add oil to full mark on gage.	LO 5-2805-258-12
2	X	X	X		Restriction indicator	Observe restriction indicator for indication that air cleaner element is clogged. Clean or replace element if indicator shows red.	TM 5-2805-258-14
3				X	Fuel filter	Inspect for accumulation of water or sediment. Clean element	TM 5-2805-258-14
4	X		X		Fuel supply	Add fuel as required.	Appendix C
5	X	X			Ground terminal	Inspect for a proper ground, both at the ground terminal of the unit and also at the ground rod or other point where the ground connection is made.	Para 2-3
6				X	Battery and cables	Tighten loose connections or mountings and remove corrosion. Inspect for cracks and leaks. Fill cells with distilled water to a level 3/8 inch above the top of plates. Make certain the vent holes in the filler caps are free of obstructions. In freezing weather run the engine a minimum of one hour after adding water.	Para 2-2
7	X	X	X		Controls and instruments	Inspect for damage and insecure mounting with the unit operating; check for proper operation. Normal readings for instruments are as follows: Battery charging ammeter____should read on plus side of scale Oil pressure gage____20 to 60 psi Frequency meter____60 cps (Hertz) (Model MEP-017A) 400 cps (Hertz) (Model MEP-022A) Current indicator meter____Not to exceed 100% load current (maximum)	Para 2-9

Figure 1. Operator/crew preventive maintenance checks and services.

SKILL LEVEL 1

REFERENCES

TM 5-6115-332-14

TM 38-750

TASK**113-601-3002**

Perform Daily Preventive Maintenance Checks and Services on Generator Set 10 KW

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 10 KW.
2. TM 5-6115-275-14.
3. TM 38-750.
4. DA Form 2404.
5. 8-inch adjustable wrench and 8-inch flat-tip screwdriver.
6. Clean, lint-free cloth and mild detergent solution.
7. 1 quart of oil.

Supervision and assistance will be available.

STANDARDS

This task has been performed correctly when the exterior of the generator set is clean, all dials and knobs are tight and services have been performed according to the requirements in figure 1; all cables are in good condition (no cracks or broken connectors); 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.

SKILL LEVEL 1

PERFORMANCE MEASURES

1. Perform daily preventive maintenance checks and services on Generator Set 10 KW. (Refer to TM 5-6115-275-14, para 3-4 and 3-5, table 3-4.)
2. Correct defects if necessary. Replacement parts or materials can be obtained from your team chief. (Refer to TM 5-6115-275-14, para 3-6 and 3-7, table 3-4.)
3. Complete DA Form 2404, Equipment Inspection and Maintenance Worksheet, as a daily maintenance form. (Refer to TM 38-750, para 3-4.)
4. Report all uncorrectable defects. (Refer to TM 38-750, para 3-4d.)
 - a. Notify your immediate supervisor of all uncorrectable faults found.
 - b. Submit DA Form 2404 to your supervisor or support maintenance personnel.

REFERENCES

TM 5-6115-275-14

TM 38-750

TASK**113-609-1001**

**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 and 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.

SKILL LEVEL 1

- c. Switch radio power OFF (when using RT-524/VRC or RT-246/VRC, 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 recurs, 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 recurs, switch to PLAIN voice and notify your supervisor or support maintenance facility.

REFERENCES

TM 11-5810-224-10

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 1: Operator can contact selected stations only. Retransmission is not possible until HYL-3/TSEC FUNCTION switch is returned to the RETRANS position.

SKILL LEVEL 1

NOTE 2: The procedures outlined in TM 11-5810-247-10, paragraph 7, for plain break-in operation with the HYL-3/TSEC are applicable when the equipment is used with the PRC-77 radio only. When the HYL-3/TSEC is used with the RT 524 or RT 246, the procedures listed above will not work. In order to perform plain break-in with these radios, the cable to the radio must be disconnected and the X-MODE plug reinstalled on the unit. The operator must then connect the handset to the radio to talk. Once the plain break-in is finished, the radio and RETRANS unit must be reconnected to perform RETRANS.

- 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

TASK**113-609-2013**

**Prepare/Operate Communications Security Equipment
TSEC/KY-57 with VRC-12 Series Radio Sets**

CONDITIONS

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

1. AN/VRC-12 Series Radio Set installed and operational.
2. Security Equipment TSEC/KY-57.
3. Electronic transfer device KYK-13/TSEC with variables stored.
4. Unit CEOI.
5. TM 11-5810-256-OP-4.
6. (O)TM 11-5810-312-12.

STANDARDS

Task standard has been met when the equipment has been mounted and interconnected, keyed, and an operational check made in accordance with the performance measures.

PERFORMANCE MEASURES

WARNING 1: Operators of the TSEC/KY-57 secure radio system must have a clearance at least as high as the highest level of traffic to be passed (the classification of the keying material).

WARNING 2: Keyed equipment must be under direct continuous United States control to prevent tampering or unauthorized access.

SKILL LEVEL 1

1. Mount and interconnect the security equipment. (Refer to (O)TM 11-5810-312-12, para 2-21.)

NOTE: Make sure that the radio has been prepared for X-MODE operation by the unit organizational repairman before the cables are connected to the radio set.

- a. Attach Vehicular Power Cable Adapter HYP-57/TSEC to back of TSEC/KY-57 and secure spring latches. (Refer to (O)TM 11-5810-312-12 para 2-15.)
 - b. Place TSEC/KY-57 with HYP-57/TSEC attached on Mount MT-4626/URC and slide unit back until edge of HYP-57/TSEC is under MT-4626/URC top lip.
 - c. Engage MT-4626/URC retainer bracket with TSEC/KY-57 hold-down bar and tighten thumbscrew securely.
 - d. Connect cable CX-13061/U to TSEC/KY-57 front panel RADIO receptacle and CX-13062/U to the AUDIO receptacle. Connect CX-13063/U to the POWER receptacle located on back of HYP-57/TSEC.
2. Prepare the TSEC/KY-57 for keying. (Refer to TM 11-5810-256-OP-4, para 5-15a(1) thru (7).)
 - 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 pressing and releasing the PUSH-TO-TALK switch on the handset one time.
 3. Key the TSEC/KY-57. (Refer to (O)TM 11-5810-312-12, para 5-15a(8) thru (14).)
 - a. Place the KY-57 MODE switch to LD (load).
 - b. Place the KY-57 FILL switch to position 1.
 - c. Press 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. Press 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.

4. Remove the KYK-13 from the KY-57. (Refer to (O)TM 11-5810-312-12, para 5-15a(15) thru (17).)
 - a. Place MODE switch on the KYK-13 to the OFF position.
 - b. Disconnect the KYK-13 from the KY-57.
5. Operate the KY-57. (Refer to (O)TM 11-5810-312-12, para 5-16b(1) thru (7).)
 - a. Place the MODE switch on the KY-57 to C (cipher).
 - b. Perform a parity check.
 - (1) With the FILL switch in position 6, press the PUSH-TO-TALK switch, and listen for a single beep.
 - (2) Place FILL switch in position 1, press 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 3.

- c. Begin secure transmission. (Refer to (O)TM 11-5810-312-12, para 5-16b(8).)

SKILL LEVEL 1

REFERENCES

TM 11-5810-256-OP-4

(O)TM 11-5810-312-12

CEOI

TASK**113-609-2032**

**Prepare/Operate Communications Security Equipment
TSEC/KY-38, Mounted with Radio Sets AN/GRC-160 or
AN/VRC-64**

CONDITIONS

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

1. Radio Set AN/GRC-160 or AN/VRC-64, mounted and operational.
2. Security Equipment TSEC/KY-38, with Z-ACD/TSEC.
3. KYK-28/TSEC.
4. Interconnecting Cable Assembly CX-10475/U.
5. Amplifier, Audio Frequency AM-4979A/GR.
6. CEOI and Current Key List extracts.
7. Operational secured radio net.

STANDARD

Task standard has been met when the equipment has been mounted and interconnected, keyed and an operational check of the system made in accordance with the performance measures.

PERFORMANCE MEASURES

WARNING 1: Operators of the TSEC/KY-38 secure radio system must have a clearance at least as high as the highest level of traffic to be passed (the classification of the key list extract).

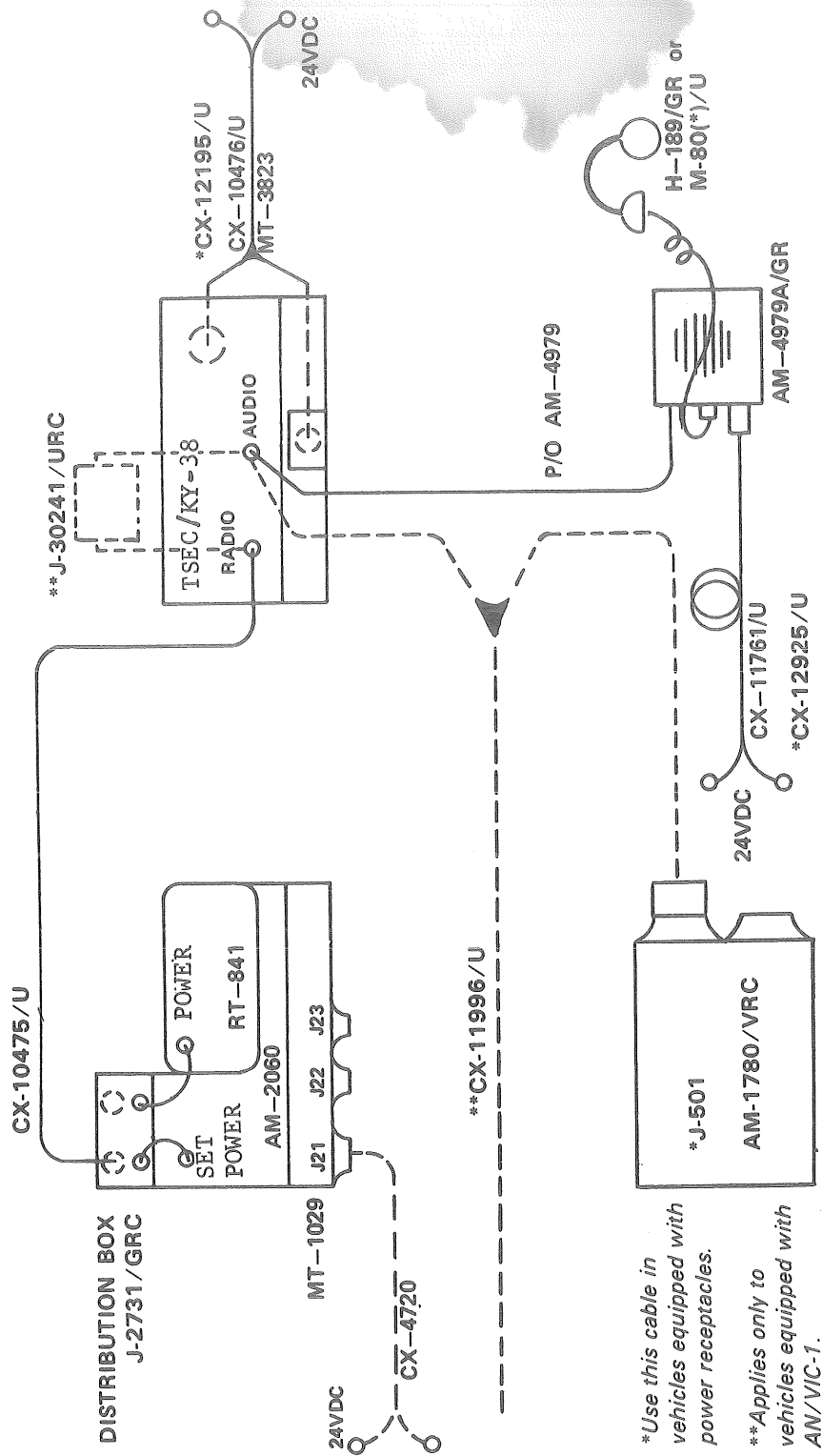
SKILL LEVEL 1

WARNING 2: Keyed equipments shall be under direct continuous United States control to prevent tampering or unauthorized access.

1. Prepare the radio for secure operation. (Refer to fig 1.)
 - a. Disconnect Cable Assembly CX-4655/GRC between the AM-2060(*)/GRC SET POWER connector and the receiver-transmitter POWER connector, and restore it to the storage clips.

NOTE: If Distribution Box J-2731/GRC is not available, you must install a Battery BA-4386/U in the RT-841/PRC-77 for operation of the system. The Amplifier-Power Supply AM-2060(*)/GRC will not be able to power the system.

- b. Connect the cable from the left side of Distribution Box J-2731/GRC to the SET POWER connector of AM-2060(*)/GRC.
 - c. Connect the cable from the right side of Distribution Box J-2731/GRC to the POWER connector of RT-841/PRC-77.
 - d. Connect the small end of interconnecting Cable Assembly CX-10475/U to the connector (J1) on the left rear of Distribution Box J-2731/GRC.
2. Mount and interconnect the security equipment (fig 1).
 - a. Balance the TSEC/KY-38 on the front of the mount and remove the power connector cover on the bottom of the Z-ACD/TSEC. Insure that the Z-ACD/TSEC circuit breaker is at OFF, and the ON-OFF switch on the front of MT-3823(*)/GRC is at OFF.
 - b. Pass the connector of Cable Assembly CX-10476/U through the hole in the rear plate of the MT-3823(*)/GRC. Connect the cable to the connector on the Z-ACD/TSEC.
 - c. Set the Z-ACD/TSEC circuit breaker to ON and slide the TSEC/KY-38 into the mount. Pass the power connector cover through the hole in the rear plate.
 - d. Raise and tighten the two clamps on the MT-3823(*)/GRC to secure the TSEC/KY-38.
 - e. Connect the large end of interconnecting Cable Assembly CX-10475/U to the RADIO connector (fig 1 and 2) on TSEC/KY-38.



**Use this cable in vehicles equipped with power receptacles.*

***Applies only to vehicles equipped with AN/VIC-1.*

Figure 1. TSEC/KY-38 for AN/VRC-64 or AN/GRC-160.

SKILL LEVEL 1

- f. Mount the Amplifier, Audio Frequency AM-4979A/GR in the speaker mounting bracket (fig 1 and 3).
- g. Connect the power cable CX-11761/U to the POWER connector of AM-4979A/GR.
- h. Connect the AM-4979A/GR cable to the AUDIO connector (fig 1 and 2) of the TSEC/KY-38.
- i. Connect the radio handset to the AUDIO connector of the AM-4979A/GR (fig 1 and 2).

3. Prepare the KYK-28/TSEC.

NOTE: This procedure is to be followed when placing the equipment into operation, and at the end of each CRYPTO PERIOD, as designated in the CEOI and/or unit SOP.

- a. Open the KYK-28/TSEC like a book by releasing the lock on the right side (data plate facing up).
- b. Push the two locking levers on the sides of the KYK-28/TSEC to the rear (unlock) position.
- c. Set the various slides in accordance with the extract key list, and double check the settings.

NOTE: A valid key must be used or the TSEC/KY-38 will not complete the check cycle and an alarm condition will result.

- d. Pull the locking levers on the sides forward to the lock position.

NOTE: If the levers will not lock, recheck each slide to make sure it is clicked into position.

- e. Close the KYK-28/TSEC and secure the lock.
- f. Check the gate mechanism by forcing the gate back to expose the keying pins.

4. Key the TSEC/KY-38.

- a. Make sure that the OFF-PLAIN-CIPHER switch of TSEC/KY-38 is at OFF. (Radio set and MT-3823(*)/GR power switches may be ON.)

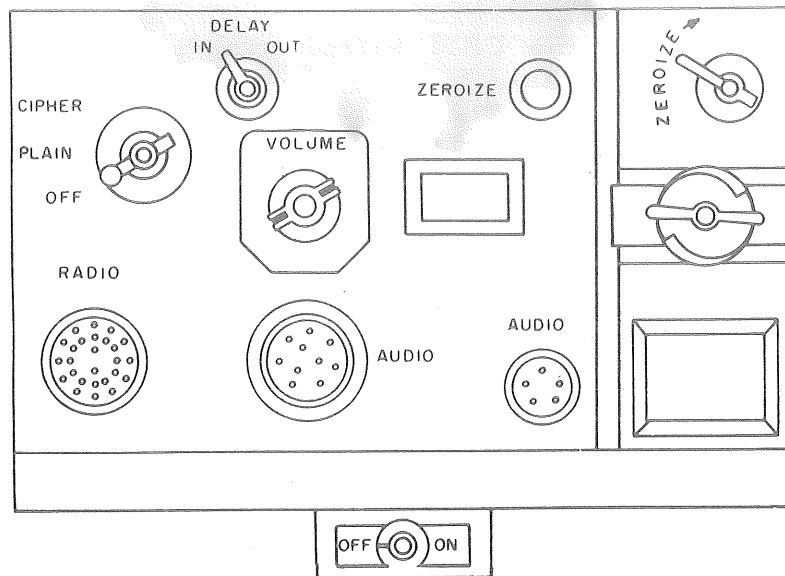


Figure 2. TSEC/KY-38 on MT-3823(*)/GRC, controls and indicators.

- b. Open the access cover on the TSEC/KY-38 and align the two guide pins of the KYK-28/TSEC with the guide pin holes of the TSEC/KY-38. (The data plate of the KYK-28/TSEC should be facing away from the open access cover.)
 - c. Press firmly and smoothly on the KYK-28/TSEC until it bottoms out on the TSEC/KY-38.
 - d. Remove the KYK-28/TSEC and secure the access cover of the TSEC/KY-38. (Do not fumble and release the cover or flip the ZEROIZE lever.)
5. Place the system into operation (fig 1 thru 3.)
- a. Set radio switches and controls.
 - (1) Set AM-2060(*)/GRC POWER switch to ON, and SPKR switch to OFF.
 - (2) Set the Distribution Box J-2731/GRC circuit breaker to ON.
 - (3) Turn the receiver-transmitter function switch to ON or SQUELCH, as authorized in the unit SOP.

SKILL LEVEL 1

- (4) Refer to the CEOI extract and set the operating frequency of the net.
 - (5) Set the receiver-transmitter VOLUME control fully clockwise.
- b. Set secure equipment switches and controls.
- (1) Set the MT-3823(*)/GRC ON-OFF switch to ON.
 - (2) Set the AM-4979A/GR power switch to ON.
 - (3) Set the TSEC/KY-38 power switch to CIPHER and the VOLUME control to approximately mid-range.
 - (4) Set the DELAY switch to IN.
6. Operate the secure system.

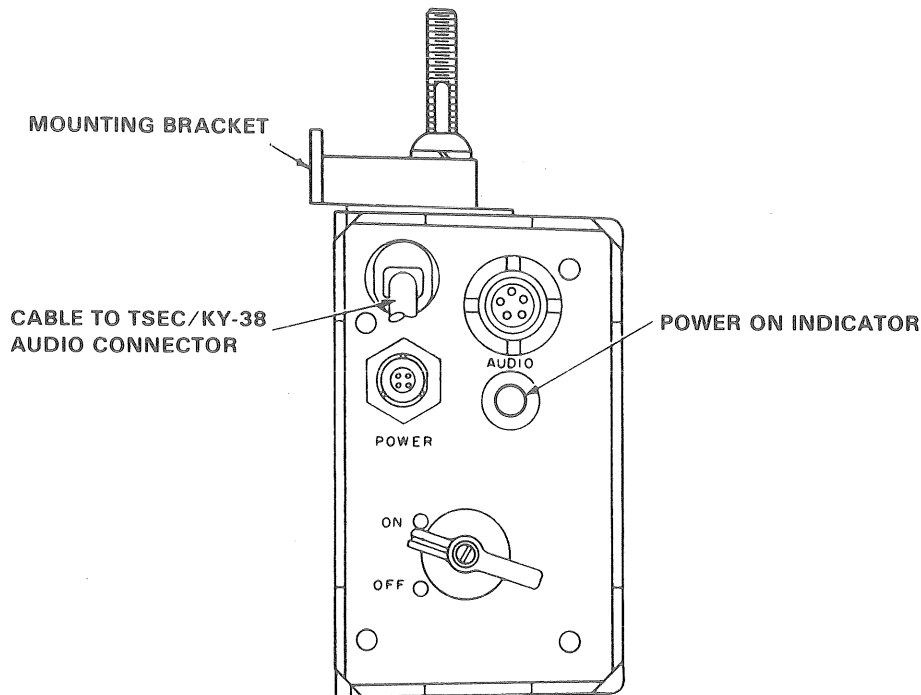


Figure 3. Amplifier, Audio Frequency AM-4979A/GR, controls and indicators.

- a. Press the PUSH-TO-TALK switch on the handset. A multitone signal will be heard followed by a final beep tone, then no tone. This sequence of events indicates overall system operation.

NOTE: System failure is indicated by either a continuous tone or a series of beeps when the PUSH-TO-TALK switch is pressed. If this condition exists, zeroize the TSEC/KY-38 using the ZEROIZE lever and rekey, using the KYK-28/TSEC.

- b. Adjust the system volume controls.
 - (1) For CIPHER operation, adjust the VOLUME control on the TSEC/KY-38.
 - (2) For PLAIN operation, adjust the VOLUME control on the receiver-transmitter.
- c. Set the DELAY switch to OUT.
- d. Press the PUSH-TO-TALK switch on the handset. A single beep followed by quiet indicates normal system functioning.
- e. Begin secure transmission and reception.

7. Zeroize KYK-28/TSEC.

NOTE: This step must be performed as soon as it is determined that CIPHER operation of the TSEC/KY-38 can be performed.

- a. Unlock and open the KYK-28/TSEC.
- b. Push the two locking levers to the rear.
- c. Move all slides to the zeroize position.
- d. Pull the locking levers forward.
- e. Close and lock the KYK-28/TSEC.

REFERENCES

(O)TM 11-5810-300-12

TM 11-5810-245-10

TM 11-5820-498-12

TM 11-5820-667-12

CEOI

TASK

113-609-2033

Prepare/Operate Communications Security Equipment TSEC/KY-38 with AN/VRC-12 Series Radio Sets

CONDITIONS

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

1. AN/VRC-12 series radio set installed and operational.
2. Security Equipment TSEC/KY-38 with Z-ACD/TSEC.
3. KYK-28/TSEC.
4. Preinstalled Cable Assembly CX-10539/U.
5. Amplifier, Audio Frequency AM-4979A/GR.
6. CEOI and current key list extracts.
7. Operational secured radio net.

STANDARDS

Task standard has been met when the equipment has been mounted and interconnected, keyed, and an operational check made in accordance with the performance measures.

PERFORMANCE MEASURES

WARNING 1: Operators of the TSEC/KY-38 secure radio system must have a clearance at least as high as the highest level of traffic to be passed (the classification of the key list extract).

WARNING 2: Keyed equipments shall be under direct continuous United States control to prevent tampering or unauthorized access.

1. Mount and interconnect the security equipment. (Refer to fig 1.)

NOTE: Make sure that the radio set has been prepared for X-MODE operation before connecting the cables.

- a. Balance the TSEC/KY-38 on the front of the mount and remove the power connector cover on the bottom of the Z-ACD/TSEC. Insure that the Z-ACD/TSEC circuit breaker is at OFF, and the ON-OFF switch on the front of MT-3823(*)/GRC is at off.
- b. Pass the connector of Cable Assembly CX-10476/U through the hole in the rear of the MT-3823(*)/GRC. Connect the cable to the connector on the Z-ACD/TSEC.
- c. Set the Z-ACD/TSEC circuit breaker to ON and slide the TSEC/KY-38 into the mount. Pass the power connector cover through the hole in the rear plate.
- d. Raise and tighten the two clamps on the MT-3823(*)/GRC to secure the TSEC/KY-38.
- e. Connect the end of the octopus cable (CX-10539/U) to the radio connector (fig 1 and 2) on TSEC/KY-38.
- f. Connect the audio connector of the octopus cable to the RE-TRANSMIT R/W receptacle of the receiver-transmitter.
- g. Connect the X-MODE connector of the octopus cable to the X-MODE receptacle of the receiver-transmitter.
- h. Mount the Amplifier, Audio Frequency AM-4979A/GR in the speaker mounting bracket (fig 1 and 3).
- i. Connect the Power Cable CX-11761/U to the POWER connector of AM-4979A/GR.
- j. Connect the AM-4979A/GR cable to the AUDIO connector (fig 1 and 2) of the TSEC/KY-38.
- k. Connect the radio handset to the AUDIO connector of the AM-4979A/GR (fig 1 and 3).

SKILL LEVEL 1

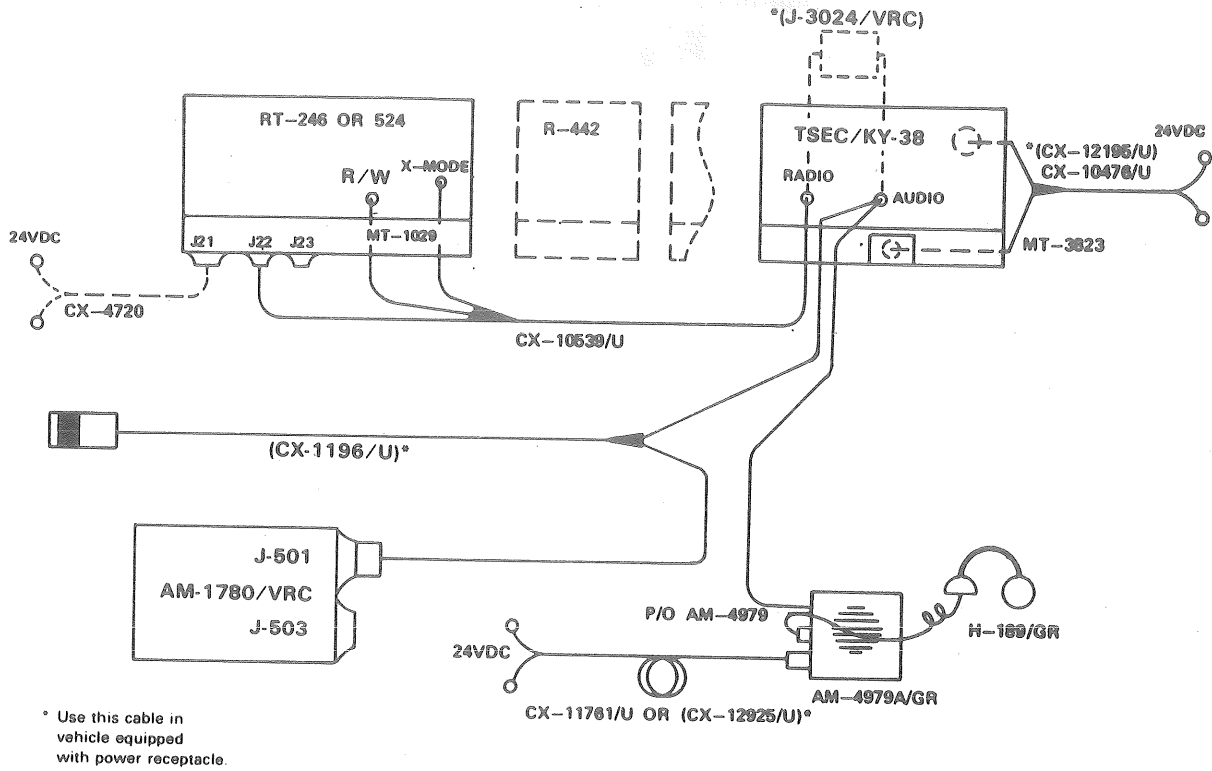


Figure 1. TSEC/KY-38 with AN/VRC-12 series radio (typical).

2. Prepare the KYK-28/TSEC.

NOTE: This procedure is to be followed when placing the equipment into operation and at the end of each CRYPTO PERIOD, as designated in the CEOI and/or unit SOP.

- a. Open the KYK-28/TSEC like a book by releasing the lock on the right side (data plate facing up).
- b. Push the two locking levers on the sides of the KYK-28/TSEC to the rear (unlock) position.
- c. Set the various slides in accordance with the extract key list and double check the settings.

NOTE: A valid key must be used or the TSEC/KY-38 will not complete the check cycle and an alarm condition will result.

- d. Pull the locking levers on the sides forward to the lock position.

NOTE: If the levers will not lock, recheck each slide to make sure it is clicked into position.

- e. Close the KYK-28/TSEC and secure the lock.
- f. Check the gate mechanism by forcing the gate back to expose the keying pins.

3. Key the TSEC/KY-38.

- a. Make sure that the OFF-PLAIN-CIPHER switch of TSEC/KY-38 is at OFF. (Radio set and MT-3823(*)/GR power switches may be on.)
- b. Open the access cover on the TSEC/KY-38 and align the two guide pins of the KYK-28/TSEC with the guide pin holes of the TSEC/KY-38. (The data plate of the KYK-28/TSEC should be facing away from the open access cover.)
- c. Press firmly and smoothly on the KYK-28/TSEC until it bottoms out on the TSEC/KY-38.
- d. Remove the KYK-28/TSEC and secure the access cover of the TSEC/KY-38. (Do not fumble and release the cover or flip the ZEROIZE lever.)

SKILL LEVEL 1

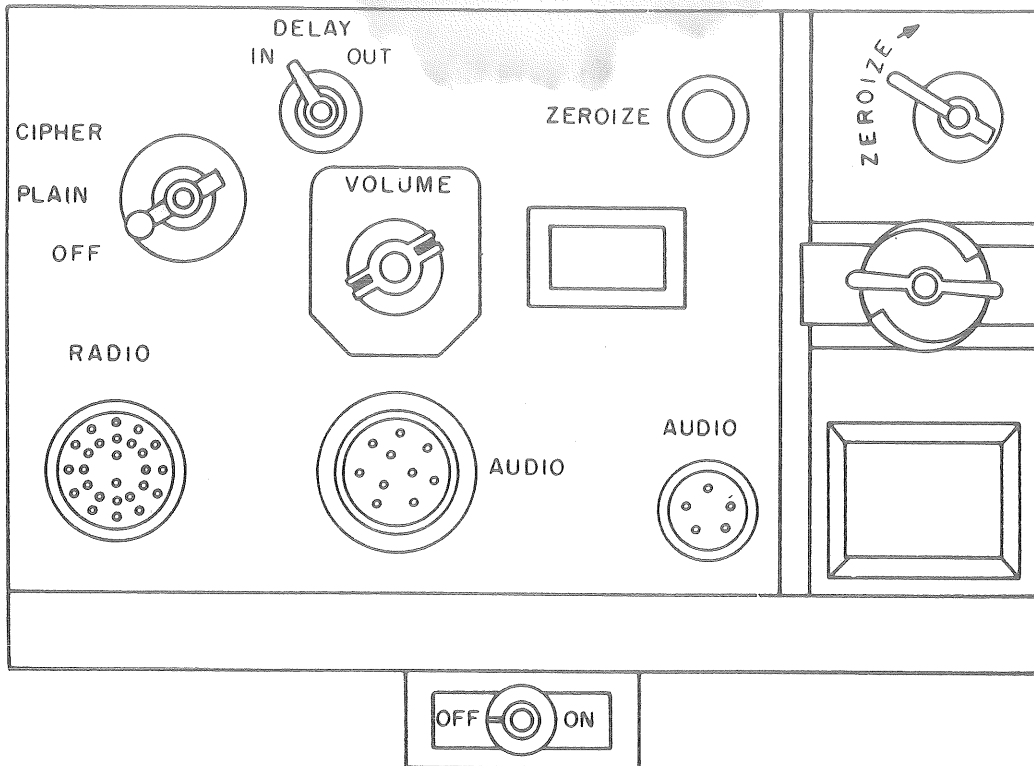


Figure 2. TSEC/KY on MT-3823(*)/GRC controls and indicators.

4. Place the system into operation. (Refer to the appropriate FM radio set task and fig 1 thru 3.)
 - a. Set radio switches and controls.
 - (1) Set the POWER switch to LOW. (On RT-246(*)/VRC, the POWER switch may be set to remote and the PWR SW on Control C-2742/VRC set to LOW.)
 - (2) Refer to the CEOI extract and set the operating frequency of the net.
 - (3) Set the SQUELCH switch to the position authorized in the unit SOP.
 - (4) Set the SPEAKER switch to OFF for CIPHER operation (or ON for plain operation).
 - (5) Set the VOLUME control for a comfortable listening level through the AM-4979A/GR.

b. Set secure equipment switches and controls.

- (1) Set the MT-3823(*)/GRC ON-OFF switch to ON.
- (2) Set the AM-4979A/GR power switch (fig 3) to ON.
- (3) Set the TSEC/KY-38 power switch to CIPHER and the VOLUME control to approximately midrange.
- (4) Set the DELAY switch to IN.

