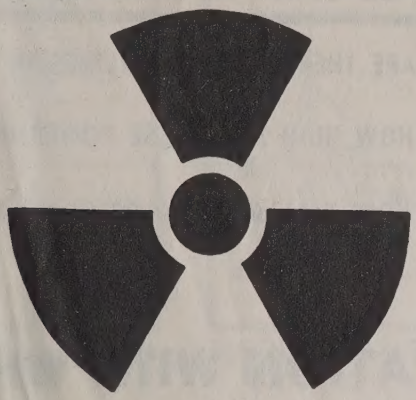
# WARNING
# RADIATION HAZARD



## RADIOACTIVE MATERIAL
## CONTROLLED DISPOSAL REQUIRED
## ACCOUNTABILITY NOT REQUIRED

STD RW—2

| | | | |
|---|---|---|---|
| Meter | Ra226 | 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-122/142(*).

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, and TB 43-0122.

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.

# WARNING

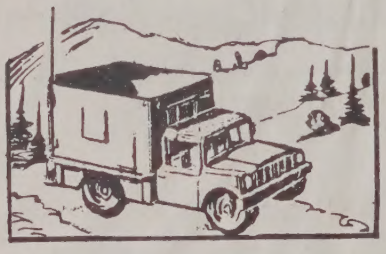
SERIOUS INJURY OR EVEN DEATH CAN HAPPEN IF THE FOLLOWING ARE NOT CAREFULLY OBSERVED WHEN INSTALLING AND USING THE ANTENNAS USED WITH YOUR RADIO SETS

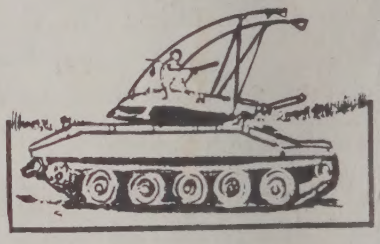
**BEFORE ANY MISSION FIND OUT**

1. ARE THERE ANY POWERLINES IN YOUR AREA OF OPERATION ?
2. HOW HIGH ARE THESE POWERLINES ?
3. HOW TALL ARE THE POLES OR TOWERS CARRYING POWERLINES ?

## MOBILE OPERATION WITH WHIP ANTENNAS





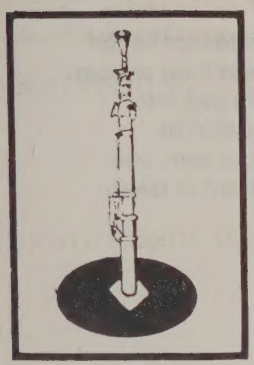


## DO NOT STOP YOUR VEHICLE UNDER POWERLINES.

- IF POSSIBLE, TRY TO MAINTAIN MOBILE COMMUNICATIONS WITH YOUR ANTENNA(S) TIED DOWN.
- MAKE SURE AN ANTENNA TIP CAP IS SECURELY TAPED ON THE END OF EACH WHIP ANTENNA.
- DO NOT LEAN AGAINST OR TOUCH A WHIP ANTENNA WHILE THE TRANSMITTER IS ON.
- DURING CROSS-COUNTRY OPERATION, DO NOT ALLOW ANYONE TO STICK AN ARM, LEG OR WEAPON OVER THE SIDES OF THE VEHICLE. IF YOUR ANTENNA ACCIDENTALLY TOUCHES A POWERLINE AND A LEG, ARM OR WEAPON CONTACTS A DAMP BUSH OR THE GROUND, A SERIOUS OR FATAL ACCIDENT CAN HAPPEN.
- IF YOU ARE NOT SURE THAT AN ANTENNA ON YOUR VEHICLE WILL CLEAR A POWERLINE, STOP BEFORE YOU GET CLOSE TO THE POWERLINE AND EITHER CAREFULLY TIE DOWN THE ANTENNA OR REMOVE ANTENNA SECTIONS TO MAKE SURE THAT YOU CAN SAFELY DRIVE UNDER THE POWERLINE.

# FIXED OPERATION WITH LONG RANGE ANTENNAS

# WARNING



TELESCOPING ANTENNA MAST



TYPICAL TOWER



EXTENDED RANGE ANTENNA



DOUBLET ANTENNA

## NEVER ERECT THESE LONG RANGE ANTENNAS DIRECTLY UNDER POWERLINES.

IF YOU MUST ERECT THESE LONG RANGE ANTENNAS NEAR POWERLINES, POWERLINE POLES OR TOWERS, OR BUILDINGS WITH OVERHEAD POWERLINE CONNECTIONS, NEVER PUT THE ANTENNA CLOSER THAN TWO TIMES THE ANTENNA HEIGHT FROM THE BASE OF THE POWERLINE, POLE, TOWER OR BUILDINGS.

## NEVER ATTEMPT TO ERECT ANY LONG RANGE ANTENNA WITHOUT A FULL TEAM.

BEFORE ERECTING ANY LONG RANGE ANTENNA, INSPECT ALL THE PARTS MAKING UP THE ANTENNA KIT. DO NOT ERECT THE ANTENNA IF ANY PARTS ARE MISSING OR DAMAGED.

DO AS MUCH OF THE ASSEMBLY WORK AS POSSIBLE ON THE GROUND.

WHEN ERECTING THE ANTENNA, ALLOW ONLY TEAM PERSONNEL IN THE ERECTION AREA.

MAKE SURE THAT THE AREA FOR THE ANCHORS IS FIRM. IF THE GROUND IS MARSHY OR SANDY, GET SPECIFIC INSTRUCTIONS FROM YOUR CREW CHIEF OR SUPERVISOR ON HOW TO REINFORCE THE ANCHORS.

WHEN SELECTING LOCATIONS FOR ANCHORS, AVOID TRAVELED AREAS AND ROADS. IF YOU CANNOT AVOID THESE AREAS, GET SPECIFIC INSTRUCTIONS FROM YOUR SUPERVISOR AS TO WHAT CLEARANCE YOUR GUY WIRES AND ROPES MUST HAVE OVER THE TRAVELED AREAS AND ROAD.

CLEARLY MARK ALL GUY WIRES AND ROPES WITH THE WARNING FLAGS OR SIGNS SUPPLIED BY YOUR UNIT. IN AN EMERGENCY, USE STRIPS OF WHITE CLOTH AS WARNING STREAMERS.

IF YOU SUSPECT THAT POWERLINES HAVE MADE ACCIDENTAL CONTACT WITH YOUR ANTENNA, STOP OPERATING, ROPE OFF THE ANTENNA AREA, AND NOTIFY YOUR SUPERIORS.

IF THE WEATHER IN YOUR AREA CAN CAUSE ICE TO FORM ON YOUR LONG RANGE ANTENNA AND ITS GUY WIRES AND ROPES, ADD EXTRA GUYS TO SUPPORT THE SYSTEM. ROPE OFF THE AREA AND POST IT WITH WARNING SIGNS LIKE "BEWARE OF FALLING ICE."

DO NOT TRY TO ERECT ANY ANTENNA DURING AN ELECTRICAL STORM.

KEEP A SHARP EYE ON YOUR ANCHORS AND GUYS. CHECK THEM DAILY AND IMMEDIATELY BEFORE AND AFTER BAD WEATHER.

## WARNING

TRICHLOROTRIFLUOROETHANE

Fumes of TRICHLOROTRIFLUOROETHANE are poisonous. Provide adequate ventilation whenever you use TRICHLOROTRIFLUOROETHANE. Do not use solvent near heat or open flame. TRICHLOROTRIFLUOROETHANE will not burn, but heat changes the gas into poisonous, irritating fumes. DO NOT breathe the fumes or vapors. TRICHLOROTRIFLUOROETHANE dissolves natural skin oils. DO NOT get the solvent on your skin, use gloves, sleeves and an apron which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

## WARNING

COMPRESSED AIR

Compressed air is dangerous and can cause serious bodily harm if protective means or methods are not observed to prevent a chip or particle (of whatever size) from being blown into the eyes or unbroken skin of the operator or other personnel. Compressed air shall not be used for cleaning purposes except where reduced to less than 29 psi, (199.95 Kilopascals) and then only with effective chip guarding and personnel protective equipment. Do not use compressed air to dry parts when TRICHLOROTRIFLUOROETHANE has been used.

Technical Manual

No. 11-5815-334-10

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 5 March 1985

# OPERATOR'S MAINTENANCE MANUAL

## RADIO TELETYPEWRITER SETS

**AN/GRC-122 (NSN 5815-00-401-9719)**
**AN/GRC-122A (NSN 5815-00-167-7998)**
**AN/GRC-122B (NSN 5815-00-937-5295)**
**AN/GRC-122C (NSN 5815-01-095-1211)**
**AN/GRC-122D (NSN 5815-01-096-0428)**
**AN/GRC-122E (NSN 5815-01-095-1212)**
**AN/GRC-142 (NSN 5815-00-401-9720)**
**AN/GRC-142A (NSN 5815-00-168-1556)**
**AN/GRC-142B (NSN 5815-00-443-5511)**
**AN/GRC-142C (NSN 5815-01-100-6815)**
**AN/GRC-142D (NSN 5815-01-104-7264)**
**AN/GRC-142E (NSN 5815-01-095-6258)**

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-ME-MP, Fort Monmouth, New Jersey 07703-5007. A reply will be furnished to you.


| | | | Page |
|---|---|---|---|
| | | HOW TO USE THIS MANUAL | ii |
| CHAPTER | 1 | INTRODUCTION | 1-1 |
| Section | I | General Information | 1-1 |
| | II | **Equipment Description** | **1-5** |
| | III | **Technical Principles of Operation** | **1-29** |
| CHAPTER | 2 | **OPERATING INSTRUCTIONS** | **2-1** |
| Section | I | Description and Use of Operator's Controls and Indicators | 2-1 |
| | II | **Preventive Maintenance Checks and Services (PMCS)** | **2-26** |
| | III | Operation Under Usual Conditions | 2-29 |
| | IV | Operation Under Unusual Conditions | 2-147 |


*This manual, together with TM 11-5815-334-20, supersedes TM 11-5815-334-12, 22 September 1967, including all changes.

| | | | Page |
|---|---|---|---|
| CHAPTER | 3 | MAINTENANCE | 3-1 |
| Section | I | Lubrication Instructions | 3-1 |
| | II | **Troubleshooting Procedures** | **3-1** |
| | III | **Maintenance Procedures** | **3-20** |
| APPENDIX | A | REFERENCES | A-1 |
| | B | COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LIST | B-1 |
| | C | ADDITIONAL AUTHORIZATION LIST | C-1 |
| | D | EXPENDABLE SUPPLIES AND MATERIALS LIST | D-1 |
| INDEX | | | INDEX-1 |
| FOLDOUTS | | | FO-1 |


## HOW TO USE THIS MANUAL

This manual is designed to help you operate and maintain the AN/GRC-122/142(*). The front cover table of contents is provided for quick reference to important information. There is also an index located in the final pages for use in locating specific items of information.

Measurements in this manual are sometimes given in both US standard and metric units. A metric to US standard conversion chart can be found on the inside back cover.

Read all preliminary information found at the beginning of each task. It has important information and safety instructions you must follow before beginning the task.

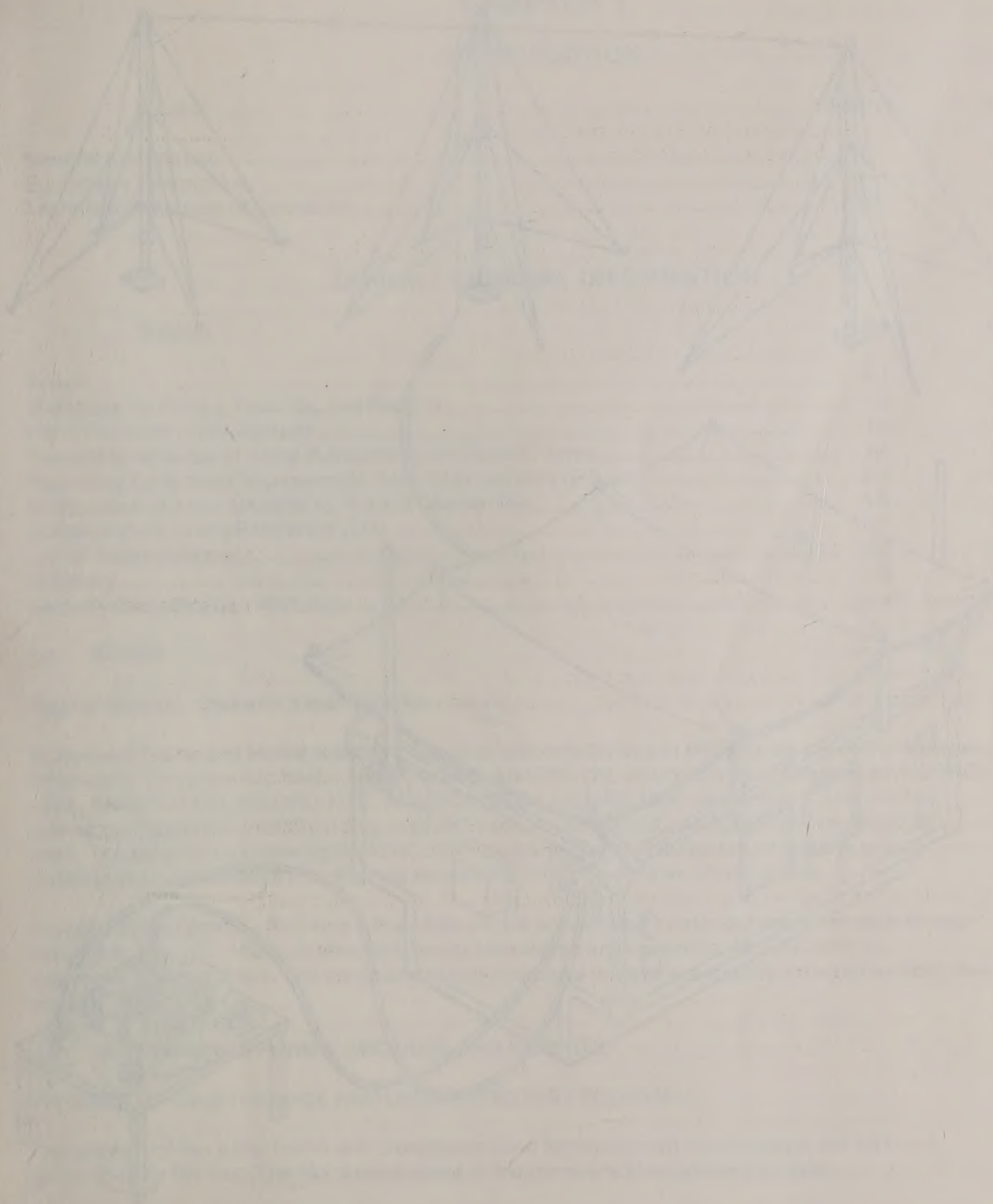
Warning pages are located in the front of this manual. You should learn the warnings before operating or doing maintenance on the equipment.

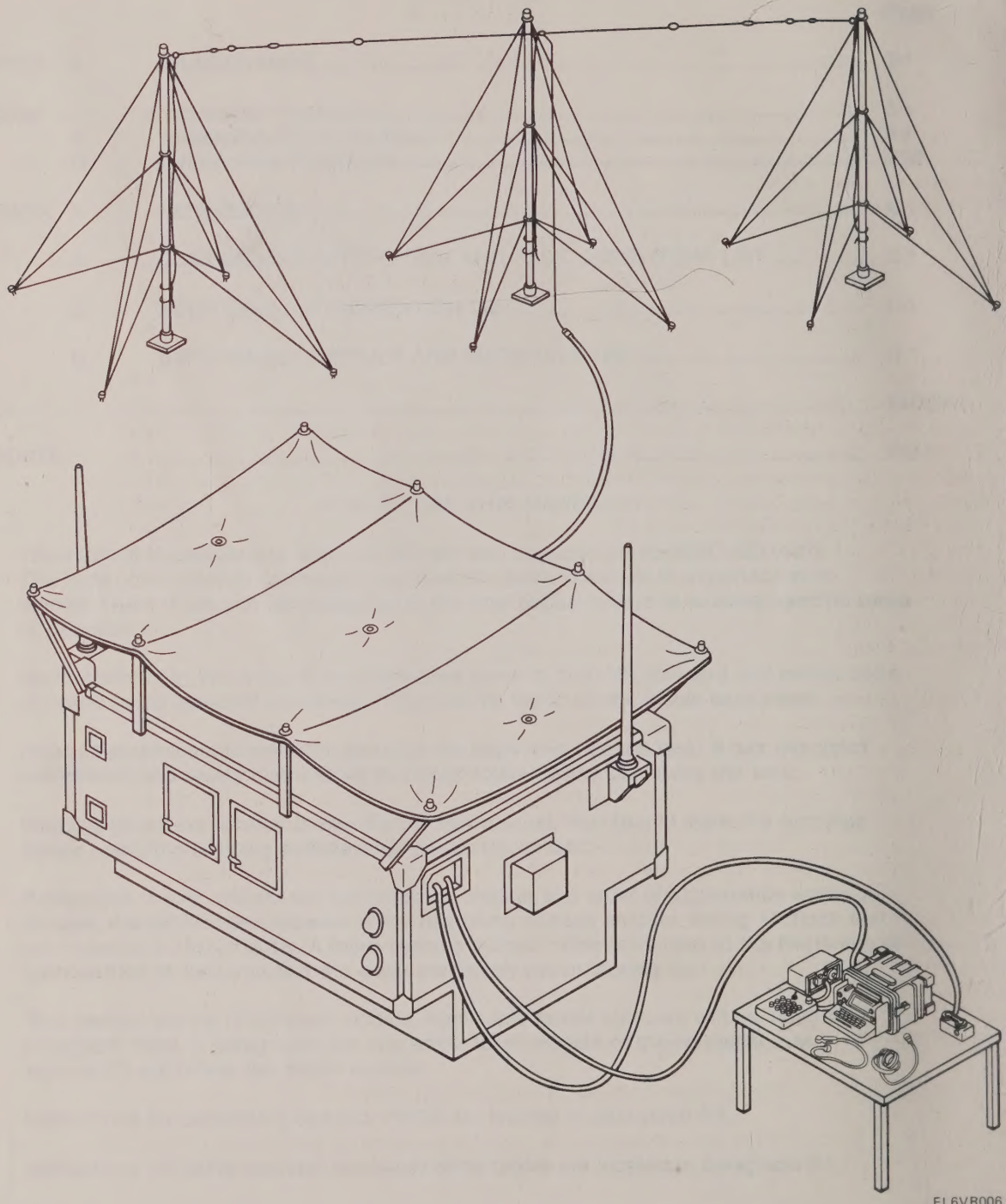
Paragraphs in this manual are numbered by chapter and order of appearance within a chapter. A subject index appears at the beginning of each chapter, listing sections that are included in that chapter. A more specific subject index is located at the beginning of each section to help you find the exact paragraph you're looking for.

This manual covers 12 different models. Applicable model numbers will be listed in paragraph titles. If paragraphs are applicable to all models of the equipment, an asterisk (*) will follow the model number.

Instructions for performing operator PMCS are located in paragraph 2-4.

Instructions for using operator troubleshooting tables are located in paragraph 3-1.






Radio Teletypewriter Set

# CHAPTER 1

## INTRODUCTION


| Subject | Section | Page |
|---|---|---|
| General Information | I | 1-1 |
| Equipment Description | II | 1-5 |
| Technical Principles of Operation | III | 1-29 |


## Section I GENERAL INFORMATION


| Subject | Para | Page |
|---|---|---|
| Scope | 1-1 | 1-1 |
| Maintenance Forms, Records, and Reports | 1-2 | 1-1 |
| Hand Receipts (-HR) Manuals | 1-3 | 1-2 |
| Consolidated Index of Army Publications and Blank Forms | 1-4 | 1-2 |
| Reporting Equipment Improvement Recommendations (EIRs) | 1-5 | 1-2 |
| Destruction of Army Materiel to Prevent Enemy Use | 1-6 | 1-2 |
| Nomenclature Cross-Reference List | 1-7 | 1-3 |
| List of Abbreviations | 1-8 | 1-3 |
| Glossary | 1-9 | 1-4 |
| Security Classification Markings | 1-10 | 1-4 |


### 1-1. SCOPE.

Type of Manual: Operator's maintenance manual.

Equipment Name and Model Number: The 12 shelters described in this manual are radio teletypewriter sets. There are two basic configurations; AN/GRC-122, which can be configured as AN/GRC-122A, AN/GRC-122B, AN/GRC-122C, AN/GRC-122D or AN/GRC-122E, and AN/GRC-142, which can be configured as AN/GRC-142A, AN/GRC-142B, AN/GRC-142C, AN/GRC-142D or AN/GRC-142E. The asterisk (*) following AN/GRC-122(*) or AN/GRC-142(*) indicates all models of that configuration. An asterisk (*) following AN/GRC-122/142(*) indicates all 12 models.

Purpose of Equipment: Provides a front-line secure or nonsecure radio or teletypewriter one-way reversible, AN/GRC-142(*), or simultaneous transmission and reception, AN/GRC-122(*), communications system. The communications system is housed in a mobile, all weather front-line shelter.

### 1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS.

REPORTS OF MAINTENANCE AND UNSATISFACTORY EQUIPMENT

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750, as contained in Maintenance Management Update.

REPORT OF PACKAGING AND HANDLING DEFICIENCIES

Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73A/AFR 400-54/MCO 4430.3F.

**1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS.** (CONT)

DISCREPANCY IN SHIPMENT REPORT (DISREP)

Fill out and forward SF 361 Discrepancy in Shipment Report (DISREP) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

**1-3. HAND RECEIPT (-HR) MANUALS.**

This manual has a companion document with a TM number followed by – HR (which stands for Hand Receipt). The TM 11-5815-334-10-HR for AN/GRC-122/142(*) consists of preprinted hand receipts (DA Form 2062) that list end item related equipment (ie, components of end item list, basic issue items list, and additional authorization list) you must account for. As an aid to property accountability, additional – HR manuals may be requisitioned from the US Army Adjutant General Publications Center in Baltimore, Maryland, in accordance with the procedures in Chapter 3, AR 310-2 and DA Pam 310-10-2.

**1-4. CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS.**

Refer to the latest issue of DA Pam 310-1 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

**1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRs).**

If your AN/GRC-122/142(*) Radio Teletypewriter set needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-ME-MP, Fort Monmouth, New Jersey 07703-5007. A reply will be sent to you.

**1-6. DESTRUCTION OF ARMY ELECTRONICS MATERIEL TO PREVENT ENEMY USE.**

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2. Comsec equipment and keying information has first priority. In addition, refer to KOA-133( ) TSEC for additional information on the TSEC/KG-27.

**1-7. NOMENCLATURE CROSS-REFERENCE LIST.**

This list contains common names used throughout this manual in place of official nomenclature.

| COMMON NAME | OFFICIAL NOMENCLATURE |
|---|---|
| amplifier AN/UGC-74 A(V)3 | Amplifier RF AM-3349/GRC-106 Terminal, Communications AN/UGC-74A(V)3 |
| control group | Control Group, AN/GRA-6 |
| control panel | Switch Assembly SA-1554/GRC-142 |
| doublet antenna | Antenna Group, AN/GRA-50 |
| dummy box | Dummy Box J-2728/GRC-142 |
| handset | Handset, H-33( ) PT |
| headset | Headset, Electrical H-227/H |

**1-7. NOMENCLATURE CROSS REFERENCE LIST.** (CONT)

| COMMON NAME | OFFICIAL NOMENCLATURE |
|---|---|
| key telegraph | Key Telegraph KY-116/U |
| local control | Local Control, C-434/GRC |
| loudspeaker | Dynamic Loudspeaker LS-166/U |
| microphone | Microphone, M-29B/U |
| modem | Modem, MD-522(*)/GRC |
| power meter | Standing Wave Ratio Power Meter ME-165/GRC |
| power supply | Power Supply PP-4763(*)/GRC |
| radio set | Radio Set, AN/GRC-106 |
| remote box | Remote Control Box, C-7279/GRC-142 |
| remote control | Remote Control, C-433/GRC |
| RT-662/GRC | Radio Transmitter RT-662/GRC |
| shelter | Shelter Electrical Equipment S-250/G or S-318(*)/G |
| switch assembly | Switch Assembly SA-1650/GRG |
| switch box | Switch Box SA-1555/GRC-142 |
| telephone or TA-312/PT | Telephone Set TA-312/PT |
| TT-76(*)/GGC | Teletypewriter Reperforator/Transmitter TT-76(*)/GGC |
| TT-98/FG | Teletypewriter, TT-98/FG or TT-722(*)/TG |
| voltmeter | Voltmeter, ME-345/GRC |
| whip antenna | Whip Antenna Consisting of:<br>Mast Base AB-652/GR<br>Mast Section MS-116A<br>Mast Section MS-117A<br>Mast Section MS-118A |

**1-8. LIST OF ABBREVIATIONS.**

| ABBREVIATION | WORD OR TERM |
|---|---|
| agc | automatic gain control |
| am. | amplitude modulation |
| bfo | beat frequency oscillator |
| cw | continuous wave |
| dx | duplex |
| fsk | frequency shift keyed |
| ma | milliamps |
| nik | normal input keying |
| nsk | narrow frequency shift keyed |
| ow | order wire |
| owr | one way reversible |
| ssb | single sideband |
| tty | teletypewriter |
| vswr | voltage standing wave ratio |
| wpm | words per minute |

## 1-9. GLOSSARY.

This list contains definitions of unusual words or terms used in this manual.

| WORD OR TERM | DEFINITION |
|---|---|
| ASCII | A code that uses eight bits to make up one character. |
| Baudot Code | A transmission code used in tty operation. One character is made up of five bits. |
| Baud Rate | A unit of measurement used to determine the speed of data transfer. |
| Compatible AM. | An am. signal that is compatible with ssb. |
| Continuous Wave (cw) | Electric current of constant amplitude and frequency. |
| Diversity | The capability of sending the same signal simultaneously over several different transmission paths. |
| Duplex (dx) | Transmission and reception at the same time. |
| Frequency Shift Keying (fsk) 850 Hz, Narrow Frequency Shift Keying (nsk) 85 Hz | A form of frequency modulation in which the modulating wave shifts the output frequency between two predetermined values (mark and space). |
| Halyard | A rope for hoisting and lowering. |
| One-Way Reversible (owr) | Transmission in one direction, and back in the opposite direction but not at the same time. |
| Order Wire (ow) | Transmission path between two stations that is independent of channels in use. |
| Single Sideband (ssb) | Transmission of either upper or lower sideband to cut power and bandwidth to one-half that of a normal transmission. |

## 1-10. SECURITY CLASSIFICATION MARKINGS.

The following codes tell you the classification of the title and contents of a manual:

a. When a (U) appears before the title of the document, it means that the title of the document is unclassified.

b. When a (C) appears before the document number, it means the contents of the document are classified confidential.

# Section II EQUIPMENT DESCRIPTION


| Subject | Para | Page |
|---|---|---|
| Equipment Characteristics, Capabilities and Features | 1-11 | 1-5 |
| Location and Description of Major Components | 1-12 | 1-6 |
| Difference Between Models | 1-13 | 1-23 |
| Equipment Data | 1-14 | 1-24 |


## 1-11. EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES.

### CHARACTERISTICS

Can be operated over land lines from a remote site up to 1 mile away from shelter over land lines.
The AN/GRC-122(*) is capable of simultaneously receiving and transmitting radio signals, known as duplex operation.
Remote duplex operation.
Tty owr transmission and reception over land lines when not operating in duplex mode.
Can operate on 110 vac 60 Hz, or 28 vdc.

### CAPABILITIES AND FEATURES

Transportable by air or truck.
Can be used in secure or nonsecure operations.
Accommodates security equipment.
Can be used with up to six teletypewriters.
Communication between shelter and remote site over land lines.
AN/GRC-122/142C, D, and E models are modified to incorporate Communications Terminal AN/UGC-74A(V)3.
AN/UGC-74A(V)3 can compose, edit, transmit, receive, store, and print messages.
Terminal is usable at signaling speeds of 45.5, 50, 75, 150, 300, 600, and 1200 baud (bits per second) using the internal clock.
AN/GRC-122/142(*) operates at a frequency range of 2.0 to 29.999 MHz and is capable of the following modes of operation:

85 Hertz, 85-Hertz diversity, or 850-Hertz fsk local owr operation.
Compatible am or ssb voice owr local or remote operation.
Simultaneous local 85-Hertz nsk and voice owr reception.
Cw local or remote operation.

## 1-11. EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES. (CONT)

AN/GRC-122(*) contains the following additional equipment for duplex operations:

RT-662/GRC
Antenna
Auxiliary loudspeaker
Invertor or motor generator
Additional TT-98/FG or Communications Terminal AN/UGC-74A(V)3.

AN/GRC-142(*) does not have the additional units listed above but is wired to accommodate this equipment. With the addition of teletypewriter TT-98/FG or AN/UGC-74A(V)3 at a remote site, the following modes of operation are possible:

85 Hertz, 85-Hertz diversity, remote owr operation
85-Hertz nsk plus voice remote owr operation.

Radio Teletypewriter Sets AN/GRC-122/142(*) can be used with each other and also with radio teletypewriter sets:

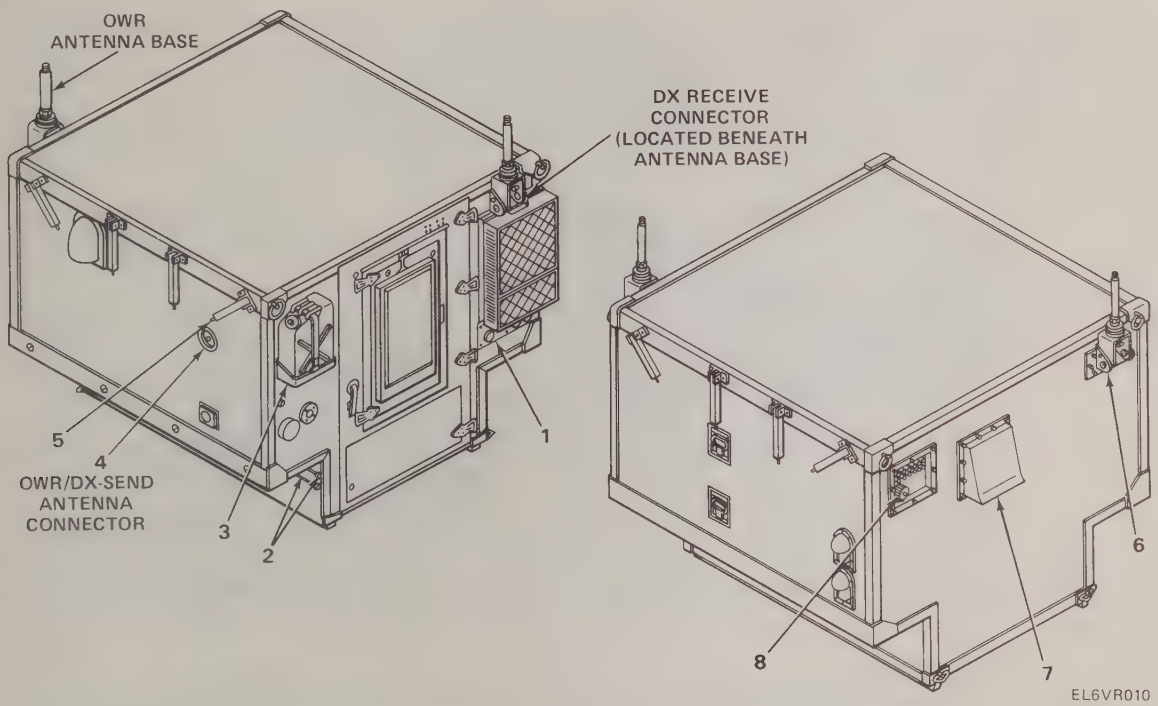
AN/VSC-2
AN/VSC-3
AN/GRC-46 series
AN/URC-29
AN/GRC-114
AN/GRC-26 series.

## 1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.

The two different shelters used (S-250/G and S-318(*)/G) provide three basic configurations of equipment due to rack arrangement. The location and description of major components are described in three sections: AN/GRC-122/142 Plain and C; AN/GRC-122/142A and B; and AN/GRC-122/142D and E models.

## 1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. (CONT)

EXTERIOR ROADSIDE AND REAR WALL OF AN/GRC-122/142 PLAIN AND C MODELS
(S-318(*)/G Shelter Shown)




1 AC Entrance Box. Provides for connection to an external 110 vac power source through AC INPUT connector.

2 Ground Rods. Used for externally grounding shelter to earth.

3 Fuel Can. Used for storage and supply of fuel for fuel heater.

4 Owr-Dx-Send Doublet Antenna Connector. Used for connection of doublet antenna to shelter during fixed or mobile-at-halt operation. Owr lead-in cable connector is located on roadside and dx receive on rear wall under antenna base.

5 Shade Tarpaulin Supports. Provides mounting facilities for shade tarpaulin to top of shelter.

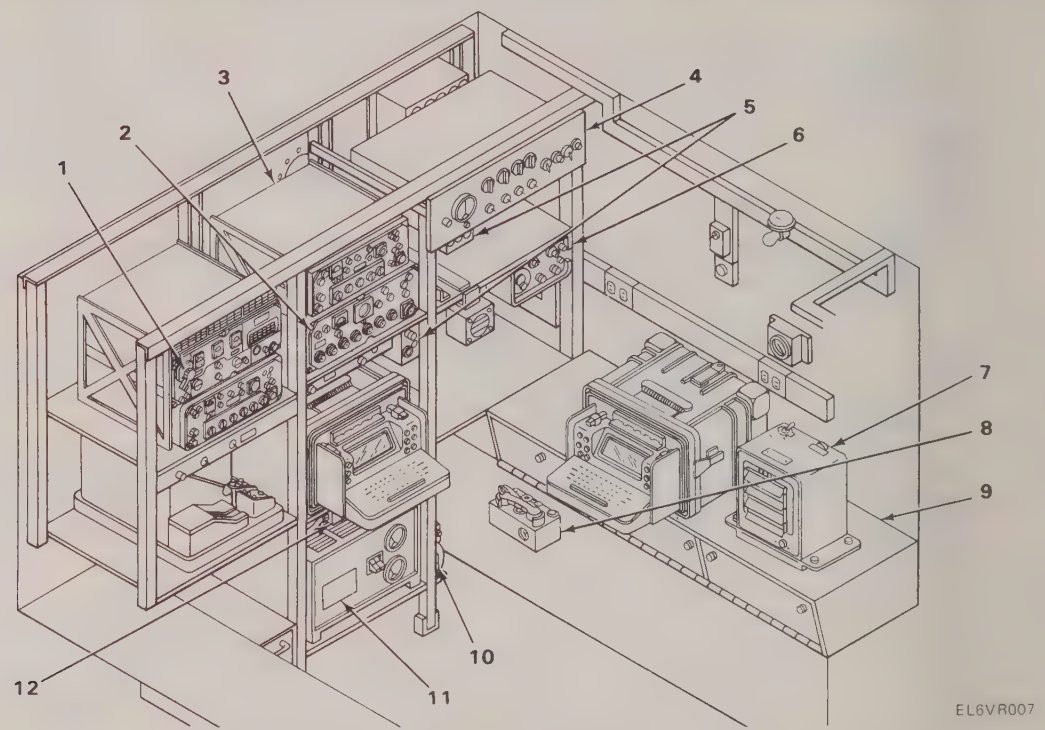
6 Antenna Assembly. Consists of Mast Sections MS-116-A, MS-117-A, MS-118-A, and Antenna Base AB-652/GR. Used primarily for mobile operation. A second duplex antenna assembly, used on AN/GRC-122(*) models only, is mounted on upper rear curbside wall.