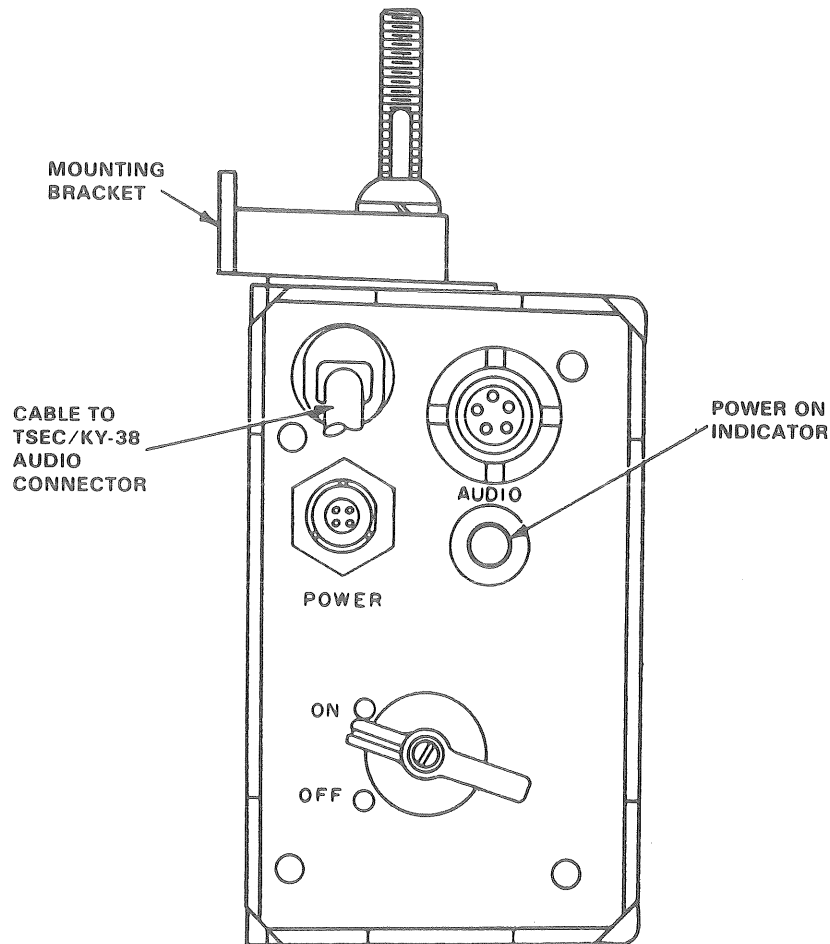


Figure 3. Amplifier, Audio Frequency AM-4979A/GR controls and indicators.

SKILL LEVEL 1

5. Operate the secure system.

- a. Press the PUSH-TO-TALK switch on the handset. A multitone signal will be heard followed by a final beep tone, then no tone. This sequence of events indicates overall system operation.

NOTE: System failure is indicated by either a continuous tone or a series of beeps when the PUSH-TO-TALK switch is pressed. If this condition exists, zeroize the TSEC/KY-38 using the ZEROIZE lever and rekey using the KYK-28/TSEC.

- b. Adjust the system volume controls.

- (1) For CIPHER operation, adjust the VOLUME control on the TSEC/KY-38.

- (2) For PLAIN operation, adjust the VOLUME control on the receiver-transmitter.

- c. Set the delay switch to OUT.

- d. Press the PUSH-TO-TALK switch on the handset. A single beep followed by quiet indicates normal system functioning.

- e. Begin secure transmission and reception.

6. Zeroize KYK-28/TSEC.

NOTE: This step must be performed as soon as it is determined that CIPHER operation of the TSEC/KY-38 can be performed.

- a. Unlock and open the KYK-28/TSEC.

- b. Push the two locking levers to the rear.

- c. Move all slides to the zeroize position.

- d. Pull the locking levers forward.

- e. Close and lock the KYK-28/TSEC.

REFERENCES

TM 11-5810-245-10

(O)TM 11-5810-300-12

TM 11-5820-401-10-1

TM 11-5820-401-10-2

CEOI

TASK

113-609-2034

**Prepare/Operate Communications Security Equipment
TSEC/KY-38 with Radio Set AN/PRC-77 (Manpack Operation)**

CONDITIONS

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

1. Radio Set AN/PRC-77 (or AN/GRC-160 assembled for manpack operation) with battery installed.
2. Security Equipment TSEC/KY-38 with Z-ACC/TSEC.
3. KYK-28/TSEC.
4. Interconnecting Cable Assembly CX-10475/U.
5. Carrying frame. (See note in performance measure 1.)
6. Batteries BA-4386/U, 2 each.
7. CEOI and current key list extracts.
8. Operational secured radio net.

STANDARDS

Task standard has been met when the equipment has been assembled, interconnected, keyed, and an operational check of the system made in accordance with the performance measures.

PERFORMANCE MEASURES

WARNING 1: Operators of the TSEC/KY-38 secure radio system must have a clearance at least as high as the highest

level of traffic to be passed (the classification of the key list extract).

WARNING 2: Keyed equipments shall be kept under direct continuous United States control to prevent tampering or unauthorized access.

WARNING 3: Remove the Batteries BA-4386/U from the TSEC/KY-38 and AN/PRC-77 when the equipment is not being used. The pressure relief valves must be installed and functional in the Battery Boxes CY-2562/PRC-25 and Z-ACC/TSEC to help vent the HYDROGEN GAS produced by the BA-4386/U. An EXPLOSIVE HAZARD exists when this battery is in use.

1. Prepare the radio set for secure operation. (Install the battery and antenna.)

NOTE: If a carrying frame (packboard) is available, perform a; if a carrying frame is not available, obtain a carrier, sleeping bag, and attach the straps in accordance with b and figure 1.

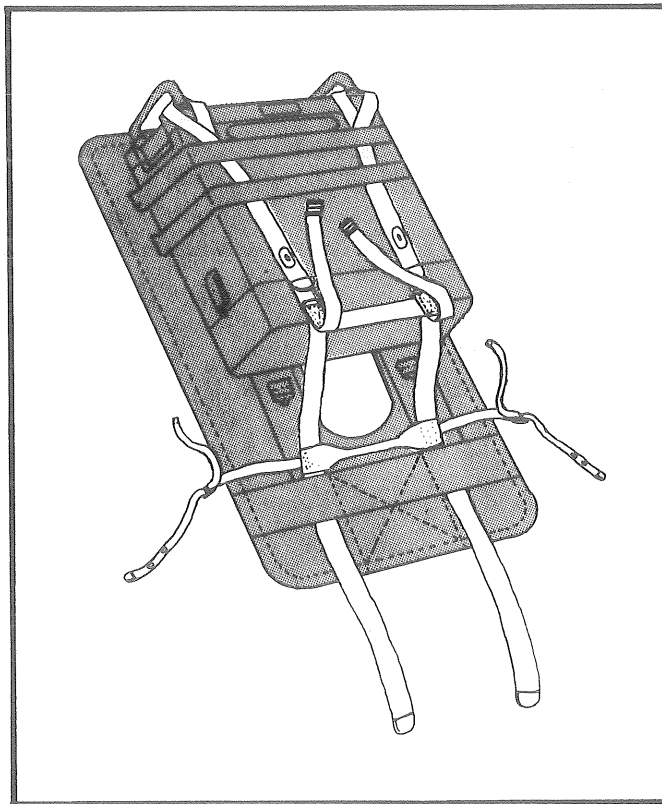


Figure 1. AN/PRC-77 with carrier, sleeping bag.

SKILL LEVEL 1

- a. Mount radio set on carrying frame.
 - (1) Dismount the receiver-transmitter and Accessory Bag CW-503/PRC-25 from the Harness ST-138/PRC-25.
 - (2) Set the carrying frame upright against a tree or wall.
 - (3) On the carrying frame, unbuckle both straps above the upper shelf.
 - (4) Set the bottom of the receiver-transmitter on top of the upper shelf on the carrying frame.
 - (5) Buckle both straps around the radio set.
 - (6) Clip the Accessory Bag CW-503/PRC-25 on the top strap on the right side.
 - b. Assemble carrier, sleeping bag on Harness ST-138/PRC-25.
 - (1) Make sure that the RT-841/PRC-77 is secured on the harness with the POWER connector and ANTENNA mount on the right side (AUDIO connectors to the left).
 - (2) Spread the sleeping bag straps so that the shoulder loops are on the receiver-transmitter (snap studs pointing up.) The long straps should drape down over the battery box and rest on the harness.
 - (3) Unsnap and pass the shoulder loop straps under the retaining straps of the harness.
 - (4) Loop one strap around each guard (handle) and pass the tips back under the retaining straps. Snap the loops.
 - (5) On the harness, the metal braces pass under a wide strap. The long straps must be pushed under this strap and pulled through until the carrier handle rests against the strap.
 - c. Connect the small end of interconnecting Cable Assembly CX-10475/U to the POWER connector of the receiver-transmitter.
2. Install batteries in TSEC/KY-38.
 - a. Release the two clamps and remove the Z-ACC/TSEC Battery Box.

- b. On the plastic divider, press the bright release and lift the divider out of the Z-ACC/TSEC.
- c. Inspect the two battery connectors on the sides and the power connector on the top of the divider.
- d. Inspect the power plug on the bottom of the TSEC/KY-38 for damage.
- e. Check the function of the pressure relief valve by blowing and then sucking through the valve. The valve must allow venting of the Z-ACC/TSEC.
- f. Mate one battery to each of the connectors on the divider.
- g. Align the assembled batteries and divider with the guides in the Z-ACC/TSEC and slide them in until the catch clicks.
- h. Align the power connector of the divider with the power plug on the TSEC/KY-38 and replace the Z-ACC/TSEC.
- i. Reconnect the two clamps.

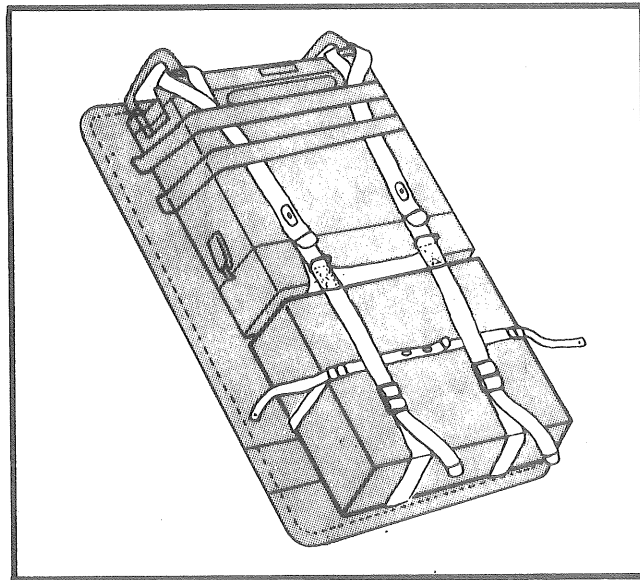


Figure 2. AN/PRC-77 with TSEC/KY-38 on ST-138/PRC-25.

SKILL LEVEL 1

3. Prepare the KYK-28/TSEC.
 - a. Open the KYK-28/TSEC like a book by releasing the lock on the right-hand side (data plate facing up).
 - b. Push the two locking levers on the sides of the KYK-28/TSEC to the rear (unlock) position.
 - c. Set the various slides in accordance with the extract key list, and double check the settings.

NOTE: A valid key must be used or the TSEC/KY-38 will not complete the check cycle; and an alarm condition will result.

- d. Pull the locking levers on the sides forward to the lock position.

NOTE: If the levers will not lock, recheck each slide to make sure it is clicked into position.

- e. Close the KYK-28/TSEC and secure the lock.
 - f. Check the gate mechanism by forcing the gate back to expose the keying pins.
4. Key the TSEC/KY-38.
 - a. On the TSEC/KY-38, set the power switch to OFF.
 - b. Open the access cover on the TSEC/KY-38 and align the two guide pins of the KYK-28/TSEC with the guide pin holes of the TSEC/KY-38. (The data plate of the KYK-28/TSEC should be facing away from the open access cover.)
 - c. Press firmly and smoothly on the KYK-28/TSEC until it bottoms out on the TSEC/KY-38.
 - d. Remove the KYK-28/TSEC and secure the access cover of the TSEC/KY-38. (Do NOT fumble and release the cover or flip the ZEROIZE (ever).)

5. Assemble the system for operation.

NOTE: If a carrying frame (packboard) is available, perform a; if the Harness ST-138/PRC-25 with carrier, sleeping bag is to be used, perform b.

- a. On a carrying frame.
 - (1) Unbuckle and remove both straps above the lower shelf.
 - (2) Install one of the straps in the third slot from the bottom of the carrying frame.
 - (3) Position the TSEC/KY-38 on the lower shelf of the carrying frame. The front (control) panel facing to the left with the access cover closest to the radio set.
 - (4) Buckle the strap around the TSEC/KY-38.

NOTE: The second strap may be wrapped vertically around the secure equipment and carrying frame.

- b. On Harness ST-138/PRC-25.
 - (1) Position the TSEC/KY-38 on the harness and spread carrier straps. The front (control) panel facing to the right with the access cover at the bottom.
 - (2) Snap together and tighten the two thin straps across the TSEC/KY-38.
 - (3) Buckle the two long straps around the TSEC/KY-38.

NOTE: These two straps may loosen after a while. You may want to tie or tape the tails of the straps to help hold the equipment secure.

- c. Connect the other end of Cable CX-10475/U to the RADIO connector of the TSEC/KY-38.
 - d. Connect the H-189/GR handset to the AUDIO connector of the TSEC/KY-38.
6. Place the system into operation. (Refer to fig 3.)
 - a. Set radio switches and controls.
 - (1) Turn the receiver-transmitter function switch to ON or SQUELCH, as authorized in the unit SOP.
 - (2) Refer to the CEOI extract and set the operating frequency of the net.

SKILL LEVEL 1

- (3) Set the receiver-transmitter VOLUME control fully clockwise.
- b. Set secure equipment switches and controls.
 - (1) Set the TSEC/KY-38 power switch to CIPHER and the VOLUME control to approximately midrange.
 - (2) Set the DELAY switch to IN.

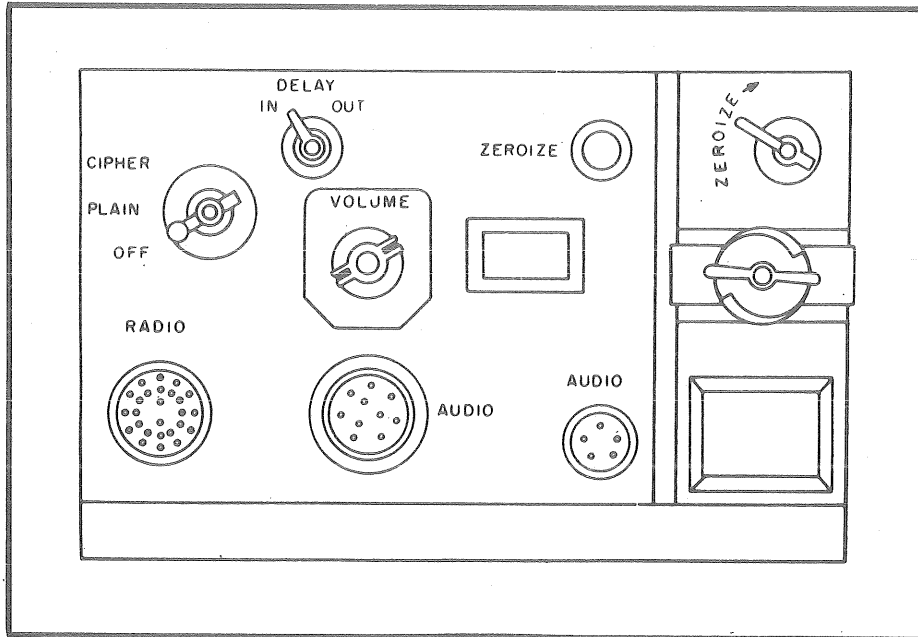


Figure 3. TSEC/KY-38 controls and indicators.

7. Operate the secure system.
 - a. Press the PUSH-TO-TALK switch on the handset. A multitone signal will be heard, followed by a final beep tone, then no tone. This sequence of events indicates overall system operation.

NOTE: System failure is indicated by either a continuous tone or a series of beeps when the PUSH-TO-TALK switch is pressed. If this condition exists, zeroize the TSEC/ KY-38 using the ZEROIZE lever and rekey using the KYK-28/TSEC.

- b. Adjust the system volume controls.
 - (1) For CIPHER operation, adjust the VOLUME control on the TSEC/KY-38.
 - (2) For PLAIN operation, adjust the VOLUME control on the receiver-transmitter.

WARNING: During manpack operation, use extreme caution when switching from CIPHER or PLAIN. The PLAIN-CIPHER switch is located high on the front panel. The ZEROIZE lever is located low and is more accessible. DO NOT reach back with the right hand and unconsciously flip a switch. If necessary, ask for assistance in switching.

- c. Set the DELAY switch to OUT.
 - d. Press the PUSH-TO-TALK switch on the handset. A single beep followed by quiet indicates normal system functioning.
 - e. Begin secure transmission and reception.
8. Zeroize KYK-28/TSEC.

NOTE: This step must be performed as soon as it is determined that CIPHER operation of the TSEC/KY-38 can be performed.

- a. Unlock and open the KYK-28/TSEC.
- b. Push the two locking levers to the rear.
- c. Move all slides to the zeroize position.
- d. Pull the locking levers forward.
- e. Close and lock the KYK-28/TSEC.

REFERENCES

- TM 11-5810-245-10
(O)TM 11-5810-300-12
TM 11-5820-667-12

TASK

113-618-1001

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, para 2-5 thru 2-13.)
2. Install Radio Set Control AN/GSA-7. (Refer to TM 11-5135-15, chap 2, para 11; and TM 11-5820-401-12, para 6-9.)
 - a. Insure Radio Set Control AN/GSA-7 is complete. (Refer to fig 1.)

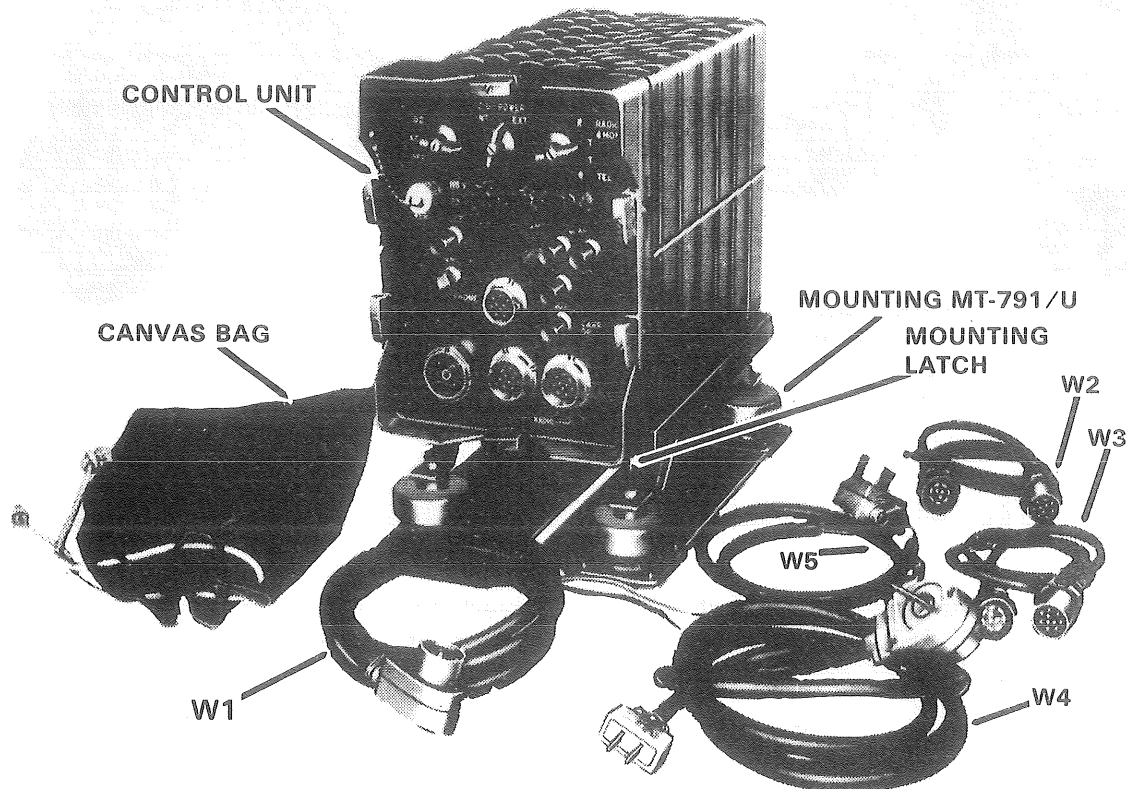


Figure 1. Radio Set Control AN/GSA-7.

- b. Insure Cable Assembly, Special Purpose, Electrical CX-7474/U is present. (Refer to fig 2, and TM 11-5820-401-12, para 6-9a(1) and b(2).)

SKILL LEVEL 1

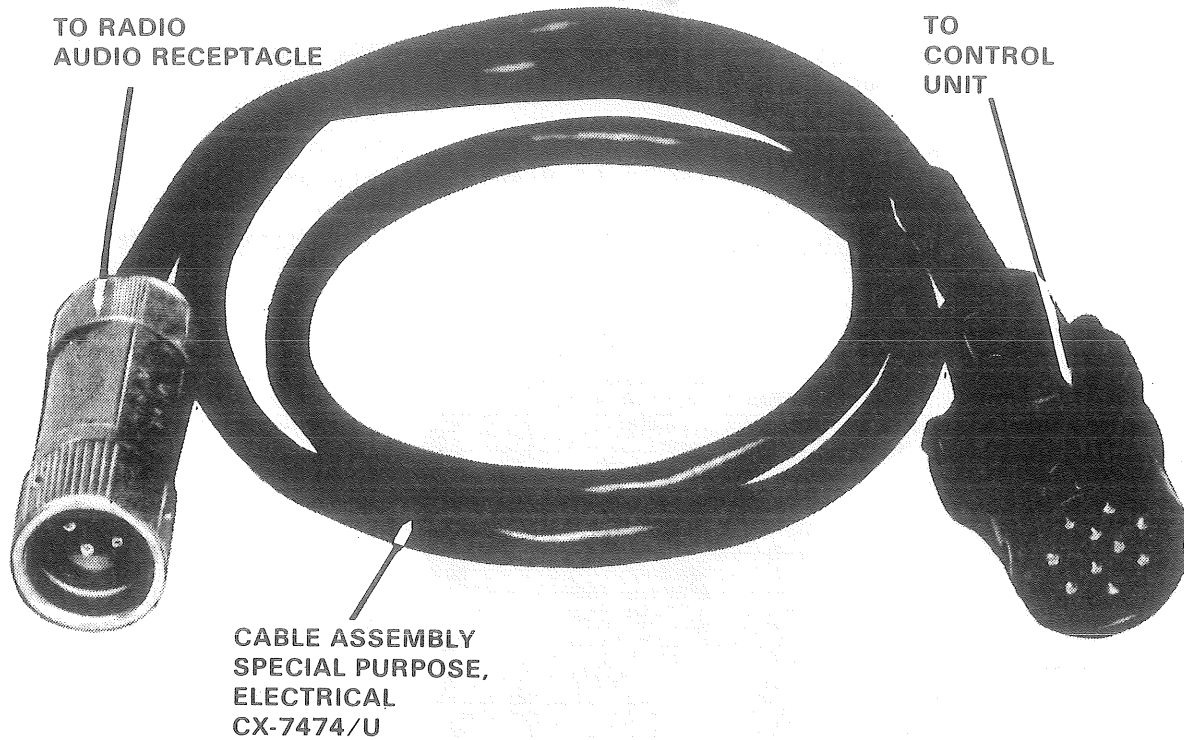


Figure 2. Cable Assembly, Special Purpose, Electrical CX-7474/U.

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.

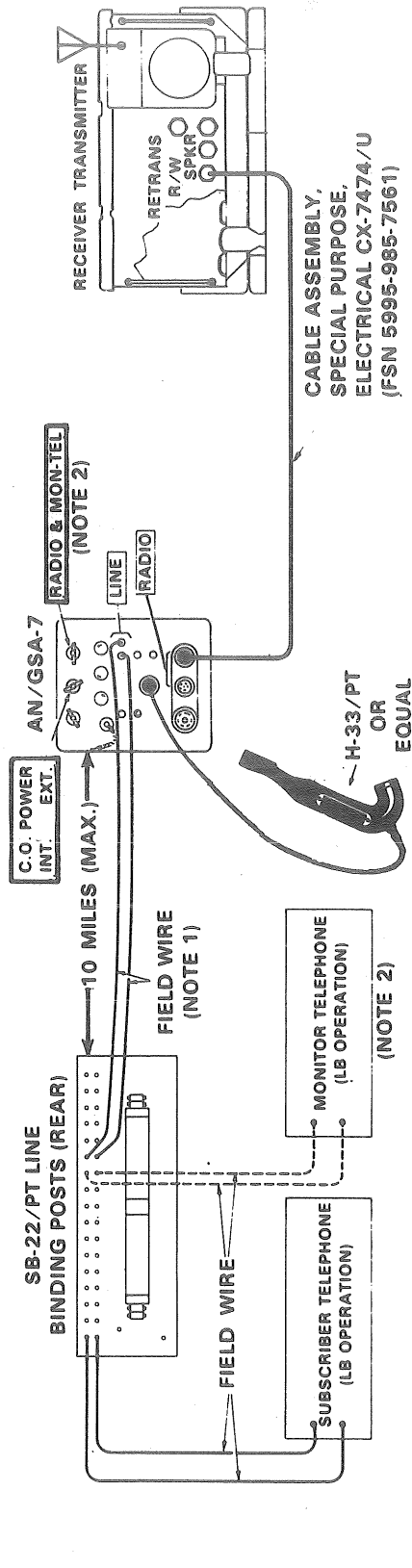
NOTE: Insure that the Radio Set AN/VRC-46 SQUELCH switch is in the OFF position (NEW or OLD).

3. Connect Radio Set Control AN/GSA-7 to a power source as required. (Refer to TM 11-5135-15, chap 2, para 11a.)
4. Insure POWER SELECTOR switch of the AN/GSA-7 is preset to correct power setting. (Refer to TM 11-5135-15, chap 2, para 11i thru j.)
5. Energize the AN/GSA-7 and the AN/VRC-46. (Refer to TM 11-5820-401-12, para 6-9a thru c.)

6. Connect the AN/GSA-7 to the AN/VRC-46. (Refer to TM 11-5820-401-12, para 6-9b.)
 - 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, para 6-9b(4)(e).)
 - 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-RADIO & MON position and listen for rushing noise from the radio set.

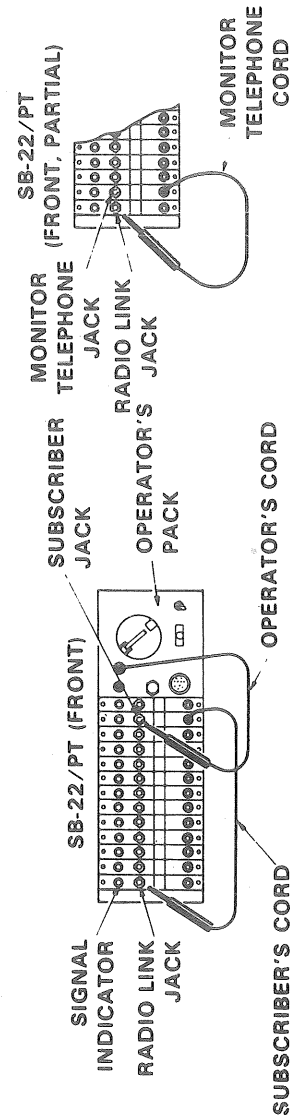
NOTE: If you do not hear rushing noise or it ceases, and you begin to hear BEEPS from the AN/GSA-7 (indicating the radio has been keyed), transpose the field wires at the line binding posts of the AN/GSA-7. The rushing noise should stop. If rushing noise does not stop, check the field wire for breaks 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, para 6-10a thru b.)
10. Install Radio Set Control Group AN/GRA-39 for remote or RWI operation. (Refer to fig 5, and TM 11-5820-401-12, para 6-8a thru b.)



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.

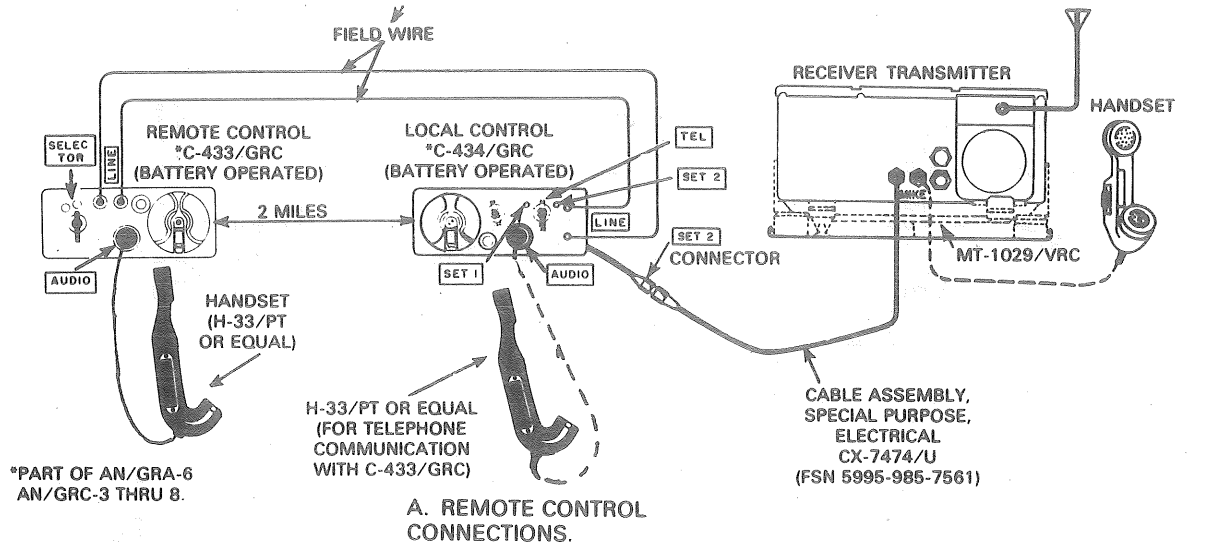


B. CORD CONNECTIONS FOR OPERATOR AND SUBSCRIBER COMMUNICATION ON RADIO LINK.

C. CORD CONNECTION FOR MONITOR TELEPHONE (NOTE 2).

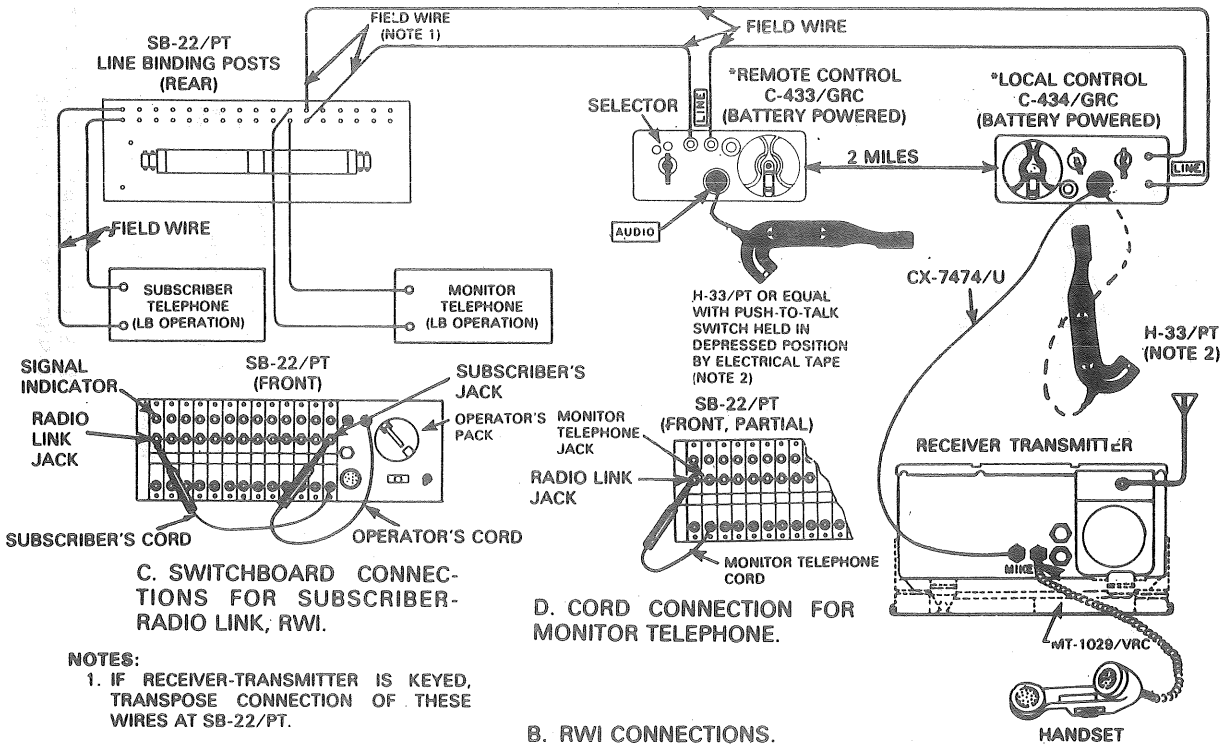
Figure 3. Connections and Control Settings of AN/GSA-7 and SB-22/PT to Provide Radio/Wire Integration Operation for Receiver-Transmitter.

WARNING
 POTENTIAL AS HIGH AS 45 VDC EXIST ON THESE WIRES WHEN THE RADIO IS KEYPED, AND AS HIGH AS 80 VAC WHEN TELEPHONE RINGING IS USED.



*PART OF AN/GRA-6
 AN/GRC-3 THRU 8.

CABLE ASSEMBLY,
 SPECIAL PURPOSE,
 ELECTRICAL
 CX-7474/U
 (FSN 5995-985-7561)

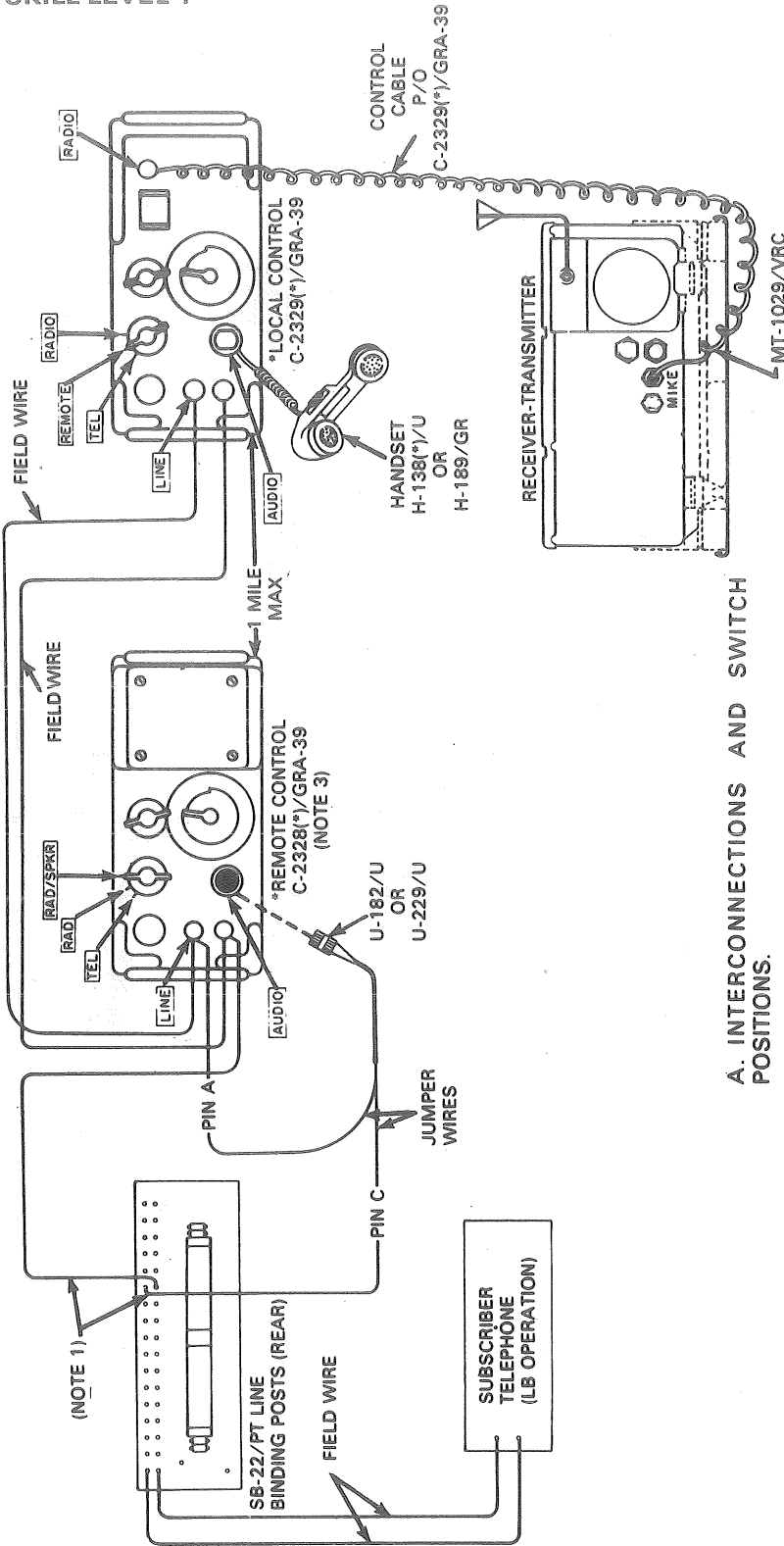


NOTES:

1. IF RECEIVER-TRANSMITTER IS KEYPED, TRANSPOSE CONNECTION OF THESE WIRES AT SB-22/PT.
2. REQUIRED FOR TELEPHONE COMMUNICATION WITH SWITCHBOARD
3. *PART OF AN/GRA-6.

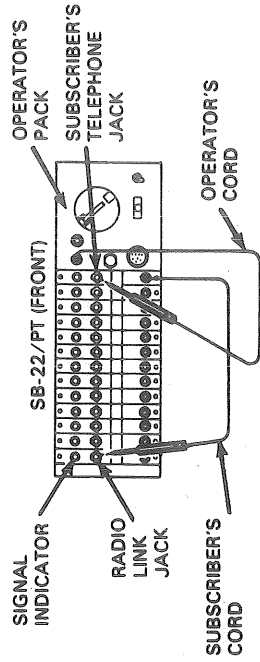
113-618-1001

Figure 4. Connections for Remote Control Operation and RWI Operation of Receiver-Transmitters Using AN/GRA-6.



A. INTERCONNECTIONS AND SWITCH POSITIONS.

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.



B. SWITCHBOARD CONNECTIONS FOR SUBSCRIBER-RADIO LINK.

Figure 5. AN/GRA-39(*) for Remote Control and Radio/Wire Integration with AN/VRC-12 Series Radios.

REFERENCES

TM 11-5820-401-12

TM 11-5135-15

TASK

113-618-2001

Operate 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 RWI system.
2. Distant radio station.
3. TM 11-5820-401-12.
4. CEOI.

Supervision and assistance will be available.

STANDARDS

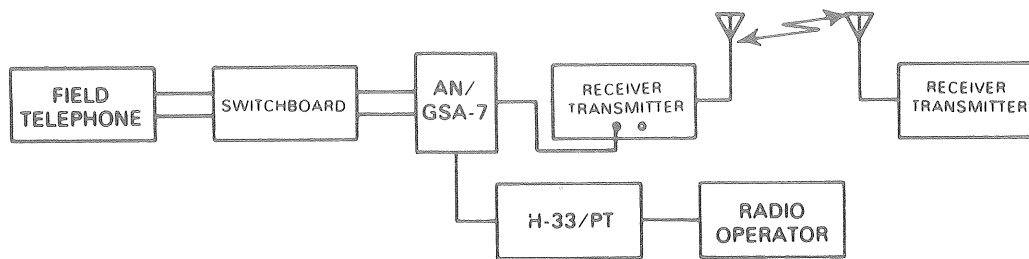
This task has been performed correctly when, in 10 minutes, the components are aligned to conform to the requirements in performance measures 2 and 3 of this task, and undistorted traffic has been passed according to performance measures 1 through 6.

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, para 6-9b.)



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

Figure 1. Typical radio wire integration (RWI) system.

- b. Set MONITOR switch on AN/GSA-7 to T-RADIO & 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, para 6-9b(2) and (3).)
 - 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, para 6-9d(1).)
 - 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, para 6-9d(1).)

SKILL LEVEL 1

- a. Advise distant radio station to stand by 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 T-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 11-5820-401-12, para 6-9c(3) and d(1).)
- 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

CEOI

TASK**113-620-1001**

Install 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 environment. Given a requirement and--

1. Radio Set AN/GRC-106(*).
2. TM 11-5820-520-12.
3. 8-inch flat-tip screwdriver.
4. Pliers.
5. Vehicle with Mount MT-3140/GRC-106 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, para 2-5.)
 - a. Place the RT-834/GRC in MT-3140/GRC-106 first.

SKILL LEVEL 1

- 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 the OPERATE position.

WARNING: Dangerous voltage exists at the antenna and antenna connectors of the AM-3349. Death can result due to accidental contact.

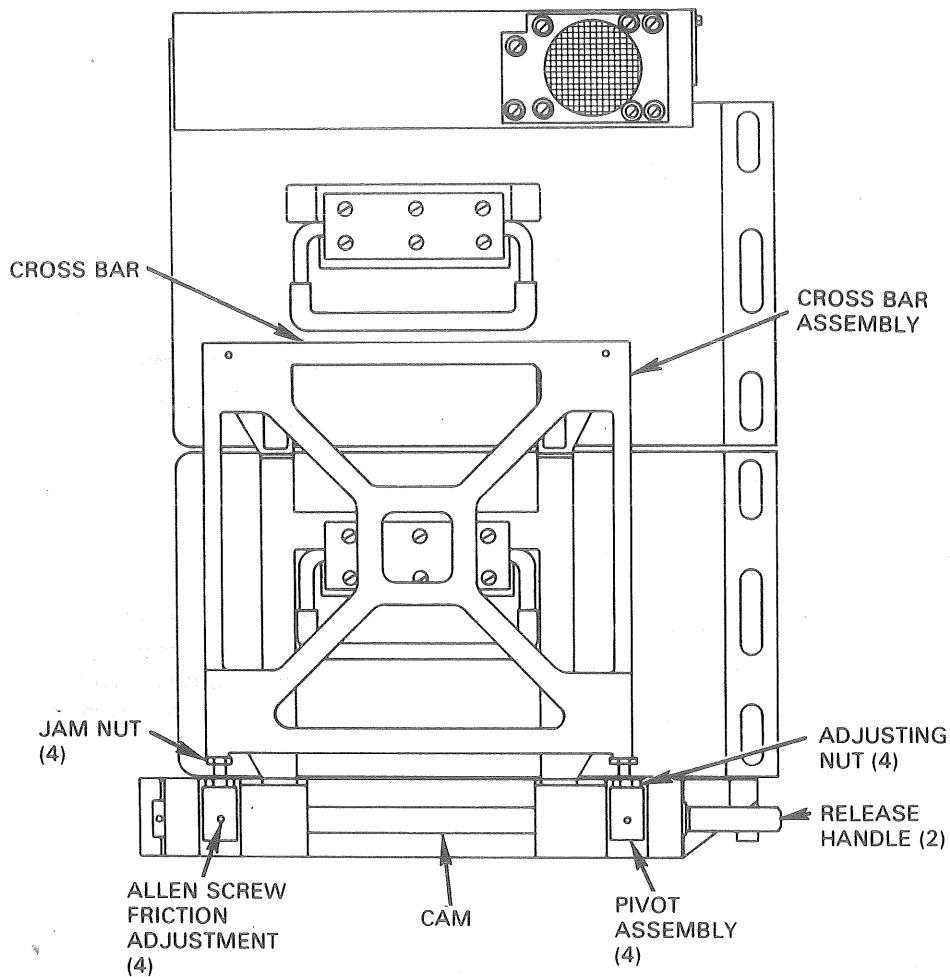


Figure 1. Radio Set AN/GRC-106(*) typical installation mounting details.

2. Connect all cables. (Refer to fig 2, and TM 11-5820-520-12, para 2-6.)
3. Connect audio accessories. (Refer to fig 2, and TM 11-5820-520-12, para 2-6.)
4. Install whip antenna. (Refer to fig 2, and TM 11-5820-520-12, para 2-6b and c.)

NOTE: If Radio Set AN/GRC-106(*) is to be operated at the halt for extended periods, ground the radio set.

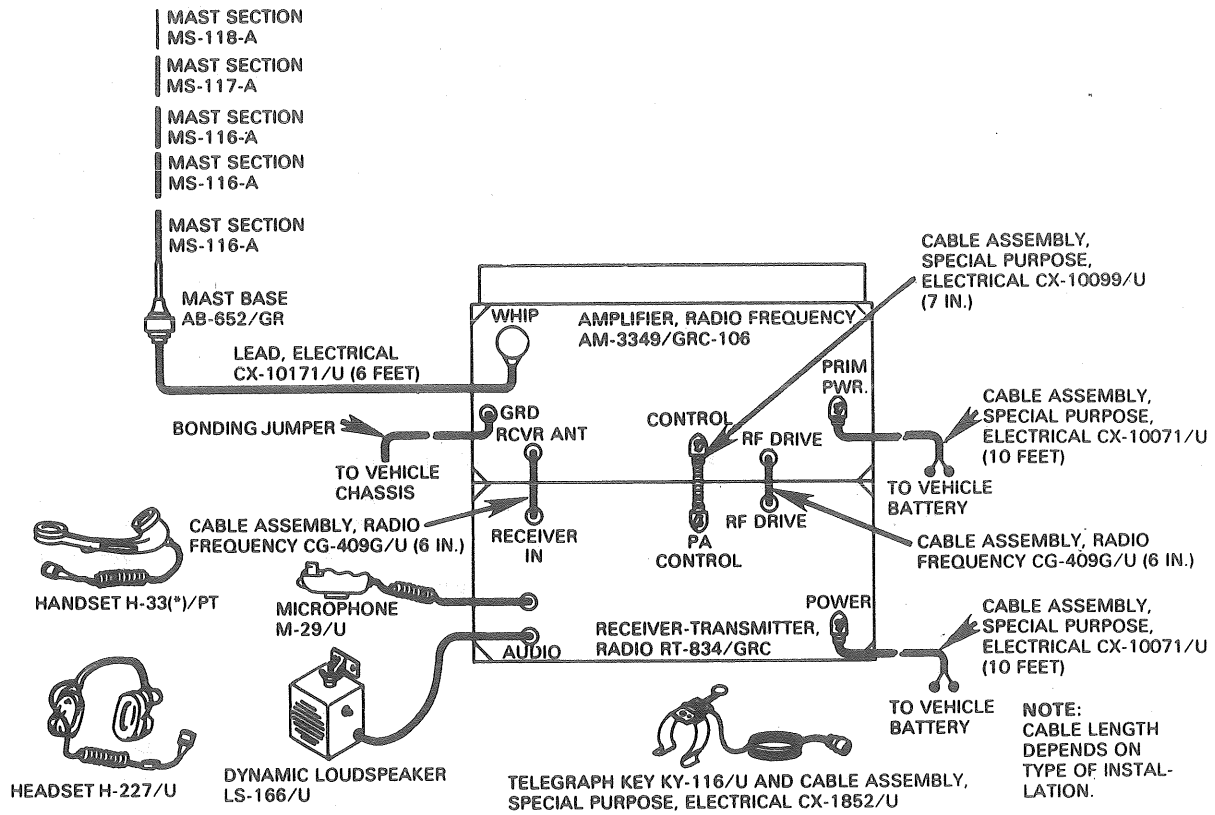


Figure 2. Installation diagram for Radio Set AN/GRC-106(*).

REFERENCES

TM 11-5820-520-12

TASK

113-620-1003

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 and FM 24-18.
3. Tool Kit TK-101/G.

Supervision and assistance will be available.

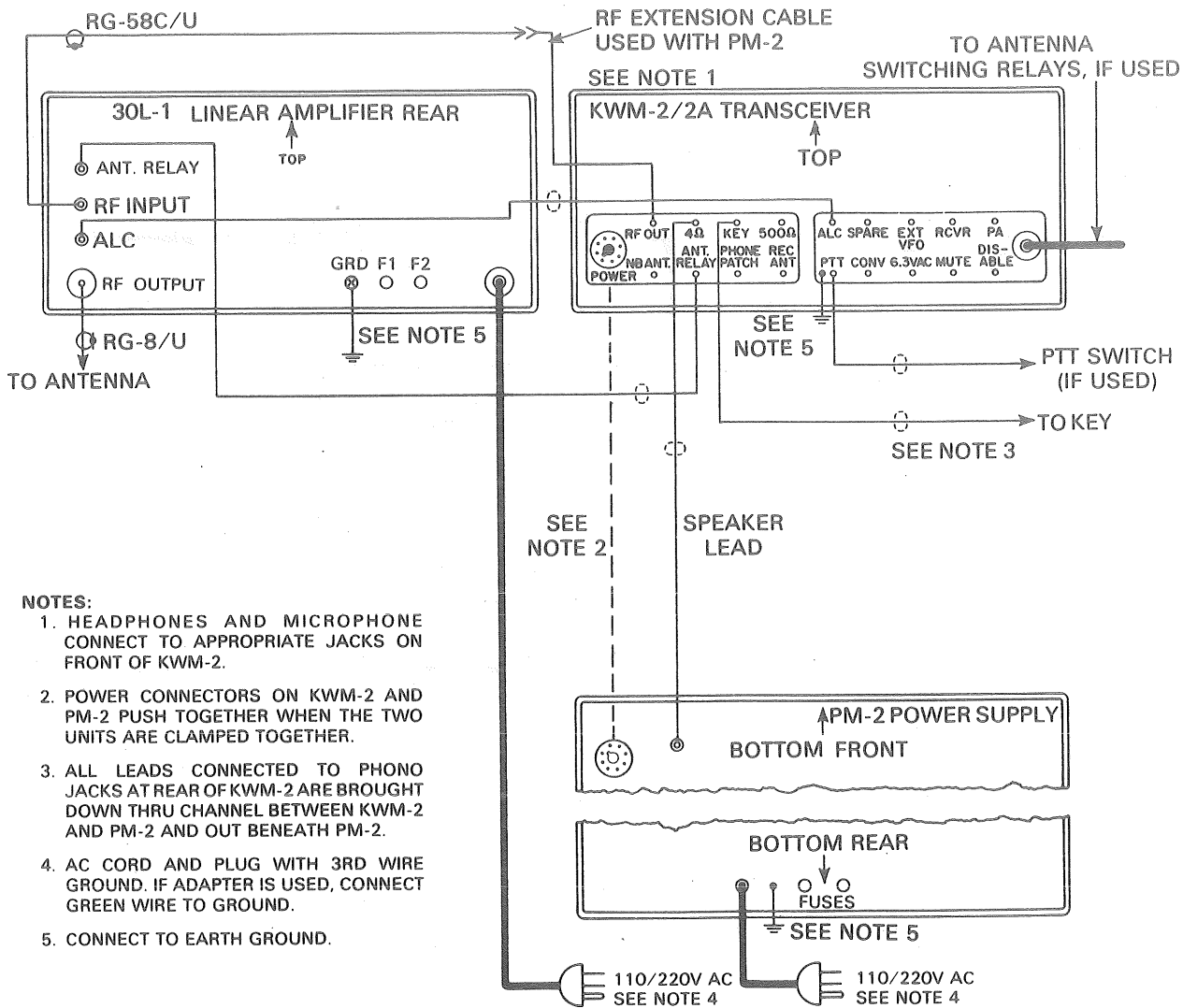
STANDARDS

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, para 11-1 thru 11-9.)

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.



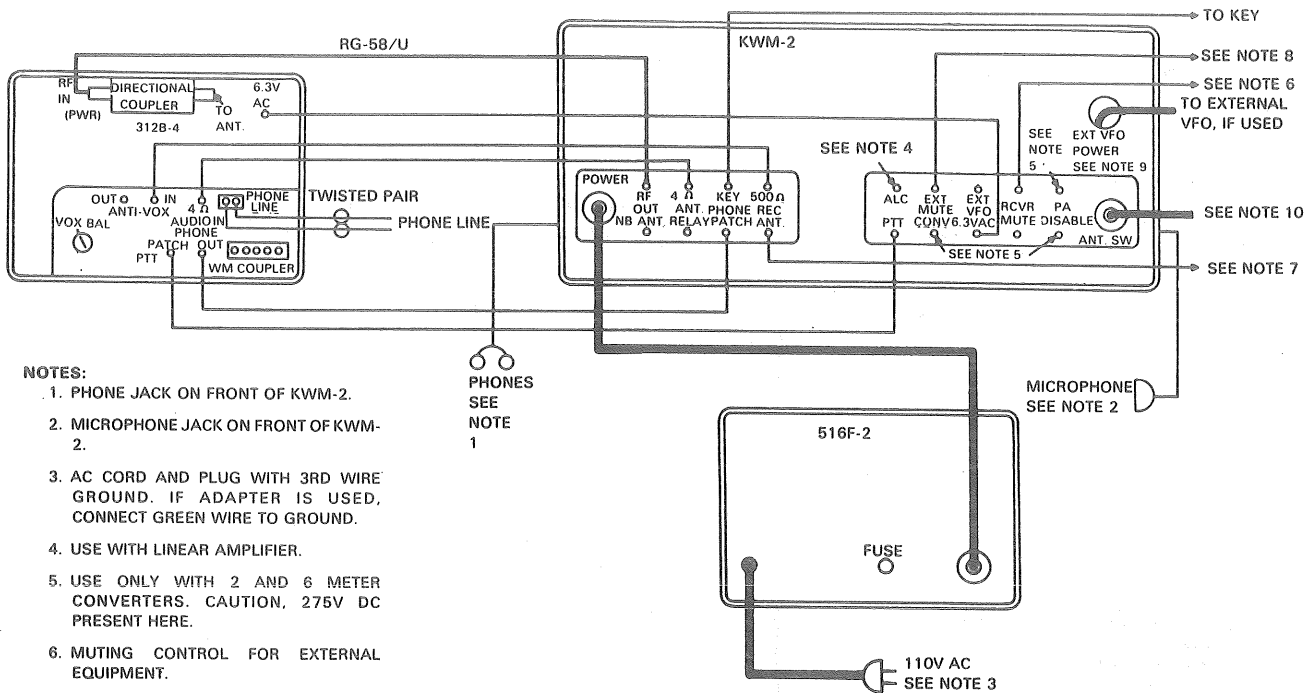
NOTES:

1. HEADPHONES AND MICROPHONE CONNECT TO APPROPRIATE JACKS ON FRONT OF KWM-2.
2. POWER CONNECTORS ON KWM-2 AND PM-2 PUSH TOGETHER WHEN THE TWO UNITS ARE CLAMPED TOGETHER.
3. ALL LEADS CONNECTED TO PHONO JACKS AT REAR OF KWM-2 ARE BROUGHT DOWN THRU CHANNEL BETWEEN KWM-2 AND PM-2 AND OUT BENEATH PM-2.
4. AC CORD AND PLUG WITH 3RD WIRE GROUND. IF ADAPTER IS USED, CONNECT GREEN WIRE TO GROUND.
5. CONNECT TO EARTH GROUND.

Figure 1. Traveling station installation

- a. Connect amplifier and transceiver as shown in figure 1 for 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, para 10-4 and 10-5.)
- a. Interconnect the C-6118/FRC-93 (Collins C-312B-4) as shown in figure 2.

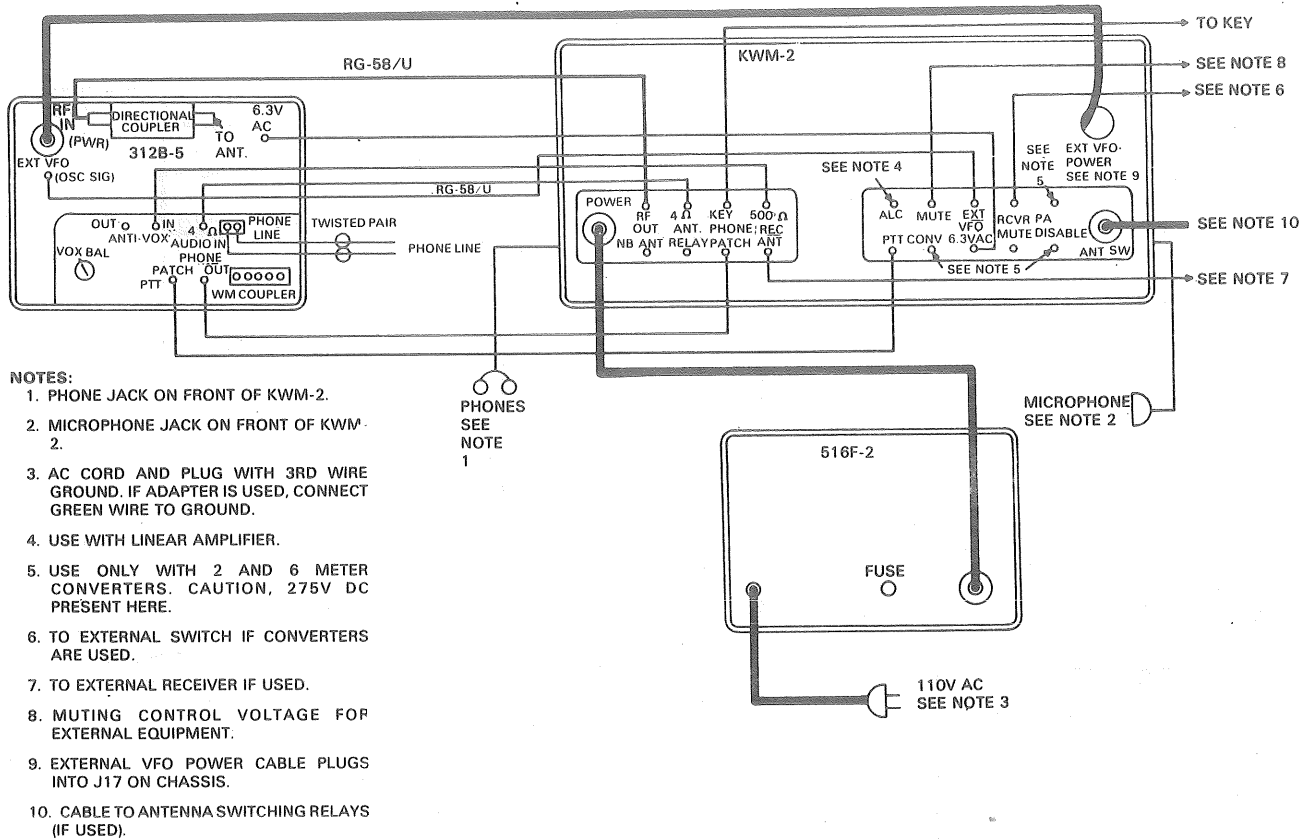
SKILL LEVEL 1



- 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).

Figure 2. Fixed or mobile station installation.

b. Interconnect the C-7515/FRC-93 (Collins C-312B-5) as shown in figure 3.



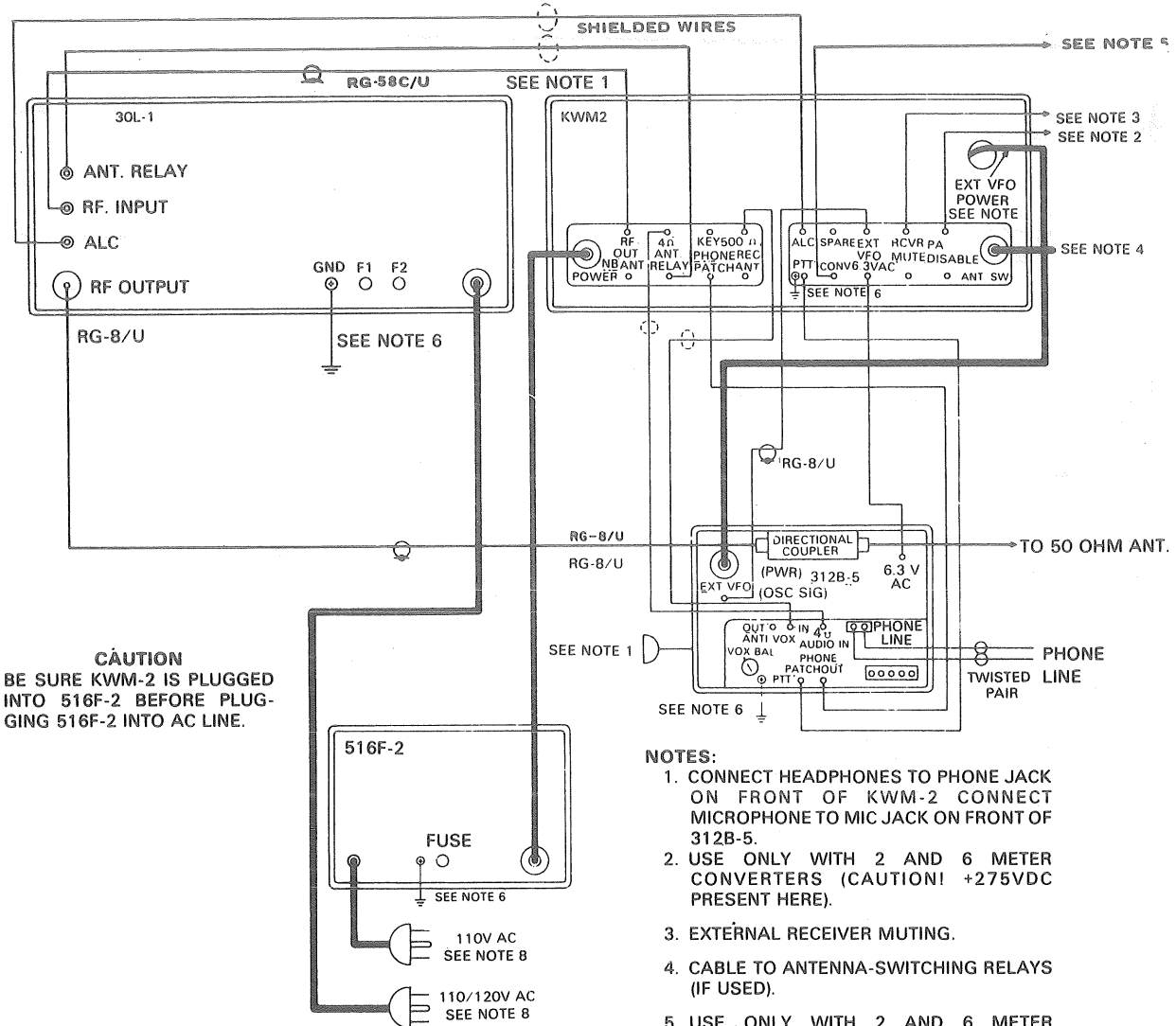
NOTES:

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. TO EXTERNAL SWITCH IF CONVERTERS ARE USED.
7. TO EXTERNAL RECEIVER IF USED.
8. MUTING CONTROL VOLTAGE FOR EXTERNAL EQUIPMENT.
9. EXTERNAL VFO POWER CABLE PLUGS INTO J17 ON CHASSIS.
10. CABLE TO ANTENNA SWITCHING RELAYS (IF USED).

Figure 3. Interconnects, Collins 312B-5 with KWM-2/2A.

- c. Insure that all equipment is properly interconnected and grounded in accordance with (IAW) applicable TMs prior to applying power.
- d. Fixed or mobile station interconnections for Radio Set AN/FRC-93 are shown in figure 4.

SKILL LEVEL 1



- NOTES:**
1. CONNECT HEADPHONES TO PHONE JACK ON FRONT OF KWM-2. CONNECT MICROPHONE TO MIC JACK ON FRONT OF 312B-5.
 2. USE ONLY WITH 2 AND 6 METER CONVERTERS (CAUTION! +275VDC PRESENT HERE).
 3. EXTERNAL RECEIVER MUTING.
 4. CABLE TO ANTENNA-SWITCHING RELAYS (IF USED).
 5. USE ONLY WITH 2 AND 6 METER CONVERTERS.
 6. CONNECT TO EARTH GROUND.
 7. EXTERNAL VFO POWER CABLE PLUGS INTO J17 ON KWM-2 CHASSIS.
 8. AC CORD AND PLUG WITH 3RD WIRE GROUND. IF ADAPTER IS USED, CONNECT GREEN WIRE TO GROUND.

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, para 3-7, fig 3-1, Note 8.)
 - a. Insure that equipment is grounded IAW applicable TMs prior to operation.
 - b. Insure that external power sources, i.e., generator set(s), are properly grounded IAW operator's TM for equipment used.
5. Erect antenna. (Refer to TM 11-5820-554-12, para 13-1 thru 13-5.)
 - 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.

SKILL LEVEL 1

- (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.

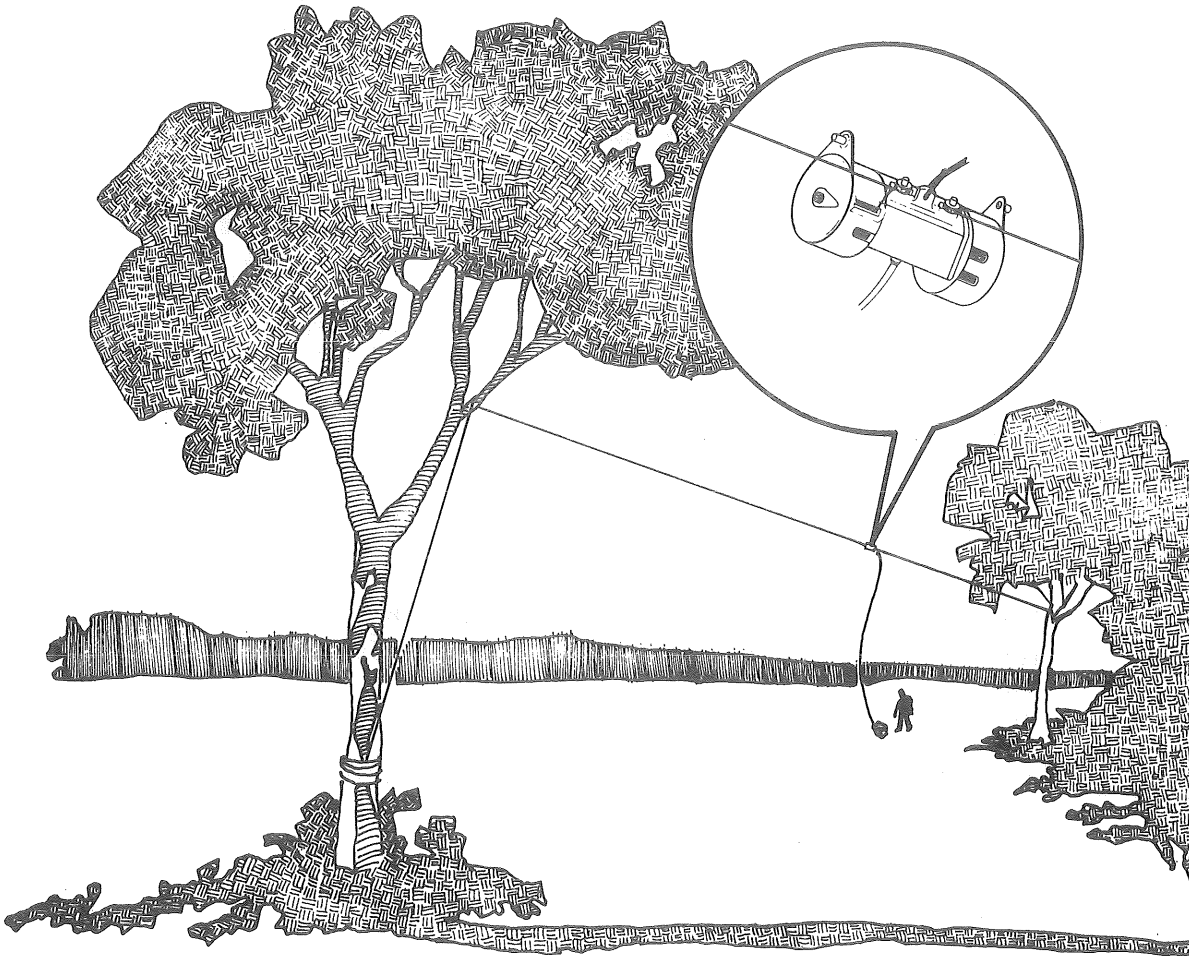


Figure 5. Collins Antenna 637T-2 dipole antenna fixture connections.