7 Personnel Exhaust Blower. Draws in fresh air, through filtered inlet in door, to cool shelter.

8 DC Entrance Box. Provides for connection to an external 28.5 dc power source through DC INPUT connector. Contains shelter ground stud for grounding and connector terminals for remote operation.

## 1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. (CONT)

FRONT AND CURBSIDE WALL OF AN/GRC-122/142 PLAIN AND C MODELS




1 Radio Set AN/GRC-106(*). High-frequency, single sideband, radio receiver- transmitter set, consisting of Radio Transmitter RT-662/GRC or Radio Transmitter RT-834/GRC and Amplifier AM-3349/GRC-106. Installed with amplifier mounted on top of radio, and operates over a frequency range of 2.0 to 29.999 MHz. For a detailed description, refer to TM 11-5820-520-12.

2 Modem MD-522(*)/GRC. Modulator-demodulator designed primarily for use as part of a radio tty system. Converts dc pulses from tty equipment to frequency shifted audio tones (850 Hz fsk or 85 Hz nsk). During reception, converts received audio tones to dc pulses, which are applied to tty equipment. For a detailed description, refer to TM 11-5805-387-15-1 or -2.

3 Duplex Receiver-Transmitter RT-662/GRC (used on AN/GRC-122(*) models only). Receiver and low-level transmitter primarily used for duplex operation. Allows operator to receive and transmit simultaneously when used with radio set. For a detailed description, refer to TM 11-5820-520-10.

4 Power Distribution Panel SB-3018/GRC-142. Controls all dc power within shelter and is rack mounted. All controls and indicators are front panel mounted.

**1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.** (CONT)

5 Interconnecting Boxes J-2728/GRC-142. Used as tty junction boxes during normal operation. Removed, and replaced by security equipment, when shelter is operated in secure mode.

6 Control Group AN/GRC-6. Allows operator to control radio set from remote site up to 1 mile away. Makes provisions for local control of radio set through continuous dc circuit and for two-way telephone communication between remote and local control operators. Consists of Local Control C-434/GRC, Cable J-654/G, Remote Control C-433/GRC, and Handset H-33/PT. Remote control and associated components are stored in shelter. For a detailed description, refer to TM 11-5038.

7 Heater. Provides heated air when needed. Operates only in ac operation. For a detailed description, refer to TM 5-4520-236-14.

8 Telephone Set TA-312/PT. Two-wire, battery-operated, field telephone containing handcrank for generating ring-down signal. Used for telephone communication from shelter. A second telephone is stored in compartment underneath TT-76A/GGC and is used for communication between local and remote operators. For a detailed description, refer to TM 11-5805-201-12.

9 Storage Compartment. Used to store spare parts and items needed to maintain shelter. A second storage compartment is located on roadside of shelter.

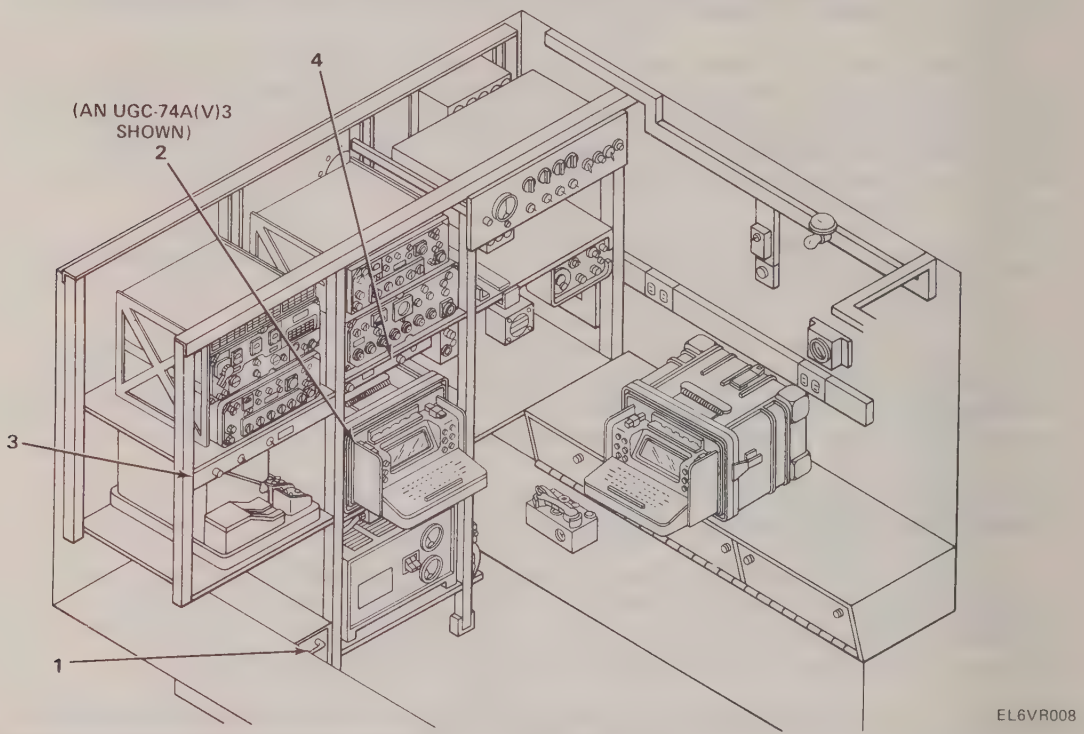
10 Motor-Generator Inverter PU-724/U (owr inverter). Converts 28.5 vdc input to 110 vac output. Provides power to TT-76A/GGC, TT-98/FG, or AN/UGC-74A(V)3. A second duplex motor generator, used on AN/GRC-122(*) models only, is located in front of owr inverter and is used for duplex TT-98/FG or AN/UGC-74A(V)3. Inverters are not used during ac operation.

11 DC Power Supply PP-4763(*)/GRC. Converts 115 vac, 60 Hz to 28.5 vdc at 50 amp. Provides major components with dc voltage in ac operation. For a detailed description, refer to TM 11-5820-765-12.

12 Distribution Box J-2776/GRC-142. Mounted under front TT-98/FG. Provides switching and power distribution for shelter operation from ac or dc power source combinations.

## 1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. (CONT)

FRONT AND CURBSIDE WALL OF AN/GRC-122/142 PLAIN AND C MODELS (CONT)




1 TT-76A/GGC Storage Drawers. Used for storage of TT-76A/GGC punched or unpunched tapes.

2 Terminal Communications AN/UGC-74A(V)3 (used in AN/GRC-122/142C models only). Provides a full-duplex, asynchronous (ASCII or baudot) communications capability with MIL-STD-188C and normal input keying (nik) interfaces. Used to compose, edit, transmit, receive, store, and print messages at signaling speeds of 45.5, 50, 75, 150, 300, 600, and 1200 baud (bits per second) utilizing internal clock. Other rates may be used when external clock is provided. A second duplex AN/UGC-74A(V)3 is used in AN/GRC-122(*) models during duplex operation. For a detailed description, refer to TM 11-5815-602-12.

or

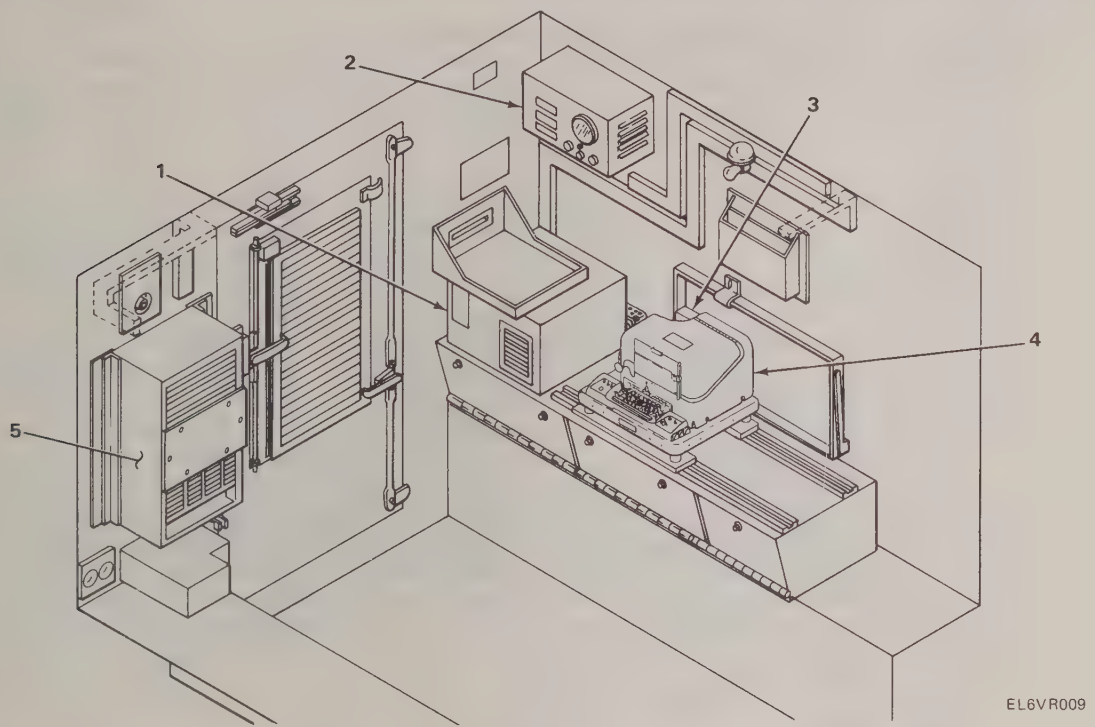
Teletypewriter TT-98/FG (used in AN/GRC-122/142 Plain models only). Slide mounted on AN/GRC-122/142 Plain models, allows for transmitting, monitoring, and receiving tty messages in baudot code. Messages are printed at 60 or 100 words per minute as page copy. A second TT-98/FG, used for duplex operation in AN/GRC-122 models, is shelf mounted on curbside storage compartment. For a detailed description, refer to TM 11-5815-200-12.

3 Switchbox SA-1555/GRC-142. Provides means of obtaining low-level tty loop current when operating in secure mode. Permits switching TT-76A/GGC between owr and duplex circuits on AN/GRC-122 models only.

4 Switch Assembly SA-1554/GRC-142. Allows operator to switch between local and remote tty modes of operation and loop current adjustment. Routes telephone and radio set mike/keying circuits. Interconnects dummy boxes through front panel tty jacks.

## 1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. (CONT)

REAR AND ROADSIDE WALL OF AN/GRC-122/142 PLAIN AND C MODELS




1 Shelter Fuel Heater. Used to heat shelter in dc mode of operation. Operates on gasoline, kerosene, burner fuel, or jet fuel. For a detailed description, refer to TM 5-4520-211-14.

2 Standing Wave Radio Power Meter ME-165/G. Used for measuring transmitter output power and standing wave ratio when doublet antenna is used. May be used for terminating amplifier power output during radio silence operation. For a detailed description, refer to TM 11-6625-333-15.

3 Low-Level Signaling Device TT-523/GGC. Used with TT-76A/GGC to make off-line tapes under secure conditions. For a detailed description, refer to TM 11-5815-338-15.

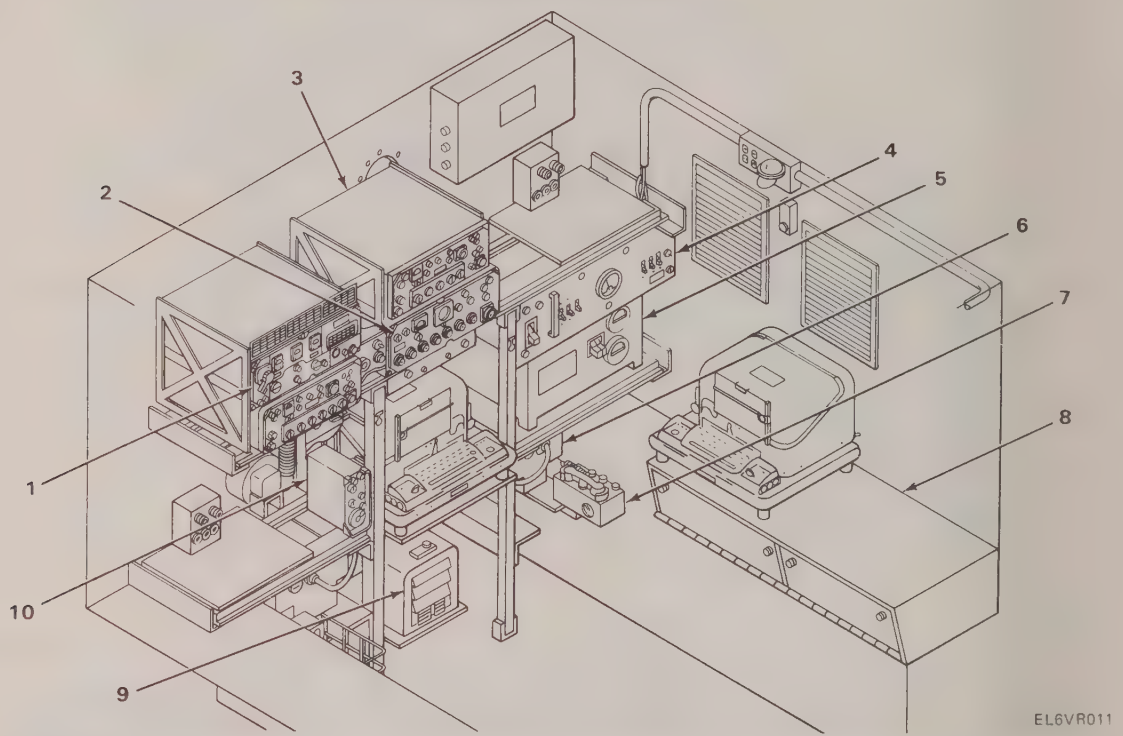
4 Teletypewriter-Reperforator/Transmitter TT-76A/GGC. Slide mounted, allows transmission by either manual keyboard operation or from punched tape. Messages received in baudot code by TT-76A/GGC are printed on and punched through paper tape. Punched tape with message received can later be used for transmission. Message tape may be prepared locally without disturbing connected signal circuits. Operating speeds are 60 or 100 words per minute. For a detailed description, refer to TM 11-5815-238-10 or -20.

5 Air Conditioner (used on AN/GRC-122 and 142 serial numbers 1 through 697 only). Provides 6,000 Btu of cooling during hot weather and 1250 watts of heating during cold weather. Used during ac operation only.

## 1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. (CONT)

AN/GRC-122/142A configurations are contained in S-318(*)/G shelter and AN/GRC-122/142B configurations are contained in S-250/G shelter.

FRONT AND CURBSIDE WALL OF AN/GRC-122/142A AND B MODELS




1 Radio Set AN/GRC-106(*). High-frequency, radio receiver-transmitter set consisting of Radio Transmitter RT-662/GRC or Radio Transmitter RT-834/GRC and Amplifier AM-3349/GRC-106. Installed with amplifier mounted on top of radio, and operates over a frequency range of 2.0 to 29.999 MHz. For a detailed description, refer to TM 11-5820-520-12.

2 Modem MD-522(*)/GRC. Modulator-demodulator designed primarily for use as part of a radio tty system. Converts dc pulses from tty equipment to frequency shifted audio tones (850 Hz fsk or 85 Hz nsk). During reception, converts received audio tones to dc pulses, which are applied to tty equipment. For a detailed description, refer to TM 11-5805-387-15-1 or -2.

3 Duplex Receiver-Transmitter RT-662/GRC (used on AN/GRC-122(*) models only). Receiver and low-level transmitter primarily used for duplex operation. Allows operator to receive and transmit simultaneously when used with radio set. For a detailed description, refer to TM 11-5820-520-10.

4 Power Distribution Panel SB-3358/GRC. Controls all dc and ac power within shelter and is rack mounted. All controls and indicators are front panel mounted.

**1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.** (CONT)

5 DC Power Supply PP-4763(*)/GRC. Converts 115 vac, 60 Hz to 28.5 vdc at 50 amp. Provides major components with dc voltage in ac operation. For a detailed description, refer to TM 11-5820-765-12.

6 Motor-Generator Inverter PU-724/U (owr inverter). Converts 28.5 vdc input to 110 vac output. Provides power to TT-76A/GGC, TT-98/FG or AN/UGC-74(V)3. A second duplex motor generator, used on AN/GRC-122(*) models only, is located in front of owr inverter and is used for duplex TT-98/FG or AN/UGC-74A(V)3. Inverters are not used during ac operation.

7 Telephone Set TA-312/PT. Two-wire, battery-operated, field telephone containing handcrank for generating ring-down signal. Used for telephone communication from shelter. A second telephone is stored in compartment underneath TT-76A/GGC and is used for communication between local and remote operators. For a detailed description, refer to TM 11-5805-201-12.

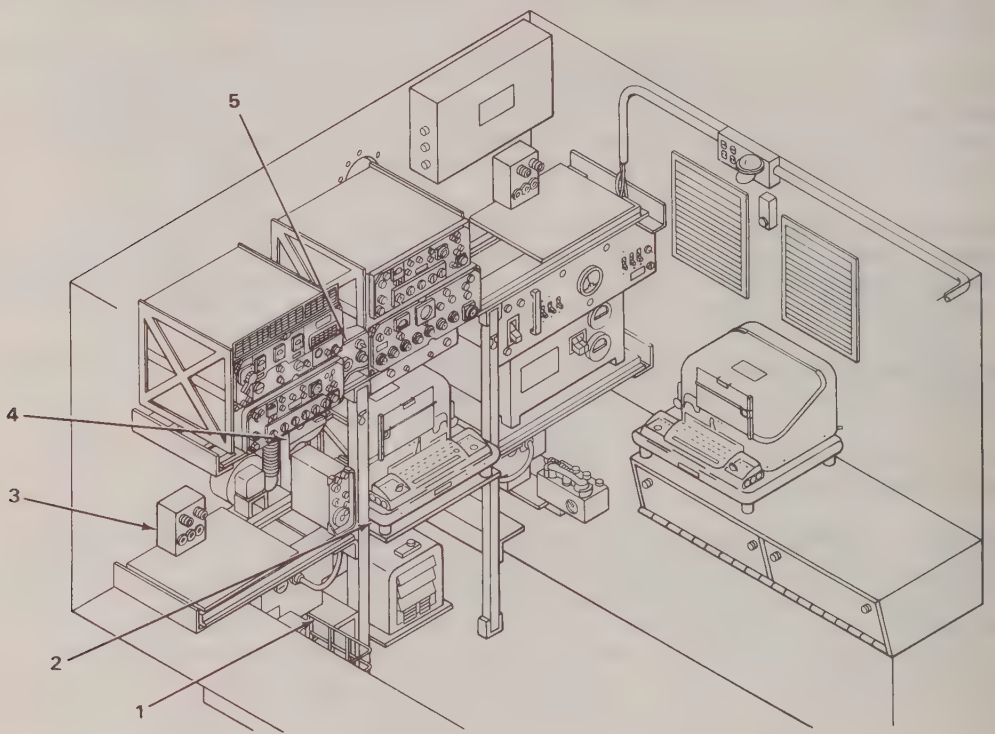
8 Storage Compartment. Used to store spare parts and items needed to maintain shelter. A second storage compartment is located on roadside of shelter.

9 Heater. Provides heated air when needed. Operates only in ac operation. For a detailed description, refer to TM 5-4520-236-14.

10 Control Group AN/GRC-6. Allows operator to control radio set from remote site up to 1 mile away. Makes provisions for local control of radio set through continuous dc circuit and for two-way telephone communication between remote and local control operators. Consists of Local Control C-434/GRC, Cable J-654/G, Remote Control C-433/GRC, and Handset H-33/PT. Remote control and associated components are stored in shelter. For a detailed description, refer to TM 11-5038.

## 1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. (CONT)

FRONT AND CURBSIDE WALL OF AN/GRC-122/142A AND B MODELS (CONT)




1 Tape/Paper Storage Basket. Used for storage of TT-76A/GGC punched or unpunched tapes.

2 Teletypewriter TT-98/FG (used in AN/GRC-122/142A and B models only). Allows for transmitting, monitoring, and receiving tty messages in baudot code. Messages are printed at 60 or 100 words per minute as page copy. A second TT-98/FG, used for duplex operation in AN/GRC-122 models, is shelf mounted on curbside storage compartment. For a detailed description, refer to TM 11-5815-200-12.

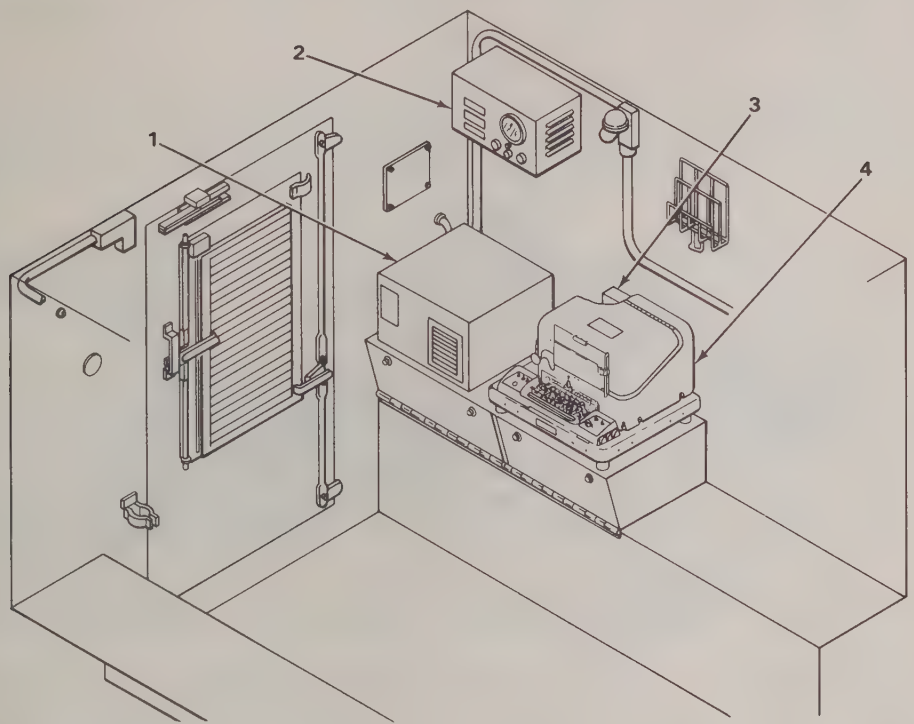
3 Interconnecting Boxes J-2728/GRC-142. Used as tty junction boxes during normal operation. Removed, and replaced by security equipment, when shelter is operated in secure mode.

4 Power Terminal Assembly. Provides receptacles for power hookup of equipment. Permanently mounted on front wall.

5 Switch Assembly SA-1650/GRC. Allows switching between local and remote tty modes of operation and switching of TT-76A/GGC between owr and duplex circuits. When operating in secure mode, a set low-level loop current is provided for tty equipment. Interconnects dummy boxes through front panel tty jacks.

## 1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. (CONT)

REAR AND ROADSIDE WALL OF AN/GRC-122/142A AND B MODELS




1 Shelter Fuel Heater. Used to heat shelter in dc mode of operation. Operates on gasoline, kerosene, burner fuel, or jet fuel. For a detailed description, refer to TM 5-4520-211-14.

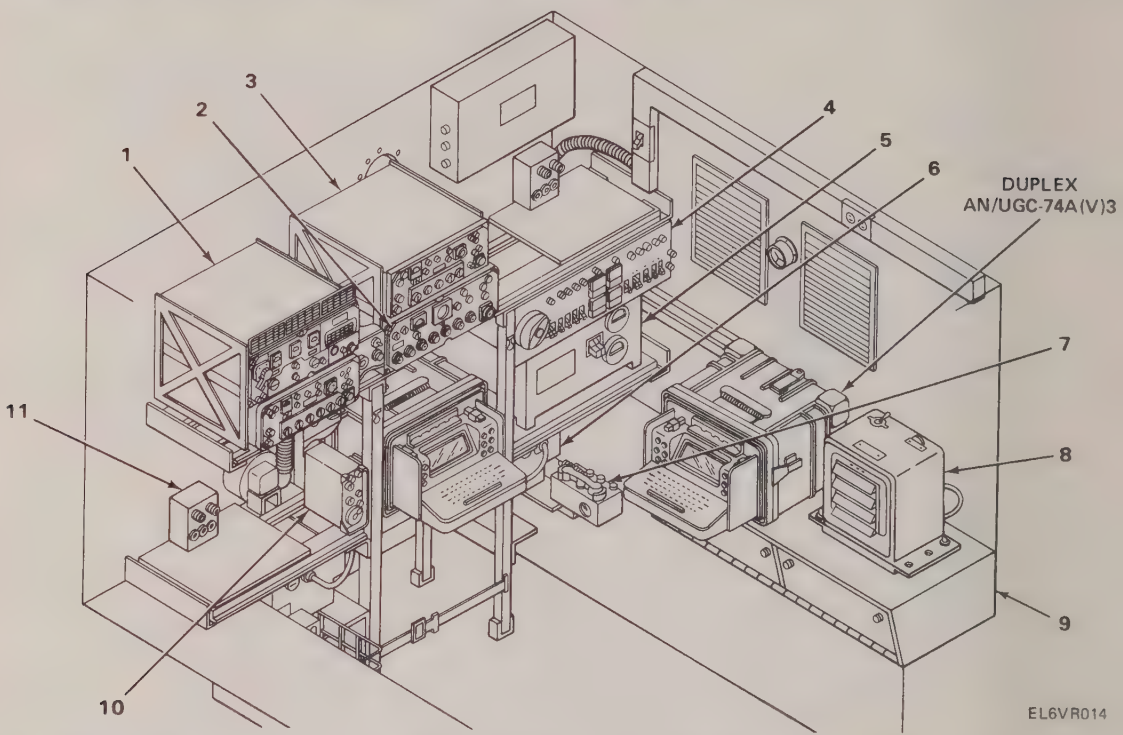
2 Standing Wave Ratio Power Meter ME-165/G. Used for measuring transmitter output power and standing wave ratio when doublet antenna is used. May be used for terminating amplifier power output during radio silence operation. For a detailed description, refer to TM 11-6625-333-15.

3 Low-Level Signaling Device TT-523/GGC. Used with TT-76A/GGC to make off-line tapes under secure conditions. For a detailed description, refer to TM 11-5815-338-15.

4 Teletypewriter-Reperforator/Transmitter TT-76A/GGC. Slide mounted, allows transmission by either manual keyboard operation or from punched tape. Messages received in baudot code by TT-76A/GGC are printed on and punched through paper tape. Punched tape with message received can later be used for transmission. Message tape may be prepared locally without disturbing connected signal circuits. Operating speeds are 60 or 100 words per minute. For a detailed description, refer to TM 11-5815-238-10 or -20.

## 1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. (CONT)

FRONT AND CURBSIDE WALL OF AN/GRC-122/142D AND E MODELS




1 Radio Set AN/GRC-106(*). High-frequency, radio receiving-transmitting set consisting of Radio Transmitter RT-662/GRC or Radio Transmitter RT-834/GRC and Amplifier AM-3349/GRC-106. Installed with amplifier mounted on top of radio, and operates over a frequency range of 2.0 to 29.999 MHz. For a detailed description, refer to TM 11-5820-520-12.

2 Modem MD-522(*)/GRC. Modulator-demodulator designed primarily for use as part of a radio tty system. Converts dc pulses from tty equipment to frequency shifted audio tones (850 Hz fsk or 85 Hz nsk). During reception, converts received audio tones to dc pulses, which are applied to tty equipment. For a detailed description, refer to TM 11-5805-387-15-1.

3 Duplex Receiver-Transmitter RT-662/GRC (used on AN/GRC-122(*) models only). Receiver and low-level transmitter primarily used for duplex operation. Allows operator to receive and transmit simultaneously when used with radio set. For a detailed description, refer to TM 11-5820-520-10.

4 Power Distribution Panel SC-F-960672. Controls all ac and dc power within shelter and is rack mounted. All controls and indicators are front panel mounted.

**1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.** (CONT)

5 DC Power Supply PP-4763(*)/GRC. Converts 115 vac, 60 Hz to 28.5 vdc at 50 amp. Provides major components with dc voltage in ac operation. For a detailed description, refer to TM 11-5820-765-12.

6 Inverter PU-724A/U (solid state inverter). Converts 28.5 vdc input to 110 vac output. Provides power to TT-76A/GGC and AN/UGC-74A(V)3. A second duplex inverter, used on AN/GRC-122(*) models only, supplies duplex AN/UGC-74A(V)3 with power. Duplex inverter is located under front roadside end of rack. Inverters are not used during ac operation.

**CAUTION**

Inverter PU-724A/U to be used with authorized equipment only. Do not exceed 400 watts. Overheating of inverter could cause fracture of solid state components.

7 Telephone Set TA-312/PT. Two-wire, battery-operated, field telephone containing handcrank for generating ring-down signal. Used for telephone communication from shelter. A second telephone is stored in compartment underneath TT-76A/GGC and is used for communication between local and remote operators. For a detailed description, refer to TM 11-5805-201-12.

8 Heater. Provides heated air when needed. Operates only in ac operation. For a detailed description, refer to TM 5-4520-236-14.

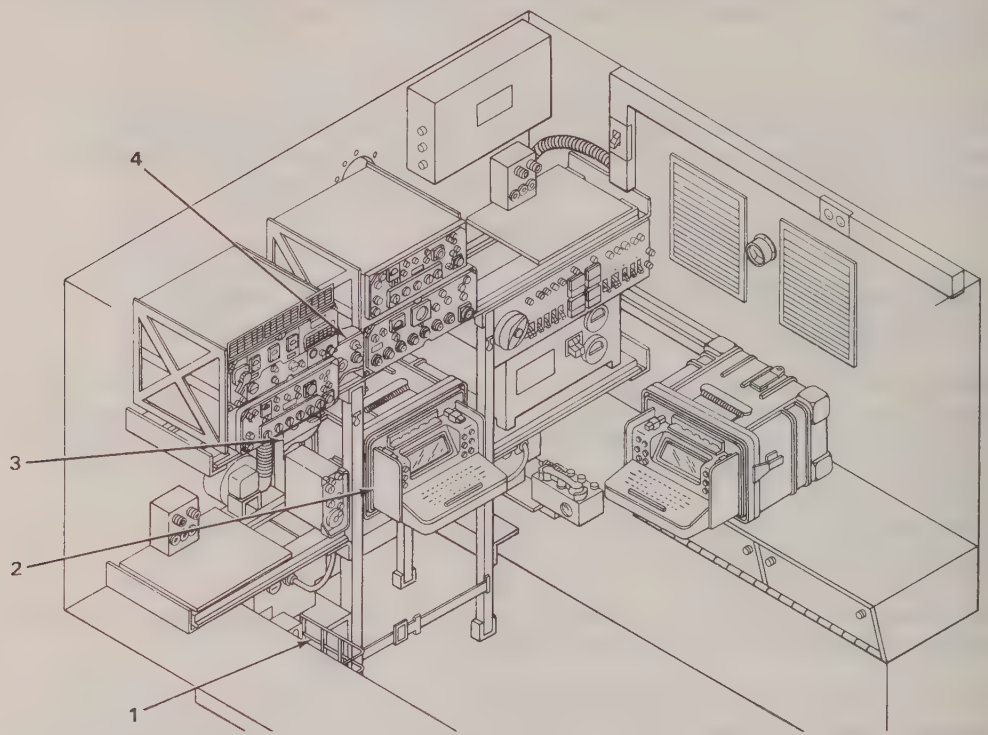
9 Storage Compartment. Used to store spare parts and items needed to maintain shelter. A second storage compartment is located on roadside of shelter.

10 Control Group AN/GRC-6. Allows operator to control radio set from remote site up to 1 mile away. Makes provisions for local control of radio set through continuous dc circuit and for two-way telephone communication between remote and local control operators. Consists of Local Control C-434/GRC, Cable J-654/G, Remote Control C-433/GRC, and Handset H-33/PT. Remote control and associated components are stored in shelter. For a detailed description, refer to TM 11-5038.

11 Interconnecting Boxes J-2728/GRC-142. Used as tty junction boxes during normal operation. Removed, and replaced by security equipment, when shelter is operating in secure mode.

## 1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. (CONT)

FRONT AND CURBSIDE WALL OF AN/GRC-122/142D AND E MODELS (CONT)




1 Tape/Paper Storage Basket. Used for storage of TT-76A/GGC punched or unpunched tapes.

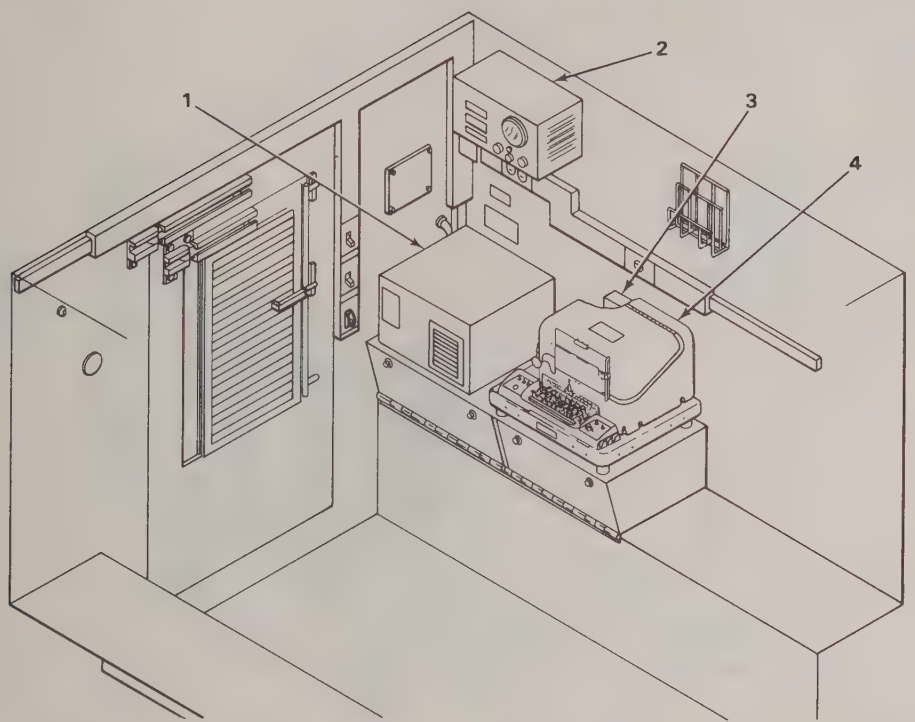
2 Terminal Communications AN/UGC-74A(V)3. Provides a full-duplex, asynchronous (ASCII or baudot) communications capability with MIL-STD-188C and normal input keying (nik) interfaces. Used to compose, edit, transmit, receive, store, and print messages at signaling speeds of 45.5, 50, 75, 150, 300, 600, and 1200 baud (bits per second) utilizing internal clock. Other rates may be used when external clock is provided. A second duplex AN/UGC-74A(V)3 is used in AN/GRC-122(*) models during duplex operation. For a detailed description, refer to TM 11-5815-602-12.

3 Power Terminal Assembly. Provides receptacles for power hookup of equipment. Permanently mounted on front wall.

4 Switch Assembly SA-1650/GRC. Allows switching between local and remote tty modes of operation and switching of TT-76A/GGC between owr and duplex circuits. When operating in secure mode, a set low-level loop current is provided for tty equipment. Interconnects dummy boxes through front panel tty jacks.

## 1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. (CONT)

REAR AND ROADSIDE WALL OF AN/GRC-122/142D AND E MODELS




1 Shelter Fuel Heater. Used to heat shelter in dc mode of operation. Operates on gasoline, kerosene, burner fuel, or jet fuel. For detailed description, refer to TM 5-4520-211-14.

2 Standing Wave Ratio Power Meter ME-165/G. Used for measuring transmitter output power and standing wave ratio when doublet antenna is used. May be used for terminating amplifier power output during radio silence operation. For detailed description, refer to TM 11-6625-333-15.

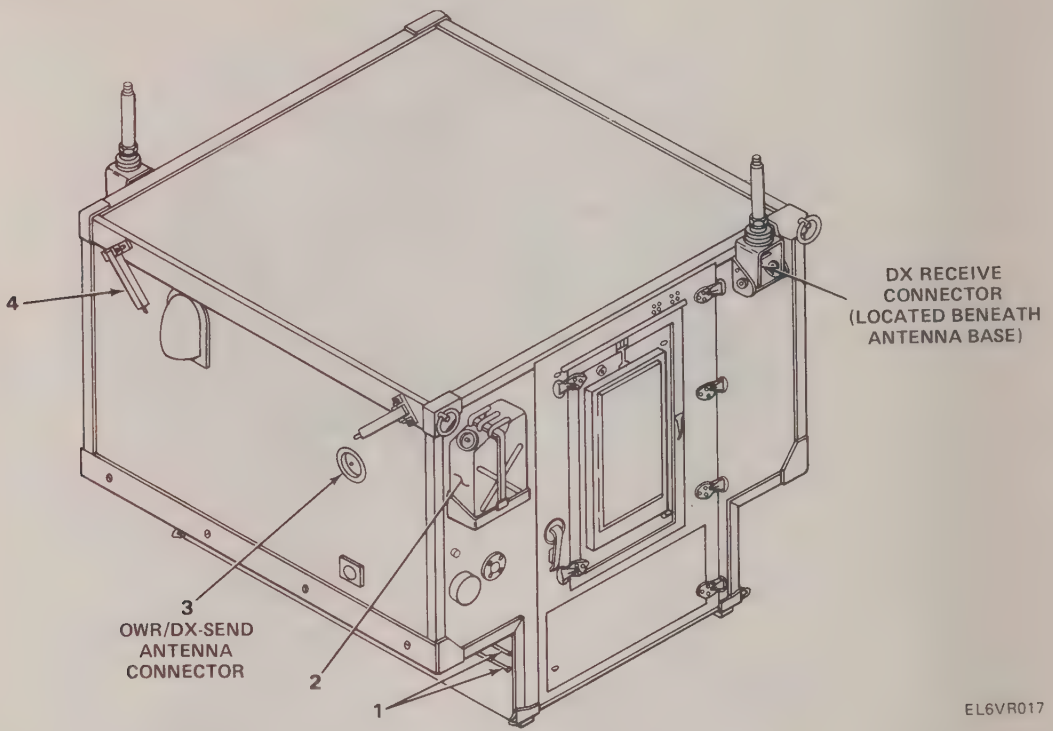
3 Low-Level Signaling Device TT-523/GRC. Used with TT-76A/GGC to make off-line tapes under secure conditions. For a detailed description, refer to TM 11-5815-338-15.

4 Teletypewriter-Reperforator/Transmitter TT-76A/GGC. Slide mounted, allows transmission by either manual keyboard operation or from punched tape. Messages are received in baudot code by TT-76A/GGC and are printed on and punched through paper tape. Punched tape with message received can later be used for transmission. Message tape may be prepared locally without disturbing connected signal circuits. Operating speeds are 60 or 100 words per minute. For a detailed description, refer to TM 11-5815-238-10 or -20.

## 1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. (CONT)

EXTERIOR ROADSIDE AND REAR WALL OF AN/GRC-122/142A, B, D, AND E MODELS

(S-250/G Shelter Shown)




1 Ground Rods. Used for externally grounding shelter to earth.

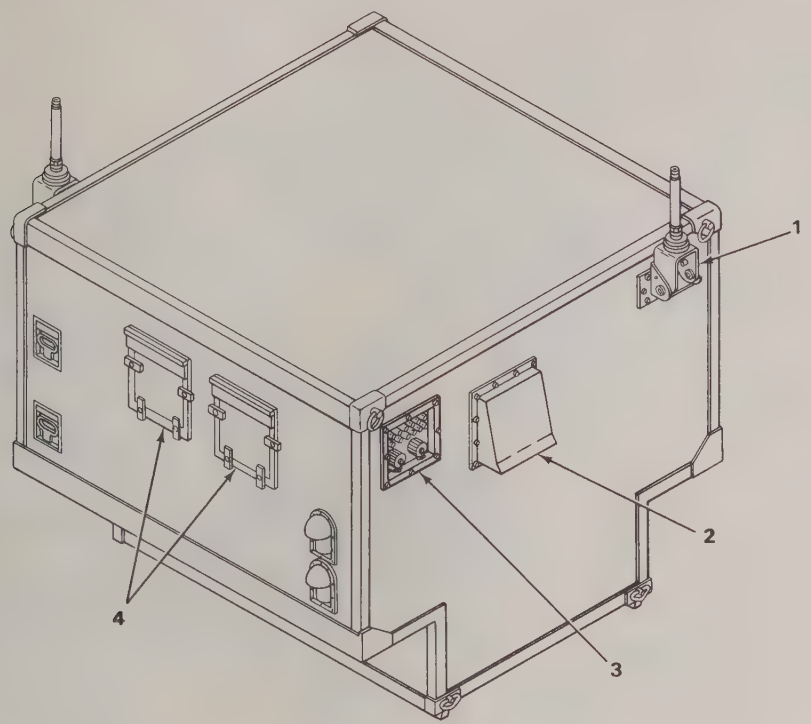
2 Fuel Can. Used for storage of fuel supply for fuel heater.

3 Owr-Dx-Send Doublet Antenna Connector. Used for connection of doublet antenna to shelter during fixed or mobile-at-halt operation. Owr lead-in cable connector is located on roadside and dx receive on rear wall under antenna base.

4 Shade Tarpaulin Supports. Provides mounting facilities for shade tarpaulin to top of shelter.

## 1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. (CONT)

EXTERIOR CURBSIDE AND FRONT WALL OF AN/GRC-122/142A, B, D, AND E MODELS




EL6VR018

1 Antenna Assembly. Consists of Mast Sections MS-116-A, MS-117-A, MS-118-A, and Antenna Base AB-652/GR. Used primarily for mobile operation. A second duplex antenna assembly, used on AN/GRC-122(*) models only, is mounted on upper rear curbside wall.

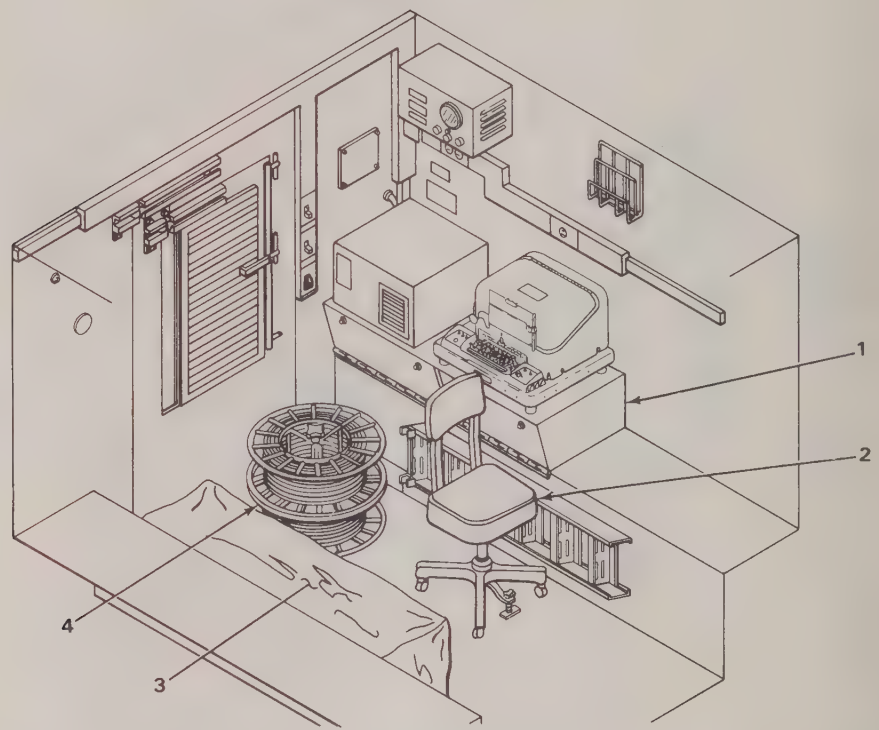
2 Personnel Exhaust Blower. Draws in fresh air, through filtered inlet in door, to cool shelter.

3 Power Signal Entrance Box. Provides for connection to an external 28.5 vdc power source through DC INPUT connector or 110 vac power source through AC INPUT connector. Contains shelter ground stud for grounding and connector terminals for remote operation.

4 Air Conditioner Ports. Provides mounting facilities for external air conditioner when adapter plates, which are stored in shelter, are installed in ports.

## 1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. (CONT)

INTERIOR AN/GRC-122/142(*) MODELS




1 Antenna Group AN/GRA-50. Doublet antenna assembly used for transmission and reception of radio signals between 2.0 and 29.999 MHz. Provides greater range and reliability, and is stored in canvas bag in storage compartment.

2 Personnel Chair. Provides seating with safety belt for operator and is fastened to floor for mobile operation.

**NOTE**

Mast assemblies and cable reels may be stored on a roof rack if one is provided with shelter.

3 Mast Assembly AB-155/U. Used to support doublet antenna for long range operations.

4 Cable Reel C-432. Contains power cable for connecting external power source to shelter power entrance box.

## 1-13. DIFFERENCES BETWEEN MODELS.

Radio tty sets differ in shelter models, internal components, and configuration. The following table indicates differences between all 12 models. Items common to all models are not listed.

| EQUIPMENT | AN/GRC-122 | | | | | | AN/GRC-142 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P* | A | B | C | D | E | P* | A | B | C | D | E |
| Shelter Electrical/Equipment S-250/G | | | X | | | X | | | X | | | X |
| Shelter Electrical Equipment S-318/G | X | X | | X | X | | X | X | | X | X | |
| RT-662/GRC | X | X | X | X | X | X | | | | | | |
| Teletypewriter TT-98/FG | X | X | X | | | | X | X | X | | | |
| Teletypewriter TT-98/FG (duplex) | X | X | X | X | X | X | | | | | | |
| Communications Terminal AN/UGC-74A(V)3 | | | | X | X | X | | | | X | X | X |
| Communications Terminal AN/UGC-74A(V)3 (duplex) | X | X | X | X | X | X | | | | | | |
| Motor-Generator PU-724/G | X | X | X | | | | X | X | X | | | |
| Motor-Generator PU-724/G (duplex) | X | X | X | | | | | | | | | |
| Inverter PU-724A/G | | | | X | X | X | | | | X | X | X |
| Inverter PU-724A/G (duplex) | | | | X | X | X | | | | | | |
| Air Conditioner (serial numbers 1 through 697 only) | | | | | | | | | X | | | |
| Switch Assembly SA-1554/GRC-142 | X | | | X | | | X | | | X | | |
| Switch Assembly SA-1650/GRC | | X | X | | X | X | | X | X | | X | X |
| Switch Box SA-1555/GRC-142 | X | | | X | | | X | | | X | | |
| Power Terminal Assembly | | X | X | | X | X | | X | X | | X | X |
| Distribution Box J-2776/GRC-142 | X | | | X | | | X | | | X | | |
| Power Distribution Box SB-3018/GRC | X | | | X | | | X | | | X | | |
| Power Distribution Box SB-3358/GRC | | X | X | | | | | X | X | | | |
| Power Distribution Box SC-F-960672 | | | | | X | X | | | | | X | X |
| AC Entrance Box (front) | X | | | X | | | X | | | X | | |
| DC Entrance Box (rear) | X | | | X | | | X | | | X | | |
| AC Volt Meter | X | | | X | | | X | | | X | | |
| Power Signal Entrance Box | | X | X | | X | X | | X | X | | X | X |
| Headset H-227/U (duplex) | X | X | X | X | X | X | | | | | | |
| TT-98/FG Slide Mount | X | | | | | | X | | | | | |
| TT-76A/GGC Slide Mount | X | | | X | | | X | | | X | | |
| TT-98/FG (duplex) Slide Mount | X | | | | | | X | | | | | |
| Fluorescent Lighting | | | | | X | X | | | | | X | X |

*P stands for plain models

## 1-14. EQUIPMENT DATA.

POWER REQUIREMENTS

| | |
|---|---|
| Input Voltage: | 100 amp at 28.5 vdc<br>60 amp at 110 vac, 60 Hz, single-phase |
| Power Consumption Direct Current: | |
| AN/GRC-122 Plain | 90 amp at 28.5 vdc |
| AN/GRC-122 A and B | 80 amp at 28.5 vdc |
| AN/GRC-122 C | 90 amp at 28.5 vdc |
| AN/GRC-122 D and E | 80 amp at 28.5 vdc |
| AN/GRC-142 Plain | 87 amp at 28.5 vdc |
| AN/GRC-142 A and B | 68 amp at 28.5 vdc |
| AN/GRC-142 C | 87 amp at 28.5 vdc |
| AN/GRC-142 D and E | 68 amp at 28.5 vdc |
| Maximum Alternating Current Power Consumption: | |
| Air conditioner | 20 amp at 110 vac, 60 Hz |
| Power Supply PP-4763(*)/GRC | 25 amp at 110 vac, 60 Hz |
| Shelter, Electrical Equipment S-318(*)/G: | |
| Lights | 50 w, dc |
| Exhaust blower | 165 w, dc |
| Air conditioner | 2,100 w, ac |
| Shelter heater (fuel) | 315 w, dc |
| Shelter heater (electric) | 1500 w, ac |
| Shelter, Electrical Equipment S-250/G: | |
| Lights | 50 w, dc |
| Exhaust blower | 165 w, dc |
| Shelter heater (fuel) | 315 w, dc |
| Shelter heater (electric) | 1500 w, ac |
| Major Components: | |
| Teletypewriter TT-98/FG (supplied by inverter) | 150 w, ac |
| Duplex TT-98/FG (AN/GRC-122 only) (supplied by duplex inverter) | 150 w, ac |
| Teletypewriter-Reperforator Transmitter TT-76A/GGC (supplied by inverter) | 150 w, ac |
| Teletypewriter AN/UGC-74A(V)3 | 100 w, ac |
| Radio Set AN/GRC-106 | 1045 w, dc |
| Duplex RT-662/GRC (AN/GRC-122(*) only) | 45 w, dc |
| Radio Teletypewriter Modem MD-522(*)/GRC | 40 w, dc |

**1-14. EQUIPMENT DATA.** (CONT)

| | |
|---|---|
| Motor-Generator PU-724/U (60 Hz), Wincharger Model SS-688, and Duplex Motor-Generator (60 Hz), Wincharger Model SS-668 (AN/GRC-122(*) only) | 8 amp at 28.5 vdc unloaded<br>12.5 amp at 28.5 vdc with 1 tty<br>16.5 amp at 28.5 vdc with 2 tty |
| Local Area Communication Facilities: | |
| Telephone Set TA-312 P/T | Internal battery |

COMPLETE SHELTER WEIGHTS

| | |
|---|---|
| Shelter Electrical Equipment S-318(*)/G (AN/GRC-122 Plain) | 1,832 lb (831.72 kg) |
| Shelter Electrical Equipment S-318(*)/G (AN/GRC-122A) | 1,700 lb (771.8 kg) |
| Shelter Electrical Equipment S-250/G (AN/GRC-122B) | 2,164 lb (982.45 kg) |
| Shelter Electrical Equipment S-318(*)/G (AN/GRC-122C) | 1,832 lb (831.72 kg) |
| Shelter Electrical Equipment S-318(*)/G (AN/GRC-122D) | 1,700 lb (771.8 kg) |
| Shelter Electrical Equipment S-250/G (AN/GRC-122E) | 2,164 lb (982.45 kg) |
| Shelter Electrical Equipment S-318(*)/G (AN/GRC-142 Plain) | 1,694 lb (769.07 kg) |
| Shelter Electrical Equipment S-318(*)/G (AN/GRC-142A) | 1,552 lb (704.6 kg) |
| Shelter Electrical Equipment S-250/G (AN/GRC-142B) | 1,900 lb (862.6 kg) |
| Shelter Electrical Equipment S-318(*)/G (AN/GRC-142C) | 1,694 lb (769.07 kg) |
| Shelter Electrical Equipment S-318(*)/G (AN/GRC-142D) | 1,552 lb (704.6 kg) |
| Shelter Electrical Equipment S-250/G (AN/GRC-142E) | 1,900 lb (862.6 kg) |

SHELTER EXTERIOR DIMENSIONS

| | |
|---|---|
| S-250/G | |
| Length | 85 in. (215.8 cm) |
| Height | 70 in. (177.8 cm) |
| Width | 79 in. (200.66 cm) |
| S-318(*)/G | |
| Length | 75.38 in. (191.46 cm) |
| Height | 70.38 in. (178.76 cm) |
| Width | 72.0 in.(182.88 cm) |

**1-14. EQUIPMENT DATA.** (CONT)

SHELTER EXTERIOR DIMENSIONS (CONT)

| | |
|---|---|
| Types of Signals Transmitted/Received: | 85 Hz narrow nsk or 850 Hz fsk compatibility am, ssb voice and cw<br>Voice and teletypewriter simultaneously (voice plus nsk)<br>Nsk diversity |
| Transmitted Power Output (Maximum): | 400 w, peak envelope power |
| Transmit Range: | 20 mi (32.18 km) planning range<br>Nominal (groundwave); 100 mi (160.9 km) to 1,500 mi (2413.5 km) (skywave), depending on terrain, frequency antenna, time, and atmospheric conditions |
| Frequency Range: | 2.0 to 29.999 MHz |
| Antenna Systems for Transmission and/or Reception: | Whip or doublet |
| Mobile Carrier: | M880 or equivalent<br>1 1/4-ton truck M-715 or 1 1/4-ton truck, 6 x 6, M-561 all with 100 amp electrical system |

TERMINAL, COMMUNICATIONS AN/UGC-74A(V)3

| | |
|---|---|
| Application: | Used to compose, edit, transmit, receive, print, and store messages |
| Operational States: | Operates as an intelligent communications terminal, a keyboard send/receive terminal, or a receive only terminal |
| Types of Installation: | Tactical, fixed or mobile, table, or replay rack mounted |
| Models Installed: | AN/GRC-122C<br>AN/GRC-122D<br>AN/GRC-122E<br>AN/GRC-142C<br>AN/GRC-142D<br>AN/GRC-142E |

**1-14. EQUIPMENT DATA.** (CONT)

Operating Speeds:

| Baud Rate | Code |
|---|---|
| 1200 | ASCII 10 unit (1 stop bit) |
| | ASCII 11 unit (2 stop bits) |
| 600 | ASCII 10 unit (1 stop bit) |
| | ASCII 11 unit (2 stop bits) |
| 300 | ASCII 10 unit (1 stop bit) |
| | ASCII 11 unit (2 stop bits) |
| 150 | ASCII 10 unit (1 stop bit) |
| | ASCII 11 unit (2 stop bits) |
| 75 | ASCII 10 unit (1 stop bit) |
| | ASCII 11 unit (2 stop bits) |
| | Baudot 7 unit (1 stop bit) |
| | Baudot 8 unit (2 stop bits) |
| 50 | Baudot 7 unit (1 stop bit) |
| | Baudot 8 unit (2 stop bits) |
| 45.5 | Baudot 7 unit (1 stop bit) |
| | Baudot 8 unit (2 stop bits) |

System Interface: Operates with MIL-STD-188-114 equipment (eg KW-7, TH-22/TG, and MD-522) TT-76(*)/GGC, and TT-98/FG and the following comsec equipment; Vinson (TSEC/KY-57), KG-30 (TSEC/KY-30), DLED (TSEC/KY-84)

Keyboard: MIL-STD-1280 TYPE 1
Class 1 plus 4 special keys

Printer:

| | |
|---|---|
| Type | Drum |
| Print rate | 60 characters per second, minimum |
| Printed characters | Gothic 63 character of ASCII subset and a diamond |
| Printed character per line | Operator selectable from 40 to 80 characters |

Paper Type and Capacity: Single or multi-ply (3 ply maximum) roll paper, 5 in. diameter, 8 1/2 in. wide.
Single or multi-ply (3 ply maximum) fanfold

**1-14. EQUIPMENT DATA.** (CONT)

TERMINAL, COMMUNICATIONS AN/UGC-74A(V)3 (CONT)

| | |
|---|---|
| Other Printer Features: | Single or double line feed<br>Paper low lamp (for roll paper only)<br>Automatic shutdown of printing on physical paper outage (for roll paper only)<br>Automatic shutdown of print drum motor if there is no printing for between 2 and 4 min. |
| Power Requirement: | 100 w, maximum |
| Operating Voltages: | 26 ± 4 vdc 115 vac ± 15 percent, 50, 60, or 400 Hz ± 5 percent. 230 vac ± 15 percent, 50, 60, or 400 Hz ± 5 percent |
| Voltage and Transient Voltage Protection: | Overvoltage 36 vdc input for 1 hr maximum.<br>Over voltage transients: 100 vdc input. Under voltage transients: 15 vdc input |
| Environmental Conditions: | |
| Operating temperature | -25°F to + 125°F (-32°C to + 52°C) plus solar radiation |
| Nonoperating temperature | -65°F to + 155°F (-54°C to + 68°C) |
| Case closed | Water and dust proof |
| Case cover removed | Spray proof |
| Physical Characteristics: | |
| Total weight | 100 lb (45.5 kg) with case, cover, and paper |
| Dimensions | 21.75 in. (64 cm) long, 17.5 in. (55 cm) wide and 9.5 in. (24 cm) high |

## Section III TECHNICAL PRINCIPLES OF OPERATION


| Subject | Para | Page |
|---|---|---|
| General | 1-15 | 1-29 |
| Local OWR Radio Teletypewriter Operation AN/GRC-122/142 Plain and C Models | 1-16 | 1-30 |
| Local OWR Radio Teletypewriter Operation AN/GRC-122/142A, B, D, and E Models | 1-17 | 1-31 |
| Local OWR Voice Operation AN/GRC-122/142(*) Models | 1-18 | 1-32 |
| Local OWR CW Operation AN/GRC-122/142(*) Models | 1-19 | 1-33 |
| Local OWR Voice Plus Teletypewriter (NSK) Operation AN/GRC-122/142 Plain and C Models | 1-20 | 1-34 |
| Local OWR Voice Plus Teletypewriter (NSK) Operation AN/GRC-122/142A, B, D, and E Models | 1-21 | 1-35 |
| Duplex Operation | 1-22 | 1-36 |
| Duplex Operation AN/GRC-122 Plain and C Models | 1-23 | 1-36 |
| Duplex Operation AN/GRC-122A, B, D, and E Models | 1-24 | 1-38 |
| Remote Field Telephone Operation AN/GRC-122/142(*) Models | 1-25 | 1-39 |
| Remote OWR Voice Operation AN/GRC-122/142(*) Models | 1-26 | 1-40 |
| Remote OWR Teletypewriter Operation AN/GRC-122/142(*) Models | 1-27 | 1-41 |
| Remote CW Operation AN/GRC-122/142 Plain and C Models | 1-28 | 1-42 |
| Remote CW Operation AN/GRC-122/142A, B, D, and E Models | 1-29 | 1-43 |
| Teletypewriter Order Wire (Pony Circuit) AN/GRC-122 Plain and C Models | 1-30 | 1-44 |
| Teletypewriter Order Wire (Pony Circuit ) AN/GRC-122A, B, D, and E Models | 1-31 | 1-45 |


### 1-15. GENERAL.

This section explains the operation of Radio Teletypewriter Sets AN/GRC-122/142(*). AN/GRC-142(*) models provide owr communication. This means an operator can transmit and receive a message, but not at the same time. AN/GRC-122(*) models provide dx operation which means an operator can transmit and receive a message at the same time. AN/GRC-122(*) models also provide a pony circuit which allows simultaneous tty order-wire transmission and reception over field wires when not operating in a duplex mode.

AN/GRC-122/142(*) models are capable of transmitting and receiving ssb, compatible am, and cw signals. Fsk nsk and nsk plus voice operation are possible using the tty equipment.

Systems block diagrams of AN/GRC-122/142(*) models are given in FO-5 and FO-6.

Separate signal block diagrams, accompanied by text showing all modes of operation, are given in paragraphs 1-16 through 1-31.

All signal block diagrams illustrate nonsecure modes of operation. In order to operate in a secure mode, the appropriate dummy box must be replaced with security equipment. Any reference to a dummy box refers to the applicable security equipment. With the exception of this change, block diagrams are applicable to both secure and nonsecure modes of operation.

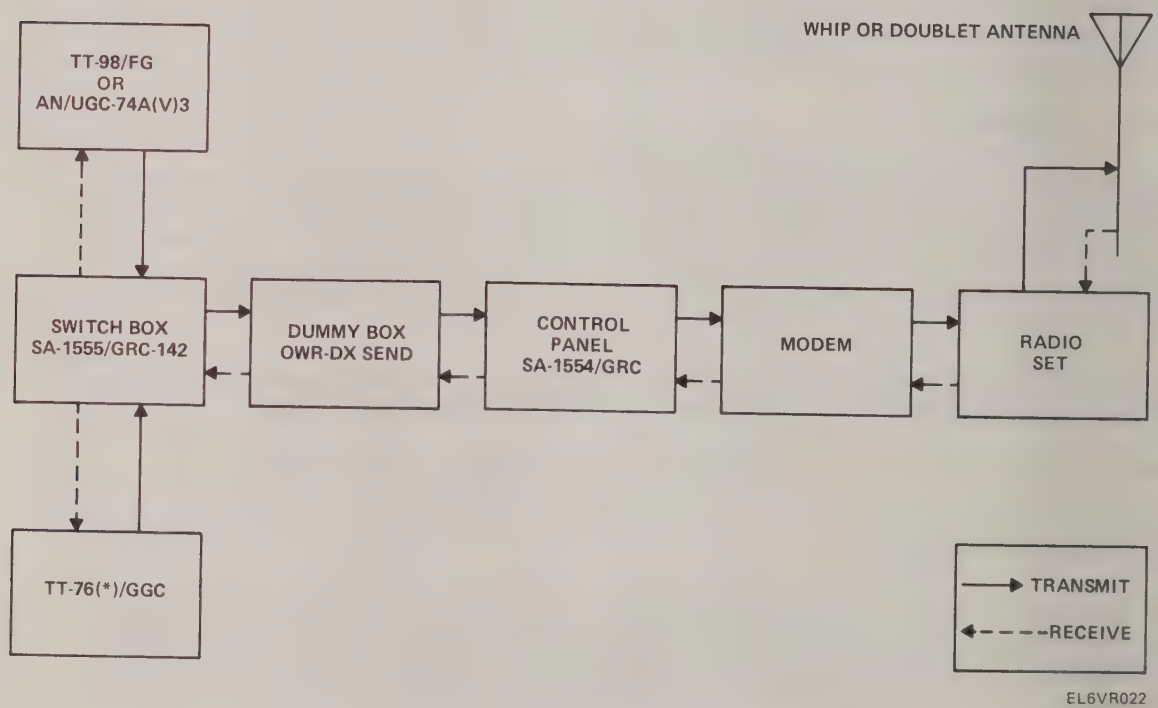
## 1-16. LOCAL OWR RADIO TELETYPEWRITER OPERATION AN/GRC-122/142 PLAIN AND C MODELS.

TRANSMIT

Operator originates a signal by operating keyboard on TT-76(*)/GGC, TT-98/FG, or AN/UGC-74A(V)3. When a key on the keyboard is pressed, a signal which consists of mark and space pulses travels from tty through switch box to owr-dx-send dummy box. From owr-dx-send dummy box, the signal is routed through control panel to modem. Modem converts mark and space pulse signals to audio tones. Audio tones are now routed to radio set which converts audio tones to radio frequency signals. Radio frequency signals are then routed to antenna for transmission to a distant radio set.

RECEIVE

Radio frequency signals transmitted from a distant radio set are received by antenna. Radio frequency signals are then routed to radio set which converts the signals to audio tones. Audio tones are then routed to modem which converts audio tones to mark and space pulse signals. From modem the signals are routed through control panel to owr-dx-send dummy box. The signals then travel from owr-dx-send dummy box, through switch box, to associated tty. TT-98/FG or AN/UGC-74A(V)3 prints a page copy of the received message. TT-76(*)/GGC makes a punched tape copy.



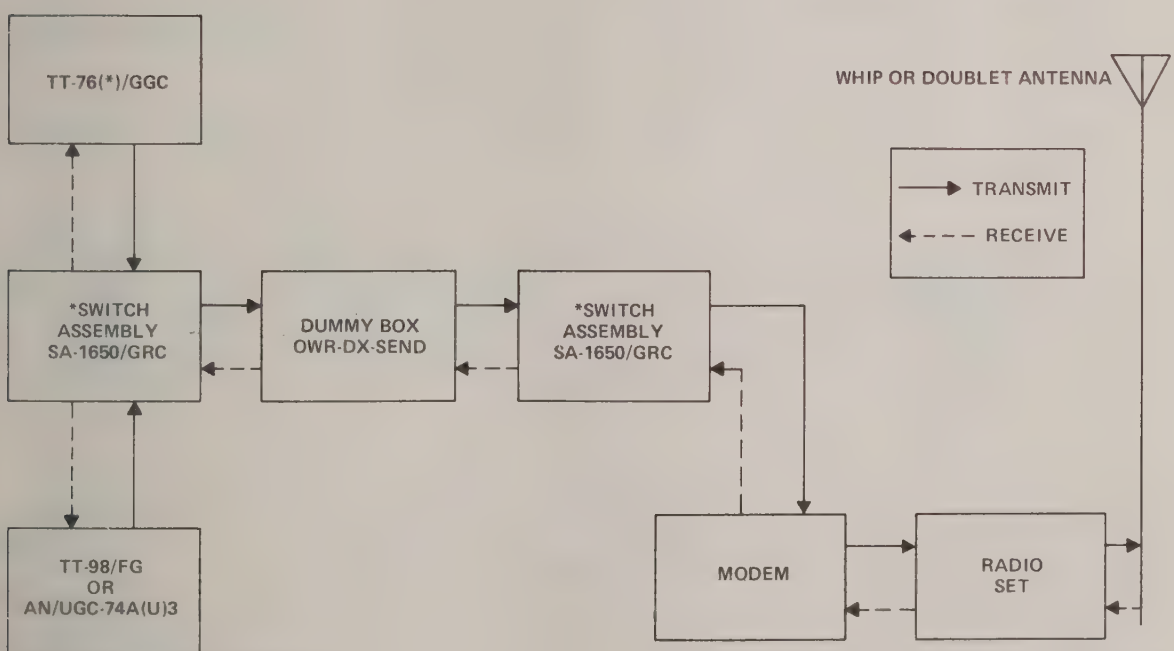
## 1-17. LOCAL OWR RADIO TELETYPEWRITER OPERATION AN/GRC-122/142A, B, D, AND E MODELS.

TRANSMIT

Operator originates a signal by operating keyboard on TT-76(*)/GGC, TT-98/FG, or AN/UGC-74A(V)3. When a key on the keyboard is pressed, a signal which consists of mark and space pulses travels from tty through switch assembly to owr-dx-send dummy box, then back through switch assembly to modem. Modem converts mark and space pulses to audio tones. Audio tones are now routed to radio set which converts audio tones to radio frequency signals. Radio frequency signals are then routed to antenna for transmission to a distant radio set.