- (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."

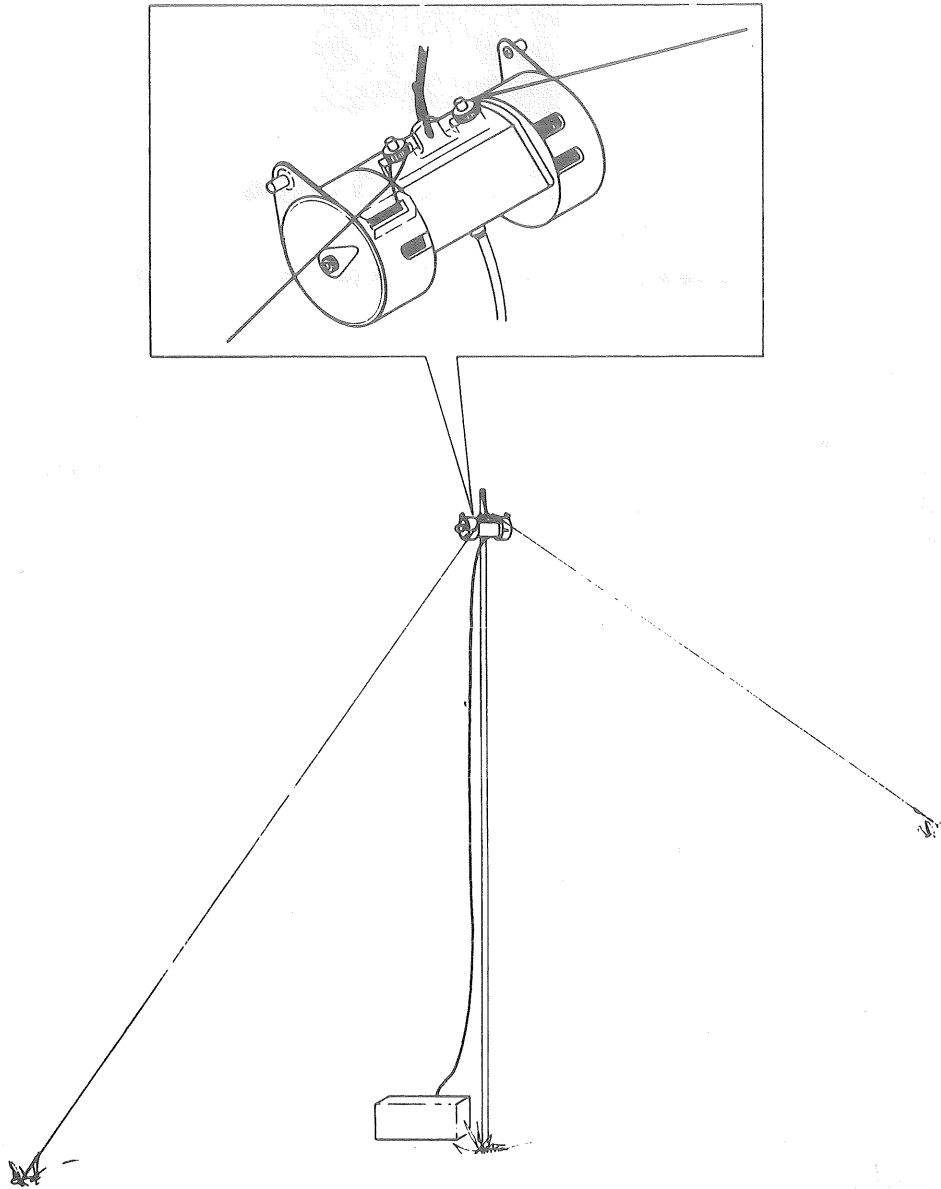


Figure 6. Collins Antenna 637T-2, supported at housing.

REFERENCES

TM 11-5820-554-12

FM 24-18

TASK

113-620-1004

Install Radio Set AN/PRC-74B

CONDITIONS

This task is performed under all weather conditions in an Unconventional Warfare Operations Area (UMOA) by a Special Forces Operational Detachment (SFOD). To accomplish this task your team chief will provide you with the following:

1. Radio Set AN/PRC-74.
2. Battery Box CY-1314.
3. Complete accessory kit.
4. Coder-Burst Group AN/GRA-71.
5. TM 11-5820-590-12-1.
6. 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, para 1-6.)

2. Prepare Radio Set AN/PRC-74 for man-pack operation. (Refer to TM 11-5820-590-12-1, para 2-3a.)
- a. If using battery pack (Battery Box CY-6314/PRC-74), insure that batteries are installed as shown in figure 1.

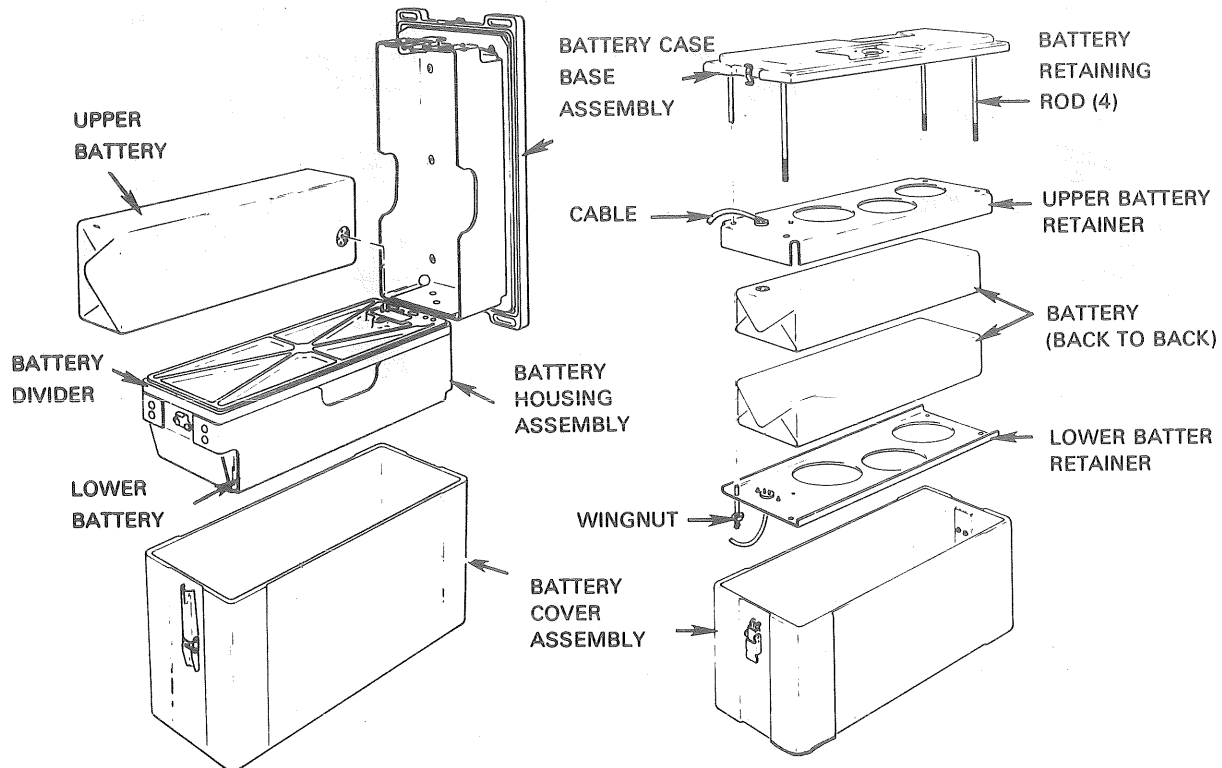


Figure 1. Dry battery for Battery Boxes CY-6314A/PRC-74 or CY-6314/PRC-74.

- 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.
- d. Engage and lock the two latches located on both sides of receiver-transmitter unit.

SKILL LEVEL 1

- e. Attach Whip Antenna Mounting Bracket MT-3613/PRC-74 supplied with Radio Set AN/PRC-74 as shown in figure 2 by performing these procedures:

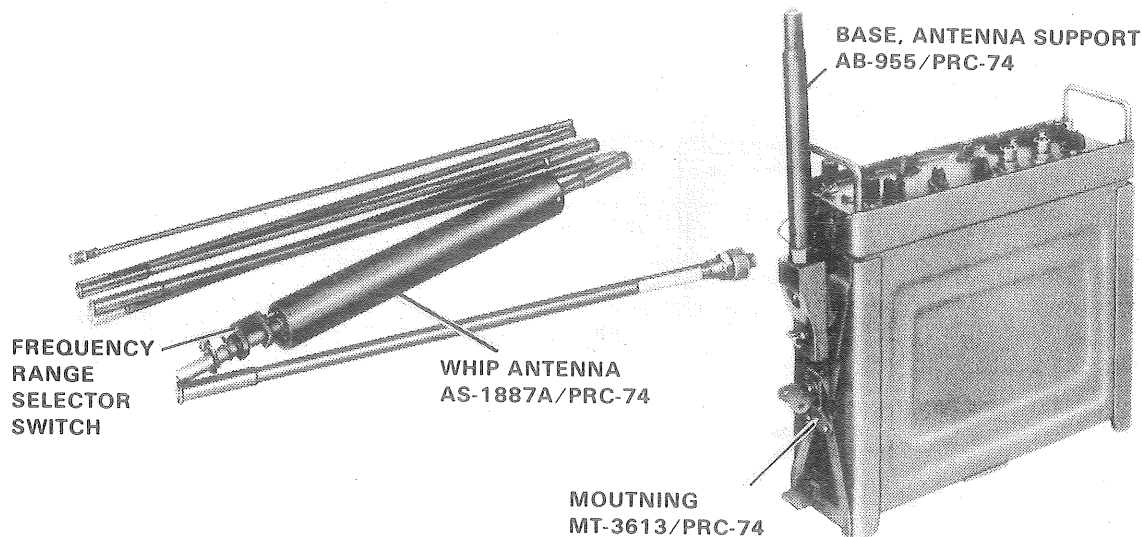


Figure 2. Radio AN/PRC-74 with antenna.

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-74. (Refer to FM 24-18, chap 6, para 75 thru 77.)

4. Erect slant wire antenna for AN/PRC-74B. (Refer to TM 11-5820-590-12-1, para 2-5b.)

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.

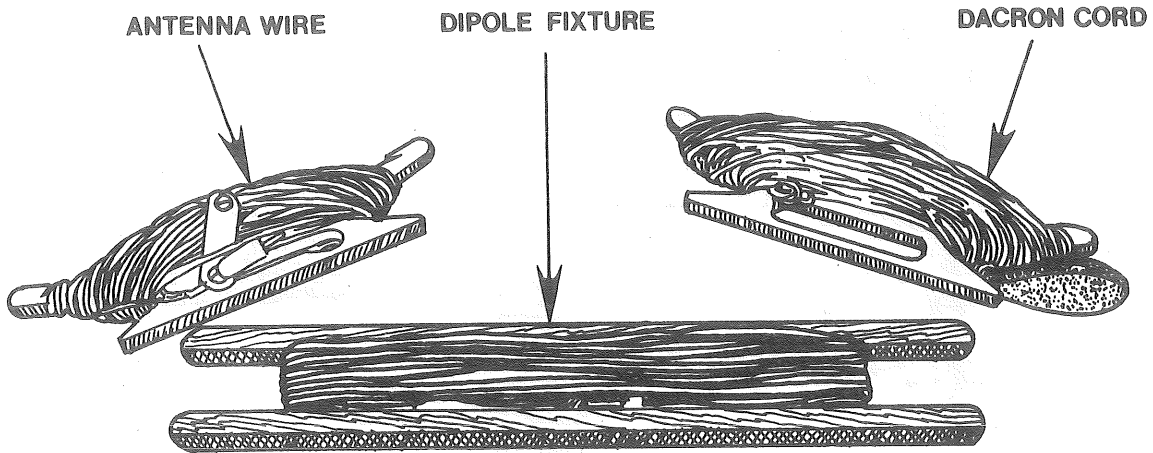


Figure 3. Antenna Kit MK-911A/PRC-74.

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

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.

SKILL LEVEL 1

- 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.

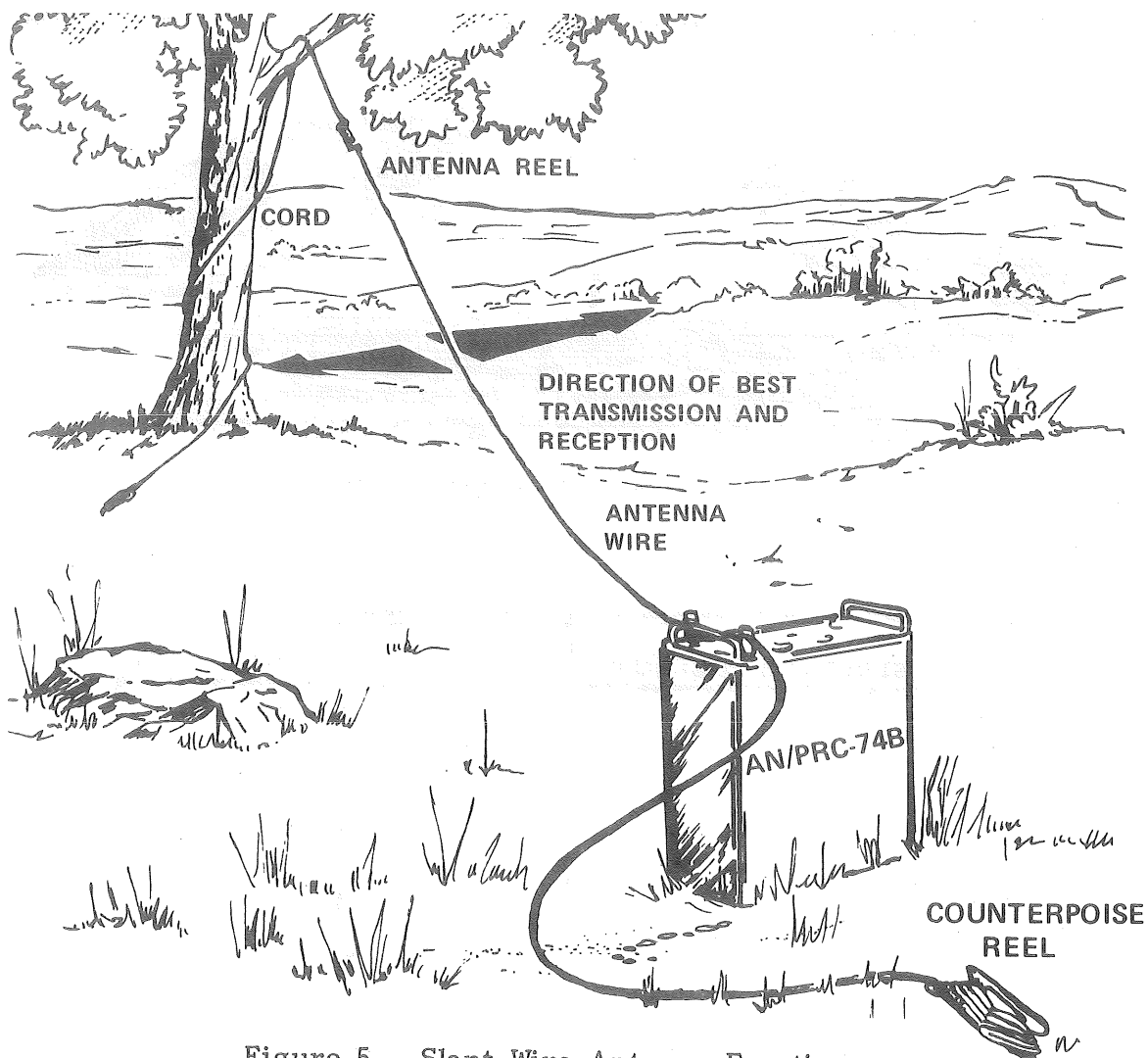


Figure 5. Slant Wire Antenna Erection.

- e. Attach a weight to one end of dacron cord provided with antenna kit; throw the weight over any convenient antenna support, and raise antenna broadside to receiving station as shown in figure 5.

5. Erect dipole antenna for Radio Set AN/PRC-74. (Refer to TM 11-5820-590-12-1, para 2-5c.)

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.

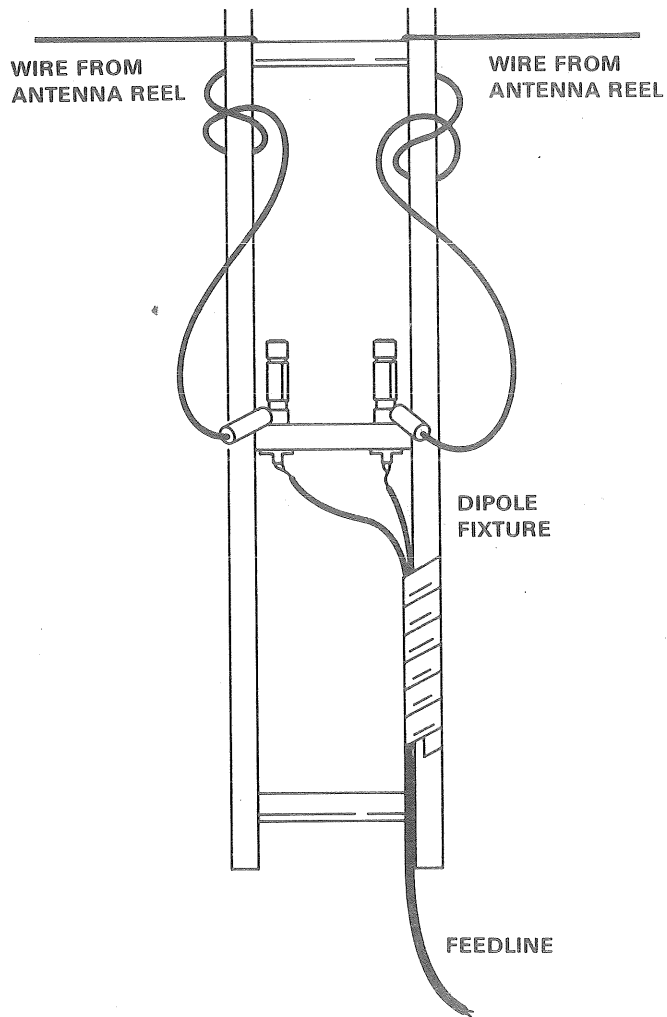


Figure 6. Dipole antenna fixture connections

SKILL LEVEL 1

- 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-74.
- d. Erect antenna as illustrated in figure 7.

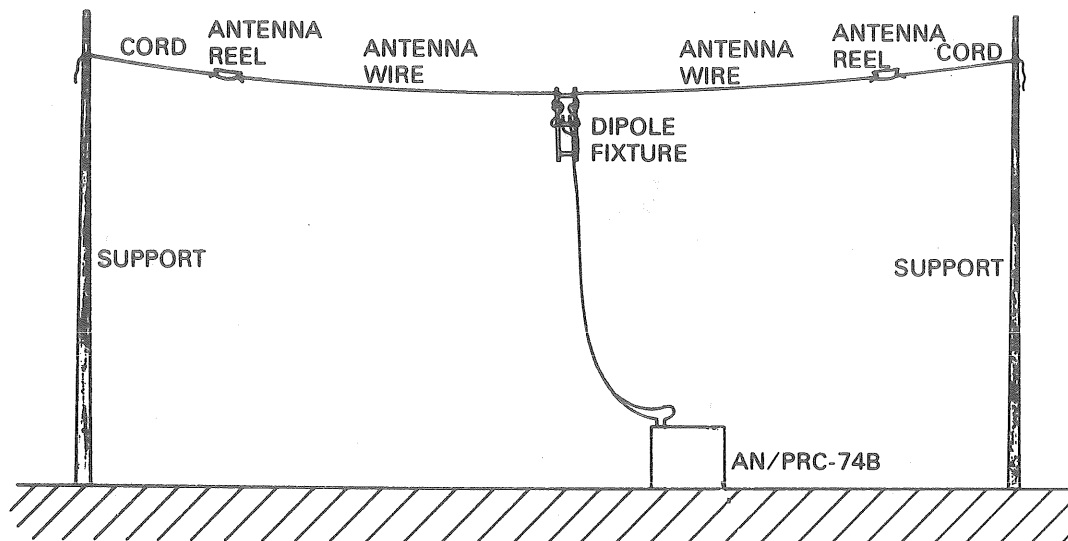


Figure 7. Erected dipole antenna.

REFERENCES

TM 11-5820-590-12-1

FM 24-18

TASK**13-620-2001**

Operate Radio Set AN/GRC-106(*)

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 have a complete Radio Set AN/GRC-106(*) already positioned with a proper ground, antenna connection, and power supply. You will have 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 of this task, 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 procedures. (Refer to fig 1 thru 4, and TM 11-5820-520-12, para 3-4.)

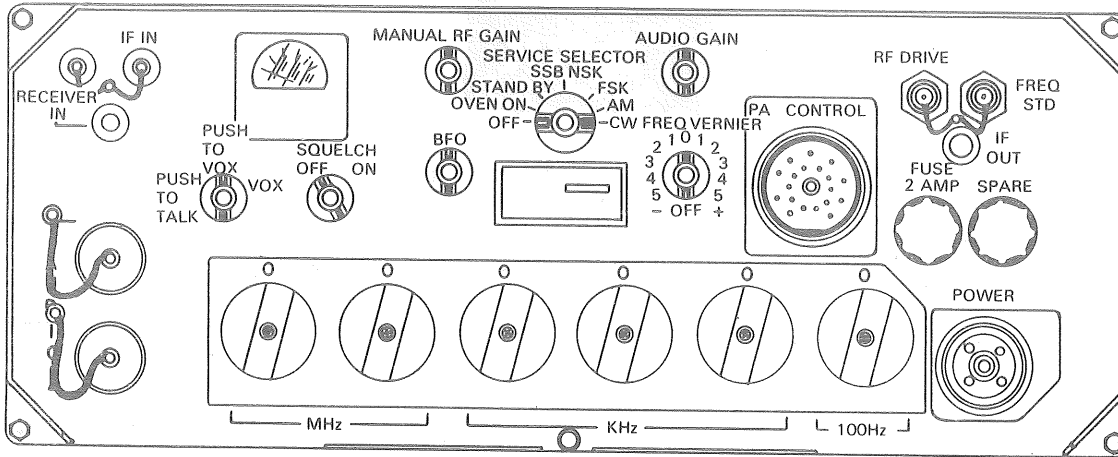


Figure 1. Receiver-Transmitter, Radio RT-834/GRC, controls, indicators, and connectors.

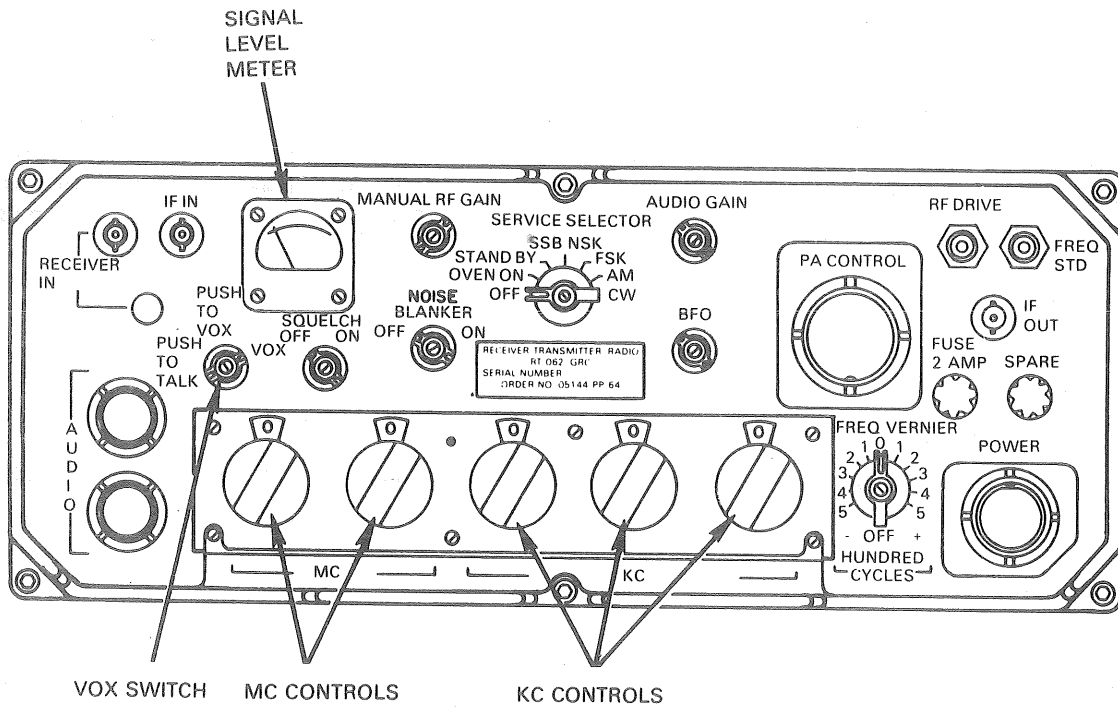


Figure 2. Receiver-Transmitter, Radio RT-662/GRC, controls, indicators, and connectors.

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.

Figure 3. Operator presets for Radio Set AN/GRC-106(*).

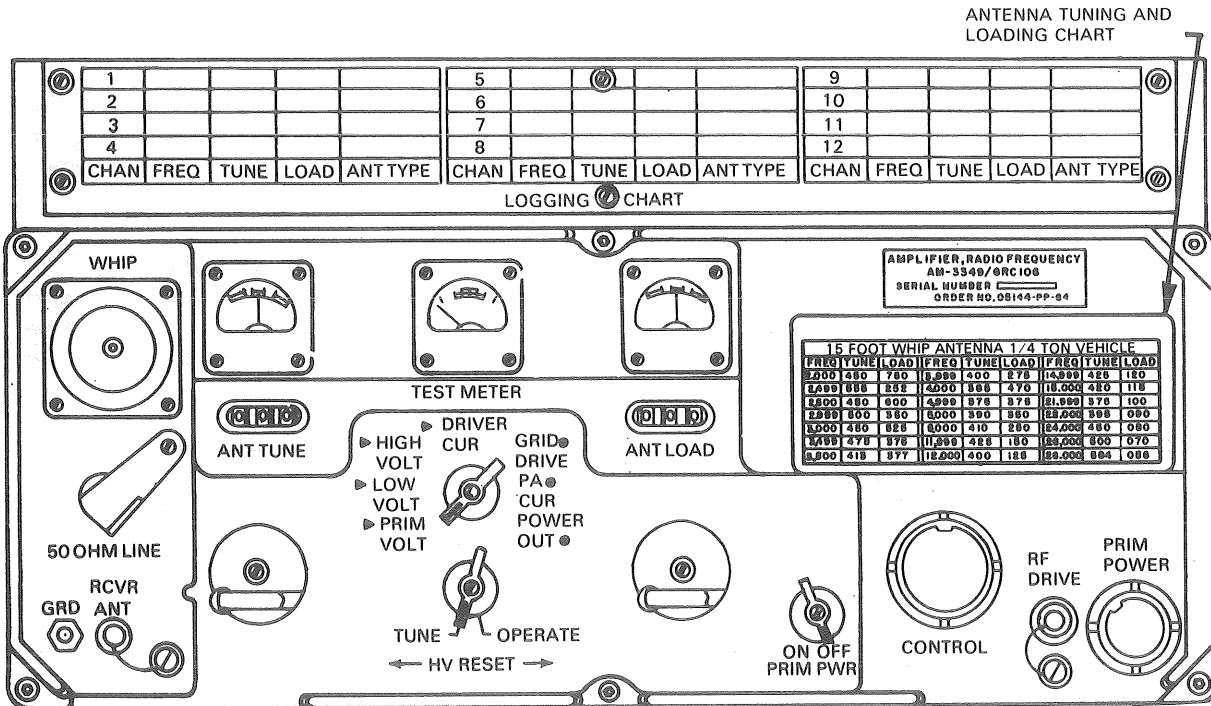


Figure 4. Amplifier, Radio Frequency AM-3349/GRC-106 controls, indicators, and connectors.

SKILL LEVEL 1

3. Conduct starting procedures. (Refer to TM 11-5820-520-12, para 3-5.)
 - 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 TM 11-5820-520-12, para 4-4, table 4-2, Operator's Troubleshooting Chart.

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.
4. Conduct tuning procedures for CW operation. (Refer to TM 11-5820-520-12, para 3-6.)
 - a. Place the SERVICE SELECTOR switch of the RT-662/GRC or RT-834/GRC to CW.
 - b. Set the RT-662/GRC or RT-834/GRC MHz and kHz controls to the assigned frequency.
 - c. Adjust the AM-3349/GRC-106 ANT TUNE control to match the numbers on the antenna tuning and loading chart.

- d. Adjust the AM-3349/GRC-106 ANT LOAD control to match the 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, move the AM-3349/GRC-106 HV RESET switch to operate and the RT-662/GRC or RT-834/GRC SERVICE SELECTOR switch to STANDBY for 5 minutes cooling. After 5 minutes cooling, set the SERVICE SELECTOR switch to the previous position, and the HV RESET switch to TUNE, and proceed with the tuning procedures.

CAUTION 2: ANT TUNE and ANT LOAD controls will interact with each other. To center their respective meter pointers, rotate them slowly in the direction that you want the pointers to go.

CAUTION 3: Be sure the antenna is attached for proper loading to prevent damage to the equipment while performing tuning procedures.

- e. Set the AM-3349/GRC-106 HV RESET switch to TUNE. Wait for a deflection on the ANT TUNE and ANT LOAD meters.
- f. Adjust the AM-3349/GRC-106 ANT LOAD control for a center scale reading on the ANT LOAD meter by rotating the control in the direction the meter pointer is to move.
- g. Adjust the AM-3349/GRC-106 ANT TUNE control for a center scale reading on the ANT TUNE meter by rotating the control in the direction the meter pointer is to move while keeping the ANT LOAD meter as close to center scale as possible.
- h. Tuning of the AM-3349/GRC-106 is complete when simultaneous center scale readings are obtained on the ANT TUNE and ANT LOAD meters.
- i. Check TEST METER functions.
- (1) Set the AM-3349/GRC-106 TEST METER switch to LOW VOLT. TEST METER pointer indicates within GREEN portion area of top scale.
 - (2) Set the AM-3349/GRC-106 TEST METER switch to HIGH VOLT. TEST METER pointer indicates within GREEN portion area of top scale.

SKILL LEVEL 1

- (3) Set the AM-3349/GRC-106 TEST METER switch to DRIVER CUR. TEST METER pointer indicates within the two DARK GREEN wedges of top scale.
- (4) Set the AM-3349/GRC-106 TEST METER switch to GRID DRIVE. TEST METER pointer indicates just below (to the left of) GRAY portion of the bottom scale.
- (5) Set the AM-3349/GRC-106 TEST METER switch to PA CUR. TEST METER pointer indicates just below (to the left of) the GRAY portion of the bottom scale.
- (6) Set the AM-3349/GRC-106 TEST METER switch to POWER OUT. TEST METER pointer indicates just below (to the left of) GRAY area of scale.
- (7) Return HV RESET of the AM-3349/GRC-106 to the OPERATE position.
- (8) Drop operating frequency by 2 kHz to complete tuning for CW.

NOTE: If above TEST METER readings cannot be obtained, place the AM-3349/GRC-106 HV RESET switch to OPERATE, the RT-834 or 662/GRC-106 SERVICE SELECTOR switch to STANDBY and notify your immediate supervisor.

5. Conduct voice operating procedure. (Refer to TM 11-5820-520-12, para 3-7.)
 - a. Place the SERVICE SELECTOR switch of the RT-662/GRC or RT-834/GRC to SSB/NSK.
 - b. The desired audio accessories (H-33/PT, H-227/U, M-29B/U, LS-166/U) will be connected to the AUDIO connectors of the RT-662/GRC or RT-834/GRC front panels.