RECEIVE

Radio frequency signals transmitted from a distant radio set are received by antenna. These signals are routed to radio set which converts radio frequency signals to audio tones. Audio tones are then routed to modem, which converts audio tones to mark and space pulse signals. From modem the signals are routed through switch assembly to owr-dx-send dummy box. The signals then travel from owr-dx-send dummy box, back through switch assembly, to associated tty. TT-98/FG or AN/UGC-74A(V)3 prints a page copy of the received message. TT-76(*)/GGC makes a punched tape copy.



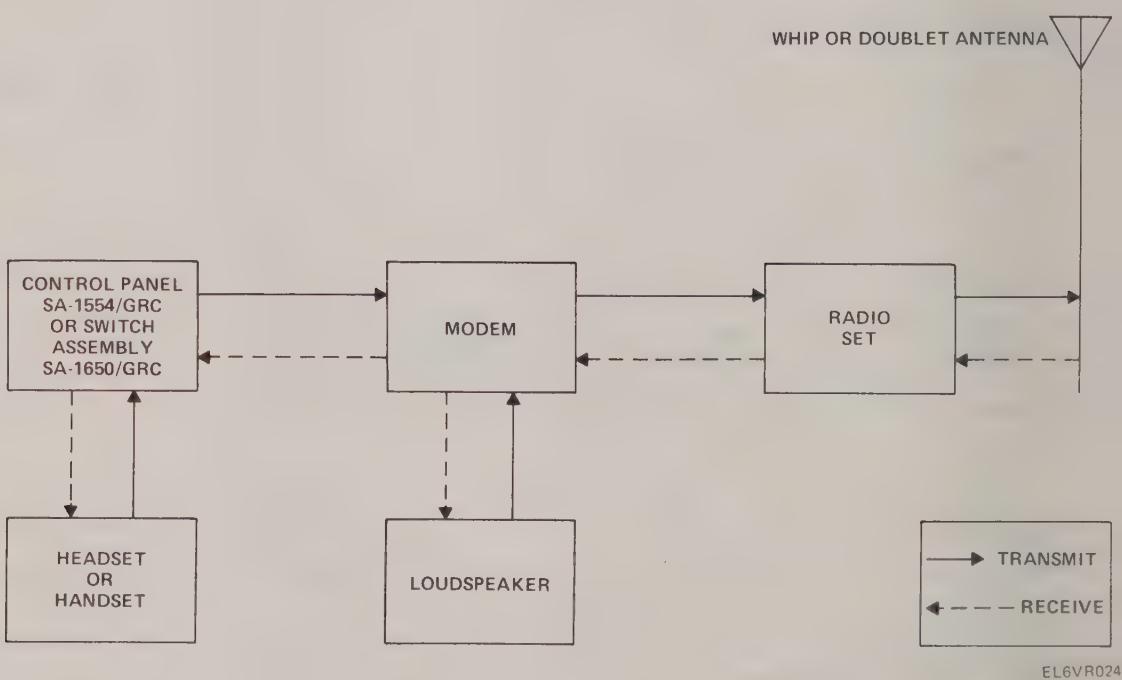
## 1-18. LOCAL OWR VOICE OPERATION AN/GRC-122/142(*) MODELS.

TRANSMIT

Voice frequency signals are generated by operator speaking into handset or headset. These signals are routed through control panel (AN/GRC-122/142 Plain and C models) or switch assembly (AN/GRC-122/142A, B, D, and E models), and then through modem to radio set. Radio set converts voice frequency signals to radio frequency signals. Radio frequency signals are then routed to antenna for transmission to a distant radio set.

RECEIVE

Radio frequency signals transmitted from a distant radio set are received by antenna. These signals are routed to radio set which converts radio frequency signals to voice frequency signals. Voice frequency signals are then routed through modem to loudspeaker, and through control panel (AN/GRC-122/142 Plain and C models) or switch assembly (AN/GRC-122/142A, B, D, and E models) to handset or headset.



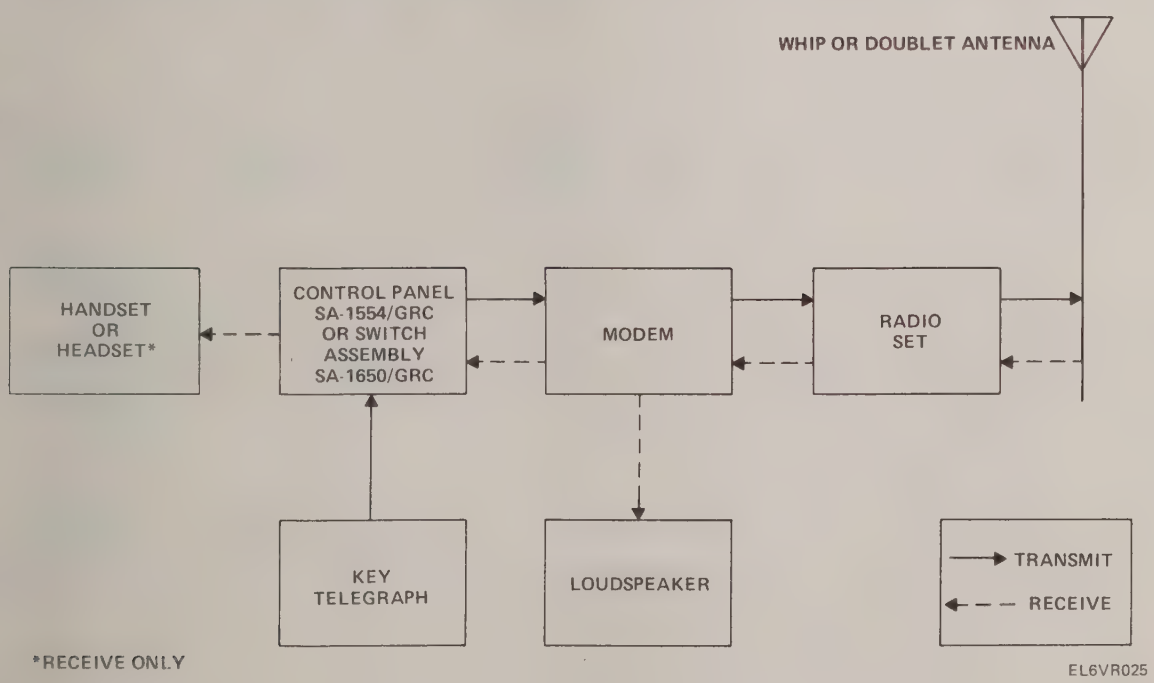
## 1-19. LOCAL OWR CW OPERATION AN/GRC-122/142(*) MODELS.

TRANSMIT

Cw signals produced by key telegraph are routed through control panel (AN/GRC-122/142 Plain and C models) or switch assembly (AN/GRC-122/142A, B, D, and E models) and through modem. As the signals pass through modem, audio tones (side tones) generated during cw transmission can be heard on loudspeaker connected to modem. From modem the signals are routed to radio set which converts audio tones to radio frequency signals. Radio frequency signals are routed to antenna for transmission to a distant radio set.

RECEIVE

Radio frequency signals transmitted from a distant radio set are received by antenna. Radio frequency signals are then routed to radio set which converts radio frequency signals to audio tones. Audio tones are routed to modem where cw signals can be heard on loudspeaker. From modem cw signals are routed to control panel (AN/GRC-122/142 Plain and C models) or switch assembly (AN/GRC-122/142A, B, D, and E models) to handset or headset.



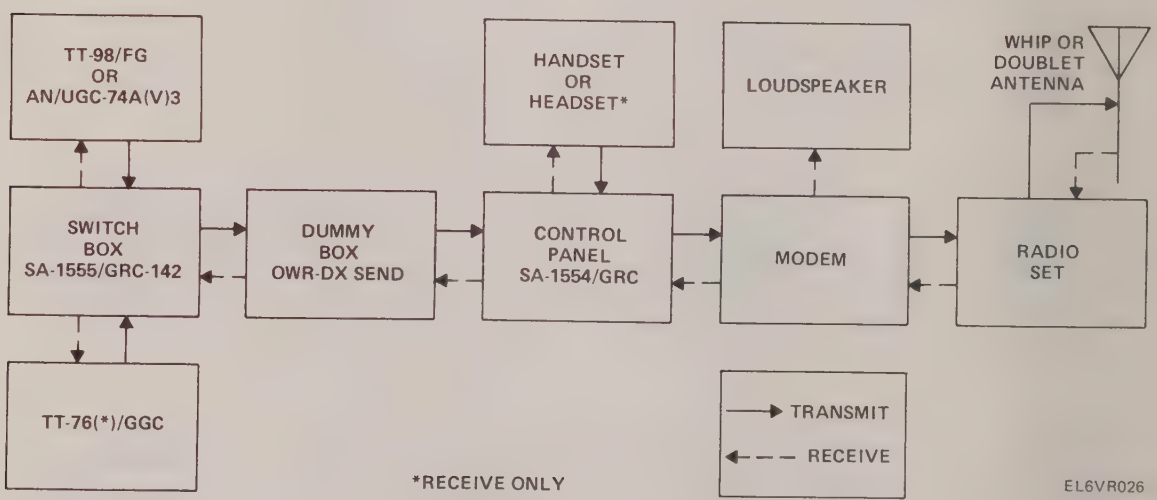
## 1-20. LOCAL OWR VOICE PLUS TELETYPEWRITER (NSK) OPERATION AN/GRC-122/142 PLAIN AND C MODELS.

TRANSMIT

Voice frequency signals generated by speaking into handset are applied to control panel. Simultaneously, tty mark and space pulses (nsk) are generated at TT-76(*)/GGC, TT-98/FG, or AN/UGC-74A(V)3 and are routed through switch box and owr-dx-send dummy box. Both tty mark and space pulses and voice frequency signals are then routed through control panel and applied to modem. Modem combines mark and space pulses and voice frequency signals and converts them to audio tones. Audio tones are then routed to radio set. Radio set converts audio tones to radio frequency signals. Radio frequency signals are then routed to antenna for transmission to a distant radio set.

RECEIVE

Radio frequency signals transmitted from a distant radio set are received by antenna. Radio frequency signals are then routed to radio set which converts signals to audio tones. Audio tones are then routed to modem which converts and separates audio tones to tty mark and space pulses and voice frequency signals. Voice frequency signals can be heard on loudspeaker connected to modem. Both signals are also routed to control panel where voice frequency signals can be heard on handset or headset. Tty mark and space pulses continue through control panel, owr-dx-send dummy box, and switch box to associated tty equipment. TT-98/FG or AN/UGC-74(V)3 prints a page copy of the received message. TT-76(*)/GGC makes a punched tape copy.



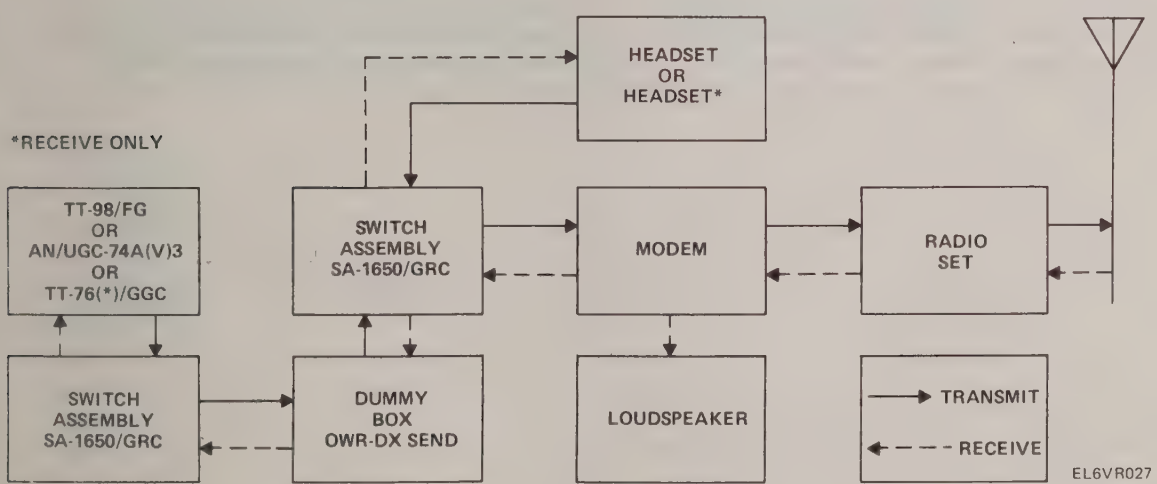
## 1-21. LOCAL OWR VOICE PLUS TELETYPEWRITER (NSK) OPERATION AN/GRC-122/142A, B, D, AND E MODELS.

TRANSMIT

Voice frequency signals generated by speaking into handset are applied to switch assembly. Simultaneously, tty mark and space pulses (nsk) are generated at TT-76(*)/GGC, TT-98/FG, or AN/UGC-74A(V)3 and are routed through switch assembly and owr-dx-send dummy box. Tty mark and space pulses are routed back through switch assembly along with voice frequency signals and are applied to modem. Modem combines tty mark and space pulses and voice frequency signals and converts them to audio tones. Audio tones are then routed to radio set. Radio set converts audio tones to radio frequency signals. Radio frequency signals are then routed to antenna for transmission to a distant radio set.

RECEIVE

Radio frequency signals transmitted from a distant radio set are received by antenna. Radio frequency signals are then routed to radio set which converts signals to audio tones. Audio tones are then routed to modem which converts and separates audio tones to tty mark and space pulses and voice frequency signals. Voice frequency signals can be heard on loudspeaker connected to modem. Both signals are also routed to switch assembly where voice frequency signals can be heard on headset or handset. Tty mark and space pulses continue through switch assembly to owr-dx-send dummy box, and are then routed back through switch assembly to associated tty equipment. TT-98/FG or AN/UGC-74A(V)3 prints a page copy of the received message. TT-76(*)/GGC makes a punched tape copy.



## 1-22. DUPLEX OPERATION.

Duplex operation involves simultaneous transmission and reception of information on two different frequencies. This can be accomplished by two tty's, one tty and a key telegraph, one tty and a handset (voice operation) or any combination of these components. Duplex operation is performed in AN/GRC-122(*) models with the addition of RT-662/GRC, associated antenna, duplex TT-98/FG, or AN/UGC-74A(V)3 loudspeaker. Duplex operation divides shelter into two radio tty systems. Each system can send or receive independent of the other. Remote duplex operation is also possible with additional authorized equipment.

## 1-23. DUPLEX OPERATION AN/GRC-122 PLAIN AND C MODELS.

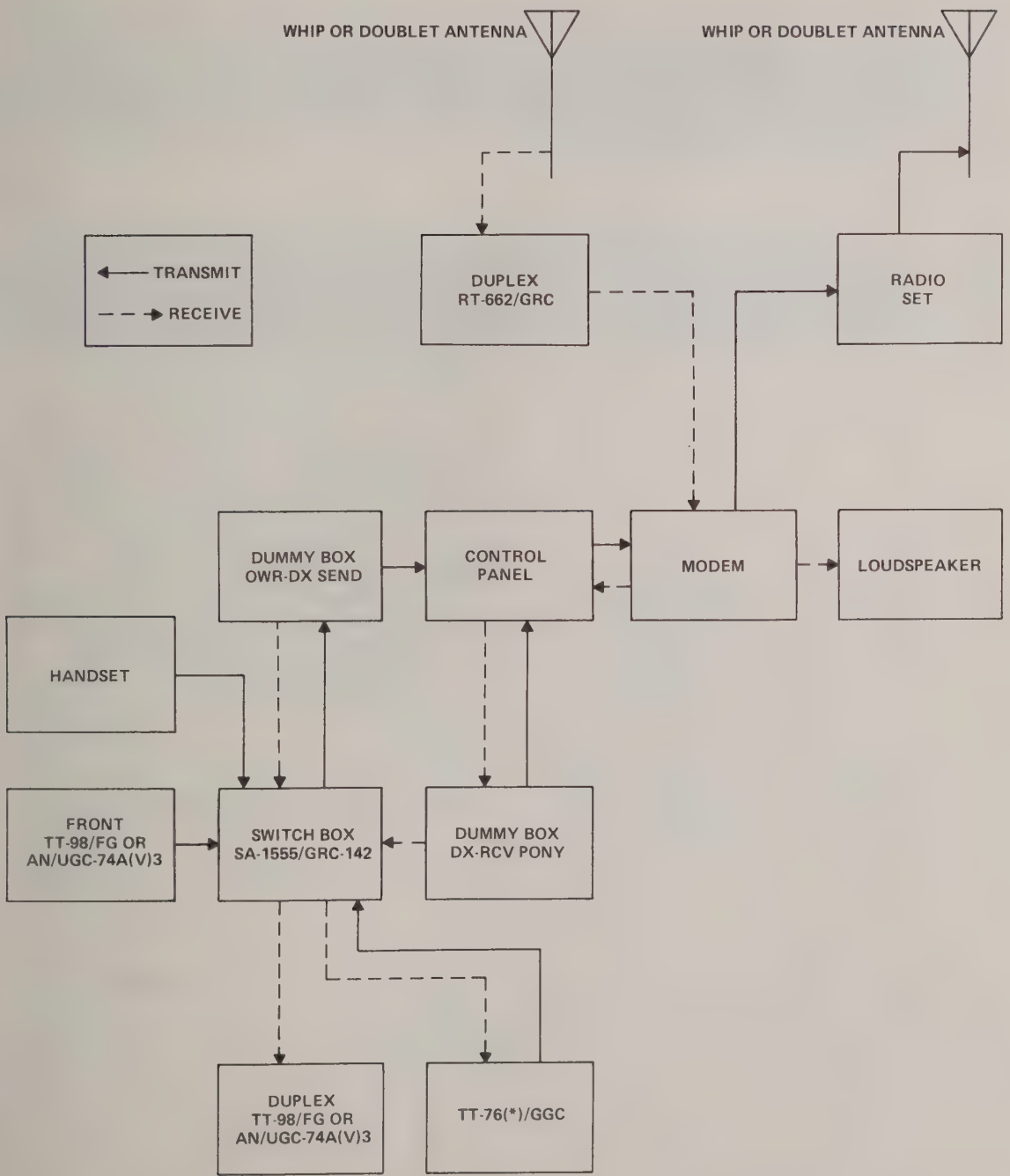
### TRANSMIT

Tty mark and space pulses generated by TT-98/FG or AN/UGC-74A(V)3 are routed through switch box, owr-dx-send dummy box, and control panel. Tty mark and space pulses are then routed through DC LOOP NO. 1 of modem. Voice frequency signals generated by handset are routed through switch box voice key connector to modem. Modem combines tty mark and space pulses and voice frequency signals and converts them to audio tones. Audio tones are routed to radio set which changes them to radio frequency signals and routes signals to antenna for transmission.

### RECEIVE

Radio frequency signals transmitted from a distant radio set are received by antenna. Radio frequency signals are then routed to duplex RT-662/GRC. From duplex RT-662/GRC, signals are routed to modem and then through DC LOOP NO. 2 where voice signals can be heard on loudspeaker. Signals are then routed through control panel, dx-rcv-pony dummy box, switch box, and duplex TT-98/FG or AN/UGC-74A(V)3 where a page copy of the message will be printed.

## 1-23. DUPLEX OPERATION AN/GRC-122 PLAIN AND C MODELS.



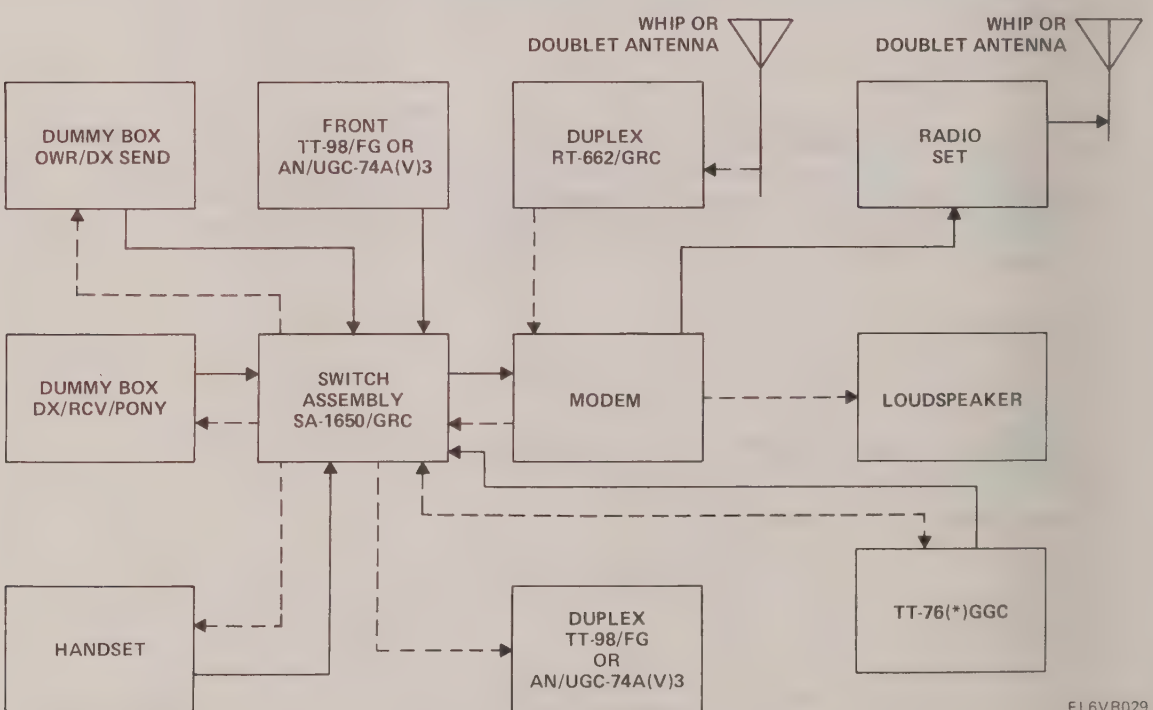
## 1-24. DUPLEX OPERATION AN/GRC-122A, B, D, AND E MODELS.

TRANSMIT

Tty mark and space pulses generated by TT-98/FG or AN/UGC-74A(V)3 are routed through switch assembly, owr-dx-send dummy box, back through switch assembly into DC LOOP NO. 1 of modem. Voice frequency signals generated by handset are routed through switch box voice key connector to modem. Modem combines tty mark and space pulses and voice frequency signals and converts them to audio tones. Audio tones are then routed to radio set which changes them to radio frequency signals and routes signals to antenna for transmission.

RECEIVE

Radio frequency signals transmitted from a distant radio set are received by antenna. Radio frequency signals are then routed to duplex RT-662/GRC. From duplex RT-662/GRC, signals are routed to modem and then through DC LOOP NO. 2 where voice signals can be heard on loudspeaker. Signals are then routed through switch assembly, dx-rcv-pony dummy box, and back through switch assembly to duplex TT-98/FG or AN/UGC-74A(V)3.



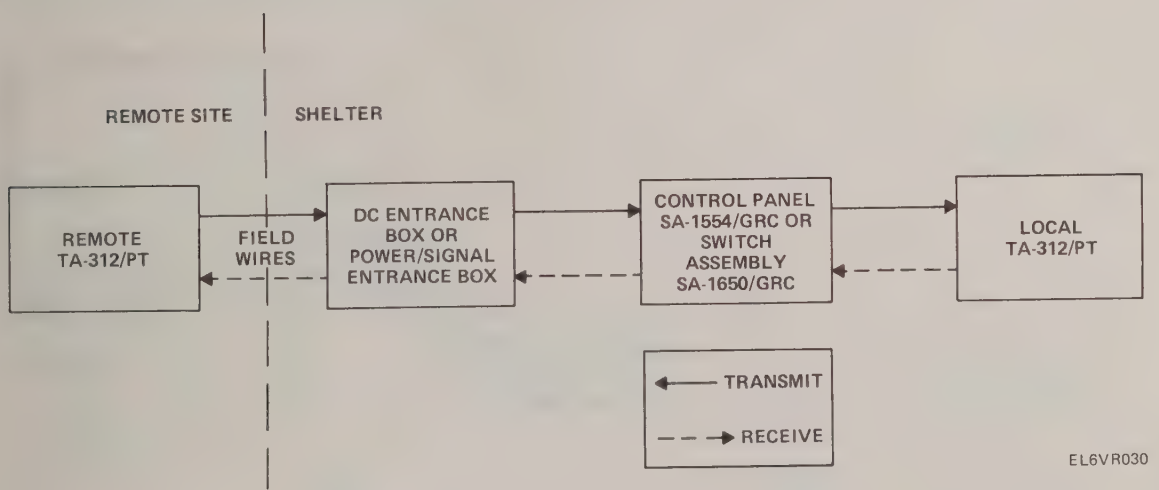
## 1-25. REMOTE FIELD TELEPHONE OPERATION AN/GRC-122/142(*) MODELS.

TRANSMIT

Voice frequency signals generated at remote TA-312/PT are routed through field wires to dc entrance box (AN/GRC-122/142 Plain and C models) or power/signal entrance box (AN/GRC-122/142A, B, D, and E models). Signals are then routed through control panel (AN/GRC-122/142 Plain and C models) or switch assembly (AN/GRC-122/142A, B, D, and E models) to local TA-312/PT.

RECEIVE

Voice frequency signals generated at local TA-312/PT are routed through control panel (AN/GRC-122/142 Plain and C models) or switch assembly (AN/GRC-122/142A, B, D, and E models). Signals are then routed through dc entrance box (AN/GRC-122/142 Plain and C models) or power/signal entrance box (AN/GRC-122/142A, B, D, and E models) through field wires to remote TA-312/PT.



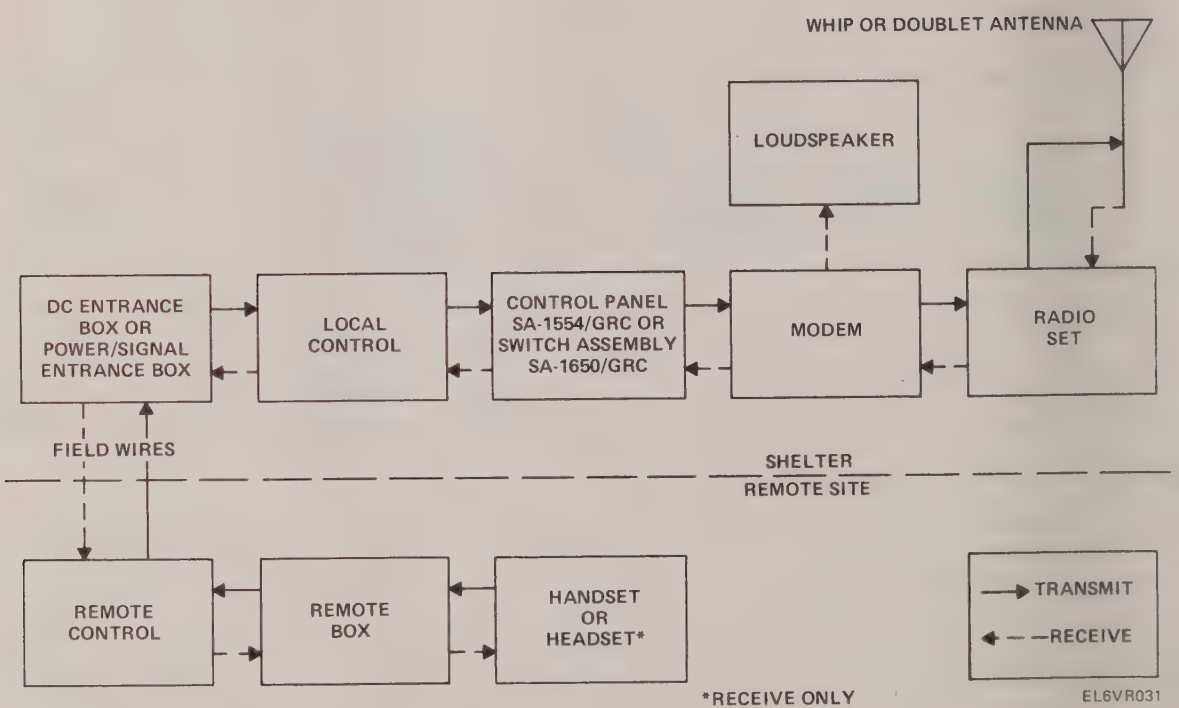
## 1-26. REMOTE OWR VOICE OPERATION AN/GRC-122/142(*) MODELS.

TRANSMIT

Voice frequency signals are generated by speaking into handset. Signals are routed through remote box, remote control, and field wires to dc entrance box or power/signal entrance box. Signals are then routed through local control, control panel or switch assembly, and modem to radio set which converts voice frequency signals to radio frequency signals. Radio frequency signals are then routed to antenna for transmission to a distant radio set.

RECEIVE

Radio frequency signals transmitted from a distant radio set are received by antenna. Radio frequency signals are then routed to radio set which converts radio frequency signals to voice frequency signals. Signals are then routed through modem where distant operator's voice can be heard on loudspeaker. Voice frequency signals are then routed through control panel or switch assembly, local control, dc entrance box or power/signal entrance box, and through field wires to remote control. From remote control, voice frequency signals pass through remote box where operator can hear distant operator's voice on handset or headset.



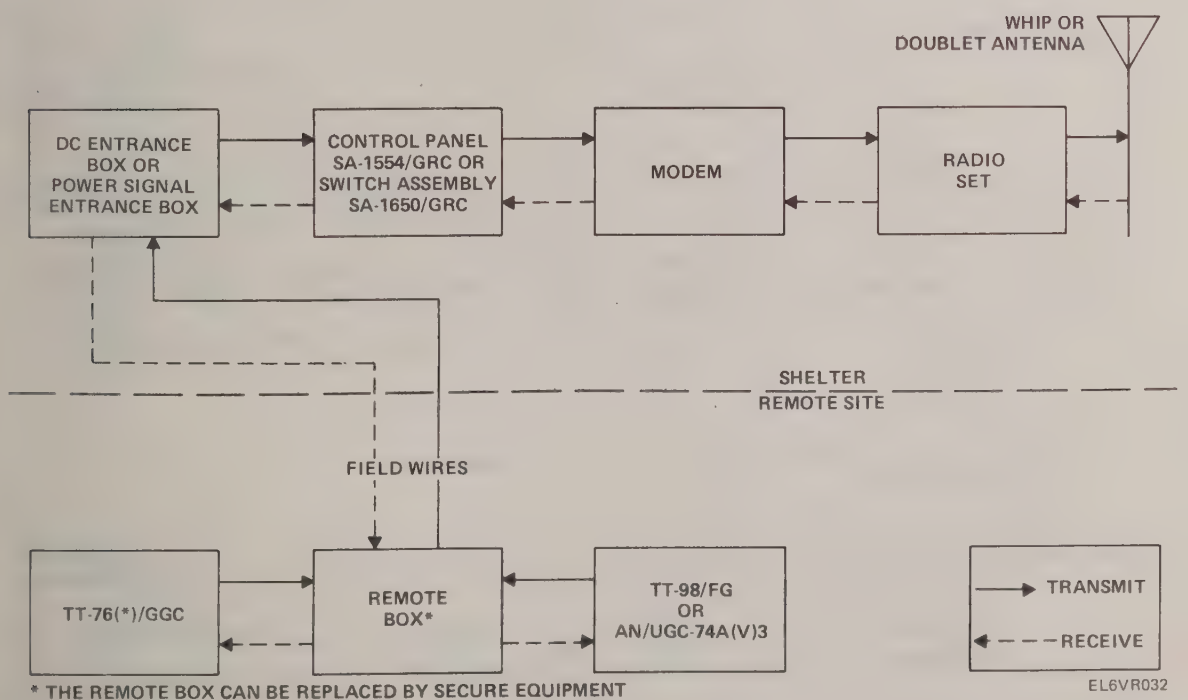
## 1-27. REMOTE OWR TELETYPEWRITER OPERATION AN/GRC-122/142(*) MODELS.

TRANSMIT

Operator originates a signal by operating keyboard on TT-76(*)/GGC, TT-98/FG, or AN/UGC-74A/(V)3. Tty mark and space pulses are routed through remote box and field wires to dc entrance box or power signal entrance box. Tty mark and space pulses are then routed through control panel or switch assembly to modem which converts tty mark and space pulses to fsk or nsk audio tones. Audio tones are then routed to radio set which converts audio tones to radio frequency signals. Radio frequency signals are then routed to antenna for transmission to a distant radio set.

RECEIVE

Radio frequency signals transmitted from a distant radio set are received by antenna. Radio frequency signals are routed to radio set which converts radio frequency signals to nsk or fsk audio tones. Audio tones are routed to modem which converts audio tones to tty mark and space pulses. Tty mark and space pulses are then routed through control panel or switch assembly, dc entrance box or power/signal entrance box through field wires to remote box. From remote box, tty mark and space pulses are routed to tty being used. TT-76(*)/GGC makes a punched tape copy of the received message. TT-98/FG or AN/UGC-74A(V)3 prints a page copy. Copy of the message will be printed on the TT-98/FG or AN/UGC-74A(V)3.