CAUTION: Changes of 100 kHz in frequency setting require retuning of this radio set or damage may occur to the AM-3349.

- c. Adjust AUDIO GAIN control to a comfortable listening level.
6. Perform stopping procedures. (Refer to TM 11-5820-520-12, para 3-8.)

SKILL LEVEL 1

- a. Place SERVICE SELECTOR switch on the RT-834(662) to STANDBY (minimum of 2 minutes).
- b. After 2 minutes place PRIMARY POWER switch to OFF on AM-3349.
- c. Place SERVICE SELECTOR switch to OFF on the RT-834(662).

NOTE: If radio set is not to be used for 1 hour or less, place the SERVICE SELECTOR switch to STANDBY.

REFERENCES

TM 11-5820-520-12

TB SIG 291

TASK

113-620-2002

Perform Operator Troubleshooting Procedures 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 environment. Given a requirement and--

1. Radio Set AN/GRC-106(*).
2. TM 11-5820-520-12, TM 38-750.
3. 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, para 4-4 thru 4-6.)

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.

Figure 1. Operator's troubleshooting chart for Radio Set AN/GRC-106(*).

NOTE: Insure that fuse, 2 AMP, located on front panel of RT-834/GRC-106 or RT-622/GRC-106 is present prior to performing any checks or troubleshooting procedures.

SKILL LEVEL 1

ITEM	TROUBLE SYMPTON	PROBABLE CAUSE	CHECK AND CORRECTIVE MEASURES
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.
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. CAUTION: 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.

Figure 1. Operator's troubleshooting chart for Radio Set AN/GRC-106(*) (Cont).

- 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, pp 3-6 thru 3-13.)

3. Notify your immediate supervisor or supporting maintenance activity of any troubles you were unable to correct. (Refer to TM 38-750, pp 3-6 thru 3-13.)

REFERENCES

TM 11-5820-520-12

TM 38-750

TASK

113-620-2005

Operate Radio Set AN/FRC-93

CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. One other station will be prepared to work in a net with you. Given a requirement and --

1. An operational Radio Set AN/FRC-93.
2. TM 11-5820-554-12.
3. CEOI.

Supervision and assistance will 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, para 3-13.)

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, table 3-2.)

BAND-SWITCH POSITION	FREQUENCY BAND	CRYSTAL SUPPLIED	CRYSTAL SOCKET CONNECTED	TOTAL COVERAGE
1A - 3.4 2A - 3.6 3A - 3.8	3.4 - 3.6 MHz 3.6 - 3.8 MHz 3.8 - 4.0 MHz	6.555 MHz 6.755 MHz 6.955 MHz	1A 2A 3A	A 3.4 - 4.0 MHz
1B - 7.0 2B - 7.2	7.0 - 7.2 MHz 7.2 - 7.4 MHz	10.155 MHz 10.355 MHz	1B 2B	B 6.5 - 9.5 MHz
1C - 14.0 2C - 14.2 3C - 14.8	14.0 - 14.2 MHz 14.2 - 14.4 MHz 14.8 - 15.0 MHz	8.5775 MHz 8.6775 MHz 8.9775 MHz	1C 2C 3C	C 9.5 - 15.0 MHz
1D - 21.0 2D - 21.2 3D - 21.4	21.0 - 21.2 MHz 21.2 - 21.4 MHz 21.4 - 21.6 MHz	12.0775 MHz 12.1775 MHz 12.2775 MHz	1D 2D 3D	D 15.0 - 22.0 MHz
1E - 28A 2E - 28B 3E - 28C	28.5 - 28.7 MHz As selected As selected	15.8275 MHz Not furnished Not furnished	1E 2E 3E	E 22.0 - 30.0 MHz

Figure 1. Crystal frequencies and operating bands.

- 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.)

SKILL LEVEL 1

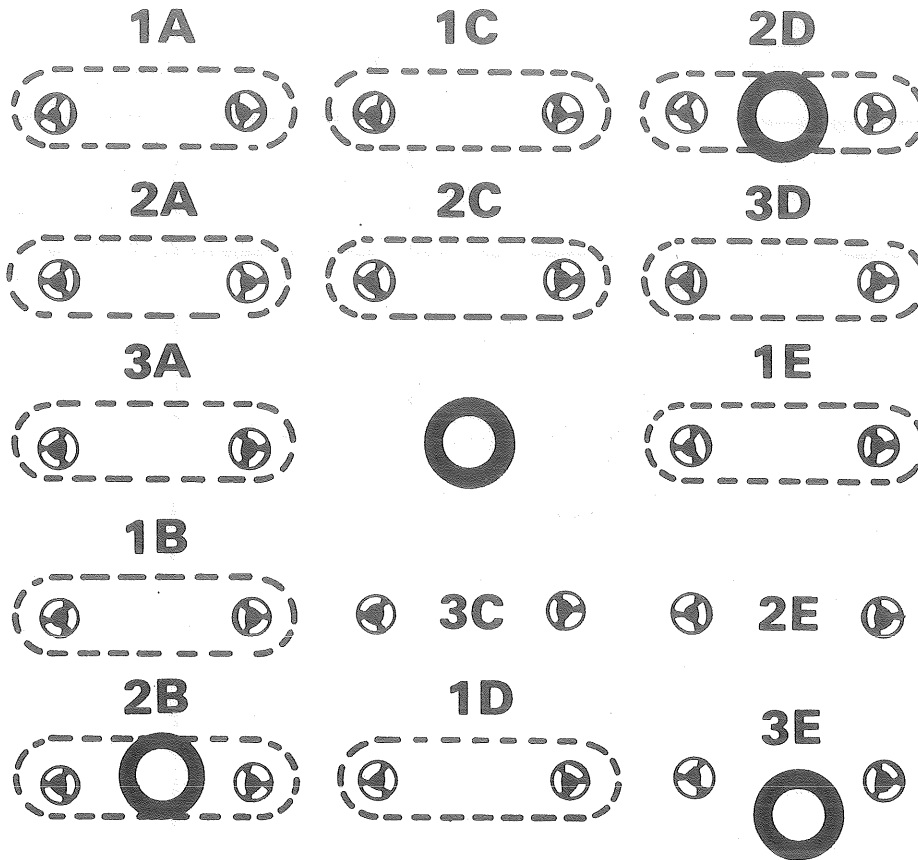


Figure 2. Crystal socket locations.

- 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, para 3-9 thru 3-11.)

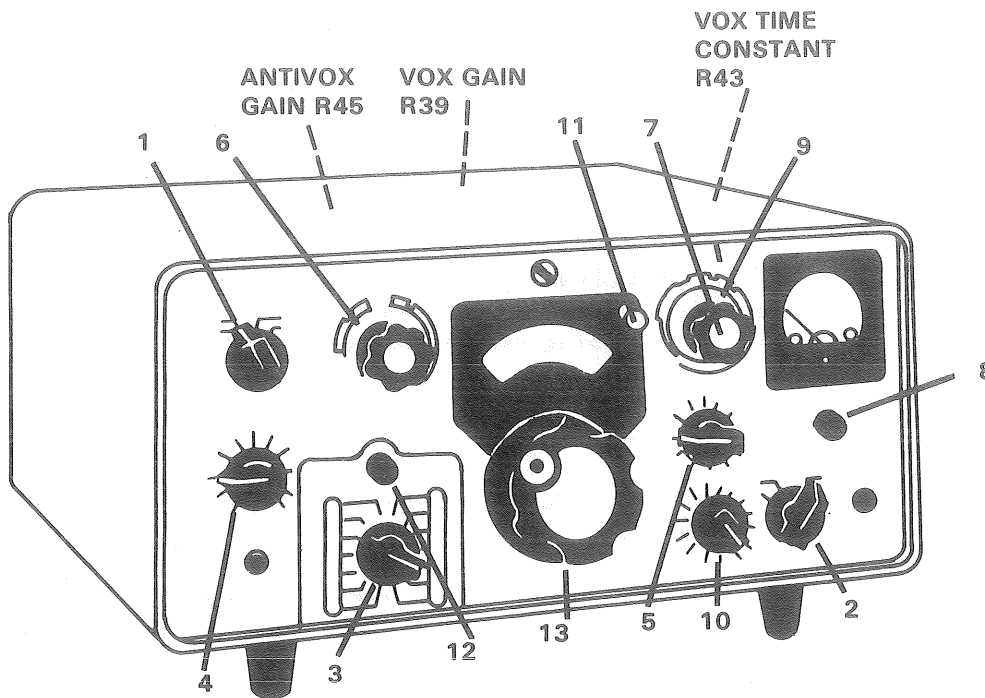


Figure 3. Operating controls for Collins KWM-2A.

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.

SKILL LEVEL 1

- 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, para 3-9 thru 3-12.)

- 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, para 3-12b.)

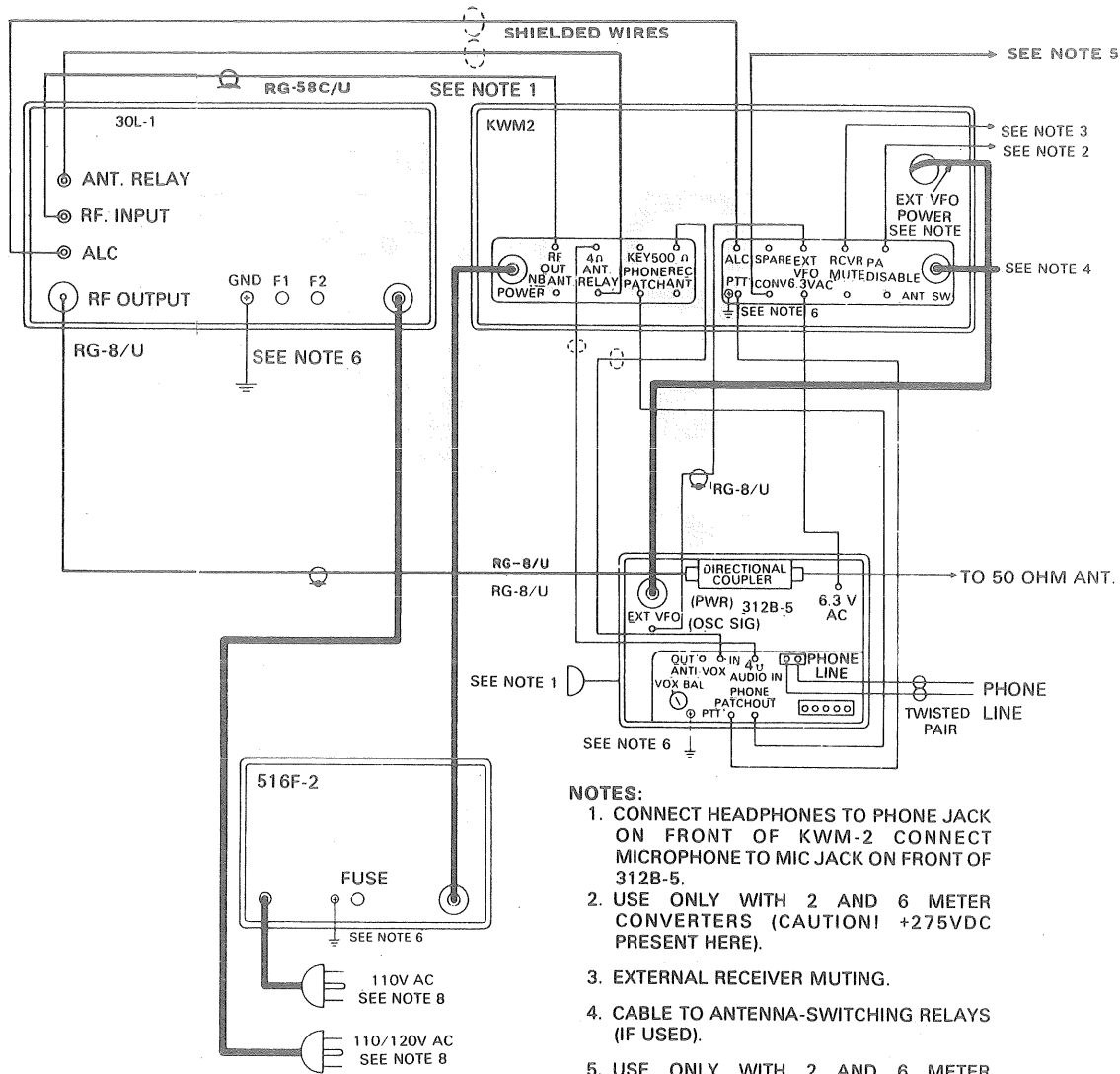
SKILL LEVEL 1

- 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 para 3-12c.)
- a. Connect CW key to RT-718/FRC-93. Place EMISSION switch (2) to CW position.
 - b. Press 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, para 11-4 thru 11-11.)
- a. Insure RF AM-3979/FRC-93(30L-1) is correctly cabled and connected to RT-718/FRC-93 as shown in figure 4.



CAUTION
BE SURE KWM-2 IS PLUGGED INTO 516F-2 BEFORE PLUGGING 516F-2 INTO AC LINE.

NOTES:

1. CONNECT HEADPHONES TO PHONE JACK ON FRONT OF KWM-2. CONNECT MICROPHONE TO MIC JACK ON FRONT OF 312B-5.
2. USE ONLY WITH 2 AND 6 METER CONVERTERS (CAUTION! +275VDC PRESENT HERE).
3. EXTERNAL RECEIVER MUTING.
4. CABLE TO ANTENNA-SWITCHING RELAYS (IF USED).
5. USE ONLY WITH 2 AND 6 METER CONVERTERS.
6. CONNECT TO EARTH GROUND.
7. EXTERNAL VFO POWER CABLE PLUGS INTO J17 ON KWM-2 CHASSIS.
8. AC CORD AND PLUG WITH 3RD WIRE GROUND. IF ADAPTER IS USED, CONNECT GREEN WIRE TO GROUND.

Figure 4. Interconnection with Collins KWM-2/2A portable (traveling) station.

SKILL LEVEL 1

- b. See figure 5 for operating control of RF AM-3979/FRC-93 (30L-1).

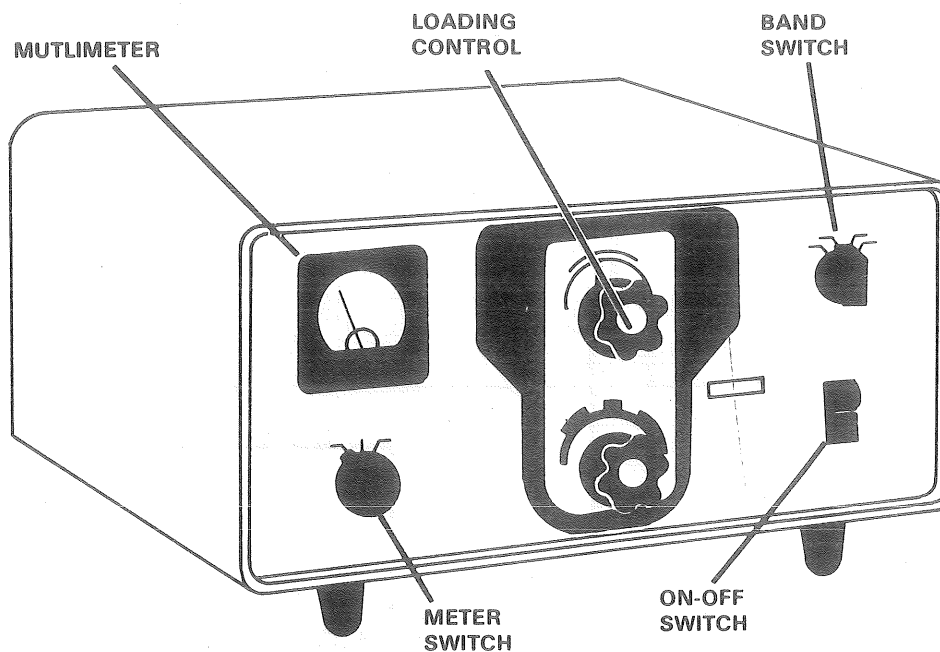


Figure 5. Operating Controls for Collins 30L-1.

- 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).

MULTIMETER SCALE VALUES.		
METER SWITCH SETTING	FULL-SCALE INDICATION	NORMAL INDICATION
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)

Figure 6. Multimeter Scale Values chart.

- p. Switch RT-718/FRC-93 to desired mode of operation.

SKILL LEVEL 1

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

TASK

113-620-2006

Operate 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). Given a requirement and--

1. Radio Set AN/PRC-74B.
2. Coder-Burst Transmission Group AN/GRA-71.
3. TM 11-5820-590-12-1.
4. TM 11-5835-224-12.
5. 25 group message.
6. CEOI.

Supervision and assistance will be 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, para 2-3.)

SKILL LEVEL 1

2. Orient and erect antenna to Special Forces Operational Base (SFOB). (Refer to TM 11-5820-590-12-1, para 2-4 thru 2-5.)
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.)
4. Operate Radio Set AN/PRC-74B and Transmission Coder-Burst Group AN/GRA-71. (Refer to TM 11-5820-590-12-1, para 3-1 thru 3-4, and TM 11-5835-224-12, para 2.1 thru 2.4.)
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 procedures. (Refer to TM 11-5820-590-12-1, para 3-2 thru 3-6.)

REFERENCES

TM 11-5820-590-12-1

TM 11-5835-224-12

CEOI

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 environment. 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, para 4-2, 4-3.)

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(*). WARNING Do not clean the equipment if the power is on.
2	Intercabling and connectors	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. WARNING 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.
6	Operational check	Operate the equipment on an authorized frequency to verify its capabilities.

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, para 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.

SKILL LEVEL 1

3. Complete DA Form 2404 (Equipment Inspection and Maintenance Worksheet) as a daily maintenance form. (Refer to TM 38-750, para 3-4.)
4. Report all uncorrectable defects. (Refer to TM 38-750, para 3-4d.)
 - 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

TM 38-750

TASK**113-622-1001**

Install Radio Set Control Group AN/GRA-6

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 Field Wire WD-1.
7. Installed Radio Set AN/VRC-46.
8. Tool Equipment TE-33 and 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.

SKILL LEVEL 1

PERFORMANCE MEASURES

1. Install Radio Set Control Group AN/GRA-6. (Refer to fig 1, and TM 11-5820-401-12, para 6-10a, and TM 11-5038, chap 2, para 14 thru 16.)

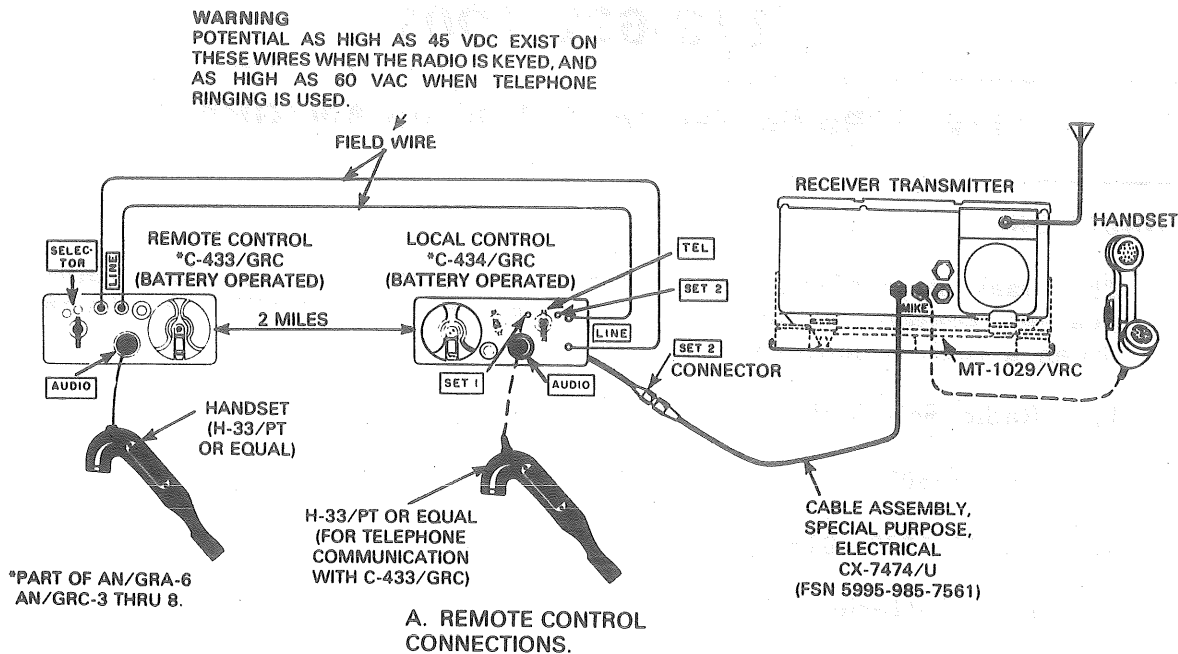


Figure 1. Remote Control Connections of AN/GRA-6.

- 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, para 6-10a.)

- 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, para 6-10d and e.)

- 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.

SKILL LEVEL 1

- 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

TM 11-5820-401-12

TASK**113-622-1006**

Install Radio Set Control Group AN/GRA-39(*)

CONDITIONS

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

1. Radio Set Control Group AN/GRA-39(*).
2. AN/VRC-12 Series or AN/PRC-25/77 Series FM radio set, installed and operational.
3. Batteries BA-30, 12 each.
4. Field wire on reel(s) (up to 2 miles).
5. Tool Equipment TE-33.
6. Designated remote site for the radio.
7. Vehicle driver/radio operator.
8. Operating frequency from CEOI.
9. Initiated DA Form 2404.
10. TM 11-5820-477-12.
11. TM 38-750.

STANDARDS

Task standard has been met when the AN/GRA-39(*) has been prepared, positioned at the designated locations, and connected in accordance with the performance measures.

SKILL LEVEL 1

PERFORMANCE MEASURES

1. Install batteries in AN/GRA-39(*). (Refer to TM 11-5820-477-12, para 2-4.)
 - a. Unsnap the clamps holding the rear covers of the cases and remove the covers (fig 1).

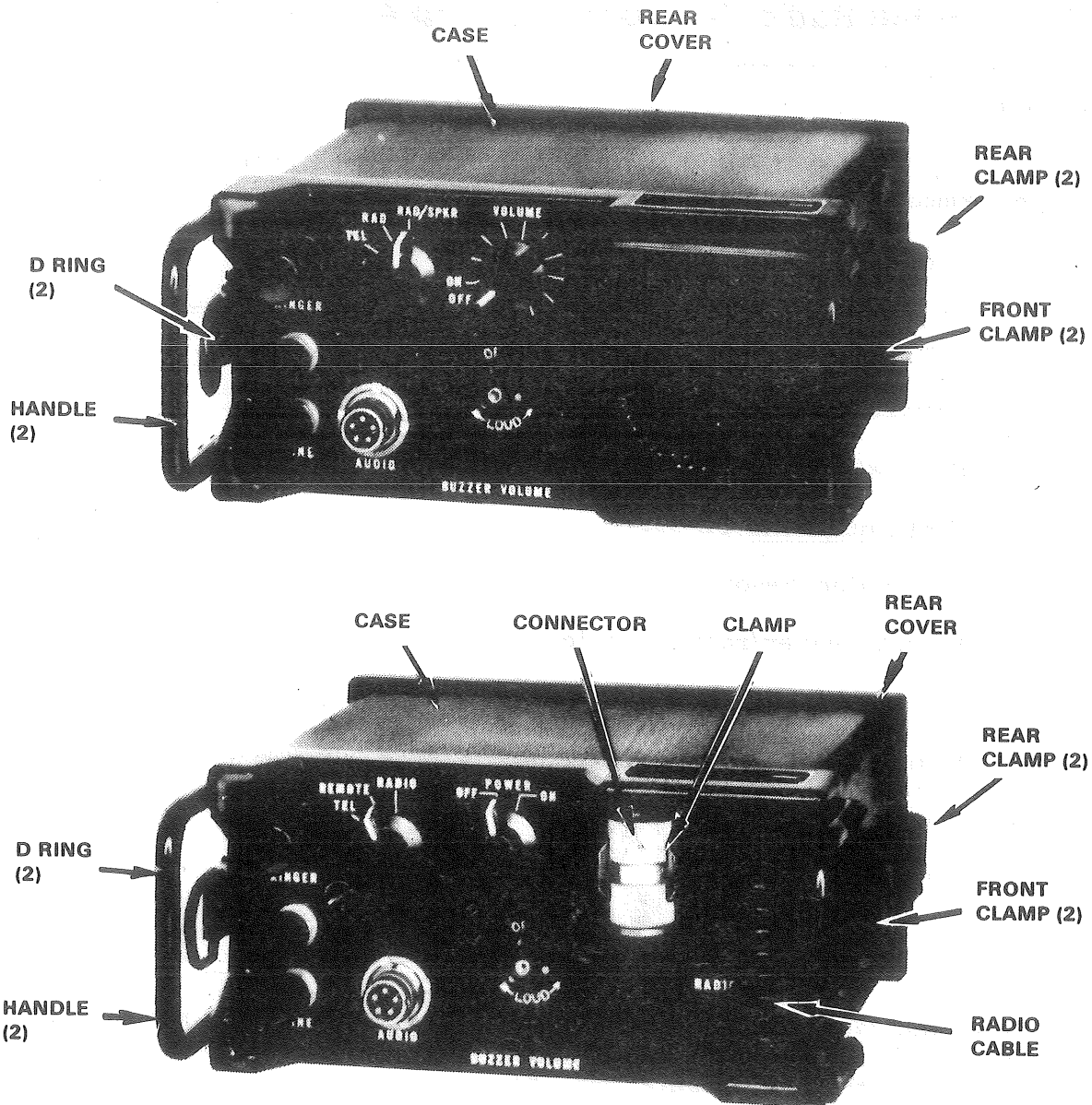


Figure 1. Major components of Radio Set Control AN/GRA-39(*).

- b. Inspect the battery compartments.
 - (1) Clean the battery compartments and the contact strips. (A pencil eraser can be used to clean the contacts.)
 - (2) Check the battery compartments for cracks.
- c. Install six batteries in each unit. Observe the polarity indicated on the battery box (fig 2).
 - (1) Insure that all contacts touch the battery terminals.
 - (2) Insure that the batteries are held in place under tension.
- d. Replace covers and snap the clamps into place.
 - (1) Position the covers squarely on the cases, without sliding them.
 - (2) Use both hands to secure both clamps of each unit at the same time.

NOTE 1: If the cover is slid into position, or the clamps are closed one at a time, the batteries can be pushed away from the contacts.

NOTE 2: Batteries in the local control unit should be replaced after approximately 72 hours of operation.

NOTE 3: Batteries in the remote control unit should be replaced after approximately 24 hours of operation.

NOTE 4: Batteries must be removed from the equipment on days the equipment is not being used.

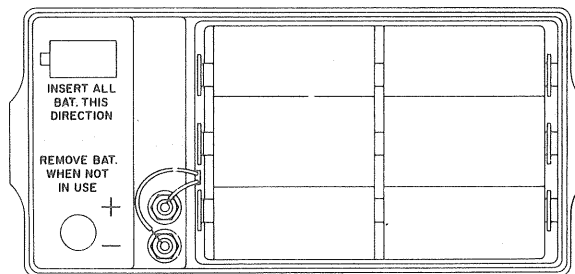


Figure 2. Local or remote control unit, rear view, cover removed.

SKILL LEVEL 1

2. Install control units on site. (Refer to fig 3 and TM 11-5820-477-12, para 2-5.)

- a. Local Control C-2329(*)/GRA-39.

- (1) Next to or on the receiver-transmitter.
- (2) Connect the connector of the radio cable (fig 1) to the receptacle of the radio receiver-transmitter (fig 3).

- b. Remote Control C-2328(*)/GRA-39 at the remote radio operation site (up to 2 miles from the radio/local control unit).

3. Install field wire line between the sites.

NOTE: Tie the field wire to a solid object prior to connecting to the control unit binding posts. This will prevent the control units from being damaged if the wire should be snagged and pulled.

- a. Remove 1/2 inch of insulation from each conductor of the field wire, press down one binding post, insert the bared end of one wire into the slot, and release the binding post. Repeat for the other binding post.
- b. Lay the field wire to the remote control site (up to 2 miles).

WARNING: Do NOT press the ringer button of either the local or remote control unit while installing the field wire to the line binding posts. Operating the RINGER button applies a voltage which can shock a person touching the binding posts or the bare conductors.

- c. Repeat performance measure 3a above for remote control unit.

4. Update DA Form 2404. (Refer to TM 38-750, para 3-4; and TM 11-5820-477-12, para 4-8.)

TRAINING NOTE: To dismount the radio set, reverse the procedures outlined in performance measures 1 through 3, observing all applicable WARNINGS, CAUTIONS, and NOTES.

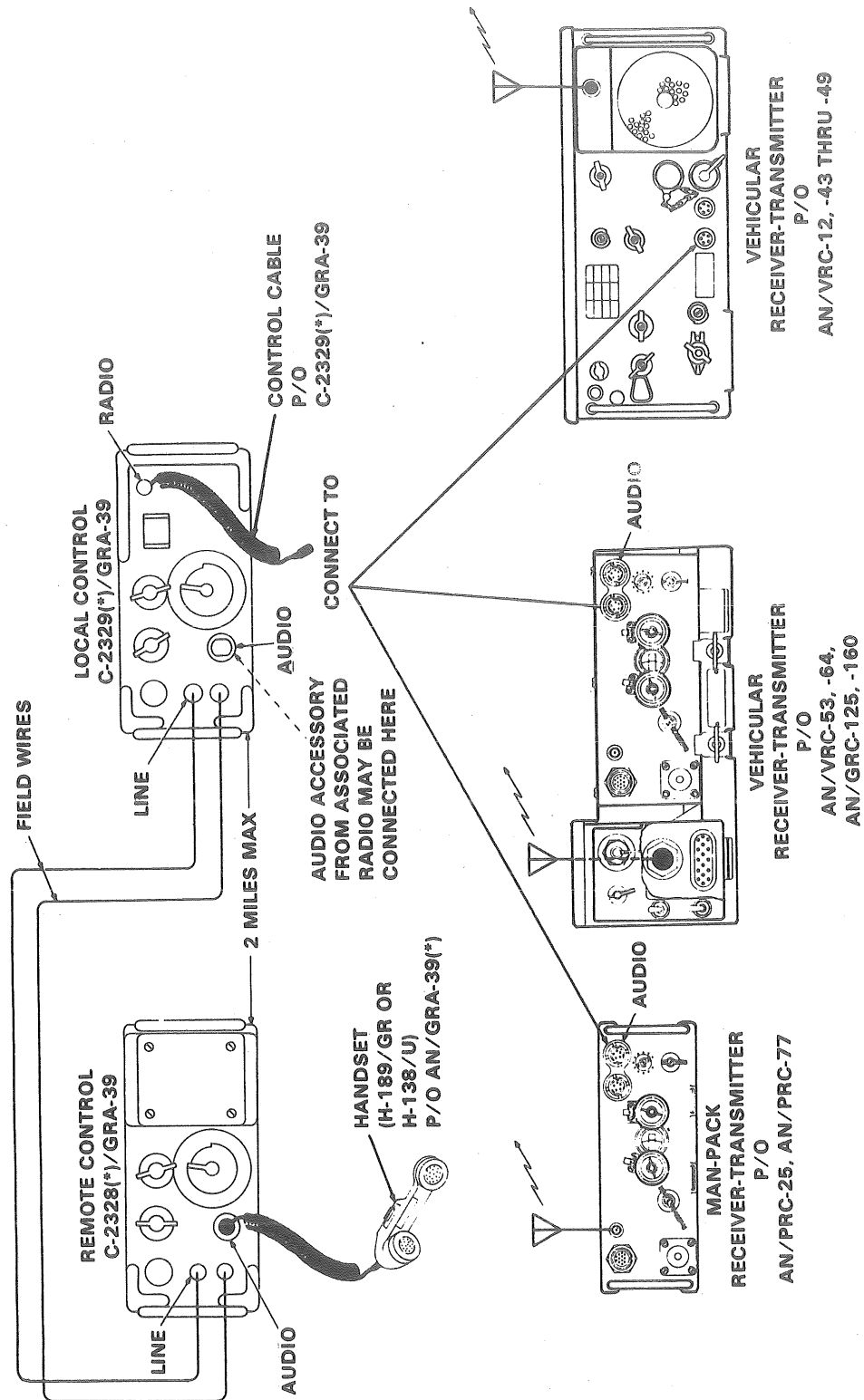


Figure 3. AN/GRA-39(*) interconnections with radios.

SKILL LEVEL 1

REFERENCES

TM 11-5820-477-12

TM 38-750

TASK**113-622-2001**

Operate Radio Set Control Group AN/GRA-6

CONDITIONS

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

1. Radio set control group installed using Radio Set AN/VRC-46.
2. TM 11-5038.
3. Distant radio station.

Supervision and assistance will 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, para 17 thru 19.)

WARNING: Insure Radio Set AN/VRC-46 is installed and grounded in accordance with 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.

SKILL LEVEL 1

- 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, para 18.)
 - 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, para 26 thru 28.)
 - a. Local Control Unit C-434/GRC: To communicate on the radio at the local control unit, use the handset connected to the radio.
 - 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 counterclockwise.
 - (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, para 31.)
 - 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, para 32.)
 - 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.

SKILL LEVEL 1

REFERENCES

TM 11-5038

TM 11-5820-401-12

TASK**113-622-2004**

Operate Radio Set Control Group An/GRA-39(*)

CONDITIONS

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

1. Installed Radio Set Control Group AN/GRA-39(*).
2. AN/VRC-12 series or AN/PRC-25/77 series FM radio set, installed and operational.
3. Another radio station with which to communicate.
4. Operator/attendant for the radio site.
5. TM 11-5820-477-12.

STANDARDS

Task standard has been met when the starting procedures have been performed and communications checks have been performed within 10 minutes.

PERFORMANCE MEASURES

1. Perform starting procedures.

NOTE: Starting procedures for the local control and radio are performed by the radio operator/attendant. Starting procedures for the remote control are performed by the remote operator. Starting procedures can be coordinated through the telephone feature of the AN/GRA-39(*).

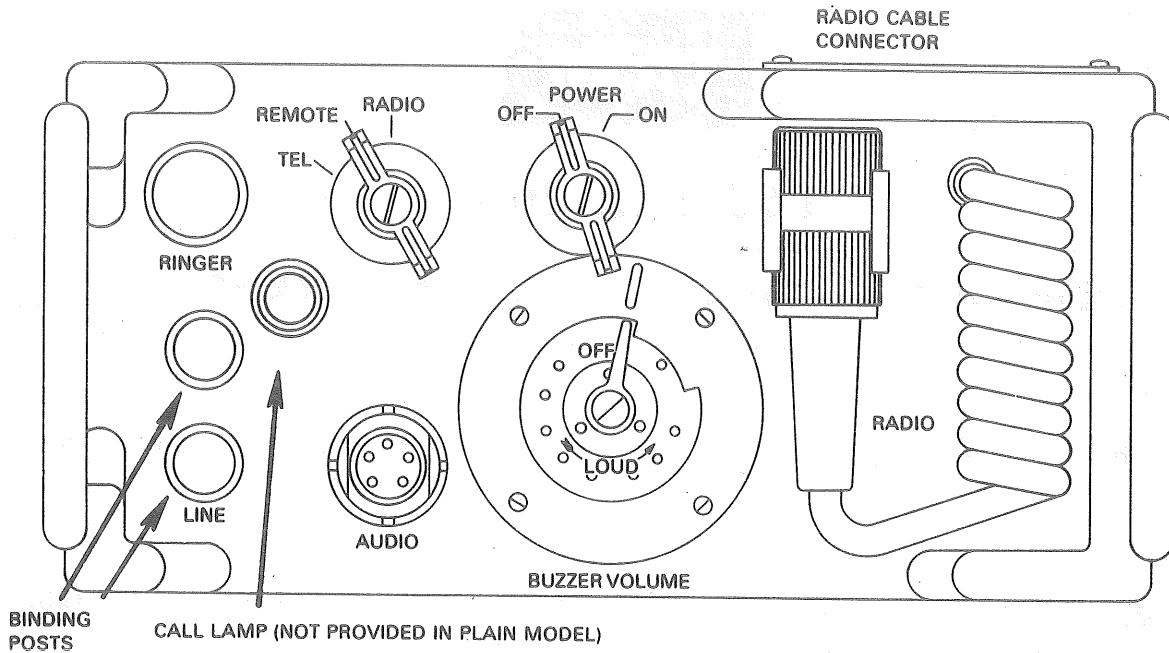


Figure 1. Local Control C-2329(*)/GRA-39, controls, indicator, and connectors.

a. Local Control C2329(*)/GRA-39. (Refer to fig 1, and TM 11-5820-477-12, para 3-3a and 3-4a.)

- (1) Turn the POWER switch to ON.
- (2) Turn the BUZZER VOLUME control to approximately midrange.
- (3) Connect a handset to the audio connector of the local control.

NOTE: AN/GRA-39(*) has one component Handset H-189/GR. In order for the local control operator to use the telephone feature, this handset is required. The microphone from the radio set may be used by the remote control operator, in conjunction with the RAD/SPKR switch.

- (4) Set the VOLUME control of the radio set for a comfortable listening level in the handset.

NOTE 1: If the radio set tries to self-key (or chatter), lower the VOLUME level of the receiver-transmitter.

NOTE 2: If Control C-2329/GRA-39 or C-2329A/GRA-39 has not had MWO 11-5820-477-30/1 applied, and an RT-841/PRC-77 or RT-505/PRC-25 is being used as the radio set, the FUNCTION switch of the RT cannot be set to SQUELCH. Additionally, if RT-505/PRC-25 is being used, the other station(s) in the net must also be operated without squelch, or in the OLD SQUELCH mode.

b. Remote Control C-2328(*)/GRA-39. (Refer to fig 2, and TM 11-5820-477-12, para 3-3b and 3-4b.)

- (1) Turn the VOLUME control to approximately midrange.
- (2) Turn the BUZZER VOLUME control to approximately midrange.
- (3) Connect a handset to the audio connector.
- (4) Set the TEL-RAD-RAD/SPKR switch to the TEL position.

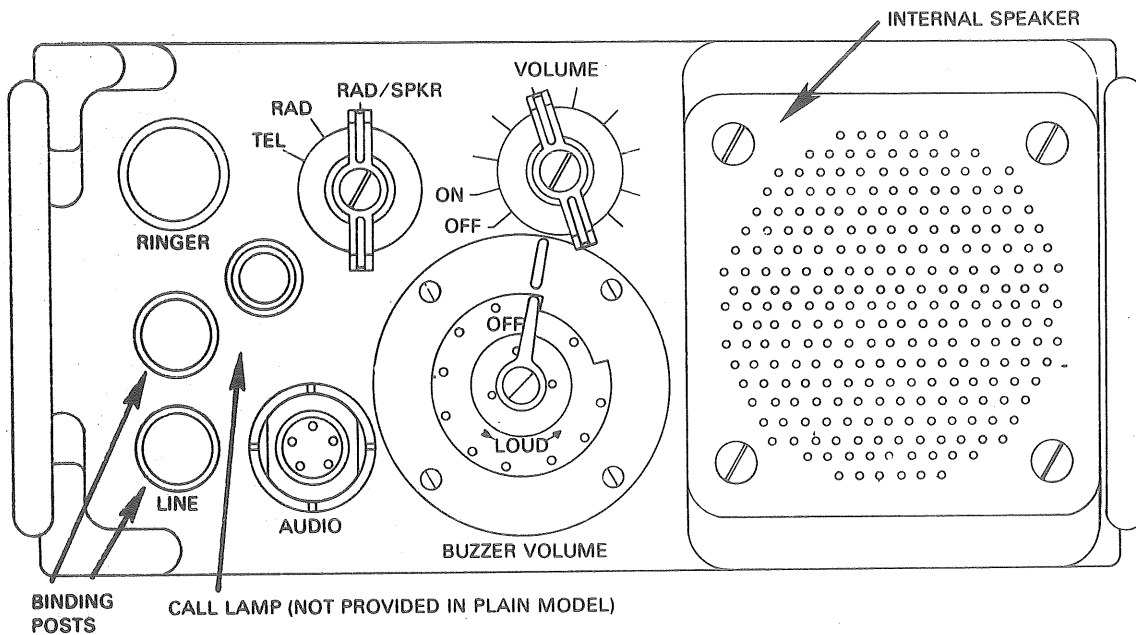


Figure 2. Remote Control C-2328(*)/GRA-39, controls, indicator, and connectors.

SKILL LEVEL 1

2. Conduct telephone communication check between local and remote control units. (Refer to TM 11-5820-477-12, para 3-4a.)

WARNING: Do not touch the LINE binding posts or the bared portions of the field wire while pumping the RINGER button.

- a. Pump the RINGER button several times in quick succession to gain the attention of the other operator.
- b. Local Control C-2329(*)/GRA-39. Turn and hold the TEL-REMOTE-RADIO switch to TEL while talking and listening.

NOTE: If Microphone M-80(*)/U is being used at the remote control, the FUNCTION switch must be set to TEL, to TALK, and to RAD/SPKR to listen to the other operator.

- c. Press the handset PUSH-TO-TALK switch to talk to the operator; release to listen.
3. Conduct radio transmission and reception check. (Refer to TM 11-5820-477-12, para 3-4b and c.)

- a. Local Control C-2329(*)/GRA-39.

- (1) Turn and hold the TEL-REMOTE-RADIO switch to RADIO.
- (2) Press the handset PUSH-TO-TALK switch to transmit; release to receive. Use proper radio call signs and procedures.

- b. Remote Control C-2328(*)/GRA-39.

- (1) Set the TEL-RAD-RAD/SPKR switch to either RAD or RAD/SPKR.
- (2) Adjust the VOLUME control to the desired listening level in the handset or loudspeaker.
- (3) Press the handset PUSH-TO-TALK switch to transmit; release to receive. Use proper radio call signs and procedures.

NOTE: The TEL-REMOTE-RADIO switch on the local control must be in the REMOTE position during this operation.

4. Stopping procedures. (Refer to TM 11-5820-477-12, para 3-5.)
 - a. Local control, turn the POWER switch to OFF.
 - b. Remote control, turn the VOLUME control to OFF.

REFERENCES

TM 11-5820-477-12

TASK

113-571-7001

Perform Station/Net Duties

CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. Given a requirement and--

1. Unit SOP.
2. AR 105-31.
3. (O)TB 380-41.
4. FM 24-18.
5. CEOI for all nets to be operated at your radio station.

Supervision and assistance will 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 SOPs 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 ARs and ACPs; and station maintenance, equipment, and personnel reports are being submitted to higher headquarters as required according to performance measures 1 through 6.

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 (O)TB 380-41 is present and safeguarded in accordance with current Army regulations.
2. Maintain shift schedules. (Refer to FM 24-18, chap 7, para 122 thru 126.)
- 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 FM 24-18, chap 10, para 172 thru 177.)
- 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 (O)TB 380-41.)

SKILL LEVEL 2

- 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 chapter 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, paragraph 3-9.
 - 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, para 172 thru 174.)
- 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

FM 24-18

(O) TB 380-41

CEOI

TASK**113-571-7002**

Inspect Station/Net Operations

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.

SKILL LEVEL 2

2. Check processing of incoming messages. (Refer to ref 1d 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 1d 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, para 120 thru 126.)
 - a. DA Form 4158 (Operator's Number Sheet) 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 1a and FM 24-18, para 127 thru 130.)
- 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, para 172 thru 177.)
- a. Submit required maintenance reports and requests.
 - b. Submit security reports.
 - c. Submit MIJI reports as required.

SKILL LEVEL 2

REFERENCES

AR 380-5

FM 24-18

ACP 124(C)

ACP 125(D)

TASK**113-574-1004**

Operate in Radio Nets

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), para 302 thru 308.)

SKILL LEVEL 2

- 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), para 305.)
 - 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), para 308.)
 - 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), para 301 thru 309.)
 - a. Open assigned net.
 - (1) Set radio set to assigned frequency.
 - (2) Use net call to call stations in net and identify yourself as 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)

CEOI

TASK

113-587-7001

Inspect Installed Operational Radio Sets

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 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 of this manual for the equipment you are inspecting.

2. Check siting of radio set. (Refer to FM 24-18, chap 6, para 75 thru 77.)
 - a. Good radio sites should have these characteristics:
 - (1) The best cover and concealment possible.

SKILL LEVEL 2

- (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.

SKILL LEVEL 2

- c. Inspect those deficiencies reported by operator personnel to insure they have been properly corrected.
8. Submit required reports. (Refer to TM 38-750, para 3-4c.)
- 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

TM 38-750

TASK**113-596-7056**

Direct Installation of a Doublet Antenna

CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. Given--

1. Three each Mast AB-155(*)/U.
2. TM 11-5820-256-10.
3. TM 11-5820-467-15.
4. TM 11-5815-334-12.
5. Antenna Group AN/GRA-50 or sufficient W-1 Antenna Wire for the construction of the doublet antenna to the assigned frequency.
6. Lensatic compass.

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. Direct Installation of antenna using W-1 Antenna Wire. (Refer to TM 11-5820-256-10, para 2-6; and TM 11-5815-334-12, para 2-8.)

SKILL LEVEL 2

a. Use formula $\frac{468}{F} = \text{length}$

b. Frequency 2.600 MHz

EXAMPLE: $\frac{468}{F} = \text{length}$

$$2.6 \frac{468}{180 \text{ ft}}$$

180 ft half-wave or 90 ft quarter-wave center fed (fig 1).

2. Direct installation of antenna using Antenna Group AN/GRA-50. (Refer to TM 11-5820-467-15, chap 2, para 11.)

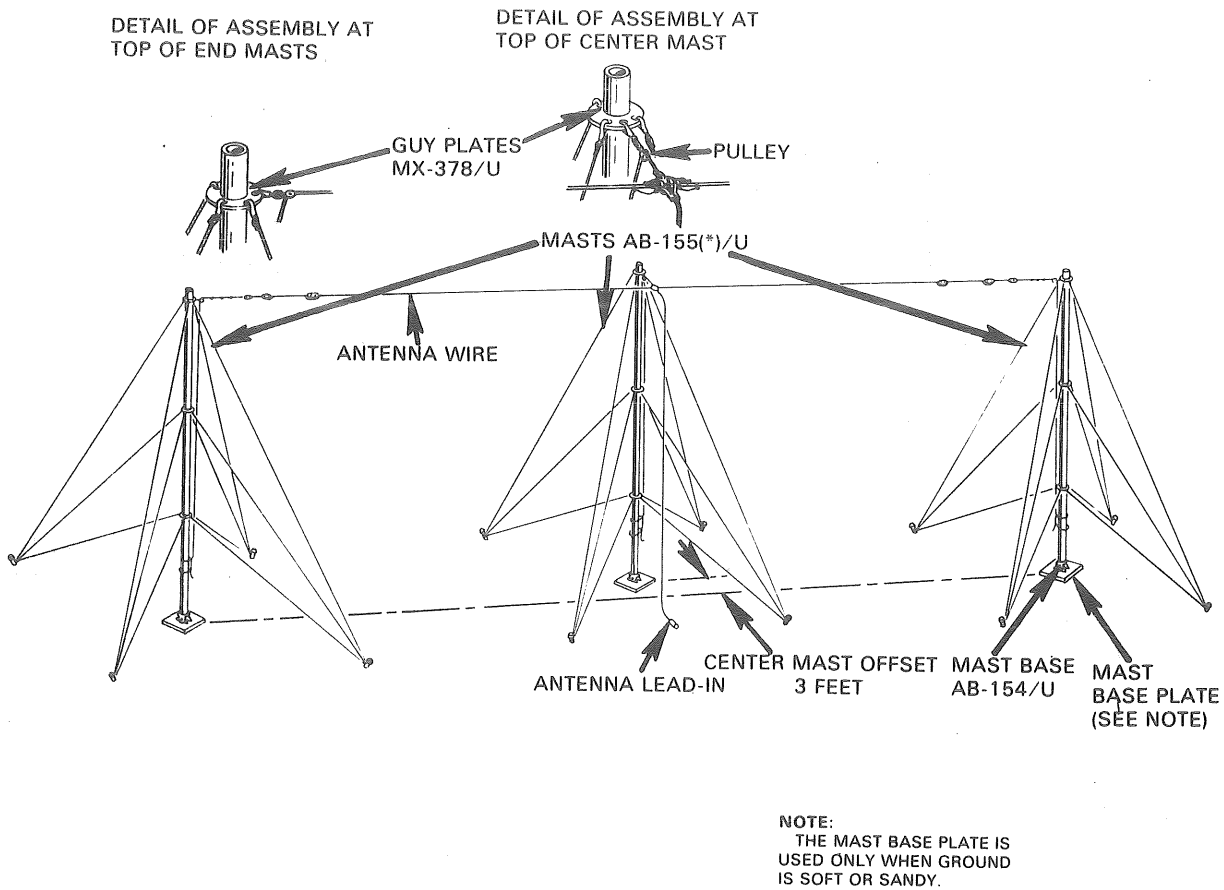


Figure 1. Doublet antenna, erection completed.

NOTE: Mast base plates are used in sandy or soft soil.

3. Check Mast AB-155(*)/U preparation for erection. (Refer to fig 2, and TM 11-5820-256-10, para 2-6c; and TM 11-5815-334-12, para 2-8.)

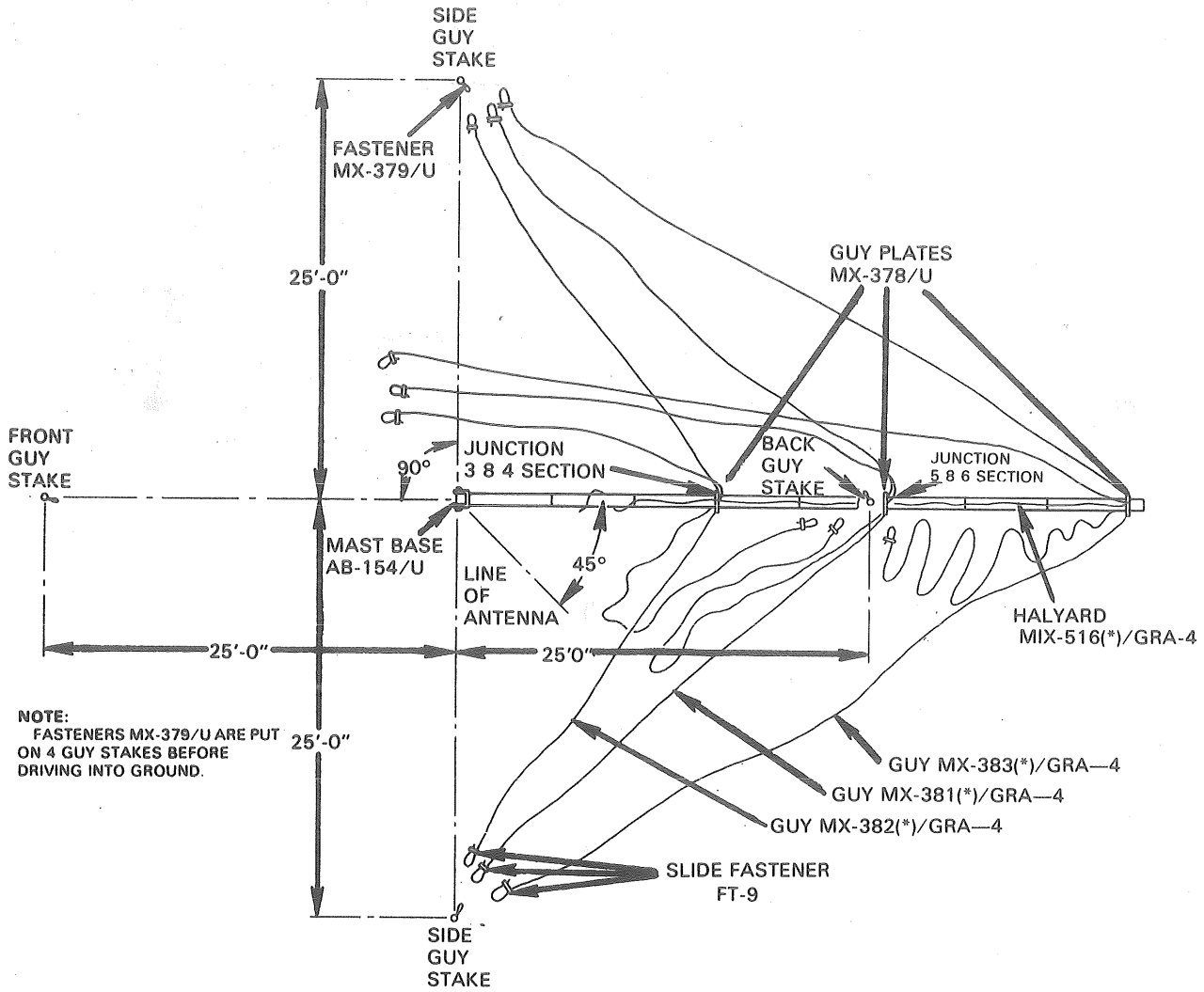


Figure 2. Preparing Mast AB-155(*)/U for Erection.

SKILL LEVEL 2

4. Check antenna to insure it is erected properly. (Refer to fig 3, and TM 11-5820-256-10, para 2-6d; and TM 11-5815-334-12, para 2-8.)
 - a. Check that antenna is broadside to the most distant station. Determine azimuth by using compass.
 - b. Check to see that antenna is raised to proper height.
 - c. Check that the antenna lead-in is properly connected to radio set.

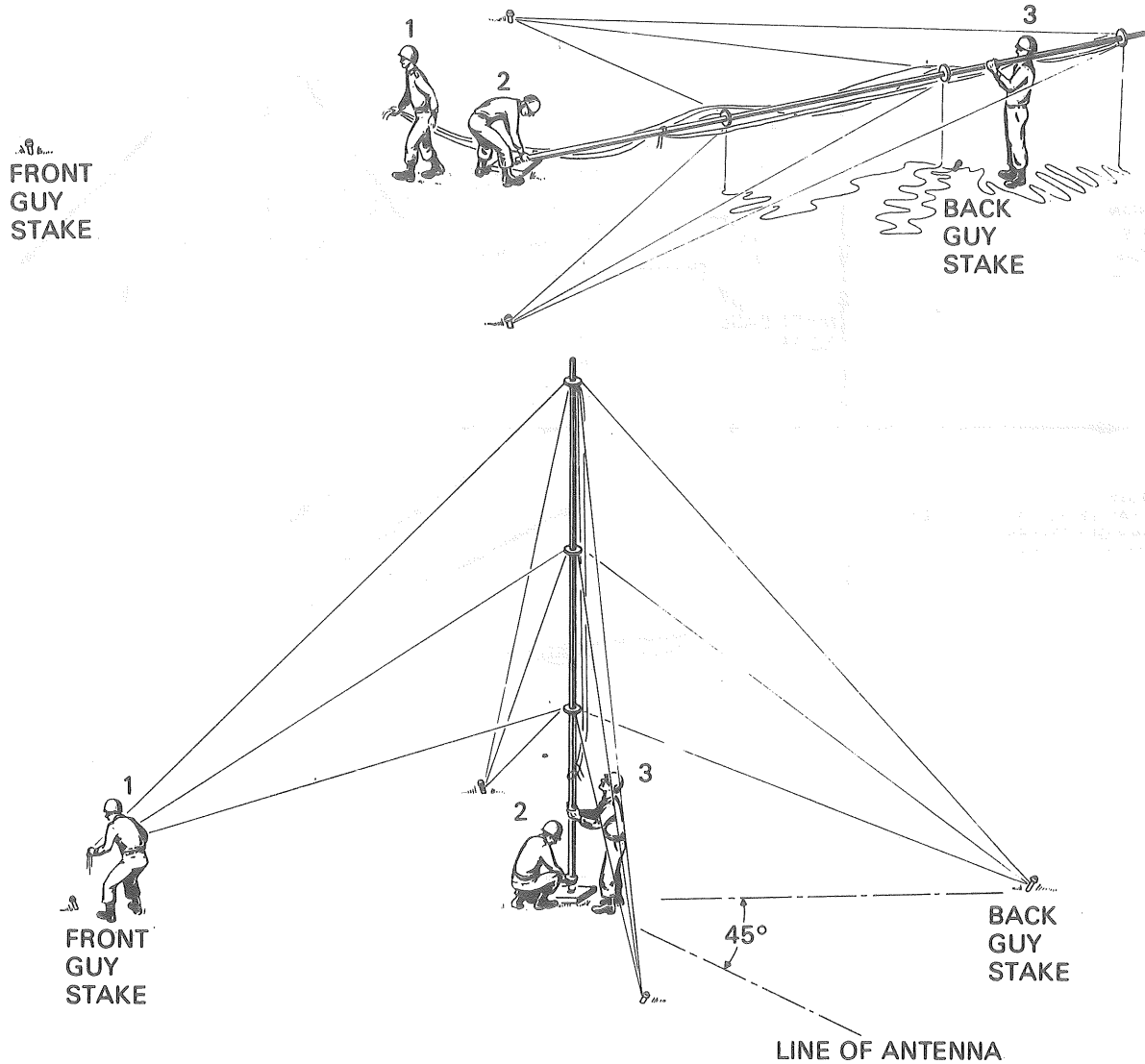


Figure 3. Raising assembled Mast AB-155(*)/U.

REFERENCES

TM 11-5820-256-10

TM 11-5820-467-15

TM 11-5815-334-12



TASK

113-601-7001

Inspect Installed Operational Generator Sets

CONDITIONS

This task may be performed in a garrison or tactical situation. You will need:

1. Appropriate equipment manual.
2. An installed operational generator set.

STANDARDS

Job standards are met when performance measures are completed within 30 minutes.

PERFORMANCE MEASURES

1. Check generator set for proper grounding. (Refer to appropriate generator installation task.)
2. Check power cable for the following:
 - a. Connections are tight.
 - b. Cable leads are connected to the proper output terminals. (Refer to equipment manual for correct wiring.)
3. Insure that output voltage and frequency meet the requirements of the equipment being supplied power.
4. Check all meter readings for correct indications. (Refer to equipment manual.)
5. Check fuel hoses for the following:
 - a. All connections are tight.

- b. No leaks exist in fuel lines or connectors.
- 6. Insure all canvas is rolled up or removed from the generator set.
- 7. Notify shelter team chief of all discrepancies found.

REFERENCES

TM 5-6115-271-14

TM 5-6115-275-14

TM 5-6115-332-14

TM 5-6115-345-12

TM 5-6115-365-15

TASK

113-611-1001

Select Team Radio Site

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 of commanding officer (VOCO) to establish a team radio site. You will use the operations order, LOI or VOCO, unit SOP, current maps, lensatic compass, and FM 24-18 to select a team radio site.

Supervision and assistance will 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, or 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, para 75.)
- 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, para 76.)
- 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, para 77.)
- a. Coordinate with the serviced headquarters or communications center on final site selected.

SKILL LEVEL 2

- b. Select an alternate radio site in event radio communication cannot be established at the primary site.

REFERENCES

FM 24-18

TASK**113-618-7001**

Inspect Installed Operational Radio Wire Integration System

CONDITIONS

This task is performed under all weather conditions in a field or a garrison location. You will be provided with an installed operational radio wire integration system and:

1. TM 11-5820-401-12.
2. FM 24-18.
3. Equipment log book.
4. DA Pam 310-1.
5. DA Form 2404.

Supervision and assistance will be available.

STANDARDS

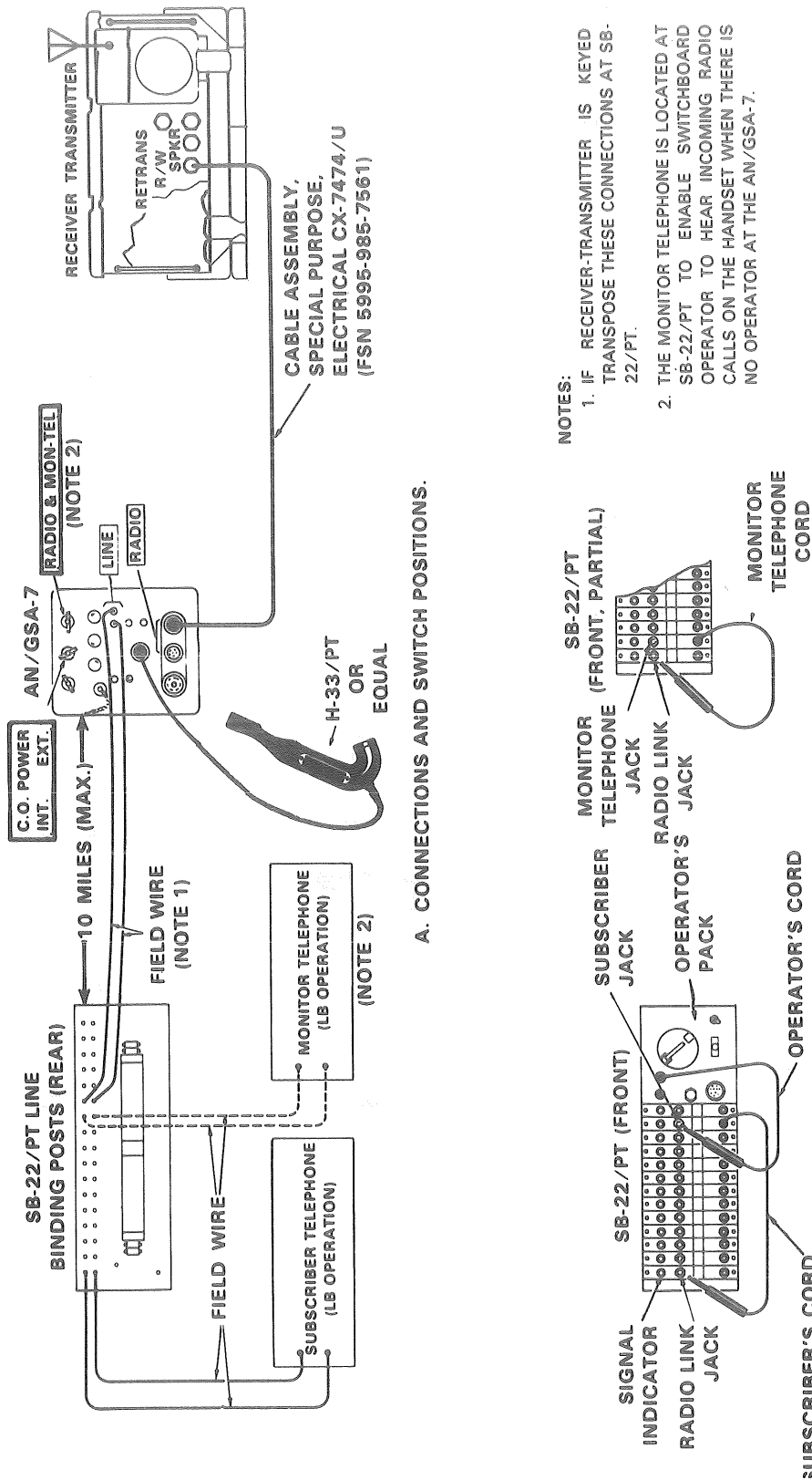
This task has been performed correctly when the inspected radio wire integration system is installed properly, operated efficiently, and operator personnel are complying with prescribed station maintenance procedures according to performance measures 1 through 7.

PERFORMANCE MEASURES

1. Obtain and review appropriate references. (Refer to DA Pam 310-4.)
 - a. Operator's and organizational maintenance manual

SKILL LEVEL 2

- b. Equipment log book
2. Check radio set. (Refer to TM 11-5820-401-12, para 2-5 thru 2-13.)
 - 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, para 6-8 thru 6-10.)
 - 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, para 6-8b(1), 6-9b, and 6-10a(1).)
 - 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, 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.
 - 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 2.
 - 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 3.



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.

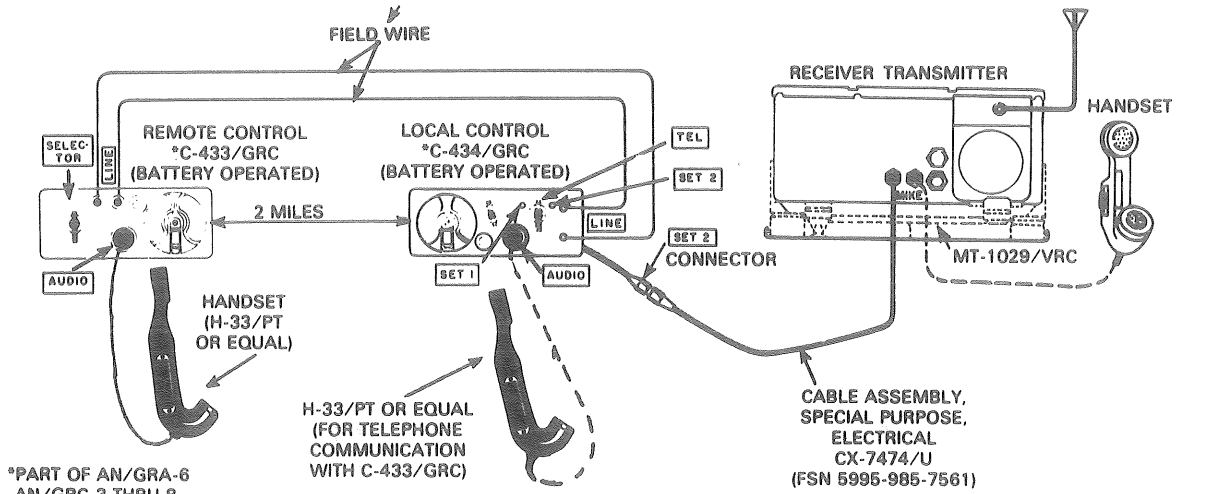
C. CORD CONNECTION FOR MONITOR TELEPHONE (NOTE 2).