* THE REMOTE BOX CAN BE REPLACED BY SECURE EQUIPMENT

## 1-28. REMOTE CW OPERATION AN/GRC-122/142 PLAIN AND C MODELS.

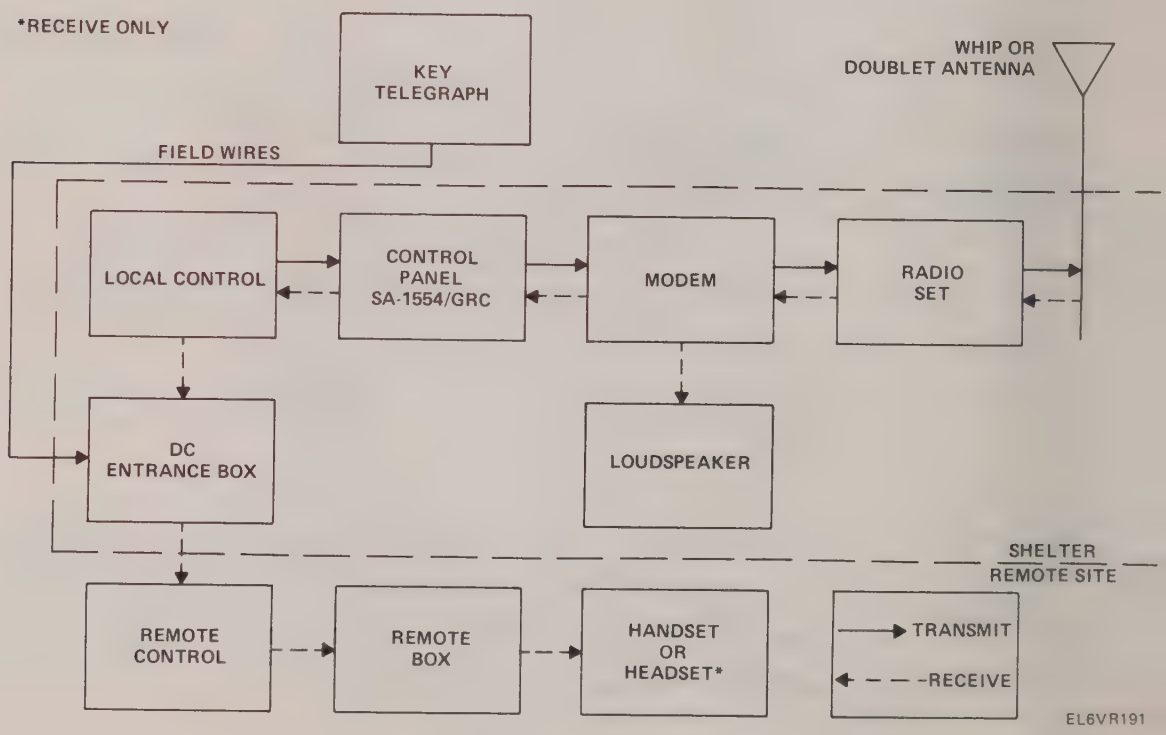
For cw operation, control panel TEL/REMOTE CW switch must be set to REMOTE CW. This causes radio set to be keyed when key telegraph is being operated. Remote key telegraph uses the same field wires as remote TA-312/PT.

TRANSMIT

Cw signals generated at remote key telegraph are routed through field wires to dc entrance box. From dc entrance box, cw signals are routed through control panel and modem to radio set. Radio set converts cw signals to radio frequency signals. Radio frequency signals are then routed to antenna for transmission to a distant radio set.

RECEIVE

Radio frequency signals transmitted from a distant radio set are received by antenna. Radio frequency signals are then routed to radio set which converts radio frequency signals to cw signals. From radio set, cw signals are routed through modem where cw signals can be heard on loudspeaker. Cw signals are then routed through control panel, local control, dc entrance box, and through field wires to remote control. From remote control, cw signals pass through remote box where operator can hear cw signals on handset or headset being used.



## 1-29. REMOTE CW OPERATION AN/GRC-122/142A, B, D, AND E MODELS.

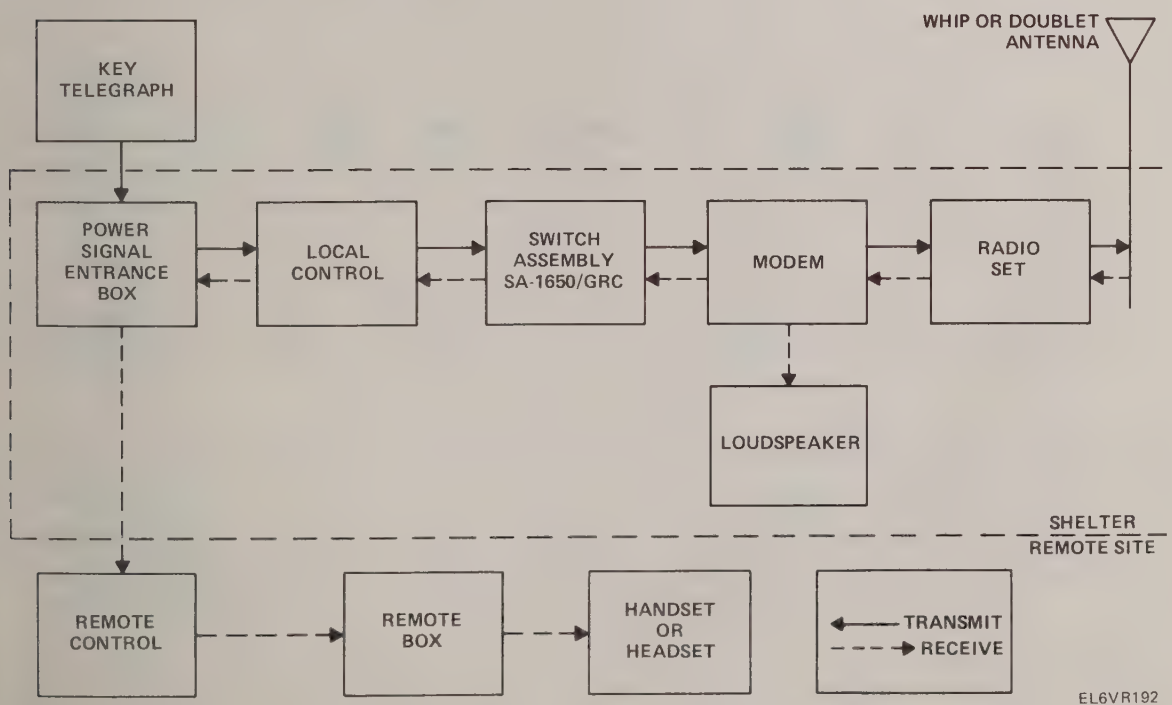
For cw operation, cable SM-C-613236 must be plugged into switch assembly. This causes radio set to be keyed when key telegraph is being operated.

TRANSMIT

Cw signals generated at remote key telegraph are routed through field wires to power/signal entrance box. From power/signal entrance box, cw signals are routed through switch assembly and modem to radio set. Radio set converts cw signals to radio frequency signals. Radio frequency signals are then routed to antenna for transmission to a distant radio set.

RECEIVE

Radio frequency signals transmitted from a distant radio set are received by antenna. Radio frequency signals are then routed to radio set which converts radio frequency signals to cw signals. From radio set, cw signals are routed through modem, where cw signals can be heard on loudspeaker. Cw signals are now routed through switch assembly, local control, power/signal entrance box, and through field wires to remote control. From remote control, cw signals pass through remote box where operator can hear cw signals on handset or headset being used.



## 1-30. TELETYPEWRITER ORDER WIRE (PONY CIRCUIT) AN/GRC-122 PLAIN AND C MODELS.

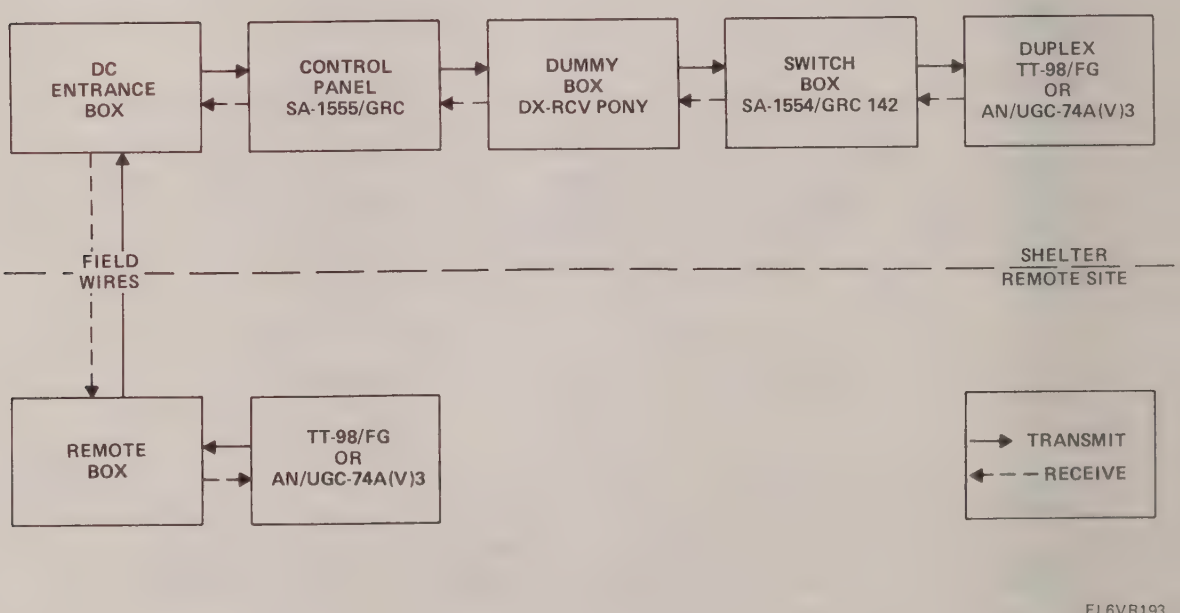
Tty order wire capability is present only in AN/GRC-122(*) models. This loop allows tty operations between local and remote operators. It uses duplex TT-98/FG or AN/UGC-74A(V)3 and a remote additional authorized TT-98/FG or AN/UGC-74A(V)3.

TRANSMIT

Tty signals generated at remote TT-98/FG or AN/UGC-74A(V)3 are routed to remote box. Signals are then routed through field wires to dc entrance box. From dc entrance box, tty signals are routed through control panel, dx-rcv-pony dummy box, switch box, and into duplex TT-98/FG or AN/UGC-74 which will print a page copy of message.

RECEIVE

Tty signals generated at local TT-98/FG or AN/UGC-74A(V)3 are routed to switch box. Tty signals are then routed through dx-rcv-pony dummy box, control panel, and into dc entrance box. From dc entrance box, tty signals are routed through field wires, remote box, and into remote TT-98/FG or AN/UGC-74A(V)3 which will print a page copy of message.




EL6VR193

## 1-31. TELETYPEWRITER ORDER WIRE (PONY CIRCUIT) AN/GRC-122A, B, D, AND E MODELS.

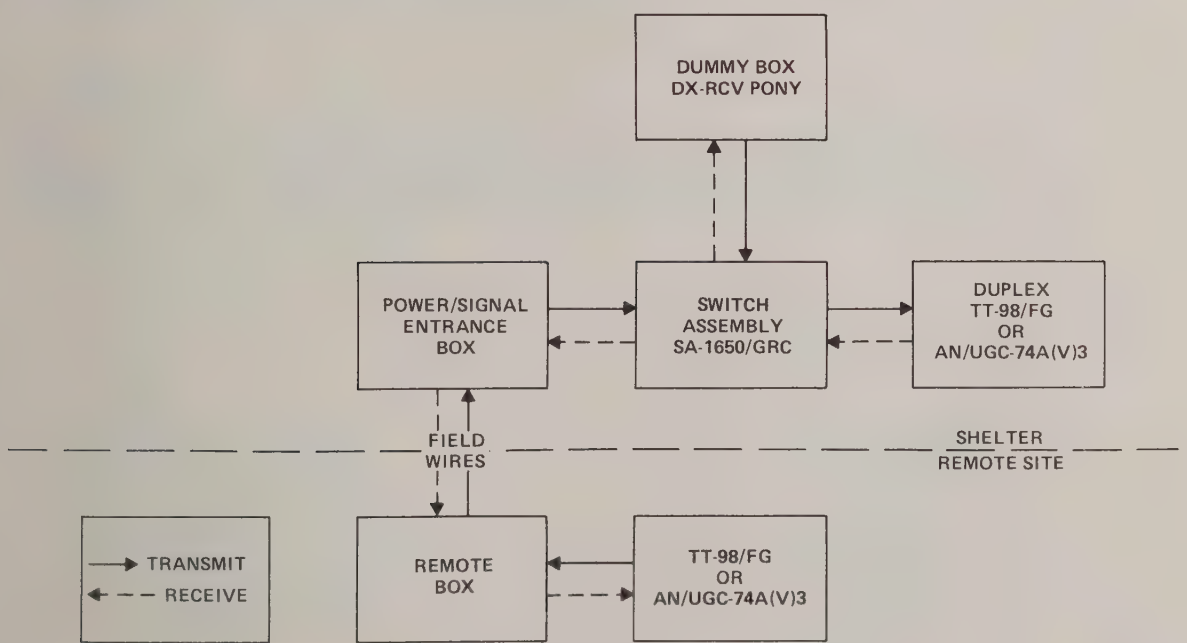
Tty order wire capability is present only in AN/GRC-122(*) models. This loop allows tty operations between local and remote operators. It uses duplex TT-98/FG or AN/UGC-74A(V)3 and a remote additional authorized TT-98/FG or AN/UGC-74A(V)3.

TRANSMIT

Tty signals generated at remote TT-98/FG or AN/UGC-74A(V)3 are routed to remote box. Signals are then routed through field wires to power/signal entrance box. From power/signal entrance box, tty signals are routed through switch assembly, dx-rcv-pony dummy box, back through switch assembly and into duplex TT-98/FG or AN/UGC-74A(V)3 which will print a page copy of the message.

RECEIVE

Tty signals generated at local TT-98/FG or AN/UGC-74A(V)3 are routed to switch assembly. Tty signals are then routed through dx-rcv-pony dummy box, back through switch assembly into power/signal entrance box. From power/signal entrance box, tty signals are routed through field wires, remote box, and into remote TT-98/FG or AN/UGC-74A(V)3 which will print a page copy of the message.




EL6VR194

# CHAPTER 2

## OPERATING INSTRUCTIONS


| Subject | Section | Page |
|---|---|---|
| Description and Use of Operator's Controls and Indicators | I | 2-1 |
| Operator Preventive Maintenance Checks and Services | II | 2-26 |
| Operation Under Usual Conditions | III | 2-29 |
| Operation Under Unusual Conditions | IV | 2-147 |


## Section I DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS


| Subject | Para | Page |
|---|---|---|
| General | 2-1 | 2-1 |
| Description of Controls and Indicators for AN/GRC-122/142 Plain and C Models | 2-2 | 2-2 |
| Description of Controls and Indicators for AN/GRC-122/142A, B, D, and E Models | 2-3 | 2-12 |

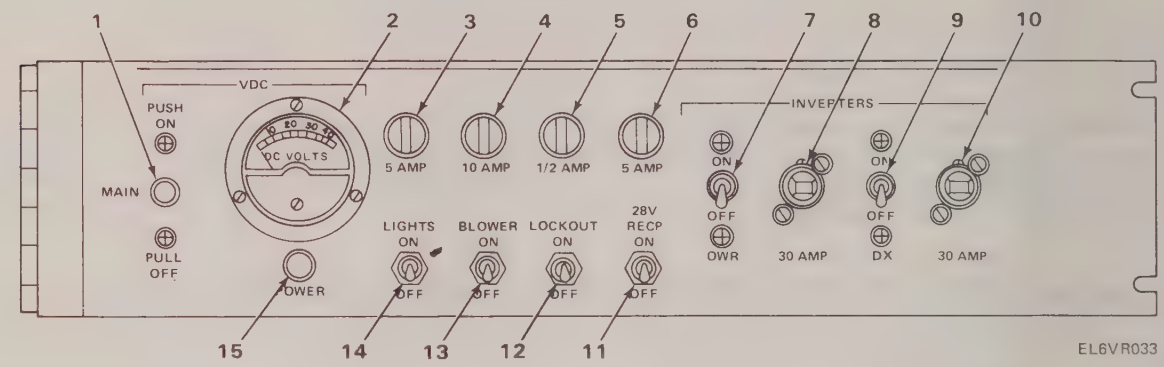

### 2-1. GENERAL.

Description of controls and indicators for radio tty sets AN/GRC-122/142(*) is presented in two paragraphs related to equipment models. These paragraphs cover data that is not covered in other technical manuals. For description of controls and indicators of equipment not in this manual, see applicable technical manual listed below.

| ITEM | TECHNICAL MANUAL |
|---|---|
| Radio Set AN/GNC-106 | TM 11-5820-520-12 |
| Modem MD-522/GRC | TM 11-5805-387-15-1 |
| Modem MD-522A/GRC | TM 11-5805-387-15-2 |
| Teletypewriter TT-98/FG | TM 11-5815-200-12 |
| Teletypewriter TT-76A/GGC | TM 11-5815-238-10 or 20 |
| Communications Terminal AN/UGC-74A(V)3 | TM 11-5815-602-12 |
| Telephone Set TA-312/PT | TM 11-5805-201-12 |
| Control Group AN/GRA-6 | TM 11-5038 |
| Space Heater | TM 5-4520-211-14 |
| Air Conditioner Model CE 6A-60 | TM 5-4120-289-15 |
| Power Supply PP-4763(*)/GRC | TM 11-5820-765-12 |
| Teletypewriter TT-722(*)/TG (LEK 122B) | TM 11-5815-206-12 |

## 2-2. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142 PLAIN AND C MODELS.

POWER DISTRIBUTION PANEL SB-3018/GRC-142




1 MAIN PUSH ON-PULL OFF Circuit Breaker. In PUSH ON position, dc voltage is available to all dc powered equipment. When operating in ac only mode, operate circuit breaker to PULL OFF position to disconnect vehicle battery or external dc power source from shelter.

2 VDC Meter. Monitors dc input voltage to shelter.

3 5 AMP Fuse (LIGHTS). Provides protection for lighting circuit.

4 10 AMP Fuse (BLOWER). Provides protection for blower unit.

5 1/2 AMP Fuse (LOCK-OUT). Provides protection for lockout circuit.

6 5 AMP Fuse (28V RECP). Provides protection for 28 vdc receptacle circuit.

7 INVERTERS OWR ON-OFF Switch. Energizes the inverter for owr circuit when set to ON.

8 30 AMP Fuse (INVERTERS). Provides protection for owr inverter circuit.

9 INVERTERS DX ON-OFF Switch (used on AN/GRC-122 models only). Energizes duplex inverter when set to ON.

10 30 AMP Fuse (INVERTERS) (used for AN/GRC-122 models only). Provides protection for duplex inverter circuit.

11 28V RECP Switch. When set to ON, 28 vdc is available on curbside wall dc receptacle.

12 LOCK-OUT Switch. Used to disable lockout circuit when shelter is set up to handle classified messages. Set switch to ON along with control panel LOCK-OUT-OVERRIDE switch.

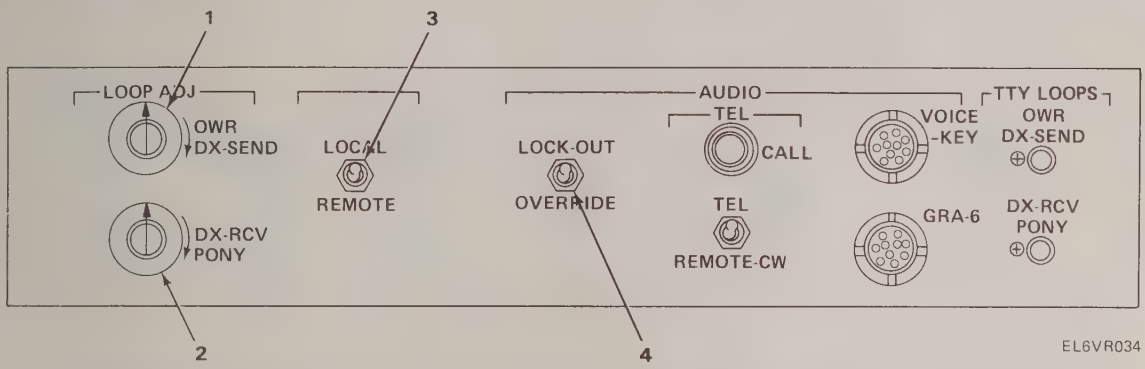
13 BLOWER Switch. Energizes shelter blower when set to ON.

14 LIGHTS Switch. When set to ON, two shelter lamps will light unless blackout switch is open.

15 POWER Lamp. Lights to indicate presence of dc power when MAIN circuit breaker is pushed in.

## 2-2. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142 PLAIN AND C MODELS. (CONT)

CONTROL PANEL SA-1554/GRC-142




1 LOOP ADJ OWR-DX-SEND Control. Used to adjust OWR-DX-SEND TTY loop current to desired level indicated on modem test meter. (Test METER FUNCTION switch set to DC LOOP NO. 1.) Clockwise rotation increases loop current.

2 LOOP ADJ DX-RCV-PONY Control (used on AN/GRC-122 models only). Used to adjust DX-RECEIVE pony loop current to desired level indicated on modem test meter. (Test METER FUNCTION switch set to DC LOOP NO. 2.) Clockwise rotation increases loop current.

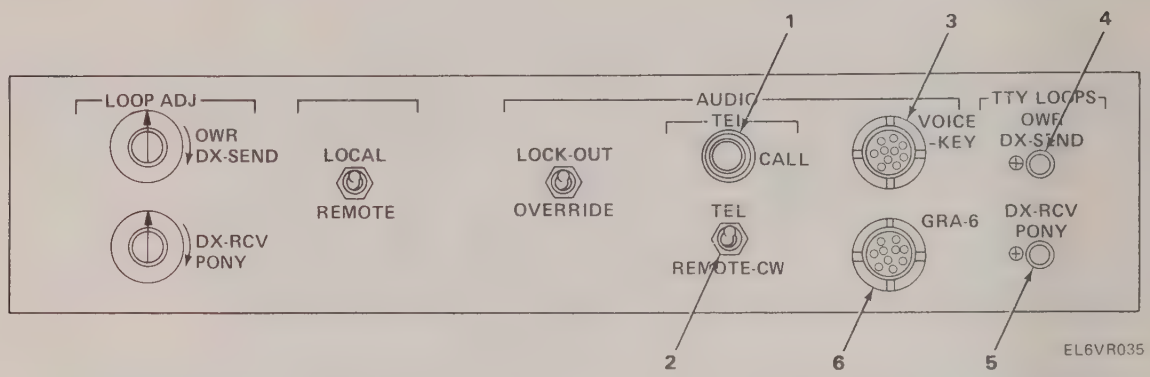
3 LOCAL-REMOTE Switch. When set to LOCAL, remote tty operation is disabled. When set to REMOTE, allows operation of remote tty.

4 LOCK-OUT-OVERRIDE Switch. Used with power distribution panel LOCK-OUT switch to disable lockout circuit when shelter is set up to handle classified messages. Disabling lockout circuit restores TA-312/PT circuit to normal operation and allows nonsecure voice over secure tty system and allows remote to local voice communications. (Spring loaded to return to LOCK-OUT position when released.)

| SWITCH POSITION | EFFECT |
|---|---|
| LOCK-OUT | Lockout circuit is enabled. |
| OVERRIDE | Lockout circuit is disabled. (Power distribution panel LOCK-OUT switch must be set to ON.) |

## 2-2. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142 PLAIN AND C MODELS. (CONT)

CONTROL PANEL SA-1554/GRC-142 (CONT)




1 AUDIO TEL CALL Lamp. In secure mode, lamp will flicker to indicate remote operator is ringing local operator and desires TA-312/PT circuit be returned to normal operation.

2 AUDIO TEL REMOTE-CW Switch. Enables TA-312/PT lines to be used for telephone or remote cw operation.

| SWITCH POSITION | EFFECT |
|---|---|
| TEL | Establishes connection for telephone operation between shelter and remote site. |
| REMOTE CW | Allows remote TA-312/PT operator to transmit CW. (Remote TA-312/PT is disconnected and KY-116/U is connected to field wires.) |

3 AUDIO VOICE-KEY Connector. Provides connection of handset, headset, or key telegraph to allow local voice, cw, or nsk plus voice operation.

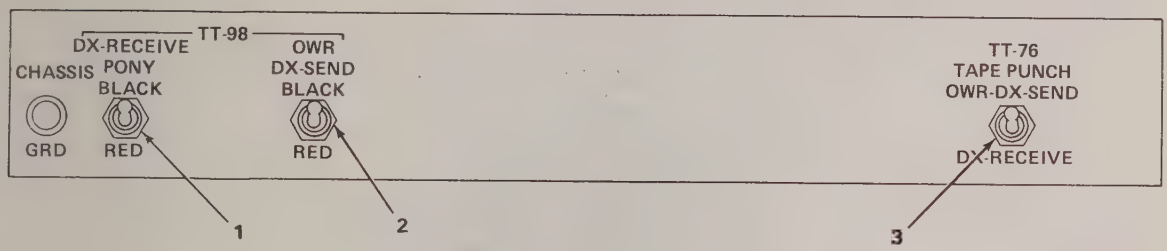
4 TTY LOOPS OWR-DX-SEND Jack. Dummy box or security equipment is connected into OWR-DX-SEND TTY loop at this jack.

5 TTY LOOPS DX-RCV-PONY Jack (used on AN/GRC-122 models only). Dummy box or security equipment is connected into DX-RECEIVE pony loop at this jack.

6 GRA-6 Connector. Provides termination for local control.

## 2-2. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142 PLAIN AND C MODELS. (CONT)

SWITCHBOX SA-1555/GRC-142




EL6VR036

1 TT-98 DX-RECEIVE-PONY BLACK-RED Switch (used on AN/GRC-122 models only). Enables operator to reduce DX-RECEIVE pony loop current through duplex TT-98/FG for use with security equipment.

| SWITCH POSITION | EFFECT |
|---|---|
| BLACK | This is normal position and results in normal loop current (20 or 60 ma). |
| RED | Reduces DX-RECEIVE pony loop current for use with security equipment. |

2 TT-98 OWR-DX-SEND BLACK-RED Switch. Enables operator to reduce OWR-DX-SEND TTY loop current through TT-98/FG for use with security equipment.

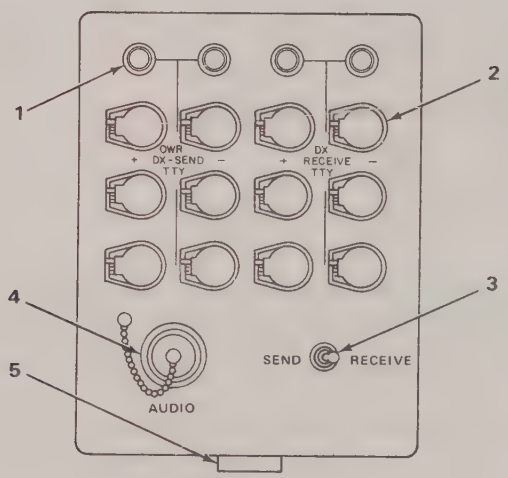
| SWITCH POSITION | EFFECT |
|---|---|
| BLACK | This is normal position and results in normal loop current (20 or 60 ma). |
| RED | Reduces OWR-DX-SEND TTY loop current for use with security equipment. |

3 TT-76 TAPE PUNCH OWR-DX-SEND-DX-RECEIVE Switch. Allows operator to switch TT-76(*)/GGC tape punch function between OWR-DX-SEND and DX-RECEIVE pony loops. (Switch must be in OWR-DX-SEND position for AN/GRC-142(*) models.)

| SWITCH POSITION | EFFECT |
|---|---|
| OWR-DX-SEND | Tape punch is connected into OWR-DX-SEND tty loop. |
| OWR-DX-RECEIVE (This switch position for AN/GRC-122 models only.) | Tape Punch is connected into DX-RECEIVE pony loop. |

## 2-2. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142 PLAIN AND C MODELS. (CONT)

REMOTE BOX




EL6VR037

1 Teletypewriter Loop Binding Posts. Provide for termination of dc tty loop field wires originating at shelter dc entrance box binding posts. One pair is for OWR-DX-SEND TTY loop, the other pair is for DX-RECEIVE tty loop (used in AN/GRC-122 models only).

2 Teletypewriter Jacks. Provide connection of remote teletypwriters into dc tty loops. Six jacks are for OWR-DX-SEND TTY loop, and six jacks are for DX-RECEIVE TTY loop (used in AN/GRC-122 models only).

3 SEND-RECEIVE Switch. Allows remote keying of shelter radio set.

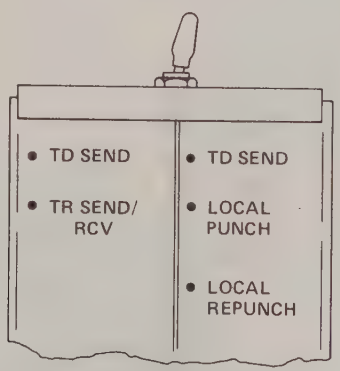
| SWITCH POSITION | EFFECT |
|---|---|
| SEND | Radio set is keyed for tty or 85 Hz + voice (nsk) transmission. |
| RECEIVE | Radio set is not keyed and is in receive mode. |

4 AUDIO Connector. Provides for connection of handset for remote voice or 85 Hz + voice (nsk) operation.

5 Pendant Plug. Provides connection between remote box and remote control (P/O AN/GRA-6).

## 2-2. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142 PLAIN AND C MODELS. (CONT)

LOW-LEVEL SIGNALING DEVICE TT-523/GGC



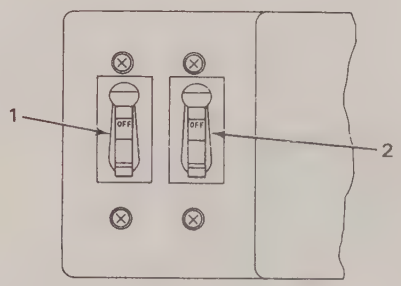

EL6VR038

TT-523/GGC Switch. Used with TT-76A/GGC SELECTOR switch to provide low- level current for punching or repunching tapes. This is done to reduce TT-76A/GGC radiation and thereby provide secure conditions for handling classified messages.

| SWITCH POSITION | EFFECT |
|---|---|
| TD SEND TR SEND/RCV | Selected when TT-76(*)/GGC SELECTOR switch is set to position 1. Operation of TT-76A/GGC is not altered. |
| TD SEND LOCAL REPUNCH | Selected when TT-76(*)/GGC SELECTOR switch is in position 2 or 3. Operation of TT-76(*)/GGC circuit is altered to operate at reduced current. |

## 2-2. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142 PLAIN AND C MODELS. (CONT)

AC ENTRANCE BOX CIRCUIT BREAKERS

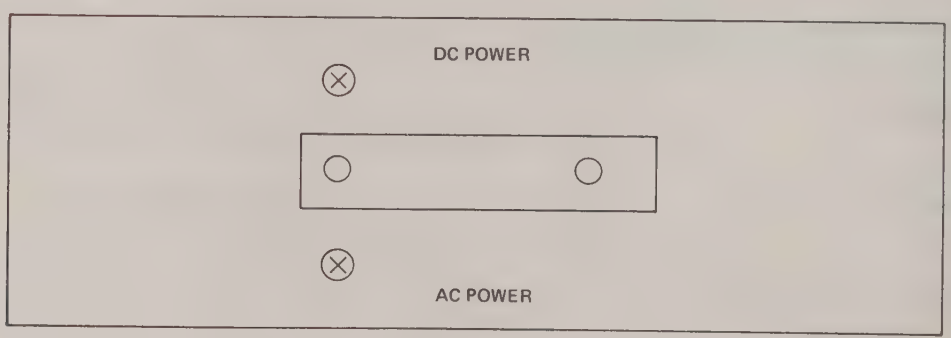



EL6VR039

1 Air Conditioner 30 Amp Circuit Breaker (used on AN/GRC-142, serial numbers 1 through 697 only). Provides protection for air conditioner and 110 vac, 15 amp convenience outlets which are located on Distribution Box J-2776/GRC-142.

2 30 Amp Out On-Off Circuit Breaker. Provides protection for 110 vac, 25 amp outlet located on Distribution Box J-2776/GRC-142.

DISTRIBUTION BOX J-2776/GRC-142

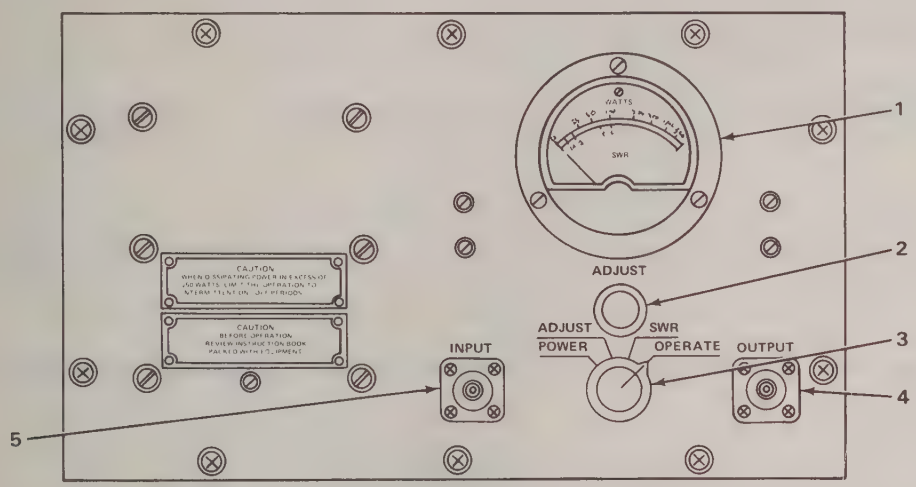



EL6VR040

Distribution Box AC POWER-DC POWER Switch. When switched to AC POWER shelter operates from external ac power source. When switched to DC POWER, shelter operates from vehicle battery or external dc power source.

## 2-2. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142 PLAIN AND C MODELS. (CONT)

STANDING WAVE RATIO METER ME-165/G




1 Meter. Indicates AM-3349/GRC-106 average output in watts or vswr, depending on setting of function switch.

2 ADJUST Control. Used with function switch (ADJUST position) to calibrate meter for vswr measurement.

3 Function Switch. Selects mode of operation for ME-165/G.

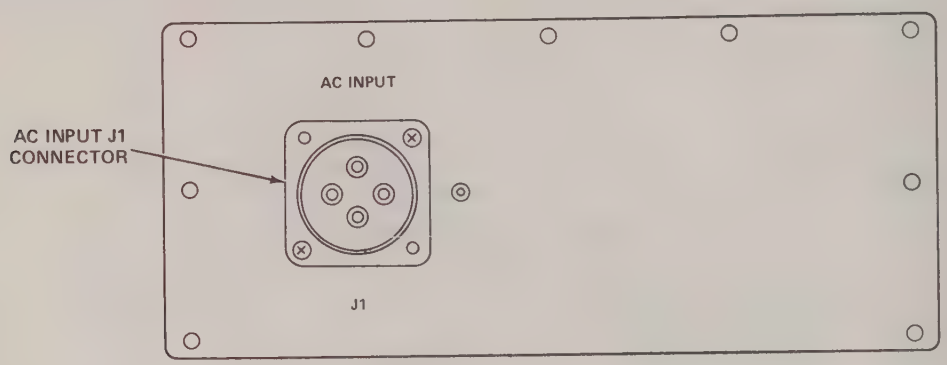
4 OUTPUT Connector. Radio frequency output appearing at this connector is routed to doublet antenna.

| SWITCH POSITION | EFFECT |
|---|---|
| POWER | ME-165/G will measure power output of AM-3349/GRC-106. |
| ADJUST | Used with ADJUST control to calibrate meter for vswr measurement. |
| SWR | Meter indicates vswr of antenna. |
| OPERATE | Output of AM-3349/GRC-106 is routed directly to doublet antenna (AN/GRC-50, if used). |

5 INPUT Connector. Output of AM-3349/GRC-106 is applied to this connector.

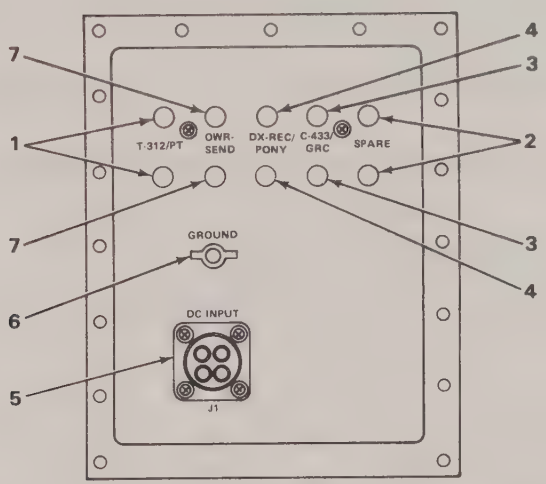
## 2-2. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142 PLAIN AND C MODELS. (CONT)

AC ENTRANCE BOX




AC INPUT J1 Connector. Provides connection to shelter ac circuits from external ac power source.