B. CORD CONNECTIONS FOR OPERATOR AND SUBSCRIBER COMMUNICATION ON RADIO LINK.

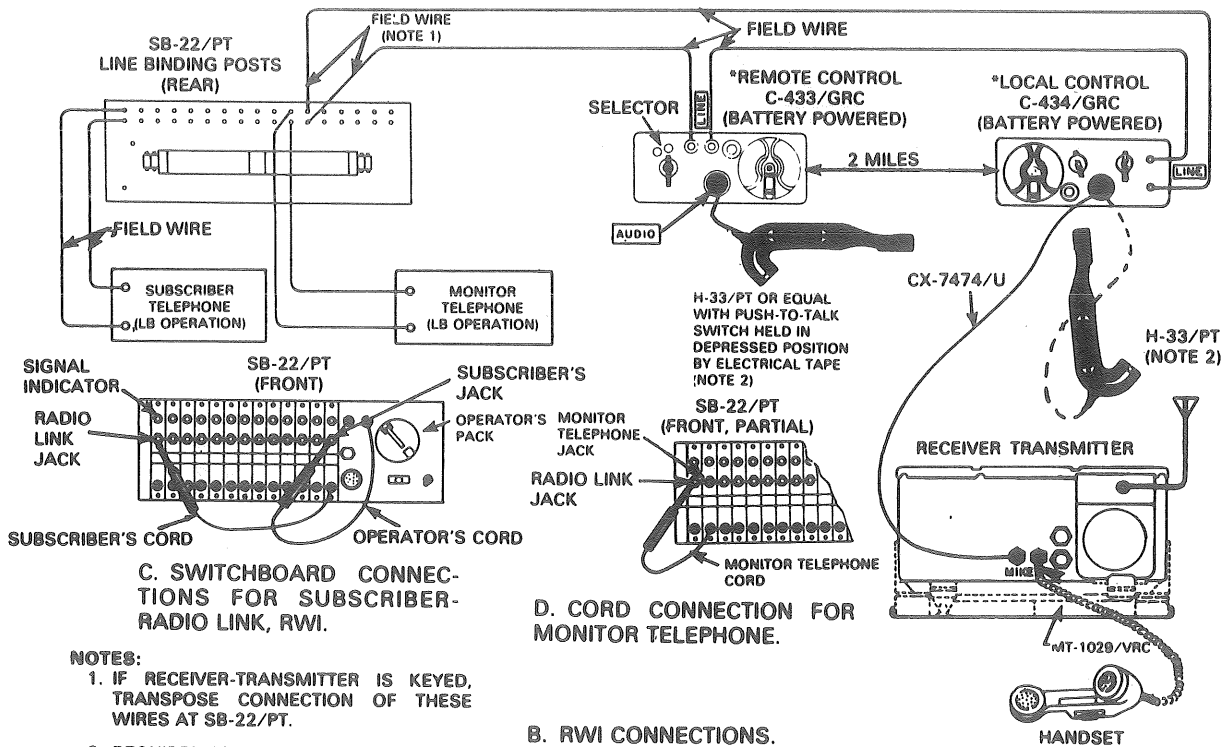
Figure 1. Connections and control settings of AN/GSA-7 and SB-22/PT to provide radio/wire integration operation for receiver-transmitter.

SKILL LEVEL 2

WARNING
 POTENTIAL AS HIGH AS 45 VDC EXIST ON THESE WIRES WHEN THE RADIO IS KEYPED, AND AS HIGH AS 60 VAC WHEN TELEPHONE RINGING IS USED.



A. REMOTE CONTROL CONNECTIONS.



B. RWI CONNECTIONS.

NOTES:

1. IF RECEIVER-TRANSMITTER IS KEYPED, TRANSPOSE CONNECTION OF THESE WIRES AT SB-22/PT.
2. REQUIRED FOR TELEPHONE COMMUNICATION WITH SWITCHBOARD
3. *PART OF AN/GRA-6.

Figure 2. Connections for remote control operation and RWI operation of receiver-transmitters using AN/GRA-6.

SKILL LEVEL 2

6. Check processing of traffic. (Refer to TM 11-5820-401-12, para 6-8b(2), 6-9c thru d, and 6-10b.)
 - 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, para 172 thru 177.)
 - 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

DA Pam 310-1

FM 24-18

TM 11-5820-401-12

TASK**113-622-7001**

Inspect Installed Operational Radio Set Control Groups

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 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. (Refer to TM 11-5820-477-12, and TM 11-5820-401-12.)
 - b. Radio Set Control Group AN/GRA-6. (Refer to TM 11-5038, and TM 11-5820-401-12.)

SKILL LEVEL 2

3. Check electrical connections. (Refer to TM 11-5820-477-12, para 2-1 thru 2-5; and TM 11-5820-401-12, para 6-8 thru 6-10 and 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, para 6-8 and 6-10.)
 - 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, para 6-8 and 6-10.)
 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, para 8-6.)
 - 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

TM 11-5820-401-12

TM 11-5820-477-12

TM 38-750

TASK

113-623-7002

Inspect Performance of Preventive Maintenance at Team Level

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 and:

1. Equipment log book (if applicable).
2. DA Form 2404.
3. DA Form 2407.
4. TM 38-750.
5. 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 spot check 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.

SKILL LEVEL 2

- 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, para 3-4c.)
 - 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 5, pp 5-15 thru 5-18.)
 - 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, para 3-9.)
 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

Appendix A

REFERENCES

ALLIED COMMUNICATION PUBLICATIONS (ACP)

ACP 124(C)	Communication Instructions Radiotelegraph Procedure
ACP 125(D)	Communication Instructions Radiotelephone Procedure
ACP 126(B)	Communication Instructions Teletypewriter (Teletypewriter) Procedure

ARMY REGULATIONS (AR)

105-31	Record Communications
380-5	Department of the Army Information Security Program
611-201	Enlisted Career Management Fields and Military Occupational Specialties

DEPARTMENT OF THE ARMY PAMPHLETS (DA PAM)

310-1	Consolidated Index of Army Publications and Blank Forms
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TRAINING CIRCULARS (TC)

32-11	How to Get Out of a Jam
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FIELD MANUALS (FM)

21-2	Soldier's Manual of Common Tasks (Skill Level 1)
21-3	Soldier's Manual of Common Tasks (Skill Levels 2, 3 and 4)
24-1 (HTF)	Combat Communications (How to Fight)
24-18	Field Radio Techniques
32-30	Electronic Warfare, Tactics of Defense

TECHNICAL MANUALS (TM)

- 5-6115-271-14 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 120/240V, 28 V DC (Less Engine)
- 5-6115-275-14 Operator's, Organizational, Intermediate (Field) (Direct Support and General Support) and Depot Maintenance Manual: Generator Set, Gasoline Engine Driven, Skid Mounted, Tubular Frame, 10 KW, AC 120/208V, 3 Phase, and 120/240V, Single Phase, Less Engine
- 5-6115-332-14 Operator, Organizational, Intermediate (Field), Direct Support, General Support, and Depot Level Maintenance Manual: Generator Set, Tactical, Gasoline Engine, Air Cooked, 5 KW, AC, 120/240V, Single Phase, 120/208V, 3 Phase, Skid Mounted, Tubular Frame (Less Engine), Utility, 60 Hz and Utility 400 Hz
- 5-6115-345-12 Operator's and Organizational Maintenance Manual: Generator Set, Diesel Engine, Skid Mounted, Liquid Cooled, 15 KW
- 5-6115-365-15 Operator's, Organizational, DS, GS and Depot Maintenance Manual: Generator Sets, Gasoline and Diesel Engine Driven, Trailer Mounted
- 11-5038 Control Group AN/GRA-6
- 11-5135-15 Radio Set Control AN/GSA-7
- 11-5810-224-10 Operator's Manual for Communications Security Equipment TSEC/KY-8
- 11-5810-245-10 Operator's Manual for Communications Security Equipment TSEC/KY-38
- 11-5810-247-10 Operator's Manual for Communications Security Equipment HYL-3/TSEC
- 11-5810-256-OP-4 Operator's Procdeures for Communications Security Equipment TSEC/KY-57 in Tracked Vehicles
- (O)11-5810-300-12 Operator's and Organizational Maintenance Manual for NESTOR Communications Systems Using TSEC/KY-8 and TSEC/KY-38 with Radio Sets and Associated Equipment
- (O)11-5810-312-12 Operator's and Organizational Maintenance Manual Installation Kits for Communications Security Equipment TSEC/KY-57
- 11-5815-204-10 Operator's Manual: Radio Teletypewriter Sets, AN/GRC-46, AN/GRC-46A, AN/GRC-46B, AN/GRC-46C, and AN/VRC-29

11-5815-331-14 Operator's Organizational, Direct Support, and General Support Maintenance Manual: Radio Teletypewriter Set AN/VSC-2

11-5815-332-15 Operator's, Organizational, DS, GS, and Depot Maintenance Manual: Radio Teletypewriter Set AN/VSC-3 and AN/VSC-3A

11-5815-334-12 Operator's and Organizational Maintenance Manual: Radio Teletypewriter Sets AN/GRC-142, AN/GRC-142A, AN/GRC-142B, AN/GRC-122, AN/GRC-122A and AN/GRC-122B

11-5815-602-12 Operator's and Organizational Maintenance Manual for Terminal, Communications, AN/UGC-74A(V)3

11-5820-256-10 Operator's Manual: Radio Set, AN/GRC-26D

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 and AN/VRC-49 (Without an INTERCOM System)

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 and AN/VRC-49 (With an INTERCOM System)

11-5820-401-12 Operator's and Organizational Maintenance Manual: 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 MT-1029/VRC, and MT-1898/VRC; Antenna AT-912/VRC; Control, Frequency Selector C-2742/VRC and Control, Radio Set C-2299/VRC

11-5820-467-15 Operator's, Organizational, DS, GS, and Depot Maintenance Manual: Antenna Group AN/GRA-50

11-5820-477-12 Operator's and Organizational Maintenance Manual: Radio Set Control Groups AN/GRA-39, AN/GRA-39A, and AN/GRA-39B

11-5820-498-12 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

11-5820-520-12 Operator's and Organizational Maintenance Manual: Radio Sets, AN/GRC-106 and AN/GRC-106A

11-5820-554-12 Operator's and Organizational Maintenance Manual: Radio Sets, 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

FM 11-05C1/2

- 11-5820-590-12-1 Operator's and Organizational Maintenance Manual:
Radio Sets, AN/PRC-74B, AN/PRC-74C; Power
Supplies, PP-4514/PRC-74 and PP4514A/PRC-74;
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
- 11-5835-224-12 Operator's and Organizational Maintenance Manual:
Coder-Burst Transmission Group AN/GRA-71
- 38-750 The Army Maintenance Management System (TAMMS)

SUPPLY BULLETINS (SB)

- 11-624 Warning Notice for Vehicles in which Radios are
Mounted

TECHNICAL BULLETINS (TB)

- (O)380-41 Procedures for Safeguarding, Accounting and
Supply Control of COMSEC Material
- SIG 291 Safety Measures to be Observed When Installing and
Using Whip, Antennas, Field-Type Masts, Towers
and Antennas and Metal Poles that are Used with
Communications, Radar, and Direction Finder
Equipment

MISCELLANEOUS TRAINING MATERIAL

- Communications-Electronics Operation Instructions (CEOI)
- CEOI, KTC 600 D Tactical Operations Code

Appendix B

TIPS FOR PLANNING YOUR TRAINING PROGRAM

This group of charts will assist you in planning your MOS training program. These charts may be used to help you through the long list of references for each task. They will lead you to the best training material for your program. The charts are printed on only one side of the pages. This allows you to remove the pages and mount them on a wall or wherever is convenient for you to make best use of them in planning your training.

The charts are designed to show major task areas. Some task areas are common to all soldiers, other areas are for administration and procedures, and some relate to the main types of equipment used within your MOS. Under each major area, you will find modules containing one or more job tasks. The modules may cover a single piece of equipment or a group of procedures within your field. For each module, there is a list of the best training material available to you in your unit. Sometimes supporting material is listed that you may find useful as a substitute if the best training material is not available. It would be a good idea to glance over one of the charts before you proceed.

To make up your training plan, start on the left-hand side of each chart and check off those modules in which you feel you should be better qualified. There may be some modules listed on the chart in which you are well qualified. The task modules you have checked form your plan. After going through each chart and selecting the modules you need, go back and list the modules in an order that will do you the most good.

Before you finish your training plan, go over it with your supervisor. Your supervisor can help you find the training material and give you more ideas on improving your job performance. After you have decided what training you need and in what order, you will be able to come up with an overall training calendar for yourself. When you have accomplished this, you can start on your training and manage your own program.

Once you start a training module, follow the lessons or material as they are listed. Don't skip around within a training module.

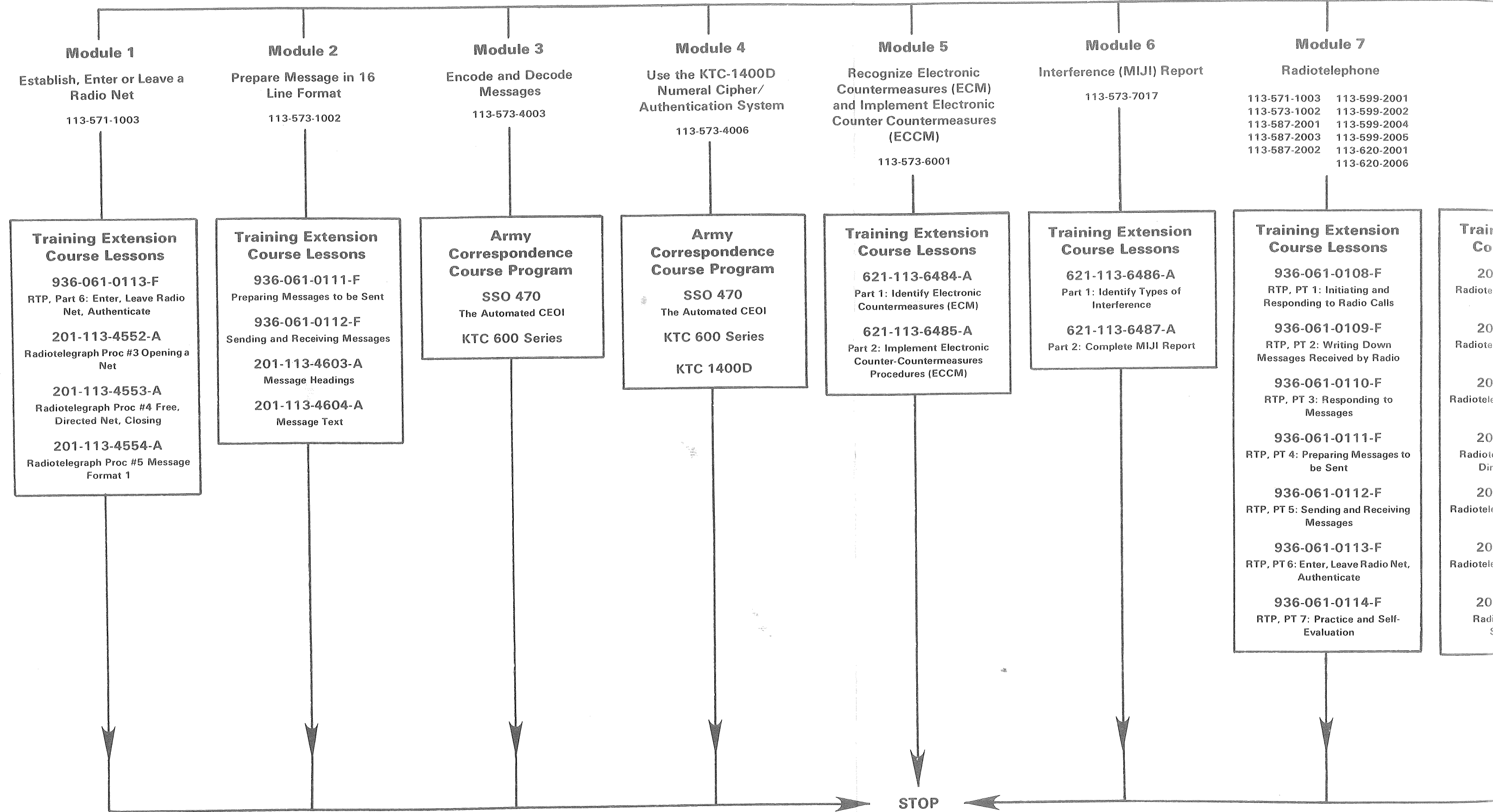
Your training plan will be as good as the time you spend using it. Knowing your job is something no one can take away from you.

Communications Procedures and Administration

Critical Tasks

Task Groups

Skill Level 1

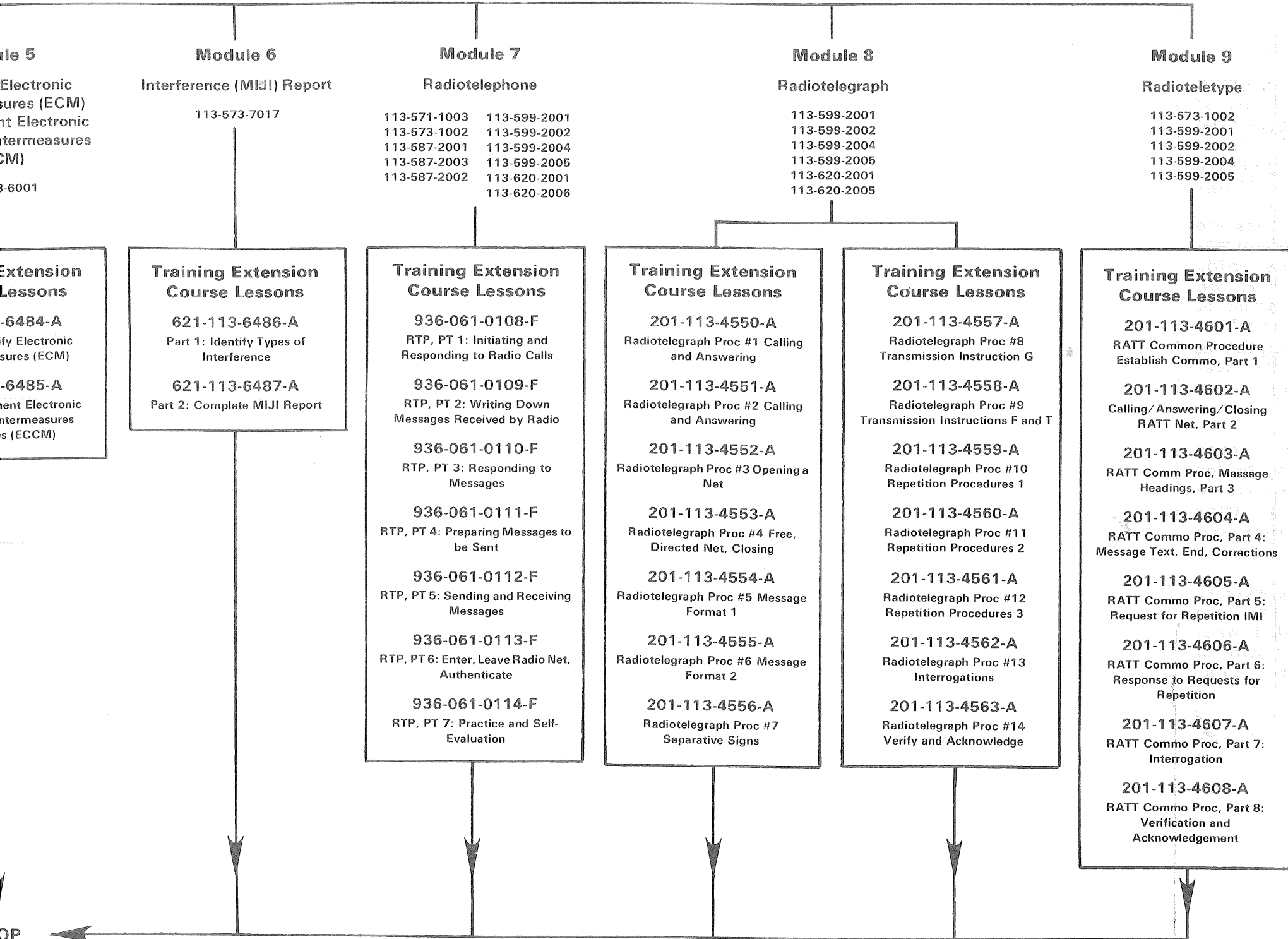


Communications Procedures and Administration

Critical Tasks

Task Groups

Skill Level 1



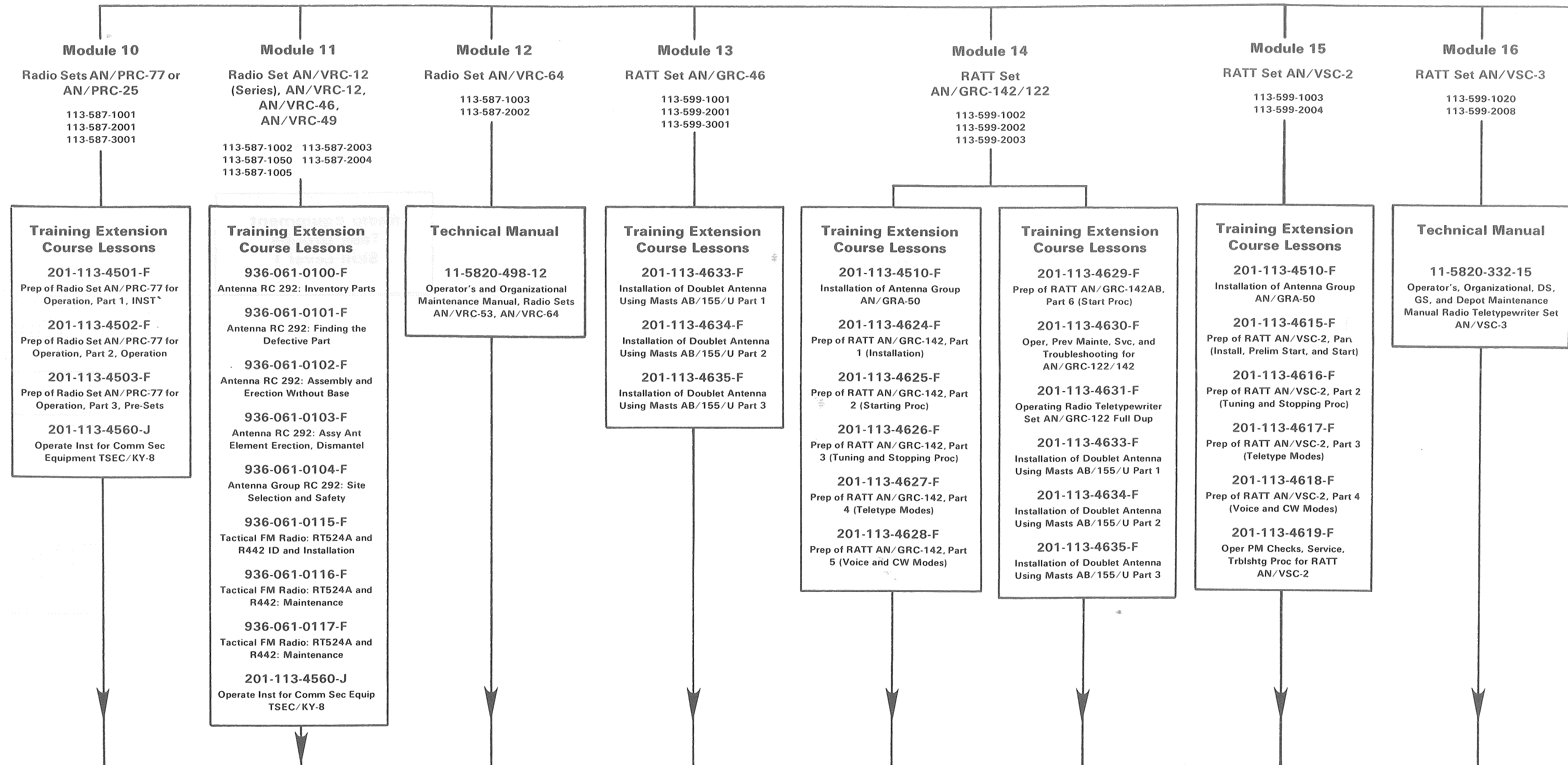
Related Training Material

Module		Title
1	ACP 124(C) ACP 125(D) ACP 126(B)	Radiotelegraph Procedure Radiotelephone Procedure Teletypewriter Procedure
2	ACP 125(D) ACP 126(B) AR 105-31	Radiotelephone Procedures Manual Teletypewriter Procedures Message Preparation
3	KTC 600 Series	Tactical Operations Code/CEOI
4	SSO 470	The Automated CEOI
5	TC 32-05-2PT TC 32-11 FM 32-30 TEC 621-113-6484-A TEC 621-113-6485-A	ECCM How to Get Out of a Jam Electronic Warfare Identify Electronic Countermeasures (ECM) Implement Electronic Countermeasure Procedures (ECCM)
6	KAV 1600 Sup 2 FM 24-18 TEC 621-113-6486-A TEC 621-113-6487-A SSO 470	CEOI Field Radio Techniques Identify Types of Interference Complete MIJI Report The Automated CEOI
7	ACP 125(D) FM 24-18	Radiotelephone Procedure Field Radio Techniques
8	ACP 124(C) TEC 201-113-4520-A/E TM 11-459 TEC 201-113-4521-A/E TEC 201-113-4522-A/E TEC 201-113-4523-A/E SS5 727 SS5 728 SS5 729	Radiotelegraph Procedure Basic International Morse Code (IMC), Part 1 International Morse Code Basic International Morse Code (IMC), Part 2 Intermediate International Morse Code (IMC) Advanced International Morse Code (IMC) Basic International Morse Code Intermediate International Morse Code Advanced International Morse Code
9	ACP 126(B) TEC 201-113-1936-B through TEC 201-113-1951-B	Teletypewriter Procedure TVR Teletypewriter Keyboard Typing

Radio Equipment

Task Groups

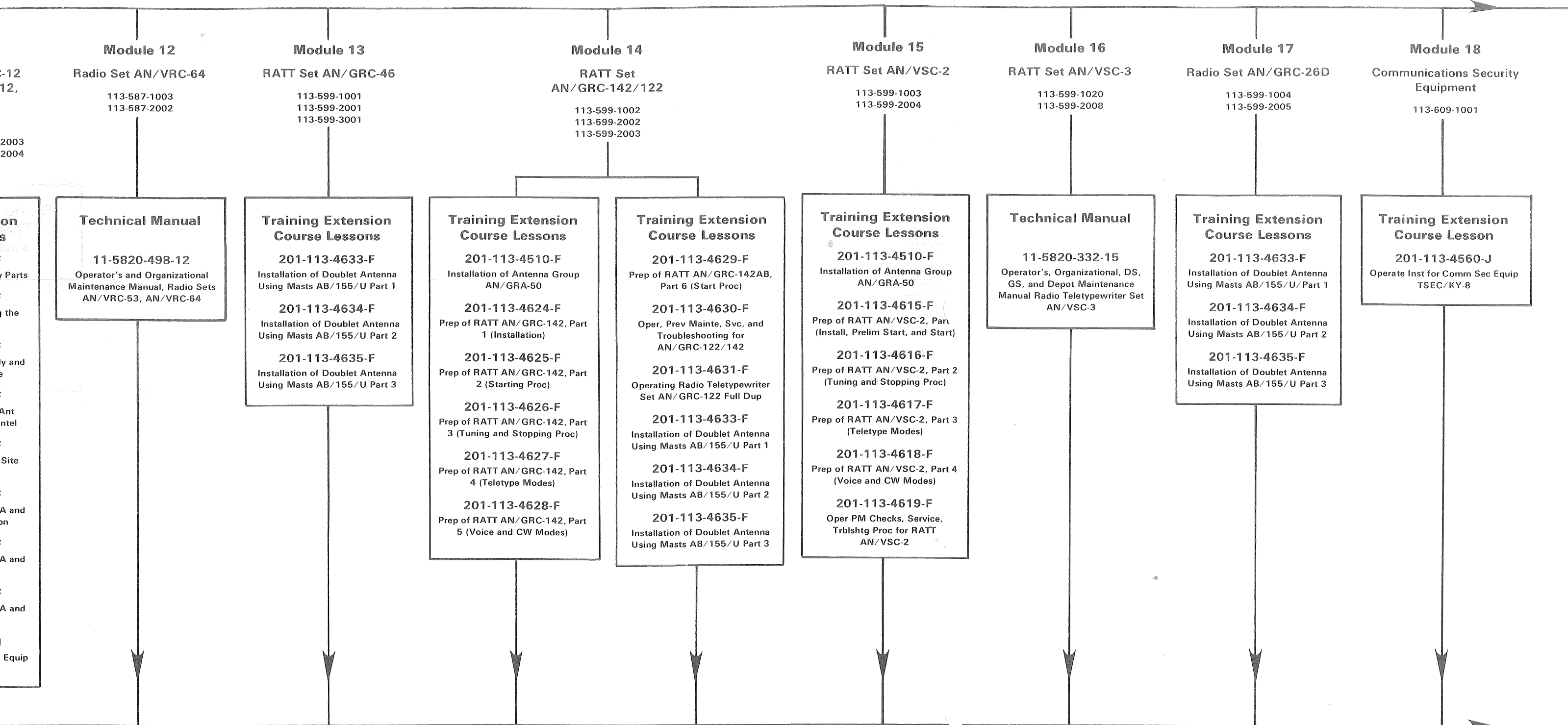
Skill Level 1



Radio Equipment

Task Groups

Skill Level 1



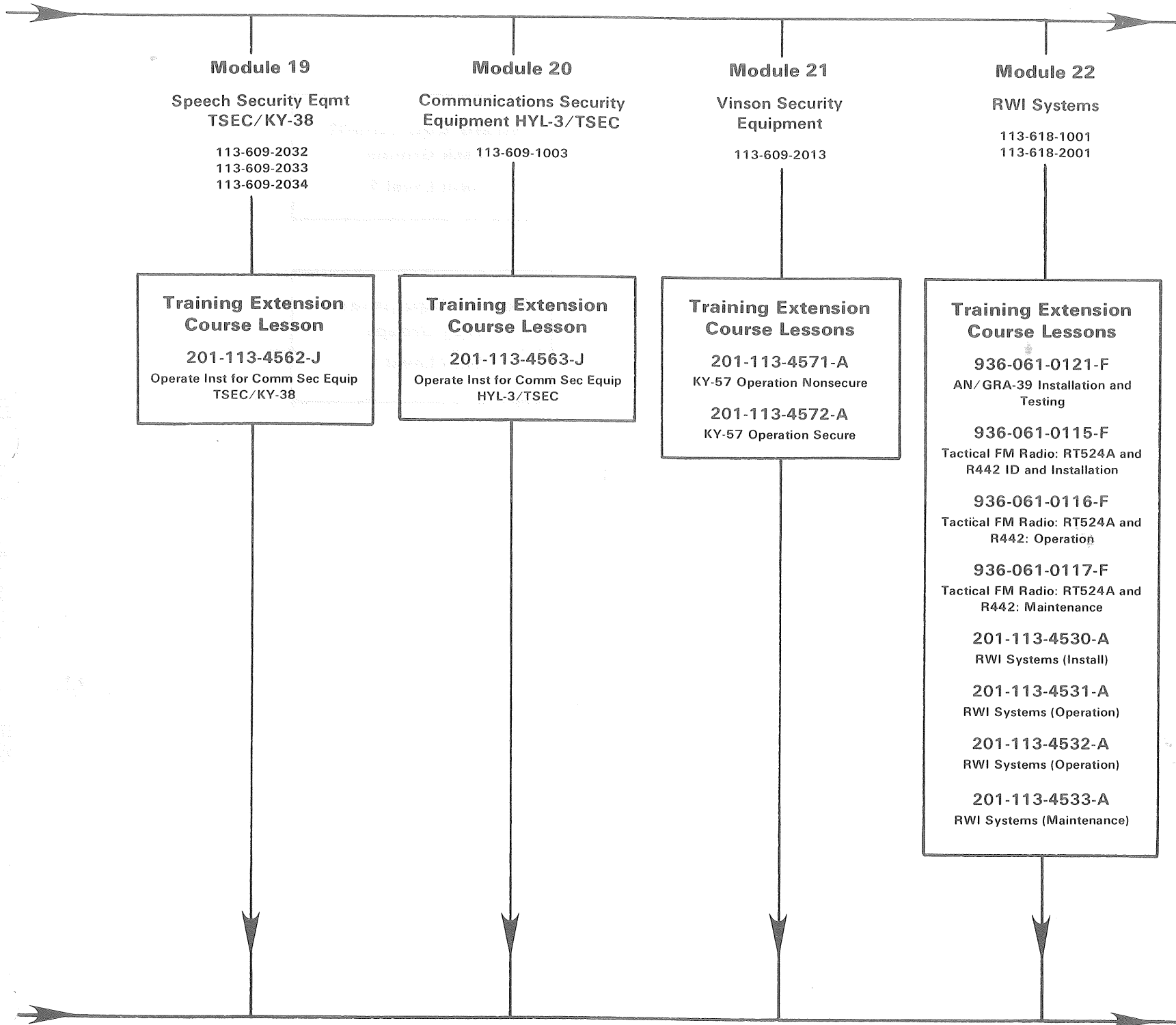
**Radio Equipment
Task Groups
Skill Level 1**

Radio Equipment

**Task Groups
Skill Level 1**

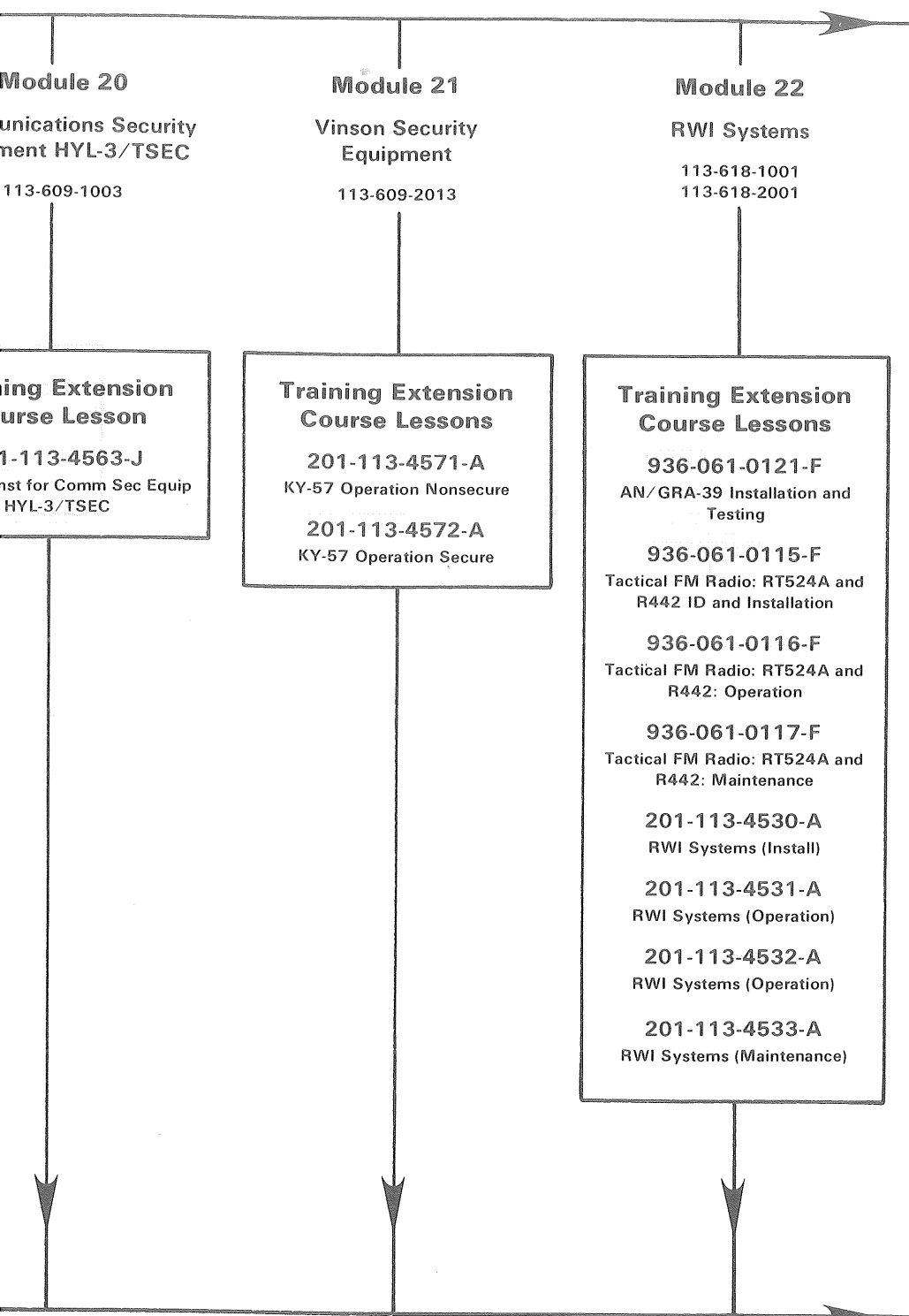
Related Training Material

Module	Title	Module
10	SS9 735 SSO 470 Operation of Radio Set AN/PRC-77 The Automated CEOI	16
11	SSO 712 SS9 712 Radio Set AN/VRC-12 Organizational Maintenance of Radio Set AN/VRC-12 SS9 724 TC 11-4 TC 32-11 TM 11-5820-401-1 Operator's Manual on Radio Sets AN/VRC-12 Series TM 11-5820-401-2 Operator's Manual on Radio Sets AN/VRC-12 Series	17
12	SS9 735 TEC 201-113-498-4560-J Radio Set AN/PRC-77 Operate Instructions for Communication Security Equipment TSEC/KY-8	
13	TVR 201-113-2074 TVR 201-113-2075 TVR 201-113-2132E TVR 201-113-2076 TVR 201-113-2133E TVR 201-113-2077 TVR 201-113-2143E TVR 201-113-2080 TVR 201-113-2084 TVR 201-113-2090 TVR 201-113-2091 SS9 726 Operation and Maintenance Radio TTY Set AN/GRC-46B Part 2 Introduction Operation and Maintenance Radio TTY Set AN/GRC-46B Part 3 Preliminary Starting, Starting and Stopping Operation and Maintenance Radio TTY Set AN/GRC-46B Part 3 Preliminary Starting, Starting and Stopping Operation and Maintenance Radio Se. AN/GRC-46B Part 4 Presets Operation and Maintenance Radio TTY Set AN/GRC-46B, Part 4 Presets Operation and Maintenance Radio TTY Set AN/GRC-46B Part 5 Modes of Operation Operation and Maintenance Radio TTY Set AN/GRC-46B Part 5 Modes of Operation Operation and Maintenance Radio TTY Set AN/GRC-46B Part 6 Netting, Voice Mode of Operation Operation and Maintenance Radio TTY Set AN/GRC-46B Part 7 Netting, CW Mode of Operation Operation and Maintenance Radio TTY Set AN/GRC-46B Part 8 Netting, RATT Mode of Operations Operation and Maintenance Radio TTY Set AN/GRC-46B Part 9 Maintenance and Troubleshooting Radio TTY Set AN/GRC-46	
14	SSO 733 TM 38-750 SS9 850 Radio Teletypewriter Sets AN/GRC-142 and AN/GRC-122 The Army Maintenance Management System (TAMMS) Troubleshooting AN/GRC-142/122	
15	TM 11-5820-498-12 FM 24-18 Operator's and Organizational Maintenance Manual Radio Sets AN/VRC-53, AN/TC-64, AN/GRC-125 and AN/GRC-160 Field Radio Techniques	



Radio Equipment

Task Groups
Skill Level 1



Related Training Material

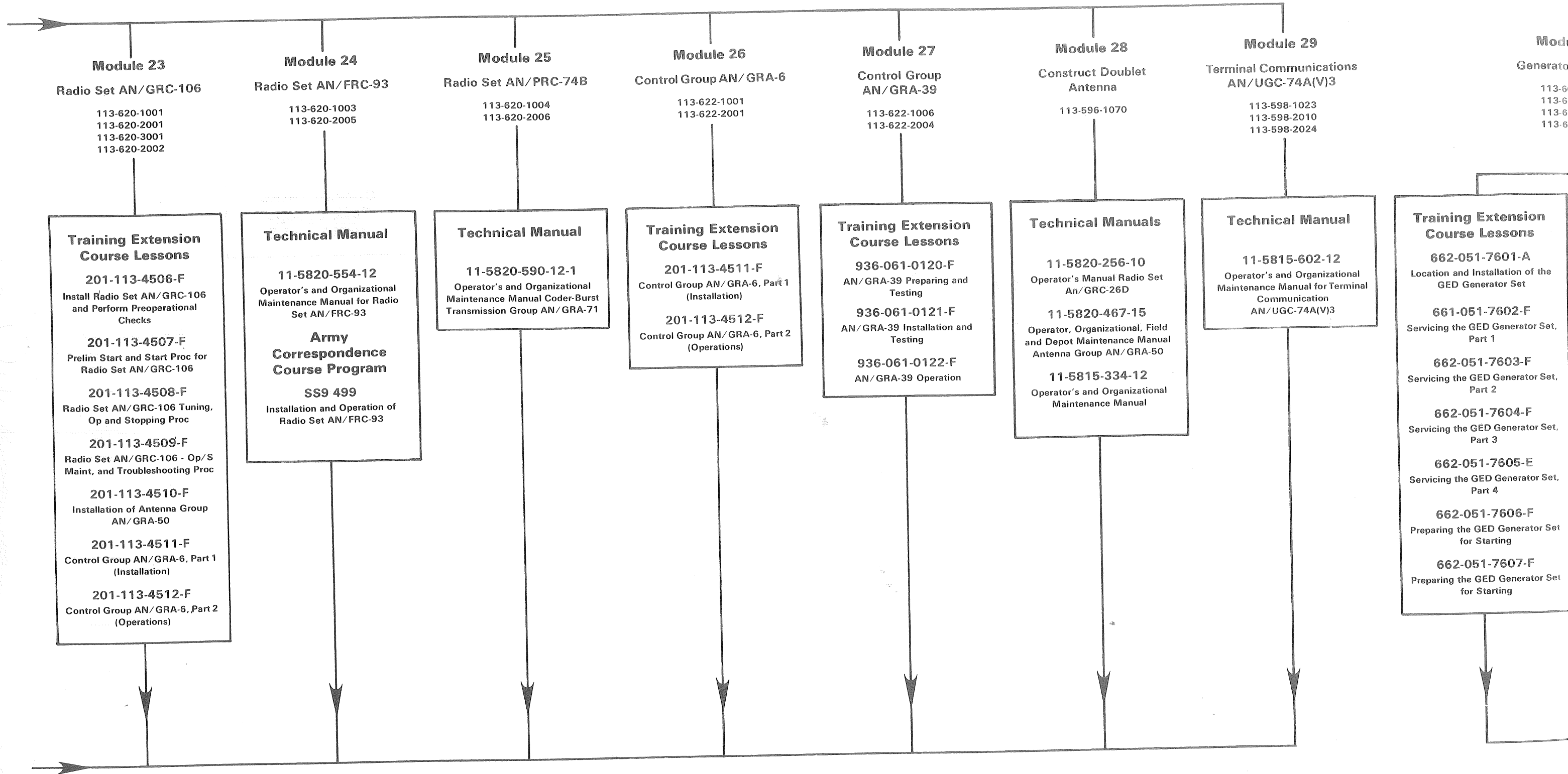
FM 11-05C1/2

Module	Title	Module	Title
10	SS9 735 SSO 470 Operation of Radio Set AN/PRC-77 The Automated CEOI	16	SS9 773 Installation and Operating Procedures for Radio Teletypewriter Set AN/VSC-3
11	SSO 712 SS9 712 Radio Set AN/VRC-12 Organizational Maintenance of Radio Set AN/VRC-12	17	TM 11-5820-256-10 TVR 201-113-2092B Radio Set AN/GRC-26D Operation and Maintenance Radio TTY Set AN/GRC-26D Part 2 Introduction
	SS9 724 TC 11-4 TC 32-11 TM 11-5820-401-1 Operator's Manual on Radio Sets AN/VRC-12 Series How to Get Out of a Jam		TVR 201-113-2093B Operation and Maintenance Radio TTY Set AN/GRC-26D Part 3 Preliminary Starting, Starting and Stopping
	TM 11-5820-401-2 Operator's Manual on Radio Sets AN/VRC-12 Series		TVR 201-113-2127E Operation and Maintenance Radio TTY Set AN/GRC-26D Part 3 Preliminary Starting, Starting and Stopping
12	SS9 735 TEC 201-113-498-4560-J Radio Set AN/PRC-77 Operate Instructions for Communication Security Equipment TSEC/KY-8		TVR 201-113-2094B Operation and Maintenance Radio TTY Set AN/GRC-26D Part 4 Presetting
13	TVR 201-113-2074 TVR 201-113-2075 TVR 201-113-2132E TVR 201-113-2076 TVR 201-113-2133E TVR 201-113-2077 TVR 201-113-2143E TVR 201-113-2080 TVR 201-113-2084 TVR 201-113-2090 TVR 201-113-2091 SS9 726 Operation and Maintenance Radio TTY Set AN/GRC-46B Part 2 Introduction Operation and Maintenance Radio TTY Set AN/GRC-46B Part 3 Preliminary Starting, Starting and Stopping Operation and Maintenance Radio TTY Set AN/GRC-46B Part 3 Preliminary Starting, Starting and Stopping Operation and Maintenance Radio Set AN/GRC-46B Part 4 Presets Operation and Maintenance Radio TTY Set AN/GRC-46B, Part 4 Presets Operation and Maintenance Radio TTY Set AN/GRC-46B Part 5 Modes of Operation Operation and Maintenance Radio TTY Set AN/GRC-46B Part 5 Modes of Operation Operation and Maintenance Radio TTY Set AN/GRC-46B Part 6 Netting, Voice Mode of Operation Operation and Maintenance Radio TTY Set AN/GRC-46B Part 7 Netting, CW Mode of Operation Operation and Maintenance Radio TTY Set AN/GRC-46B Part 8 Netting, RATT Mode of Operations		TVR 201-113-2128E Operation and Maintenance Radio TTY Set AN/GRC-26D Part 5 Tuning
	TM 11-5820-498-12 Operator's and Organizational Maintenance Manual Radio Sets AN/VRC-53, AN/TC-64, AN/GRC-125 and AN/GRC-160		TVR 201-113-2129E Operation and Maintenance Radio TTY Set AN/GRC-26D Part 5 Tuning
	FM 24-18 Field Radio Techniques		TVR 201-113-2096B Operation and Maintenance Radio TTY Set AN/GRC-26D Part 6 Operating in the RATT Mode
			TVR 201-113-2130E Operation and Maintenance Radio TTY Set AN/GRC-26D Part 6 Operating in the RATT Mode
			TVR 201-113-2097B Operation and Maintenance Radio TTY Set AN/GRC-26D Part 7 Operating in Voice and CW Modes
			TVR 201-113-2131E Operation and Maintenance Radio TTY Set AN/GRC-26D Part 7 Operating in Voice and CW Modes
			TVR 201-113-2098B Operation and Maintenance Radio TTY Set AN/GRC-26D Part 8 Netting in RATT Mode
			TVR 201-113-2099B Operation and Maintenance Radio TTY Set AN/GRC-26D Part 9 Netting in Voice and CW Mode
		18	TM 11-5810-300-12 (FOUO) SS9 725 Operator's and Organizational Maintenance Manual for NESTOR Communications Systems Using TSEC/KY-8 and TSEC/KY-38 with Radio Sets and Associated Equipment Radio Set AN/VRC-49 (Retransmission)
		19	TM 11-5820-245-12 SS9 724 Operator's Manual TSEC/KY-38 Radio Set AN/VRC-49 (Retransmission)
		20	TM 11-5810-247-10 SS9 724 Operator's Manual HYL-3/TSEC Radio Set AN/VRC-49 (Retransmission)
		21	SS9 930 thru SS9 936 Vinson Communications Security Equipment
		22	TC 11-4 TC 24-3 TM 11-5820-401-1 TM 11-5820-401-2 Handbook for AN/VRC Series Radio Sets Radio Wire Integration, Installation and Operation Tips Operator's Manual on Radio Sets AN/VRC-12 Series Operator's Manual on Radio Sets AN/VRC-12 Series

**Radio Equipment
Task Groups
Skill Level 1**

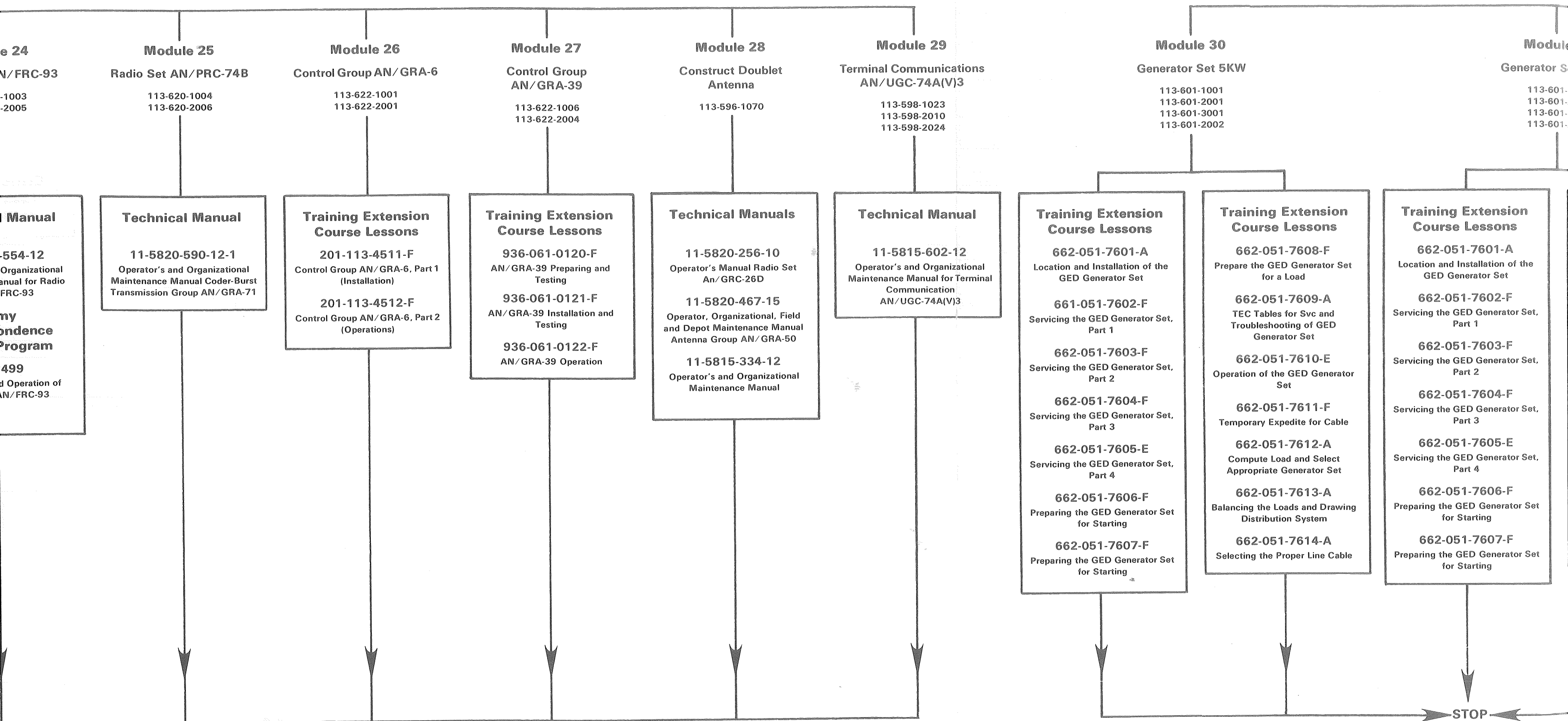
**Power Equipment
Task Groups
Skill Level 1**

**Radio Equipment
Task Groups
Skill Level 1**

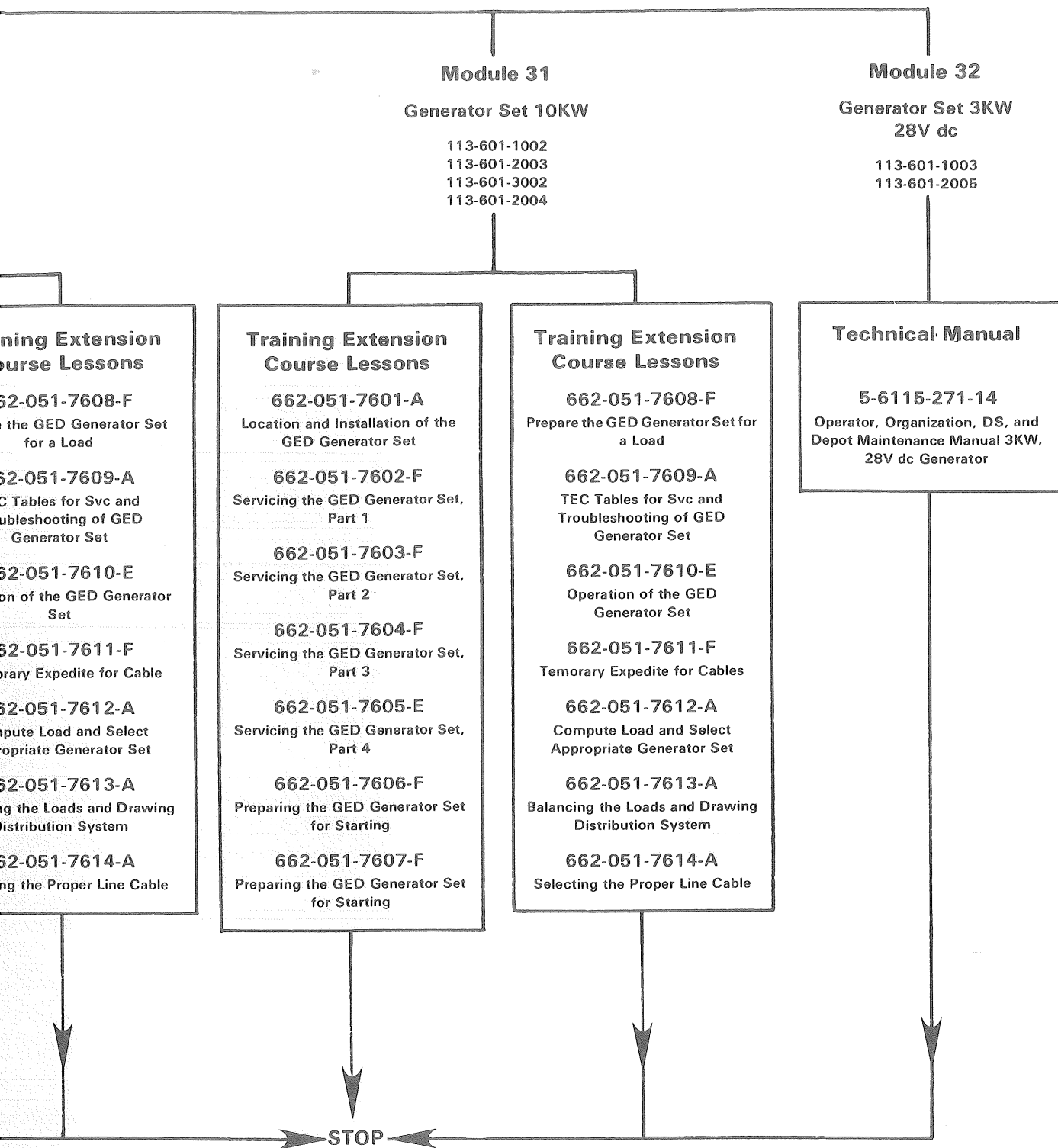


**Radio Equipment
Task Groups
Skill Level 1**

**Power Eq
Task G
Skill L**



**Power Equipment
Task Groups
Skill Level 1**



Related Training Material

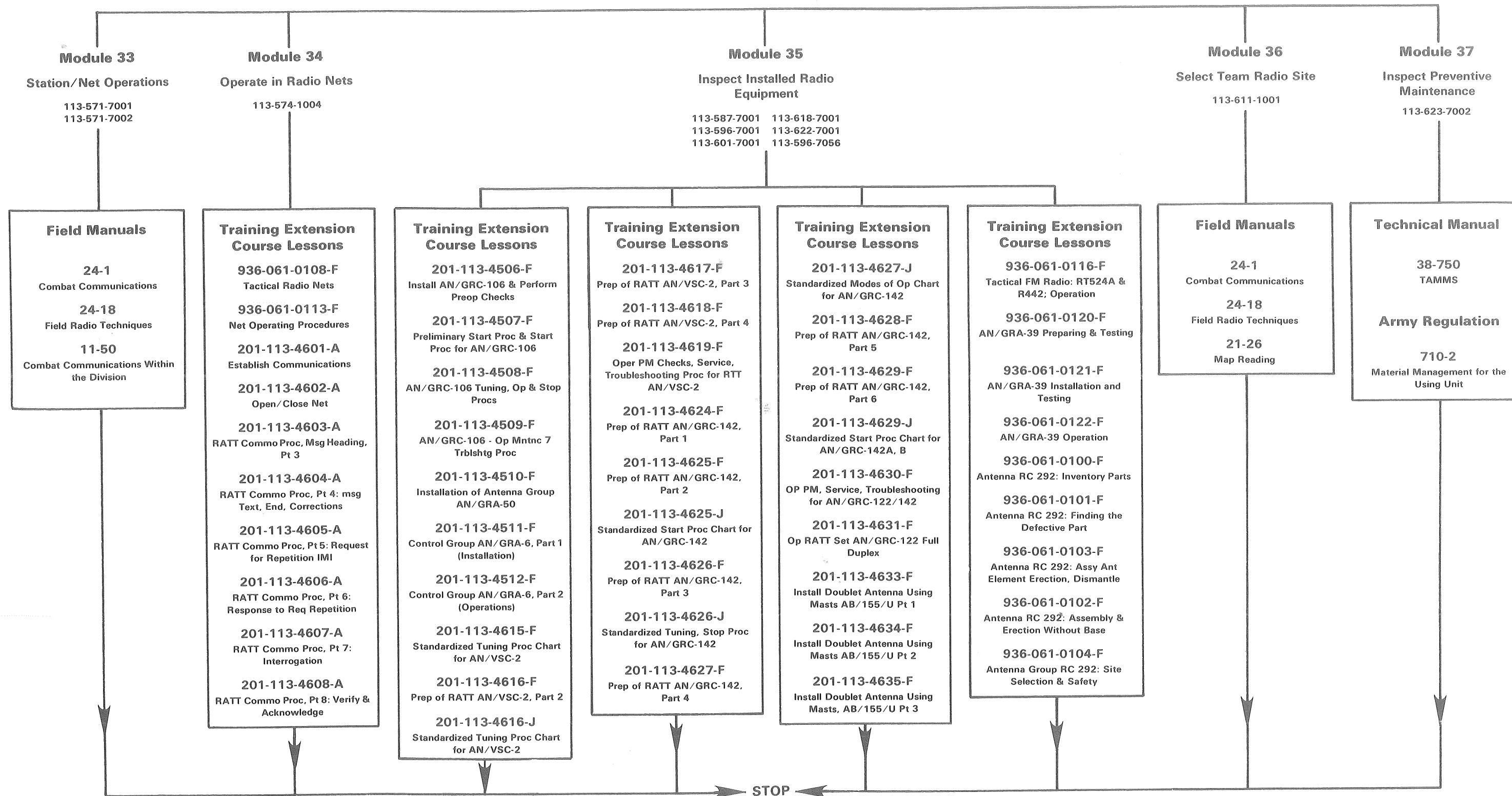
Module		Title
23	SS9 740	Radio Set AN/GRC-106 Operation (SOJT)
24	TC 11-6 SS9 499	Grounding Techniques Inst/Oper Radio Set AN/FAC-93
25	FM 24-18 TC 11-5 TC 32-11	Field Radio Techniques What's Up? How to Get Out of a Jam
26	TM 11-5038	Group Control AN/GRA-6
27	TC 24-3	Radio Wire Integration, Installation and Operation Tips
28	FM 24-18 TC 11-5	Field Radio Techniques What's Up?
29	ACP 126B	Communications Instructions Teletypewriter Procedures
30	SS9 018 TC 11-6	Communications Power Equipment Grounding Techniques
31	SS9 018 TC 11-6	Communications Power Equipment Grounding Techniques
32	TC 11-6	Grounding Techniques

**Critical Tasks
Task Groups
Skill Level 2**

Critical Tasks

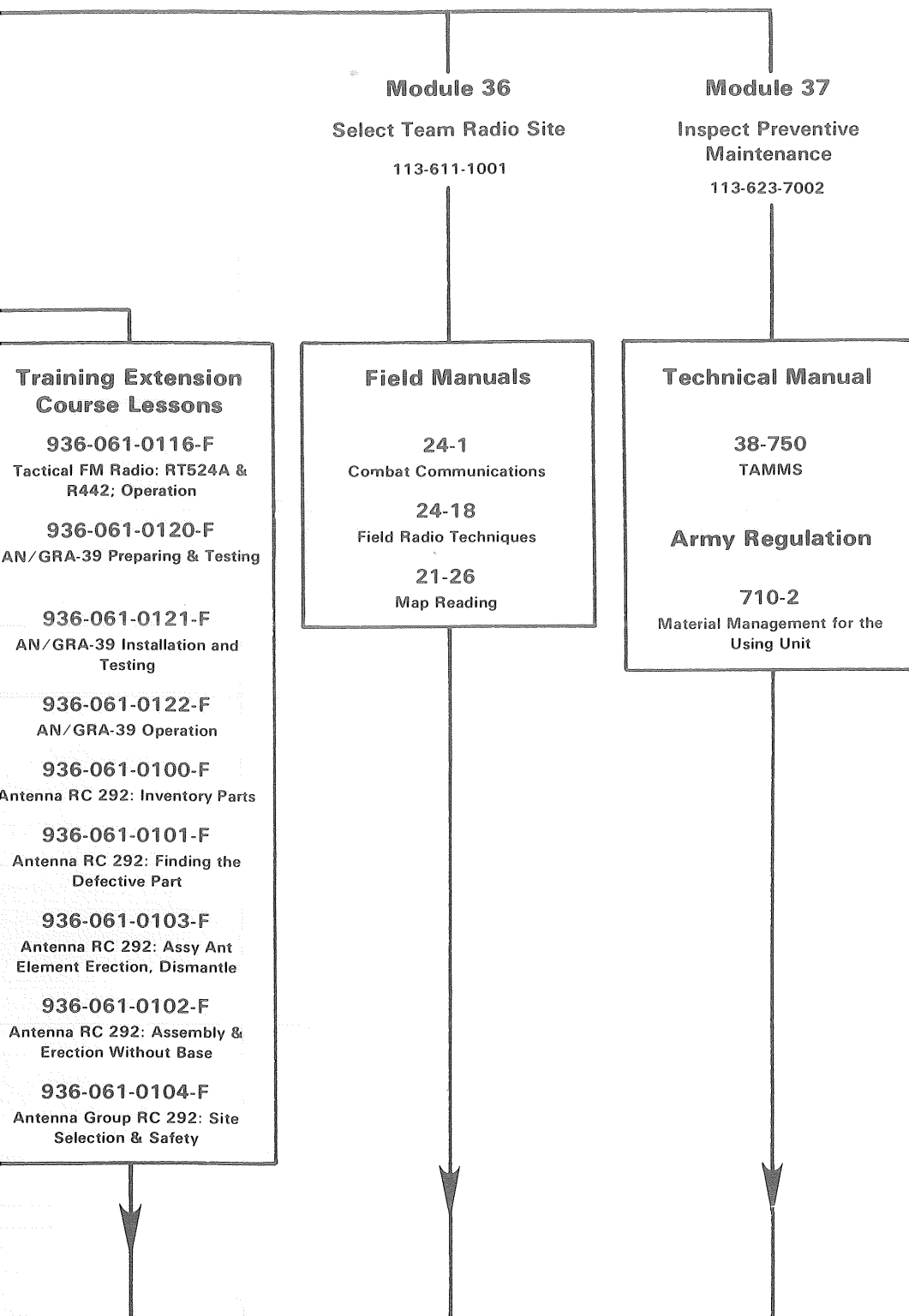
Task Groups

Skill Level 2



Related Training Material

Module		Title
33	ACP 124(A)	Radiotelegraph Procedures
	ACP 125(B)	Radio Telephon Procedures
	ACP 126(B)	Radio Teletypewriter Procedures
34	FM 24-18	Field Radio Techniques
	ACP 124(A)	Radio Telegraph Procedures
	ACP 125(B)	Radio Telephone Procedures
	ACP 126(B)	Teletypewriter Procedures
35	TM 11-5820-401	Radio Set AN/VRC-12 Series
	TM 11-5820-520	Radio Set AN/GRC-106
	TM 11-5815-331	Radioteletypewriter Set AN/VSC-2
	TM 11-5815-334	Radio Teletypewriter Set AN/GRC-142/122
36	FM 11-50	Combat Communications Within the Division
	TC 11-4	Radio Set AN/VRC-12
	TC 11-5	What's Up
37	TEC 201-113-4531-A	Preventive Maintenance (RWI)
	TEC 510-091-6456-F	DA Maintenance Forms
	TEC 510-091-6457-F	DA Form 2404
	TEC 936-061-0117-F	Maintenance RT-524/R-442
	TEC 201-113-4619-F	Maintenance AN/VSC-2
	TEC 201-113-4630-F	Maintenance AN/GRC-142/122



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15 NOVEMBER 1982

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QUESTIONNAIRE

As the user of this manual, you are a vital member of our writing team. Please provide us your opinion and suggestions by filling out this questionnaire. Be sure to include your name, AUTOVON number, and unit so we can follow up on your suggestions.

UNIT ADDRESS _____ AUTOVON _____
 _____ NAME _____
 DUTY POSITION _____ RANK _____
 TIME IN GRADE _____ TIME IN SERVICE _____

1. Are there any tasks that should be added? Yes No

2. Are there any tasks that should be dropped? Yes No

3. What would you do to improve the organization of the task list?

4. Did you have any trouble finding what you needed in this manual? Yes No

5. Did you have any trouble understanding the material in this manual? Yes No
 If your answer is Yes, which part(s) was unclear?

6. Were the CONDITIONS the way you normally perform each task? Yes No

7. Did you disagree with any of the STANDARDS? Yes No

8. Did the PERFORMANCE MEASURES help you perform the tasks to the STANDARDS listed? Yes No

9. Did this manual help you to do a better job? Yes No

10. Did you find any errors? Yes No
 If answer is Yes, please list.

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11. Should information from other publications be included in this manual? Yes No
If your answer is Yes, which and why.

12. Trainers Only: Did this manual help you improve the combat efficiency of your organization? Yes No

13. What would you do to improve this manual?

14. Comments:

Thank you for your time. Please remove this questionnaire, fold in half, staple, and drop in the mailbox.

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