DC ENTRANCE BOX




1 TA-312/PT Terminals. Provide connection from field TA-312/PT to shelter mounted TA-312/PT or from remote key telegraph to radio set.

2 SPARE Terminals (REM CW Terminals). Spare terminals are disconnected in early models and in later models are labled REM CW terminals, which are used to connect remote key telegraph to shelter.

3 C-443/GRC Remote Control Terminals. Provide connection from remote site to shelter-mounted local control for remote keying and remote voice operation.

## 2-2. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142 PLAIN AND C MODELS. (CONT)

DC ENTRANCE BOX (CONT)

4 DX-REC/PONY Loop Terminals (used on the AN/GRC-122 models only). Provide connection from remote site to shelter duplex tty receive or pony (tty order wire) circuits.

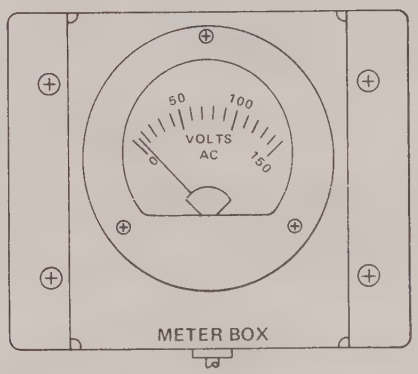
5 DC INPUT J1 Connector. Provides connection for dc input power to shelter from vehicle or external dc power source.

6 GROUND Terminal. Provides connection for grounding shelter to earth.

7 OWR-SEND Loop Terminals. Provide connection from remote site to shelter owr and duplex send tty circuits.

## 2-2. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142 PLAIN AND C MODELS. (CONT)

AC VOLTMETER

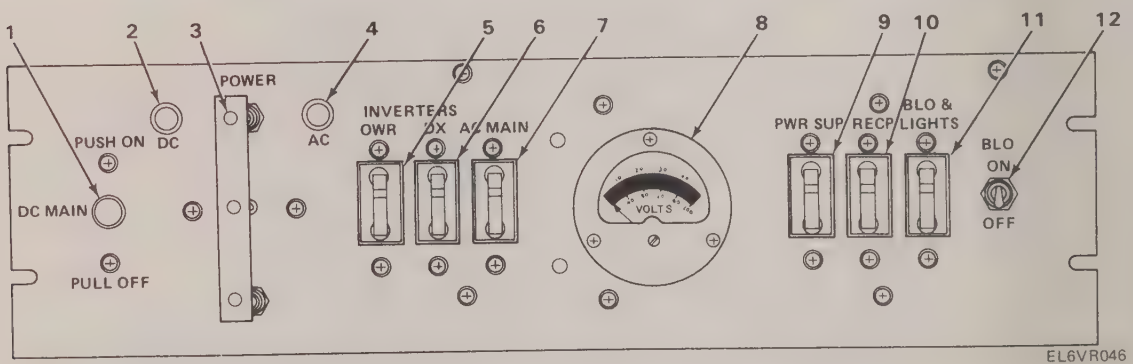



EL6VR045

VOLTS AC METER BOX. Provides an ac voltage monitor only during ac/dc modes of operation.

## 2-3. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142A, B, D, AND E MODELS.

POWER DISTRIBUTION PANEL SB-3358/GRC-142 (AN/GRC-122/142A AND B MODELS ONLY)




EL6VR046

1 DC MAIN Circuit Breaker. In PUSH ON position, provides dc circuit protection to all dc powered shelter components.

2 DC Indicator Lamp. Lights when DC MAIN circuit breaker is in PUSH ON position to indicate presence of dc power.

**2-3. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142A, B, D, AND E MODELS.** (CONT)

3 POWER Selector Switch. In ac position, external ac (115 v, 60 Hz) is transferred through switching circuits to supply dc power supply with operating voltage. Power supply then supplies shelter with dc voltage for lights and exhaust blower. In dc position, external dc or 28 vdc from vehicle battery are transferred through switches to inverters and to dc operated shelter components.

4 AC Indicator Lamp. Lights when AC MAIN circuit breaker is set to ON position to indicate presence of ac voltage.

5 INVERTERS OWR Circuit Breaker (not used when operating in ac only mode). Energizes inverter for OWR circuit when set to ON. Provides circuit protection for OWR circuit when load exceeds 30 amps.

6 INVERTERS DX Circuit Breaker (not used when operating in ac only mode). Energizes duplex inverter (AN/GRC-122 models only) when set to ON. Provides circuit protection for DX circuit when load exceeds 30 amps.

7 AC MAIN Circuit Breaker. In ON position, ac voltage is available to all ac powered shelter components except power supply. Provides circuit protection for ac circuits when load exceeds 30 amps.

8 VOLTS Meter. Monitors ac or dc input voltage to shelter.

9 PWR SUP Circuit Breaker. Energizes dc power supply when set to ON. Provides circuit protection for power supply when load exceeds 25 amps, ac.

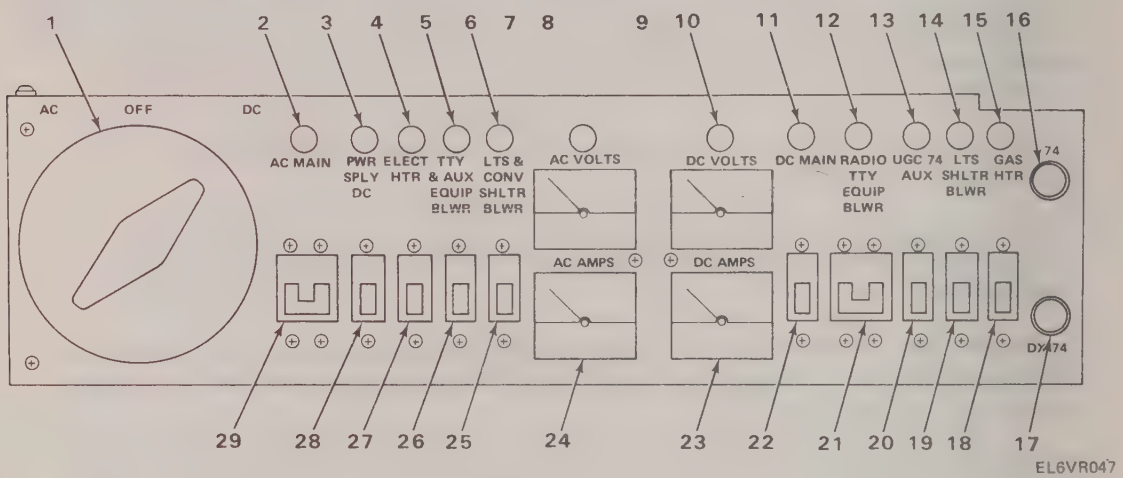
10 RECP Circuit Breaker. Energizes shelter 28-volt receptacle when set to ON. When operating from a dc power source, provides circuit protection when load exceeds 6 amps.

11 BLO & LIGHTS Circuit Breaker. Energizes blower and lights when set to ON. Provides circuit protection for blower or light circuits when load exceeds 6 amps.

12 BLO ON-OFF Switch. Energizes shelter exhaust fan when BLO & LIGHTS circuit breaker is on.

## 2-3. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142A, B. D, AND E MODELS. (CONT)

POWER DISTRIBUTION PANEL SC-F-960672 (USED IN AN/GRC-122/142D AND E MODELS ONLY)




1 AC-OFF-DC Power Selector Switch. In AC position external ac (115 v, 60 Hz) is transferred through switching circuits to supply AC MAIN circuit breaker with operating voltage. In DC position, external 28 vdc from vehicle battery is transferred through switching circuits to supply DC MAIN circuit breaker with operating voltage.

2 AC MAIN Indicator Lamp. Lights when AC MAIN circuit breaker is set to ON indicating presence of ac voltage.

3 PWR SPLY DC Indicator Lamp. Lights when PWR SPLY ac circuit breaker is set to ON.

4 ELECT HTR Indicator Lamp. Lights when ELECT HTR ac circuit breaker is set to ON.

5 TTY & AUX EQUIP BLWR Indicator Lamp. Lights when TTY & AUX EQUIP BLWR circuit breaker is set to ON.

6 LTS & CONV SHLTR BLWR Indicator Lamp. Lights when LTS & CONV SHLTR BLWR circuit breaker is set to ON.

7 AC VOLTS Meter. Monitors amount of ac voltage being used in ac operation.

8 AC VOLTS Indicator Lamp. Lights to indicate presence of ac voltage.

9 DC VOLTS Meter. Monitors amount of dc voltage being used in dc operation.

10 DC VOLTS Indicator Lamp. Lights to indicate presence of dc voltage.

11 DC MAIN Indicator Lamp. Lights when DC MAIN circuit breaker is set to ON indicating presence of dc voltage.

12 RADIO TTY EQUIP BLWR Indicator Lamp. Lights when RADIO TTY EQUIP BLWR circuit breaker is set to ON.

## 2-3. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142A, B, D, AND E MODELS. (CONT)

13 UGC-74 AUX Indicator Lamp. Lights when UGC-74 AUX circuit breaker is set to ON.

14 LTS SHLTR BLWR Indicator Lamp. Lights when LTS SHLTR BLWR circuit breaker is set to ON.

15 GAS HTR Indicator Lamp. Lights when GAS HTR circuit breaker is set to ON.

16 74 Indicator Lamp. Lights when front wall AN/UGC-74(V)3 is turned on.

17 DX 74 Indicator Lamp. Lights when duplex AN/UGC-74A(V)3 is turned on.

18 GAS HTR Circuit Breaker. Provides circuit protection for gas heater when load exceeds 15 amps.

19 LTS SHLTR BLWR Circuit Breaker. Provides circuit protection for lights, duplex inverter, and shelter blower when load exceeds 20 amps.

20 UGC-74 AUX Circuit Breaker. Provides circuit protection for AN/UGC-74A(V)3 when load exceeds 15 amps.

21 RADIO TTY EQUIP BLWR Circuit Breaker. Provides circuit protection for radio set, owr inverter, and equipment when load exceeds 50 amps.

22 DC MAIN Circuit Breaker. Provides circuit protection for dc circuits when load exceeds 100 amps.

23 DC AMPS Meter. Monitors amount of dc amperes being used during dc operation.

24 AC AMPS Meter. Monitors amount of ac amperes being used during ac operation.

25 LTS & CONV SHLTR BLWR Circuit Breaker. Provides circuit protection for lights and shelter blower when voltage exceeds 20 amps.

26 TTY & CONV SHLTR BLWR Circuit Breaker. Provides circuit protection for tty, convenience receptacles, and shelter blower when voltage exceeds 15 amps.

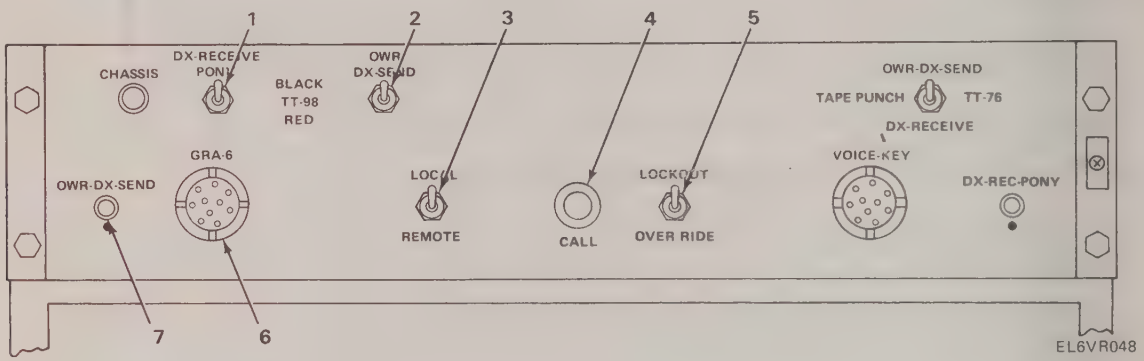
27 ELECT HTR Circuit Breaker. Provides circuit protection for electric heater when voltage exceeds 20 amps.

28 PWR SPLY DC Circuit Breaker. Provides circuit protection for power supply when voltage exceeds 30 amps.

29 AC MAIN Circuit Breaker. Provides circuit protection for ac circuits.

## 2-3. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142A, B, D, AND E MODELS. (CONT)

SWITCH ASSEMBLY SA-1650/GRC




1 TT-98 DX-RECEIVE-PONY BLACK-RED Switch (used only in AN/GRC-122 models). Enables operator to reduce DX-RECEIVE pony loop current through TT-98/FG for use with security equipment.

| SWITCH POSITION | EFFECT |
|---|---|
| BLACK | Normal position that results in normal loop current (20 or 60 ma). |
| RED | Reduces DC-RECEIVE pony loop current for use with security equipment. |

2 TT-98 OWR-DX-SEND BLACK-RED Switch. Enables operator to reduce OWR-DX-SEND tty loop current through TT-98/FG for use with security equipment.

**2-3. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142A, B, D, AND E MODELS.** (CONT)

| SWITCH POSITION | EFFECT |
|---|---|
| BLACK | Normal position that results in normal loop current (20 or 60 ma). |
| RED | Reduces OWR-DX-SEND tty loop current for use with security equipment. |

3 LOCAL-REMOTE Switch. Enables or disables remote tty operation.

| SWITCH POSITION | EFFECT |
|---|---|
| LOCAL | Remote tty operation is disabled. |
| REMOTE | Permits remote tty operation. |

4 CALL Lamp. Operational when secure condition exists and lockout circuit is enabled. Under these conditions, lamp will flicker to indicate remote operator is ringing local operator and desires TA-312/PT be restored to normal operation.

5 LOCKOUT-OVER RIDE Switch. Used to disable lockout circuit when tty is set up to handle classified messages. Disabling lockout circuit restores TA-312/PT to normal operation which allows remote voice communication with local operator. (Spring loaded to return to LOCKOUT position when released.)

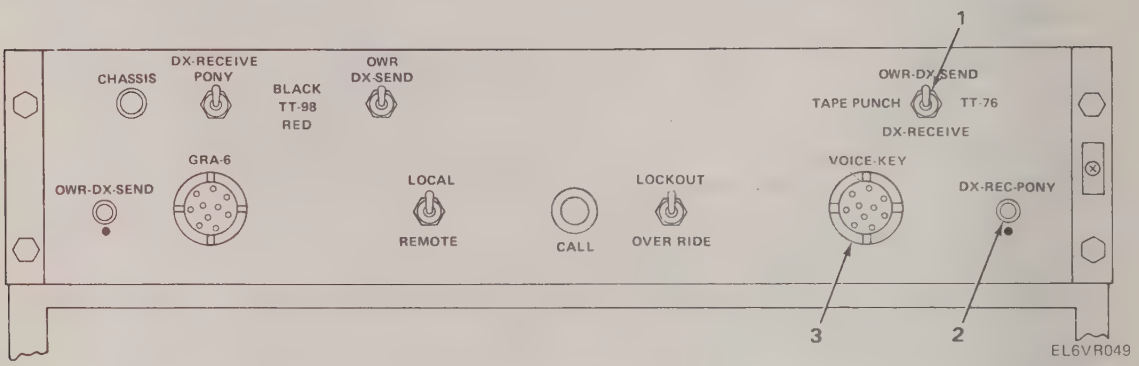
| SWITCH POSITION | EFFECT |
|---|---|
| LOCKOUT | Lockout circuit operates. |
| OVER RIDE | Lockout circuit is disabled. |

6 GRA-6 Connector. Provides termination for local control.

7 OWR-DX-SEND Jack. Dummy box or security equipment is connected into OWR-DX-SEND tty loop at this jack.

## 2-3. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142A, B, D, AND E MODELS. (CONT)

SWITCH ASSEMBLY SA-1650/GRC




1 OWR-DX-SEND/TAPE PUNCH/TT-76/DX-RECEIVE Switch. Allows operator to switch TT-76(*)/GGC tape punch function between OWR-DX-SEND loop and DX-RECEIVE or pony (tty order wire) loop.

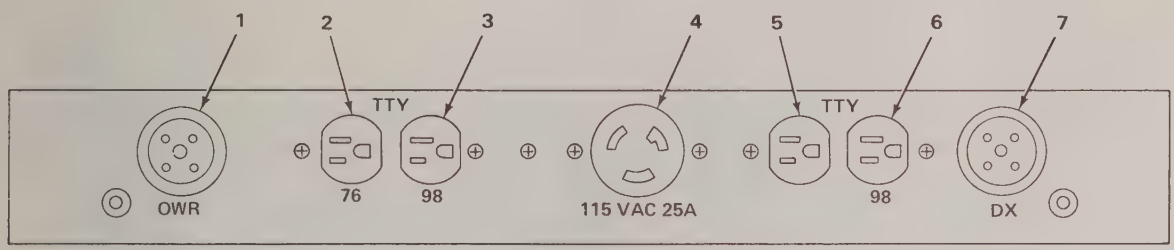
| SWITCH POSITION | EFFECT |
|---|---|
| OWR-DX-SEND | Tape punch is connected into OWR-DX-SEND tty loop. |
| DX-RECEIVE (Used for AN/GRC-122 models only. Switch must be in OWR-DX-SEND position for AN/GRC-142 models only.) | Tape punch is connected into DX-RECEIVE pony loop. |

2 DX-REC-PONY Jack (used on the AN/GRC-122 models only). Dummy box or security equipment is connected to DX-REC-PONY loop at this jack.

3 VOICE-KEY Connector. Provides connection for handset, headset, or key telegraph permitting local voice, cw, or nsk plus voice operation.

## 2-3. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142A, B, D, AND E MODELS. (CONT)

POWER TERMINAL ASSEMBLY (USED ON AN/GRC-122/142A AND B MODELS ONLY)




EL6VR050

1 OWR Connector. Dc voltage (28 vdc) for owr inverter is available at OWR connector when power distribution panel is energized and INVERTERS OWR circuit breaker is set to ON.

2 TTY 76 Receptacle. Ac voltage (115 v, 60 Hz) for TT-76(*)/GGC is available at this receptacle when power distribution panel POWER selector switch is set to AC or DC position.

3 TTY 98 Receptacle. Ac voltage (115 v, 60 Hz) for TT-98/FG is available at this receptacle when power distribution panel POWER selector switch is set to AC or DC position.

4 115 VAC 25A Receptacle. Ac voltage (115 v, 60 Hz) for power supply is available at this receptacle when power distribution panel is energized and PWR SUP circuit breaker is set to ON.

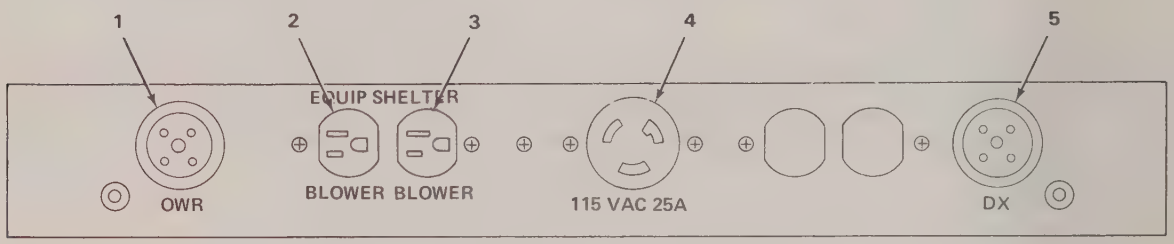
5 TTY Spare Receptacle (duplex side of power terminal assembly). Ac voltage (115 v, 60 Hz) is available at this receptacle when power distribution panel POWER selector switch is set to AC or DC position.

6 TTY 98 Receptacle (duplex side of power terminal assembly). Ac voltage (115 v, 60 Hz) for duplex TT-98/FG is available at this receptacle when power distribution panel POWER selector switch is set to AC or DC position.

7 DX Connector. Dc voltage (28 vdc) is available for duplex inverter at this receptacle connector when power distribution panel is energized and INVERTERS DX circuit breaker is set to ON.

## 2-3. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142A, B, D, AND E MODELS. (CONT)

POWER TERMINAL ASSEMBLY (USED ON AN/GRC-122/142D AND E MODELS)




EL6VR051

1 OWR Connector. Dc voltage (28 vdc) for owr inverter is available at OWR connector when RADIO TTY EQUIP BLWR circuit breaker is set to ON and power distribution panel AC-OFF-DC switch is set to DC.

2 EQUIP BLOWER Receptacle. Ac voltage (115 v, 60 Hz) for equipment blower is available at this receptacle when power distribution panel AC-OFF-DC switch is set to AC or DC position.

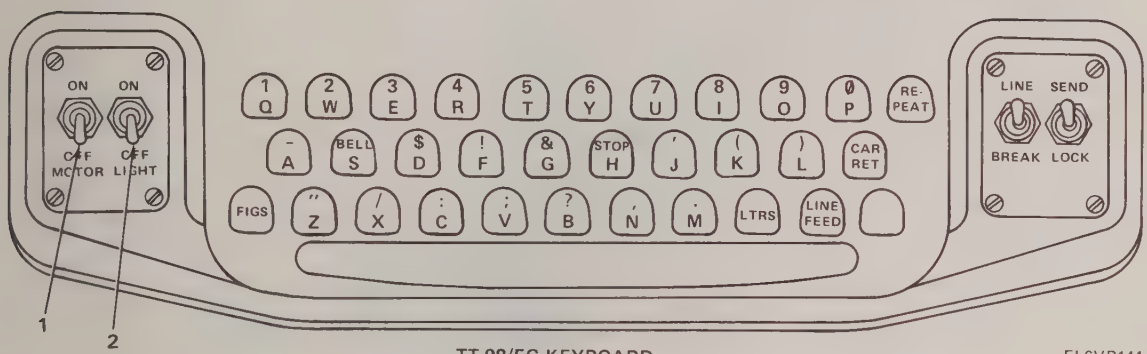
3 SHELTER BLOWER Receptacle. Ac voltage (115 v, 60 Hz) for shelter blower is available at this receptacle when power distribution panel AC-OFF-DC switch is set to AC or DC position.

4 115 VAC 25 A Receptacle. Ac voltage (115 v, 60 Hz) for power supply is available at this receptacle when power distribution panel AC-OFF-DC switch is set to AC.

5 Dx Connector. Dc voltage (28 vdc) for duplex inverter is available at DX connector when power distribution panel AC-OFF-DC switch is set to DC.

**2-3. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142A, B, D, AND E MODELS.** (CONT)

STANDING WAVE RATIO METER ME-165/G




TT-98/FG KEYBOARD EL6VR141

1 Meter. Indicates AM/3349/GRC-106 average output in watts or vswr, depending on setting of function switch.

2 ADJUST Control. Used with function switch (ADJUST position) to calibrate meter for vswr measurement.

3 Function Switch. Selects mode of operation for ME-165/G.

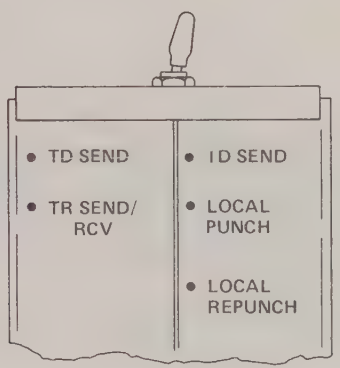
4 OUTPUT Connector. Radio frequency output appearing at this connector is routed to doublet antenna.

| SWITCH POSITION | EFFECT |
|---|---|
| POWER | ME-165/G will measure power output of AM-3349/GRC-106. |
| ADJUST | Used in conjunction with ADJUST control to calibrate meter for vswr measurement. |
| SWR | Meter indicates vswr of antenna. |
| OPERATE | Output of AM-3349/GRC-106 is routed directly to doublet antenna (AN/GRA-50, if used). |

5 INPUT Connector. Output of AM-3349/GRC-106 is applied to this connector.

## 2-3. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142A, B, D, AND E MODELS. (CONT)

LOW-LEVEL SIGNALING DEVICE TT-523/GGC



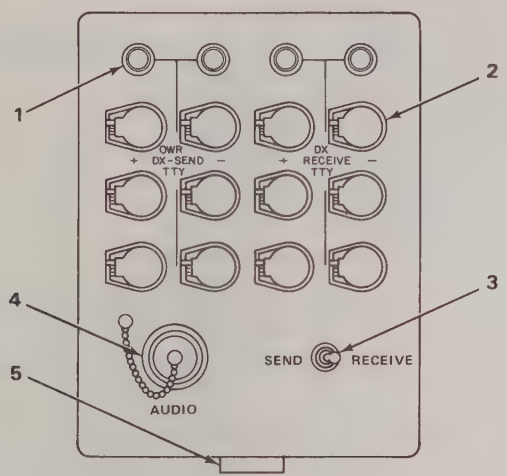

EL6VR038

TT-523/GGC Switch. Used with TT-76(*)/GGC SELECTOR switch to provide low-level current for punching or repunching tapes. This is done to reduce TT-76(*)/GGC radiation, and thereby provide secure conditions for handling classified messages.

| SWITCH POSITION | EFFECT |
|---|---|
| TD SEND TR SEND/RCV | Selected when TT-76(*)/GGC SELECTOR switch is set to position 1. Operation of TT-76(*)/GGC is not altered. |
| TD SEND LOCAL REPUNCH | Selected when TT-76(*)/GGC SELECTOR switch is in position 2 or 3. Operation of TT-76(*)/GGC circuit is altered to operate at reduced current. |

## 2-3. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142A, B, D, AND E MODELS ONLY. (CONT)

REMOTE BOX




EL6VR037

1 Teletypewriter Loop Binding Posts. Provide for termination of dc tty loop field wires originating at shelter dc entrance box binding posts. One pair is for OWR-DX-SEND TTY loop, the other pair is for DX-RECEIVE TTY loop (used in AN/GRC-122 models only).

2 Teletypewriter Jacks. Provide for connection of remote teletypewriters into dc tty loops. Six jacks are for OWR-DX-SEND TTY loop, and six jacks are for DX-RECEIVE TTY loop (used in AN/GRC-122 models only).

3 SEND-RECEIVE Switch. Allows remote keying of shelter radio set.

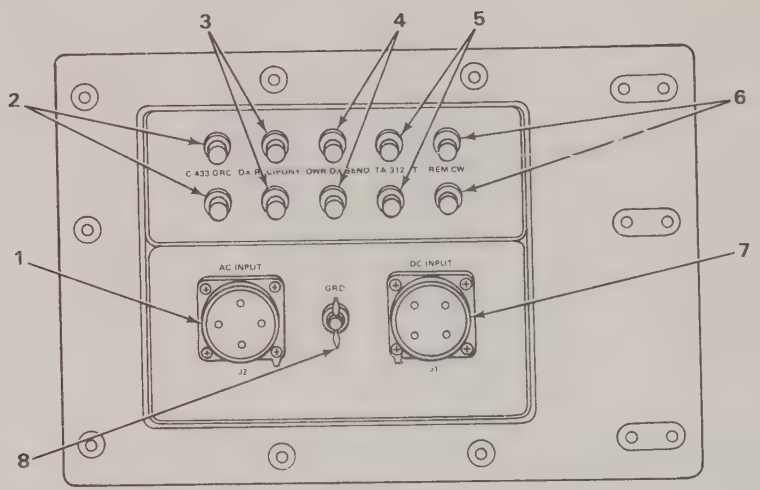
| SWITCH POSITION | EFFECT |
|---|---|
| SEND | Radio set is keyed for tty or 85 Hz + voice (nsk) transmission. |
| RECEIVE | Radio set is not keyed and is in receive mode. |

4 AUDIO Connector. Provides for connection of handset for remote voice or 85 Hz + voice (nsk) operation.

5 PENDANT PLUG. Provides connection between remote box and remote control (P/O AN/GRA-6).

## 2-3. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142A, B, D, AND E MODELS. (CONT)

POWER/SIGNAL ENTRANCE BOX




EL6VR052

1 AC INPUT J2 Connector. Provides connection to shelter ac circuits from external ac power source.

2 C-433-GRC Terminals. Provide connection from remote control to shelter mounted local control for remote keying and voice operation.

3 DX-REC-PONY Loop Terminals (used on AN/GRC-122 models only). Provide connection from remote site to shelter for duplex tty receive or pony loop (tty order wire) circuits.

4 OWR-DX-SEND Loop Terminals. Provide connection from remote site to shelter owr and duplex send loop tty circuits.

5 TA-312/PT Terminals. Provide connection from field TA-312/PT to shelter-mounted TA-312/PT.

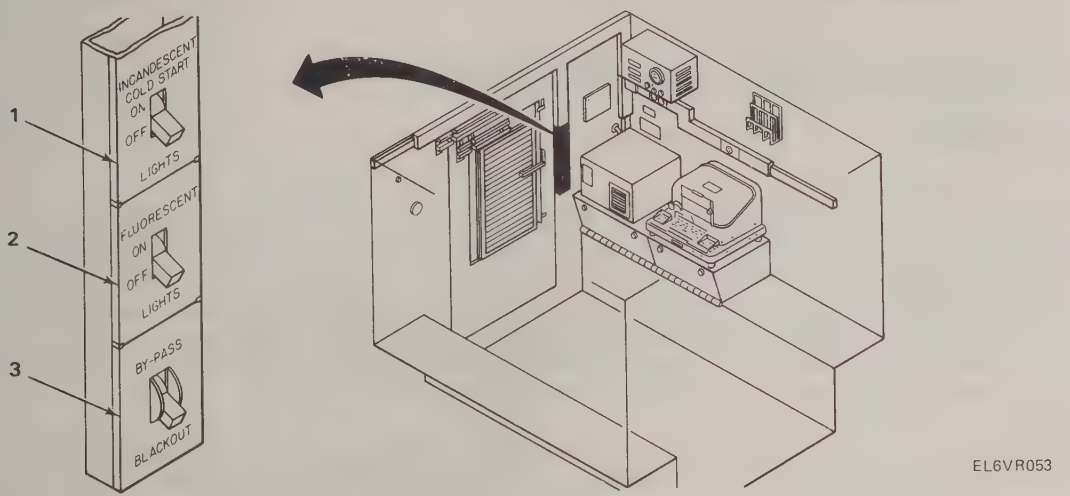
6 REM CW Terminals. Provide connection from remote key terminal to radio set.

7 DC INPUT J1 Connector. Provides connection for dc input power from vehicle or external dc power source.

8 GRD Terminal. Provides connection for grounding shelter to earth.

## 2-3. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142A, B, D, AND E MODELS. (CONT)

LIGHTING CONTROLS (USED ON AN/GRC-122/142 D AND E MODELS ONLY)

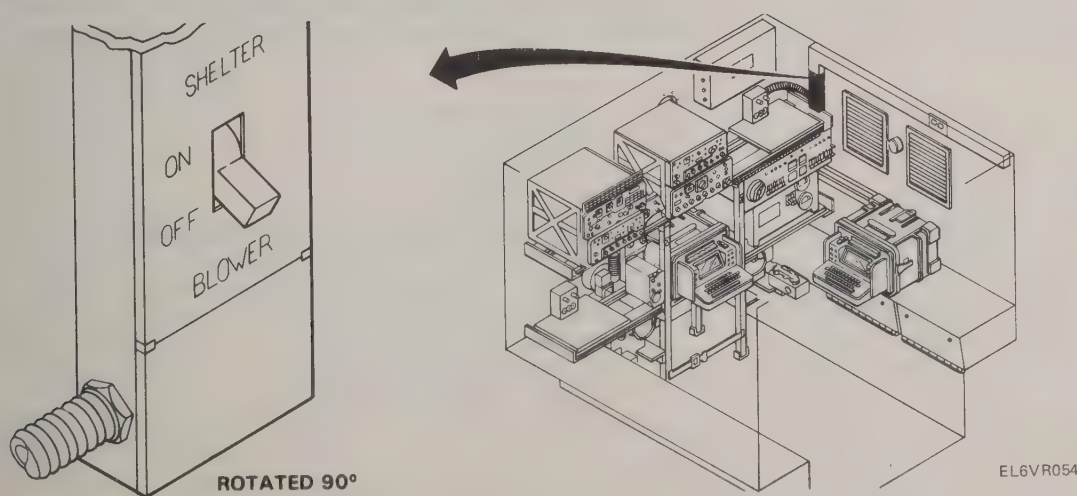



1 INCANDESCENT COLD START LIGHTS Switch. Controls power to incandescent lights.

2 FLUORESCENT LIGHTS Switch. Controls power to fluorescent lights.

3 BYPASS/BLACKOUT Lights Switch. Controls shelter lighting under blackout conditions. In BLACKOUT position, all overhead lights in shelter will go out when door is opened and light when door is closed.

SHELTER EXHAUST BLOWER SWITCH (USED ON AN/GRC-122/142D AND E MODELS ONLY)




SHELTER BLOWER Switch. Controls shelter exhaust blower.

## Section II OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)


| Subject | Para | Page |
|---|---|---|
| General | 2-4 | 2-26 |
| Operator Preventive Maintenance Checks and Services | 2-5 | 2-27 |


### 2-4. GENERAL.

To ensure maintenance facility is always ready for use, it must be inspected at definite intervals so defects may be found and corrected before they result in serious damage or failure. Preventive Maintenance Checks and Services (PMCS) which must be done are listed on page 2-27 and 2-28. These procedures are required to keep your equipment in good operating condition. They include (B) before operation, (A) after operation, and (W) weekly checks. Perform both before and weekly checks if you are the assigned operator and have not operated equipment since the last weekly check or if you are operating equipment for the first time.

If equipment fails to operate, refer to operator's troubleshooting procedures in chapter 3, section II of this manual. Use DA Pam 738-750 as a guide for reporting problems and using forms.

If Radio Set AN/GRC-122/142(*) must be kept in service, check and service only things that can be checked and serviced without disturbing operation. Make complete checks and services when equipment can be shut down.

Routine checks like equipment inventory, cleaning components, checking for frayed and damaged cables, replacing items not in use, checking for loose hardware, nuts, bolts, and screws, and corrosion on receptacles and connectors are not listed in PMCS tables. You should do these things any time you see they need to be done as a matter of good preventive maintenance. If you find a routine check in the PMCS, it was listed because other operators reported problems with this item.

The ITEM NUMBER column in the PMCS table is to be used as a source number for the TM Number column on DA Form 2404, Equipment Inspection and Maintenance Worksheet, for recording PMCS results.

**NOTE**

Always keep in mind cautions and warnings while performing PMCS procedures.

## 2-5. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

B – BEFORE A – AFTER W – WEEKLY

| ITEM NO. | INTERVAL B | INTERVAL A | INTERVAL W | ITEM TO BE INSPECTED PROCEDURE | EQUIPMENT IS NOT READY/AVAILABLE IF: |
|---|---|---|---|---|---|
| 1 | • | | | POWER CONNECTIONS<br>Check power cables for proper connection. | Power connections are damaged or not properly connected. |
| 2 | • | | • | GROUNDING<br>Check ground strap for good connection at power entrance box ground terminal and at grounding rod. | Grounding strap is not properly connected. |
| 3 | • | • | | FUEL LINES<br>Check heater fuel lines for leaks, damage, or excessive deterioration. | Cracked, deteriorated, or leaking fuel line. |
| 4 | • | | • | SHELTER<br>Check for punctures or open seams that would allow moisture to enter and create a shock hazard. | Punctures, cracks, or open seams are present. |
| 5 | | | • | FIRE EXTINGUISHER<br>Check for damaged valve or broken seal and current weight verification on tag.<br>**NOTE**<br>If your shelter has an air conditioner, do item no. 6. | Fire extinguisher is not usable or partially expended. |
| 6 | • | | • | AIR CONDITIONER<br>Clean and inspect evaporator inlets and outlets, air inlet screen, and drains. Check damper control. Check sight glass for moisture and low charge. Yellow color indicates moisture and a milky color or bubbles indicate low charge. | Inlets, outlets, drains, or screens are clogged. Air conditioner fails to respond to controls or sight glass indicates moisture or low charge. |

## 2-5. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

B – BEFORE A – AFTER W – WEEKLY

| ITEM NO. | INTERVAL B | INTERVAL A | INTERVAL W | ITEM TO BE INSPECTED PROCEDURE | EQUIPMENT IS NOT READY/AVAILABLE IF: |
|---|---|---|---|---|---|
| | | | | **WARNING**<br>Be careful when working around 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 requirements of TB SIG 291 before attempting installation or operation of Radio Set AN/GRC-106(*). | |
| 7 | ● | ● | | ANTENNAS<br>Check whip antenna for bent or kinked section.<br>Check doublet antenna for broken antenna wire. | Broken bent or kinked antenna section. |
| 8 | ● | | | BLOWERS<br>Check that exhaust ports are open and free of dirt. | Exhaust ports are jammed shut or clogged. |
| 9 | ● | | | For PMCS of components not listed in this manual, see appendix A. | |
| 10 | * | | | Perform all operating procedures given in paragraphs 2-27 through 2-34. | |

*Do this check before each deployment to a mission location. This will permit any existing problems to be corrected before mission starts. The check does not need to be done again until redeployment.

## Section III OPERATION UNDER USUAL CONDITIONS


| Subject | Para | Page |
|---|---|---|
| System Planning | 2-6 | 2-29 |
| Site and Shelter Requirements | 2-7 | 2-30 |
| Vehicle Boarding Ladder | 2-8 | 2-30 |
| Ground Rod Installation | 2-9 | 2-31 |
| DC and AC Power Connection | 2-10 | 2-32 |
| Whip Antenna Installation | 2-11 | 2-34 |
| Antenna Tip Cap Installation | 2-12 | 2-37 |
| Antenna Group AN/GRA-50 Installation | 2-13 | 2-38 |
| Dipole Antenna Assembly | 2-14 | 2-41 |
| AB-155(*)/U with Tripod Adapter AB-1089/U Erection | 2-15 | 2-44 |
| Antenna Wire Length Chart | 2-16 | 2-47 |
| Mast AB-155/U Erection | 2-17 | 2-48 |
| Camouflage Procedures | 2-18 | 2-54 |
| Shade Tarpaulin Installation (AN/GRC-122/142(*) Models) | 2-19 | 2-55 |
| Remote Equipment Installation | 2-20 | 2-56 |
| Security Equipment Installation | 2-21 | 2-69 |
| Loop Current Test | 2-22 | 2-70 |
| Shelter Door Combination Lock | 2-23 | 2-71 |
| Preoperational Procedures | 2-24 | 2-74 |
| Preliminary Starting Procedures | 2-25 | 2-78 |
| Preoperational Equipment Settings | 2-26 | 2-80 |
| Preoperational Equipment Checks | 2-27 | 2-95 |
| Operation and Self-Test of Communication Terminal AN/UGC-74A(V)3 | 2-28 | 2-97 |
| Tuning Procedure | 2-29 | 2-99 |
| Operation During Radio Silence and Output Power Measurement | 2-30 | 2-108 |
| Operation | 2-31 | 2-111 |
| Local OWR Operation | 2-32 | 2-111 |
| Local Duplex Operation (AN/GRC-122(*) Models) | 2-33 | 2-120 |
| Remote Operation | 2-34 | 2-129 |
| Stopping Procedures | 2-35 | 2-142 |
| Standby Procedures | 2-36 | 2-143 |
| Complete Shutdown of Shelter | 2-37 | 2-143 |
| Emergency Stopping | 2-38 | 2-144 |
| Preparation for Movement | 2-39 | 2-146 |


### NOTE

There are no operating instructions on decals and instruction plates used in this manual. For specific instructions on decals or plates refer to applicable manual listed in appendix A.

### 2-6. SYSTEM PLANNING.

The tactical situation and requirements determined by the system planner govern the use of Radio Set AN/GRC-122/142(*). Use AN/GRC-142(*) models for owr communications and AN/GRC-122(*) models for duplex communications. Communicating distance will determine antenna to be used. The tactical situation will determine whether shelter will be operated locally or from a remote site.

## 2-7. SITE AND SHELTER REQUIREMENTS.

The best operating site for shelter is determined by terrain in conjunction with system planning and security considerations.

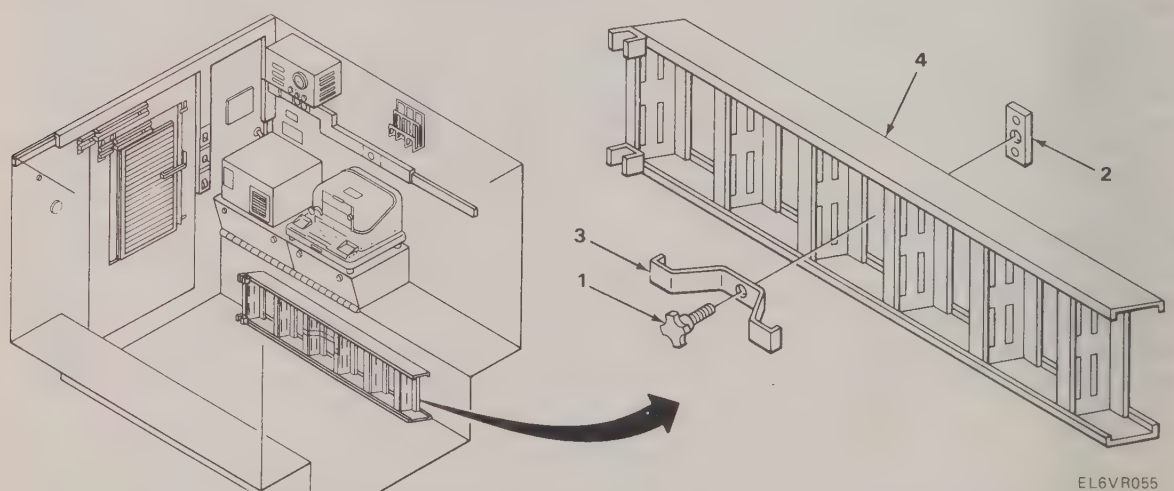
Location of antennas for long distances of communication is important. Radio signals are absorbed and sometimes reflected by nearby obstructions such as hills, buildings, bridges, or telephone lines that extend above height of antennas. Transmitted signals have their greatest range as high above ground as possible. Avoid placing antennas near sources of electrical interference such as power-lines or radar sets.

Enemy jamming is always possible. Effects of enemy jamming may be reduced by locating antennas so a nearby obstruction acts as a screen. Locate antennas so obstruction is between a probable enemy jamming transmitter and antenna. This screening action also reduces transmitted signal strength in direction of enemy.

Normally shelter is truck mounted, but if shelter is removed from truck and a site is choosen, ground should be firm, dry, and have good drainage. After a site is prepared, shelter should be placed on leveled concrete blocks or wooden beams with access to all outside entrance boxes and exhaust blower ports. If a generator set is used to provide power, it should be located approximately 50 feet (15.25 m) away from shelter to reduce fire hazard and generator noise interference.

## 2-8. VEHICLE BOARDING LADDER.

Boarding ladder must be used if shelter is truck mounted.



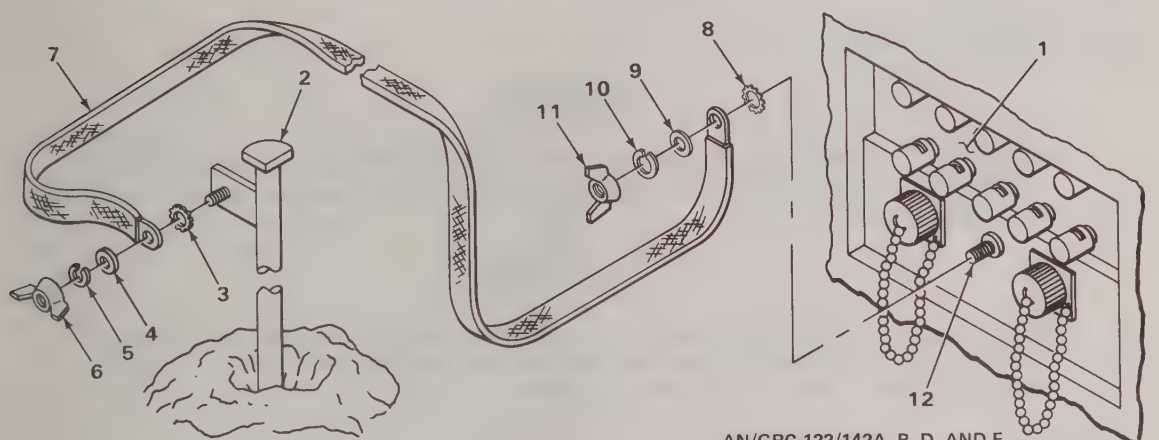

1. Unscrew tiedown assemblies (1) from side-mounted retaining plates (2).
2. Place brackets (3) in mountings for future use and remove ladder (4) from shelter.
3. Place boarding ladder bracket against tailgate of truck.
4. Fasten hook on each of two securing ropes to lower towing rings of truck.
5. Pull each end of two ropes through guy fasteners and tighten.

## 2-9. GROUND ROD INSTALLATION.

Grounding must be done before any power is connected to shelter. Two ground rods are provided, one for shelter and the other for a portable generator. Select a grounding site that will not interfere with entrance door, field wires, antenna transmission cables, or power cables.

### NOTE

Ground terminal is located in dc entrance box in AN/GRC-122/142 Plain and C models and power/signal entrance box in AN/GRC-122/142A, B, D, and E models.




AN/GRC-122/142A, B, D, AND E POWER SIGNAL BOX SHOWN

EL6VR056

1. Select location on ground by power entrance box (1). Scoop out small hole approximately 6 inches deep.
2. Remove any paint or grease from ground rod (2).
3. Using sledge hammer, drive ground rod into hole until top is approximately ground level.

### NOTE

If practical, wet ground around ground rod.

4. Using star washer (3), flat washer (4), lockwasher (5), and wingnut (6), connect one end of ground strap (7) to ground rod (2).
5. Using star washer (8), flat washer (9), lockwasher (10), and wingnut (11), connect other end of ground strap to ground terminal (12).

## 2-10. DC AND AC POWER CONNECTION.

For complete operation, AN/GRC-122/142(*) must be connected to an ac power source. Operation is possible from either a dc source or an ac source. If only a dc source is selected, air conditioner and ac outlets will not operate. If only an ac source is selected, dc convenience outlet and shelter electric heater will not operate.

To conserve battery power, use ac only mode even though shelter is connected to vehicle battery. In ac operation, pull power distribution panel MAIN circuit breaker (AN/GRC-122/142 Plain and C models) or pull DC MAIN circuit breaker (AN/GRC-122/142A and B models) or switch AC-OFF-DC switch to AC (AN/GRC-122/142D and E models) to disconnect vehicle battery from shelter power system.

PRELIMINARY PROCEDURES

**WARNING**

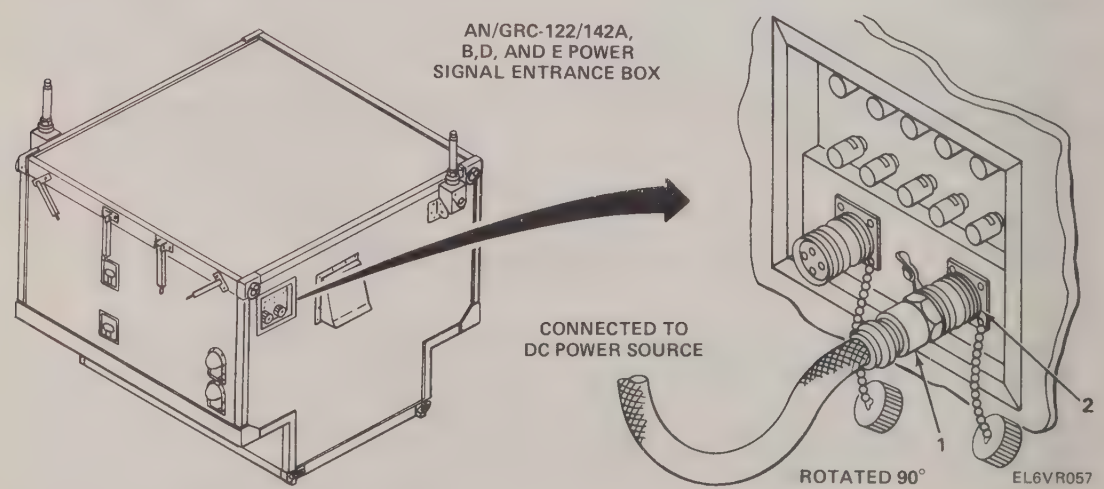
Place all circuit breakers and equipment power switches in OFF position. Make sure shelter is grounded to prevent electrical shock. Connect only one ac or dc power source to shelter at any given time.

**CAUTION**

If shelter is connected to a dc power source other than vehicle battery during secure operations, system may be adversely affected. Always switch power panel to AC or DC position before applying ac or dc power to shelter.

DC POWER CONNECTION FOR AN/GRC-122/142(*) MODELS

Dc power cable (CX-10463/GRC-142) is supplied with shelter and is connected to dc power source by organizational maintenance.

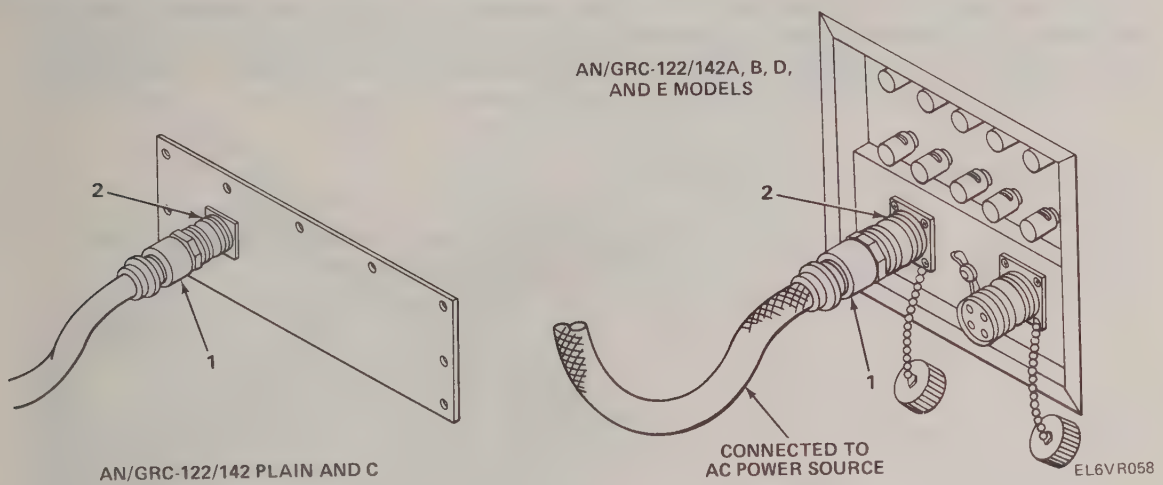



Connect dc power cable (1) from dc power source to DC INPUT receptacle (2).

## 2-10. DC AND AC POWER CONNECTION. (CONT)

AC POWER CONNECTION FOR AN/GRC-122/142(*) MODELS

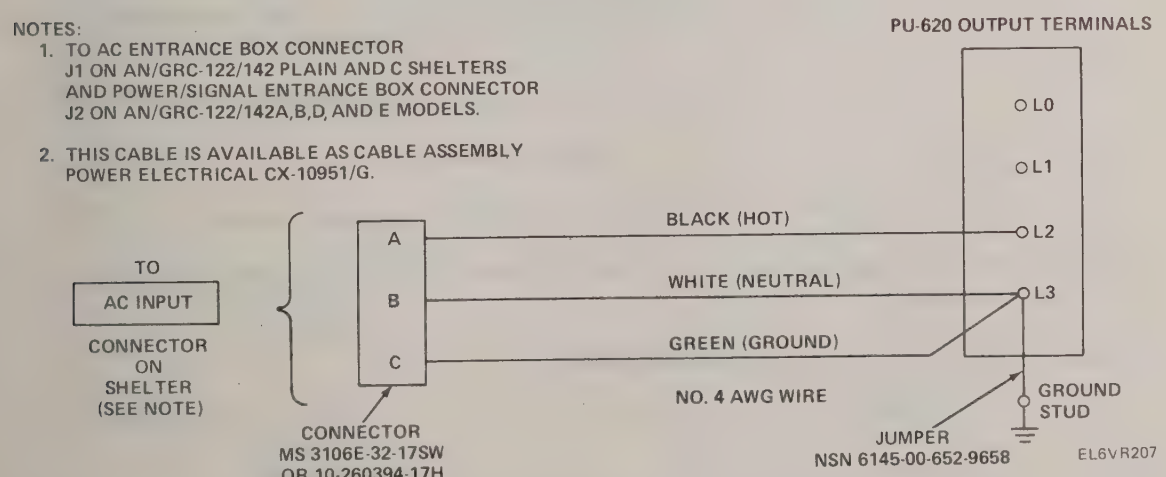
Ac power cable is supplied with shelter and is connected to ac power source as shown below. Ac power cable is connected to rear curbside wall on AN/GRC-122/142 Plain and C models and front curbside wall on AN/GRC-122/142A, B, D, and E models.




Connect ac power cable (1) from ac power source to AC INPUT receptacle (2).

AC POWER CABLE CONNECTION TO GENERATOR

Ac power cable is connected to ac power source as shown below.



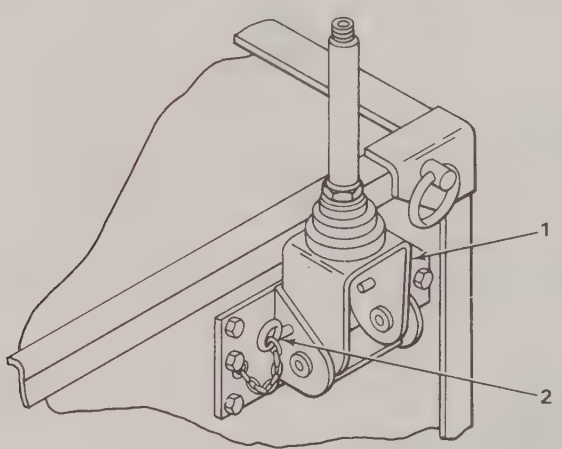
## 2-11. WHIP ANTENNA INSTALLATION.

AN/GRC-142(*) models are supplied with one whip and one doublet antenna. An additional whip and doublet antenna is supplied with AN/GRC-122(*) models.

An owr whip antenna base is mounted on roadside front wall and a duplex antenna base is mounted on curbside rear wall. An antenna connector is mounted on roadside wall for doublet antenna and an additional connector is located under rear wall whip antenna mount. Antenna mount located on front wall is used for radio set and antenna mount located on rear wall is used for duplex RT-662/GRC. As required, either duplex whip or duplex doublet antenna is used.

### ASSEMBLY AND ERECTION OF WHIP ANTENNA

Shelter is shipped with whip antenna mast base in vertical position. Position mast base in horizontal position and install whip antenna to OWR-DX-SEND antenna base as follows:




EL6VR060

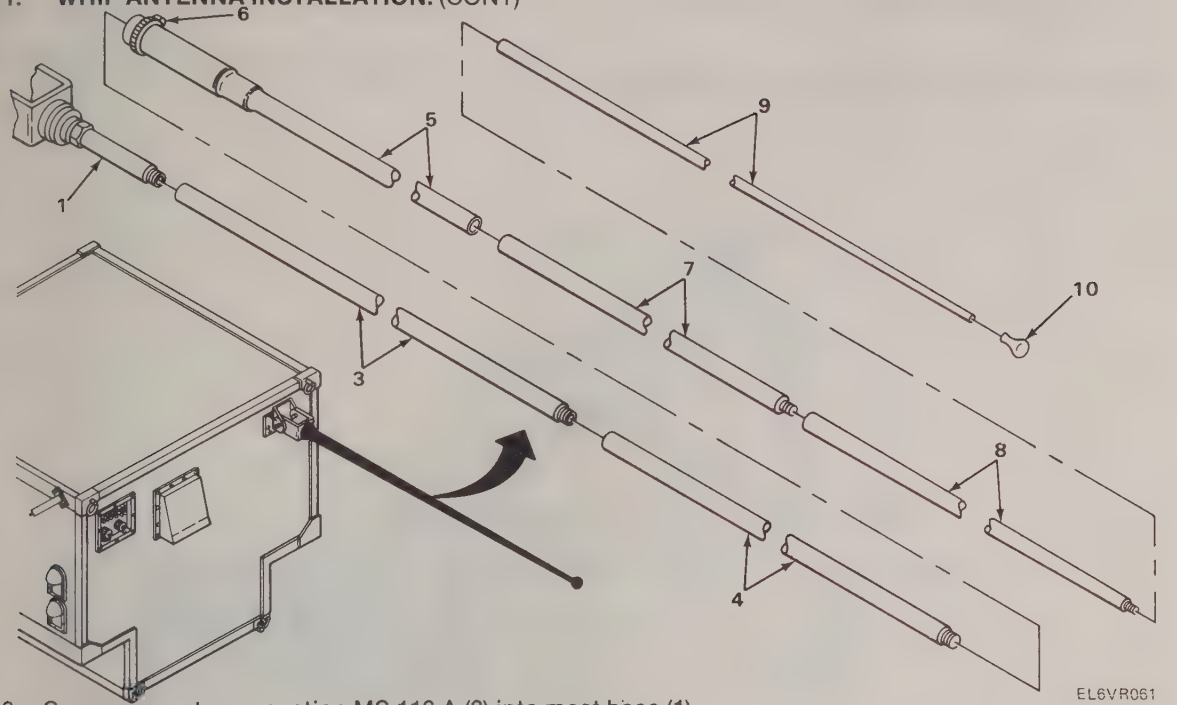
**NOTE**

For AN/GRC-122(*) models, repeat procedure for dx-receive antenna.

1. While holding antenna mast base (1) with one hand, remove two antenna bracket pins (2) by pulling them outward.

2. Lower antenna mast base (1) to horizontal position.

2-11. **WHIP ANTENNA INSTALLATION.** (CONT)



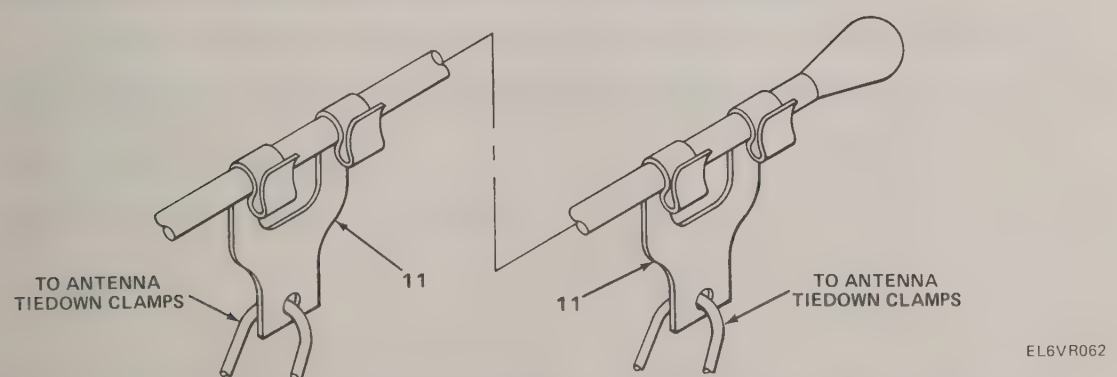

3. Screw one antenna section MS-116-A (3) into mast base (1).

4. Screw second antenna section MS-116-A (4) into first antenna mast section (3).

5. Slip antenna cover (5) and antenna cover clamp (6) onto MS-116-A installed in step 4. Slide antenna cover (5) down onto antenna mast base as far as it will go. Push antenna cover clamp (6) down antenna cover and tighten.

6. Add third antenna section MS-116-A (7), fourth antenna section MS-117-A (8), and fifth antenna section MS-118-A (9).

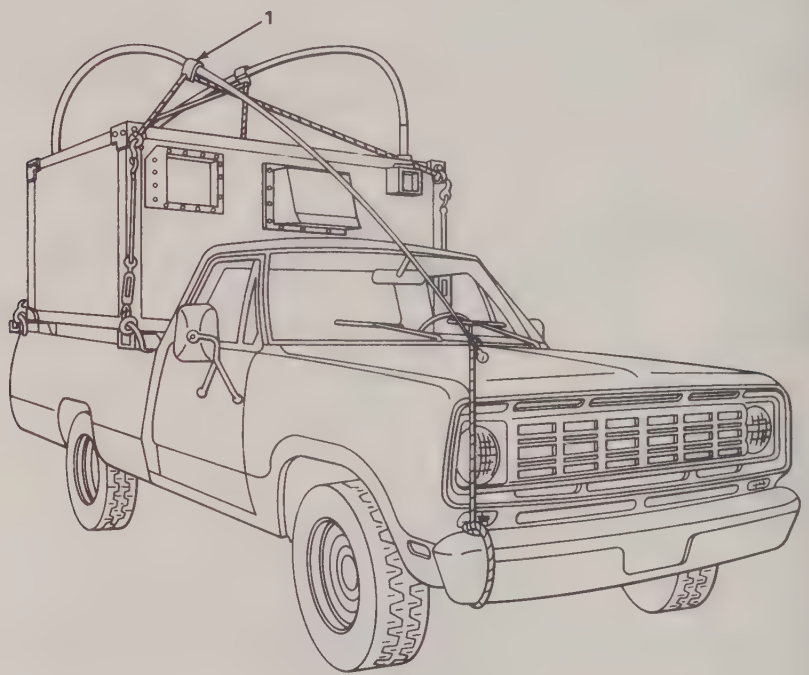
7. Fasten antenna tip (10) to antenna section MS-118-A (9) (para 2-12).




8. Fasten one antenna tiedown clamp (11) to middle and one to end of antenna mast for mobile communications.

**2-11. WHIP ANTENNA INSTALLATION.** (CONT)

ASSEMBLY AND ERECTION OF WHIP ANTENNA. (CONT)




EL6VR063

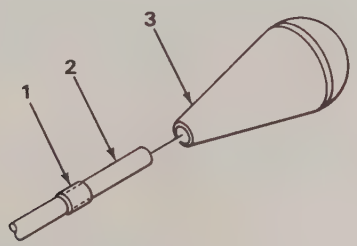
**CAUTION**

Always tie antenna down for mobile communications.

9. Raise antenna to vertical position and insert antenna bracket pins into antenna bracket.
10. Tie cords of each tiedown clamp (1) to tiedown rings of shelter for mobile communications.

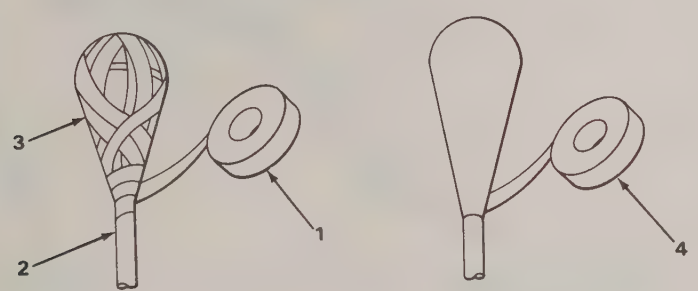
## 2-12. ANTENNA TIP CAP INSTALLATION.

MATERIALS/PARTS: Electrical tape (item 11, appx D)
Reinforced tape (item 12, appx D)




EL6VR064

1. Place reinforced tape (1) on top element (2), 2 inches from tip. Wrap approximately five times.
2. Place antenna tip cap (3) over tip of top element (2). Push down.



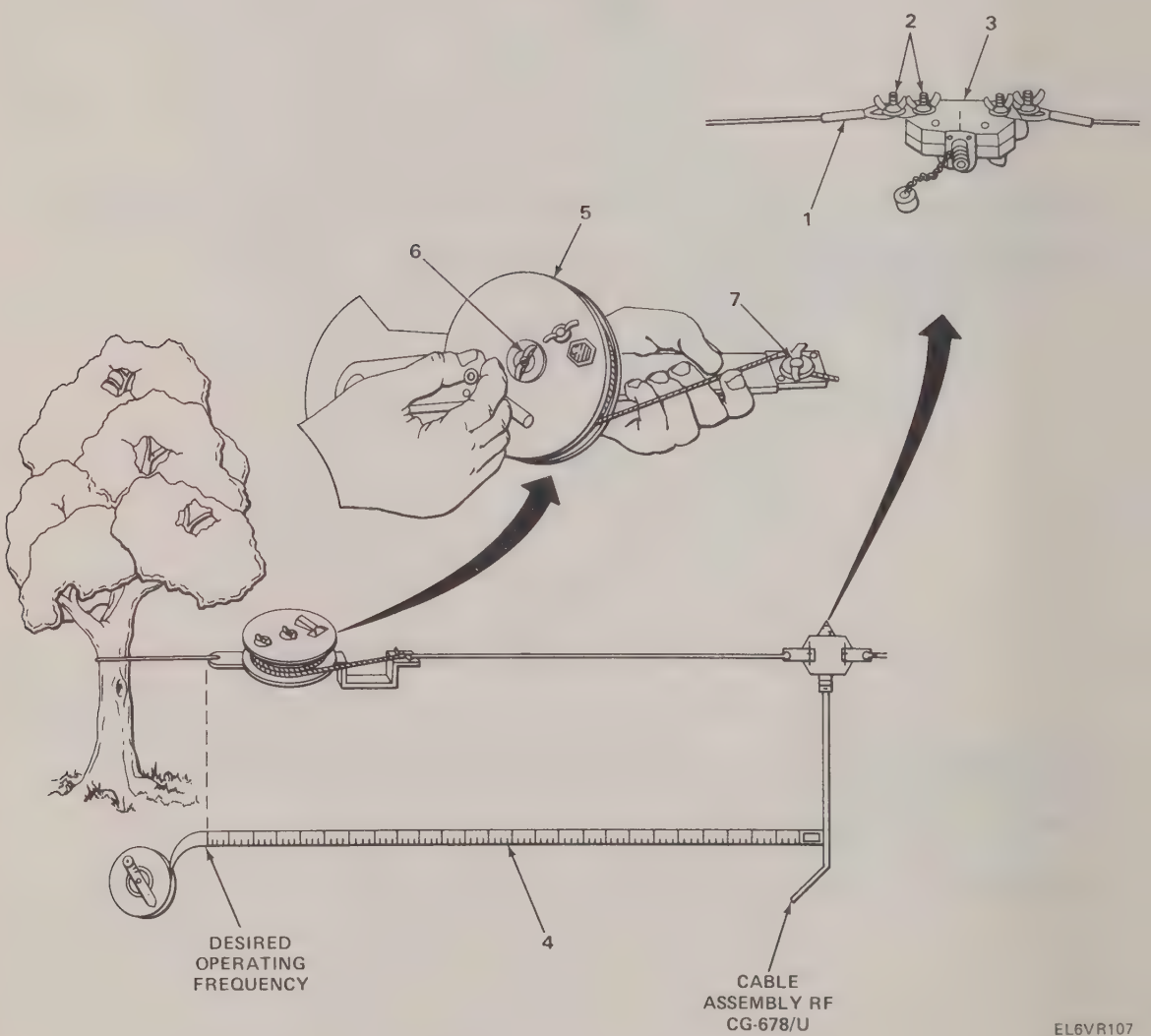

EL6VR065

3. Wrap reinforced tape (1) around base of tip cap (3) where it meets top element (2).
4. Secure tip cap (3) to top element (2).
5. Wrap tip cap (3) completely with electrical tape (4).

## 2-13. ANTENNA GROUP AN/GRA-50 INSTALLATION.

Doublet antenna is used in place of whip antenna for greater range and reliability. It is used in stationary operations. Doublet antenna can operate suspended between two vertical supports that are 4 feet or higher. Antenna can also be suspended between two or three antenna masts, depending on frequency and antenna length.

Determine antenna length required by operating frequency being used. Use antenna wire length chart given on page 2-47 to determine length of wire required on each side of insulator. A frequency-calibrated tape measure can also be used and is supplied with antenna group.



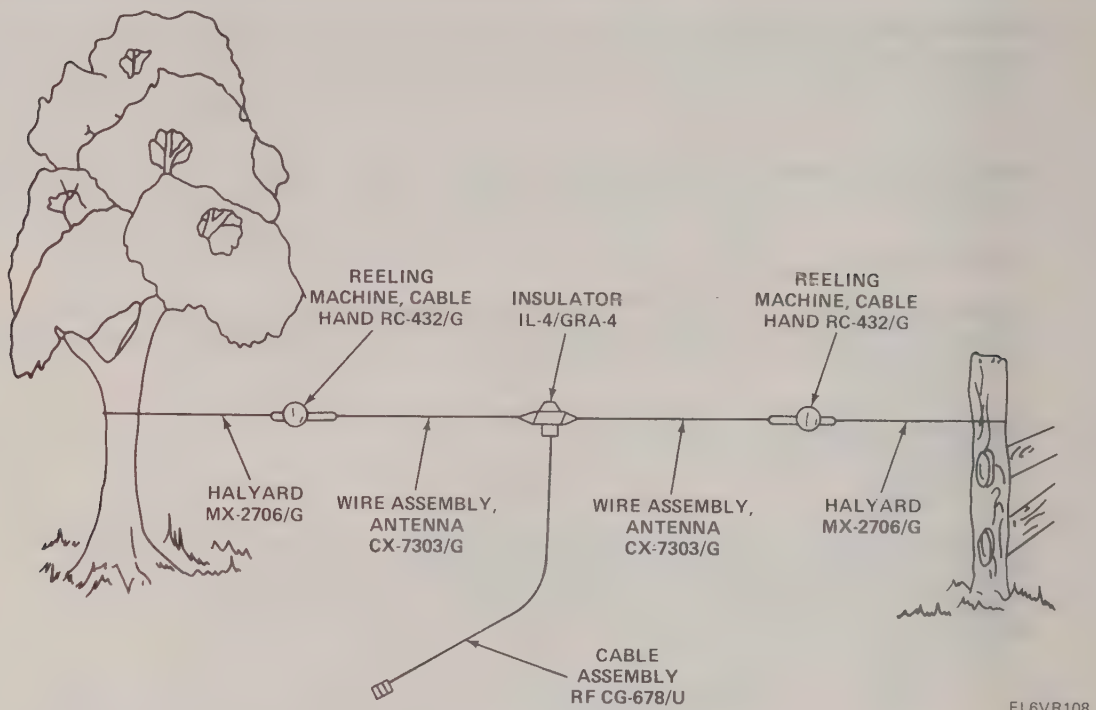
2-13. **ANTENNA GROUP AN/GRA-50 INSTALLATION.** (CONT)

1. Determine antenna length required by using either frequency-calibrated tape measure or antenna wire length chart on page 2-47.
2. Connect antenna wire terminal (1) to wingnuts (2) on one side of insulator (3).
3. Temporarily fasten tape measure (4) to insulator (3). Unwind tape measure to desired frequency (length).
4. Grasp reel assembly (5). Loosen wingnut (6) at center reel and wingnut (7) on wire clamp.
5. Unwind reel assembly (5) to required distance keeping antenna wire tight at all times. After unwinding required amount of antenna wire, tighten wingnut (7) on wire clamp and wingnut (6) on reel assembly.
6. Repeat steps 1 through 5 for second reel assembly.

**NOTE**

Check overall length of two antenna wires plus insulator and reel assemblies. Overall length should be twice the length indicated on tape measure for desired frequency or twice the length obtained from the chart on page 2-47. Adjust antenna for exact overall length. Be sure to keep insulator centered.

2-13. **ANTENNA GROUP AN/GRA-50 INSTALLATION.** (CONT)




7. Attach each reel assembly to a halyard.

8. Connect rf cable assembly CG-678/U to insulator and applicable antenna connector on shelter.

**NOTE**

Always keep in mind direction antenna is going to radiate. Consider connection of antenna to shelter before positioning antenna along ground for erection.

9. Tie halyards to best available supports (trees, fence posts, antenna masts) at a height of 4 feet or greater.

**CAUTION**

To prevent breaking antenna wire, set antenna up to sag 2 feet lower than end supports.

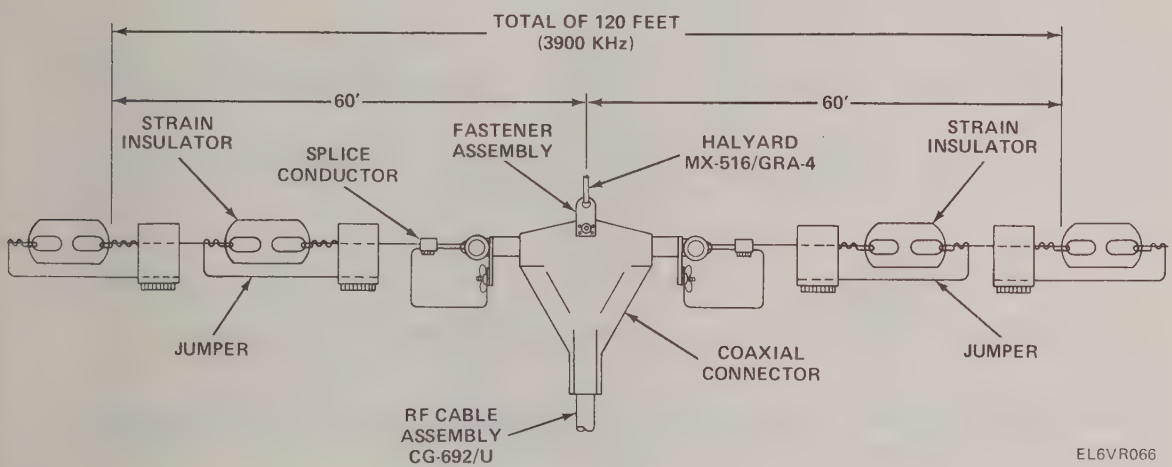
10. Shorten or lengthen antenna assembly a few inches at a time if voltage swr is within red scale of power meter.

**NOTE**

Rf cable should be at right angles to antenna wires for the first few feet from connection at insulator. Lay rf cable out as straight as possible; do not allow rf cable to form loops.

## 2-14. DIPOLE ANTENNA ASSEMBLY.

Dipole antenna assembly is a half-wave doublet antenna used for both transmitting and receiving. This antenna is normally operated at half-wave fundamental of desired frequency. Desired operating frequency determines length of antenna. Antenna can be configured to operate at more than one frequency by assembling different lengths of antenna wire separated by strain insulators. Each adjoining length of antenna wire is interconnected by a jumper to achieve a desired frequency. Follow the steps below to assemble dipole antenna.

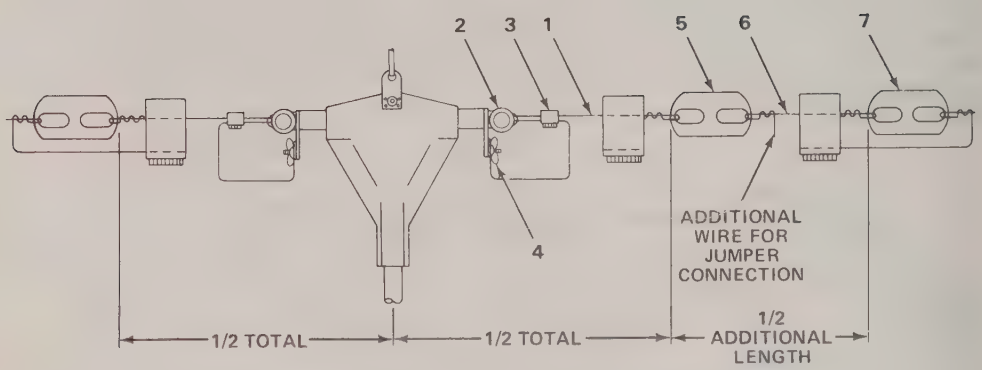



1. List operating frequencies assigned.
2. See page 2-47 to determine required length of antenna wire for each side of antenna.

### NOTE

As illustrated above, total antenna length includes distance measured from coaxial connector to each end of antenna wire, including strain insulators. Allow additional wire to connect to insulator and approximately 8 inches to serve as a jumper when needed.

## 2-14. DIPOLE ANTENNA ASSEMBLY. (CONT)




EL6VR068

### NOTE

Highest frequency being used will require shortest measured total length of antenna wire.

3. Cut total required length of antenna wire (1) for highest frequency, plus an additional length for connections on both ends.
4. Cut antenna wire in half.
5. Loop one end of antenna wire (1) through coaxial connector ring (2).
6. Use splice conductor (3) and coaxial connector wingnut (4) to secure antenna wire (1) to coaxial connector.
7. Attach strain insulator (5) to free end of antenna wire.
8. Repeat steps 5 through 8 for other half of antenna.

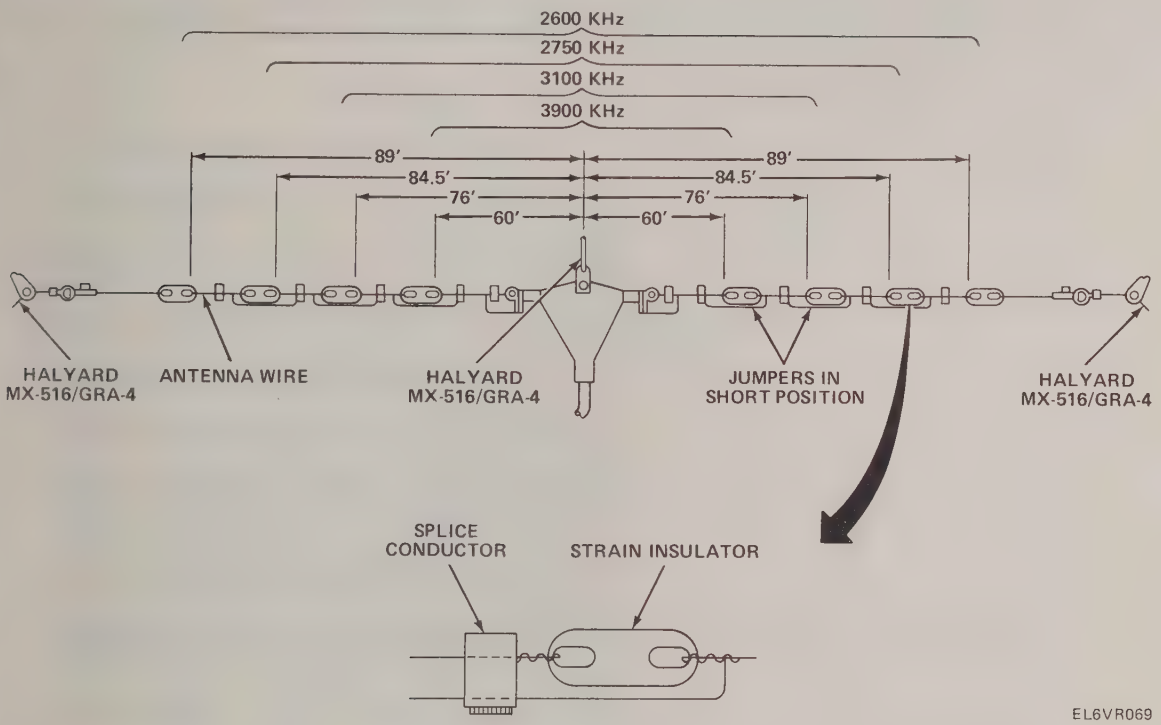
### NOTE

Each additional lower operating frequency will require lengthening existing antenna. This is done by adding wire at strain insulator on each side of antenna. Subtract existing antenna length from total length required for the new, lower frequency. Allow additional wire for jumper connections.

9. Cut additional length of antenna wire (6).
10. Cut additional length of antenna wire in half.
11. Attach antenna wire for next lower frequency to unused end of strain insulator (5).
12. Attach strain insulator (7) to free end of antenna wire at required length.

**2-14. DIPOLE ANTENNA ASSEMBLY.** (CONT)

13. Repeat steps 11 and 12 for other half of antenna.



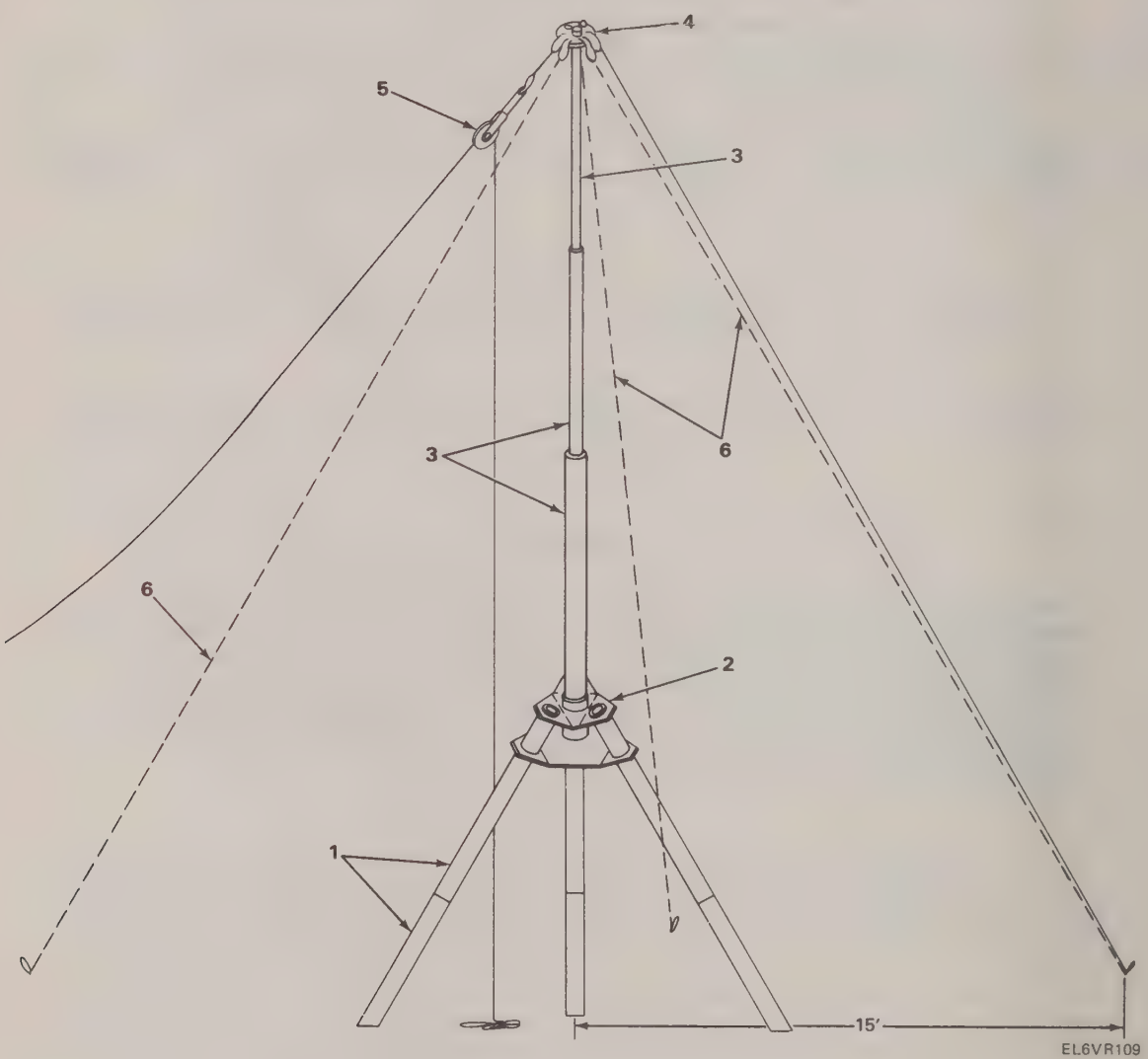

## NOTE

Construct each additional lower frequency antenna by adding more antenna wire to antenna already constructed. Each antenna length should be measured from center of coaxial connector to end of antenna including strain insulators. This measurement will give half the total length required. After antenna is constructed, use splice conductors to connect required jumpers to alter antenna length to match operating frequency. Each antenna constructed will operate on fundamental odd harmonics of fundamental frequency for which it is constructed.

## 2-15. AB-155(*)/U WITH TRIPOD ADAPTER AB-1089/U ERECTION.

AB-1089/U (tripod adapter), used with AB-155(*)/U antenna mast assembly, is designed for quick doublet antenna erection. AB-1089/U is used for temporary antenna erection and when quick erection and breakdown is required. Without being tied down, it can hold up in winds up to 25 mph.

ANTENNA MAST ASSEMBLY



**2-15. AB-155(*)/U WITH TRIPOD ADAPTOR AB-1089/U ERECTION.** (CONT)

ANTENNA MAST ASSEMBLY

**NOTE**

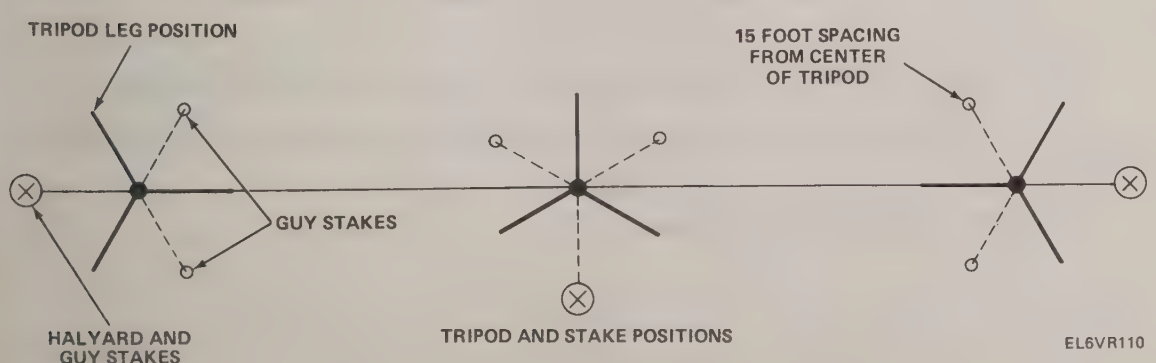
Assemble antenna on ground and then raise.

1. Join two mast assembly sections (1) together.
2. Install joined mast sections (1) into tripod adapter (2).
3. Repeat steps 1 and 2 for remaining two legs.
4. Join two mast sections (3) together inserting guy plate (4) over top section.
5. Attach pulley and halyard (5) to guy plate.
6. Attach three 30-foot guy lines (6) to guy plate.
7. Insert assembled mast sections (3) with guy plates, halyard, and guy ropes, into tripod adaptor.
8. With assistant, raise assembled mast assembly.
9. If overall antenna length is more than 120 feet (36.6 m), use three antenna masts. Do steps 1 through 8 for each antenna mast used.
10. Position either two or three antenna masts as shown below.

**NOTE**

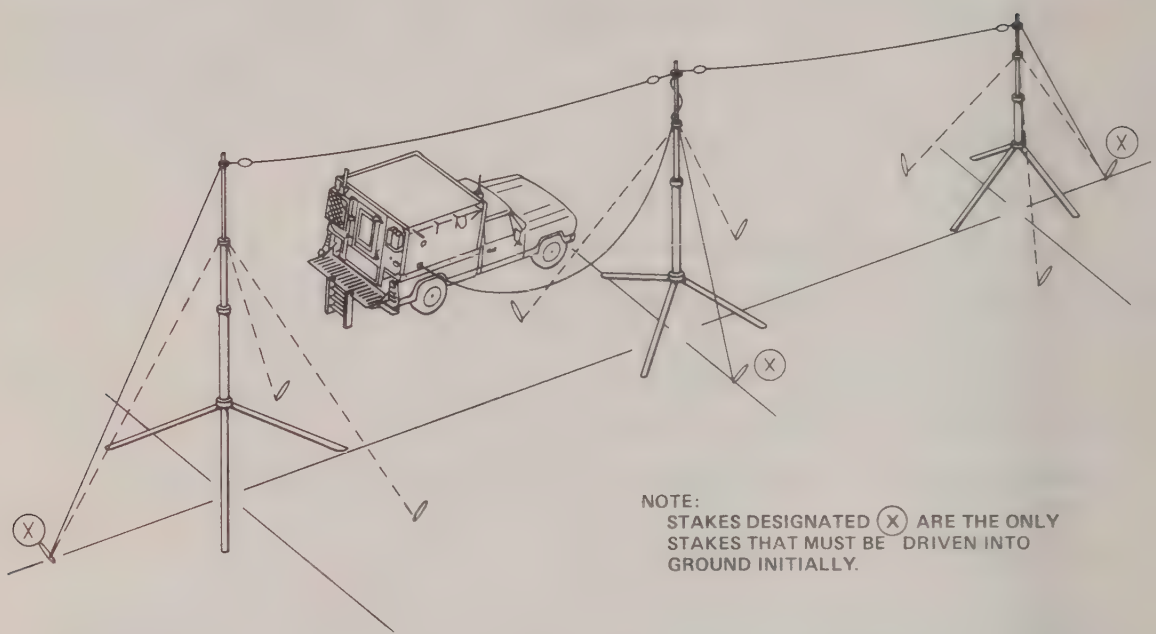
Three required stake installations are marked with an X (as shown below and on page 2-46), and are used to support halyards which support antenna wire. Six remaining stakes can be driven in ground if time permits. Use three assembled mast sections, which measure 15 feet, for proper spacing of guy stakes.

11. Install guy stakes in locations shown below.



## 2-15. AB-155(*)/U WITH TRIPOD ADAPTOR AB-1089/U ERECTION. (CONT)

ANTENNA ERECTION




DOUBLET ANTENNA INSTALLATION USING TRIPOD ADAPTER MAST AB-1089/U

EL6VR111

12. Connect center halyard to antenna wire fastener assembly.

13. Connect each end of antenna wire to end mast halyards.

### NOTE

Allow guy lines to hang freely when hoisting antenna wire.

Do step 14 for antennas that require three antenna masts for support.

14. Hoist center halyard connected to fastener assembly to full elevation and tie to guy stake.

15. With assistant, hoist both ends of antenna wire simultaneously to full elevation and tie to end guy stakes.

16. If time permits, tie guy lines to guy stakes.

## 2-16. ANTENNA WIRE LENGTH CHART.

ANTENNA WIRE LENGTH CHART

| FREQUENCY (MHz) | LENGTH OF EACH ANTENNA WIRE* (FT) | (M) | FREQUENCY (MHz) | LENGTH OF EACH ANTENNA WIRE* (FT) | (M) |
|---|---|---|---|---|---|
| 2.0 | 117.0 | (35.68) | 4.4 | 53.18 | (16.21) |
| 2.05 | 114.14 | (34.81) | 4.6 | 50.86 | (15.51) |
| 2.1 | 111.42 | (33.98) | 4.8 | 48.75 | (14.86) |
| 2.15 | 108.83 | (33.19) | 5.0 | 46.80 | (14.27) |
| 2.2 | 106.36 | (32.43) | 5.2 | 45.0 | (13.72) |
| 2.25 | 104.0 | (31.72) | 5.4 | 43.33 | (13.21) |
| 2.3 | 101.73 | (31.02) | 5.6 | 41.78 | (12.74) |
| 5.8 | 40.35 | (12.30) | 14.0 | 16.71 | (5.09) |
| 6.0 | 39.0 | (11.89) | 15.0 | 15.60 | (4.7) |
| 6.2 | 37.74 | (11.51) | 16.0 | 14.62 | (4.4) |
| 6.4 | 36.56 | (11.15) | 17.0 | 13.76 | (4.19) |
| 6.6 | 35.45 | (10.81) | 18.0 | 13.0 | (3.9) |
| 6.8 | 34.41 | (10.49) | 19.0 | 12.31 | (3.7) |
| 7.0 | 33.42 | (10.19) | 20.0 | 11.7 | (3.5) |
| 7.5 | 31.20 | (9.5) | 21.0 | 11.27 | (3.43) |
| 8.0 | 29.25 | (8.92) | 22.0 | 10.63 | (3.24) |
| 8.5 | 27.52 | (8.39) | 23.0 | 10.25 | (3.1) |
| 9.0 | 26.0 | (7.9) | 24.0 | 9.72 | (2.96) |
| 9.5 | 24.63 | (7.5) | 25.0 | 9.35 | (2.8) |
| 10.0 | 23.40 | (7.13) | 26.0 | 9.00 | (2.7) |
| 10.5 | 22.29 | (6.7) | 27.0 | 8.75 | (2.66) |
| 11.0 | 21.27 | (6.4) | 28.0 | 8.35 | (2.59) |
| 12.0 | 19.51 | (5.9) | 29.0 | 8.00 | (2.44) |
| 13.0 | 18.0 | (5.49) | 30.0 | 7.80 | (2.37) |

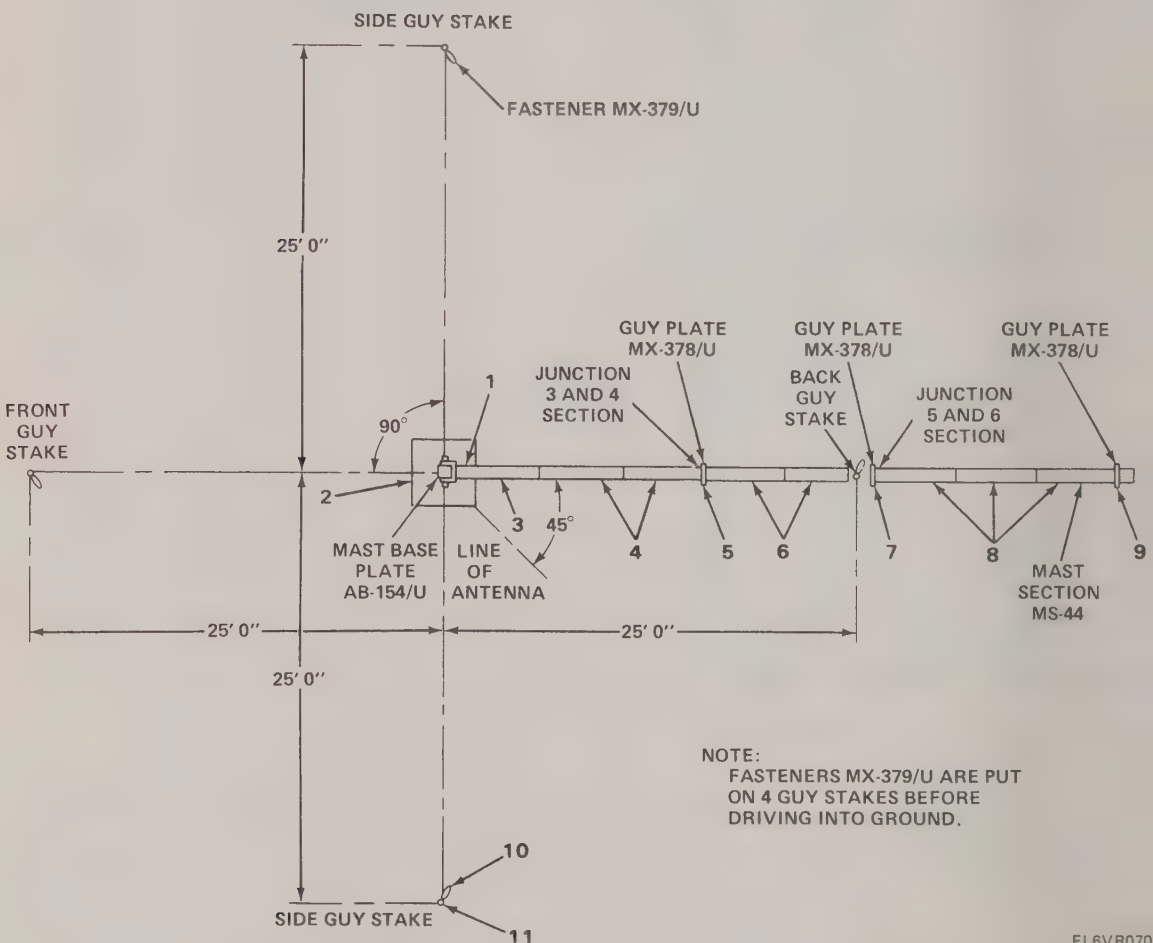
*Each antenna wire length includes reel assembly frame.

## 2-17. MAST AB-155/U ERECTION.

These procedures cover erection of antenna mast AB-155/U. Two antenna masts are used to support antenna when overall antenna length is less than 120 feet (36.6 m). A center mast is needed for antennas of 120 feet or longer. Erect end masts several feet beyond each end of antenna. Center mast must be offset 3 feet to left or right of antenna line to allow room for coaxial connector.

Determine direction antenna is to radiate. Always consider connection of antenna to shelter before positioning antenna along ground for erection. Arrange two or three antenna masts and guy plates as illustrated on page 2-53. Erect each antenna according to the following procedures.

ANTENNA ASSEMBLY



**2-17. MAST AB-155/U ERECTION.** (CONT)

1. Place mast AB-155/U assembly at each mast location.

**NOTE**

If ground is soft or sandy, place mast base plate AB-154/U on ground and push it down firmly. Then drive mast base swivel stake AB-154/U through center hole in mast base plate.

2. Drive mast base AB-154/U swivel ground stake (1) into ground, through mast base plate (2) if needed, at desired mast location with swivel end pointing 45 degrees from antenna line.
3. Aline female ends of mast sections MS-44 for assembly.
4. Install first mast section (3) to mast base swivel stake (1).
5. Install second and third mast sections (4).
6. Install guy plate MX-378/U (5) over third mast section.
7. Install fourth and fifth mast sections (6).

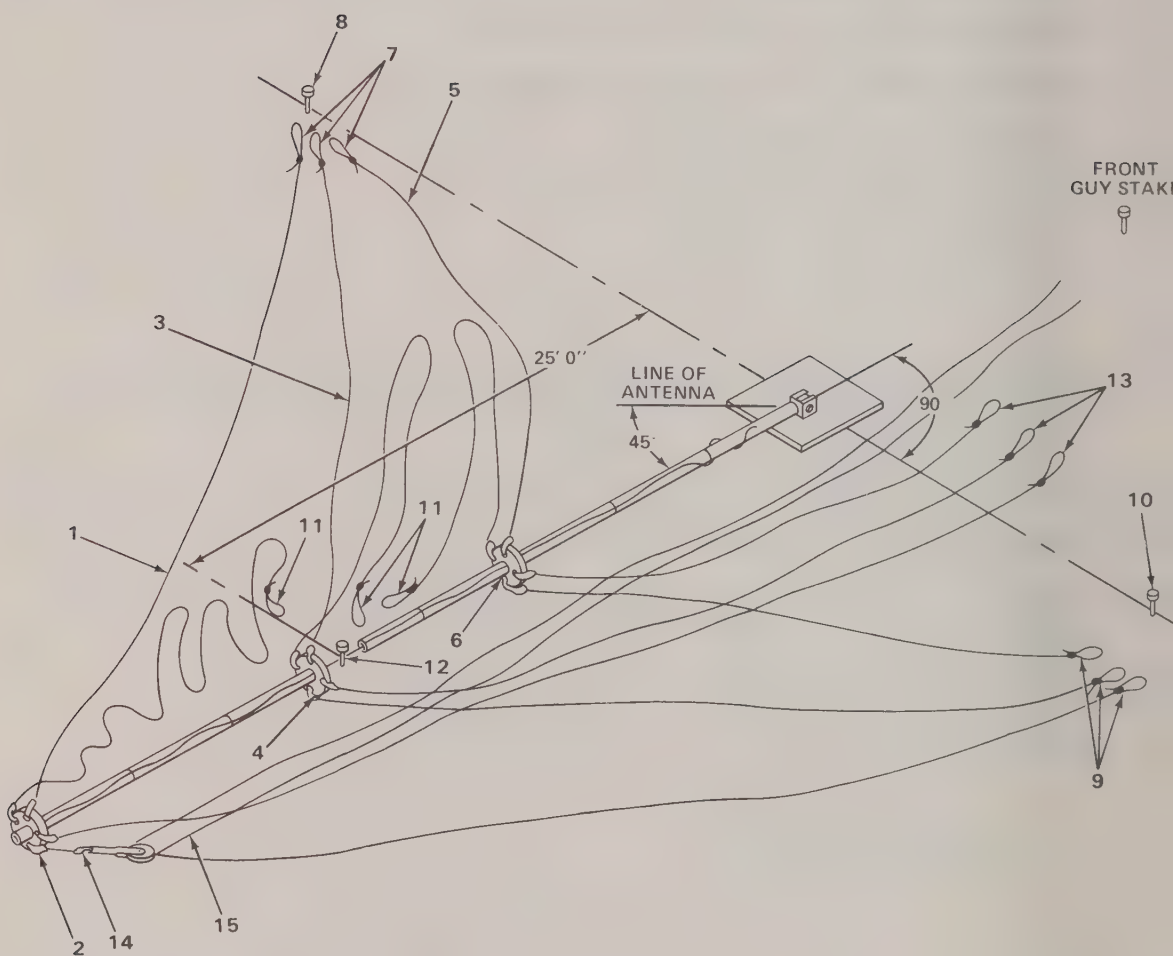
**NOTE**

Use five assembled mast sections to measure distance between mast base and guy stakes. If ground is soft or sandy use wooden stakes instead of aluminum stakes, and loop guys over stakes.

8. Install second guy plate MX-378/U (7) over fifth mast section.
9. Install sixth, seventh, and eighth mast sections (8).
10. Install third guy plate MX-378/U (9) over eighth mast section. Walk down mast assembly and turn three guy plates so three halyard holes face same direction.
11. Install four guy fasteners MX-379/U (10) over four guy stakes (11).
12. Install four guy stakes (11) 25 feet (7.6 m) from mast base as illustrated.

## 2-17. MAST AB-155/U ERECTION. (CONT)

ANTENNA ASSEMBLY (CONT)




EL6VR071

**2-17. MAST AB-155/U ERECTION.** (CONT)

**NOTE**

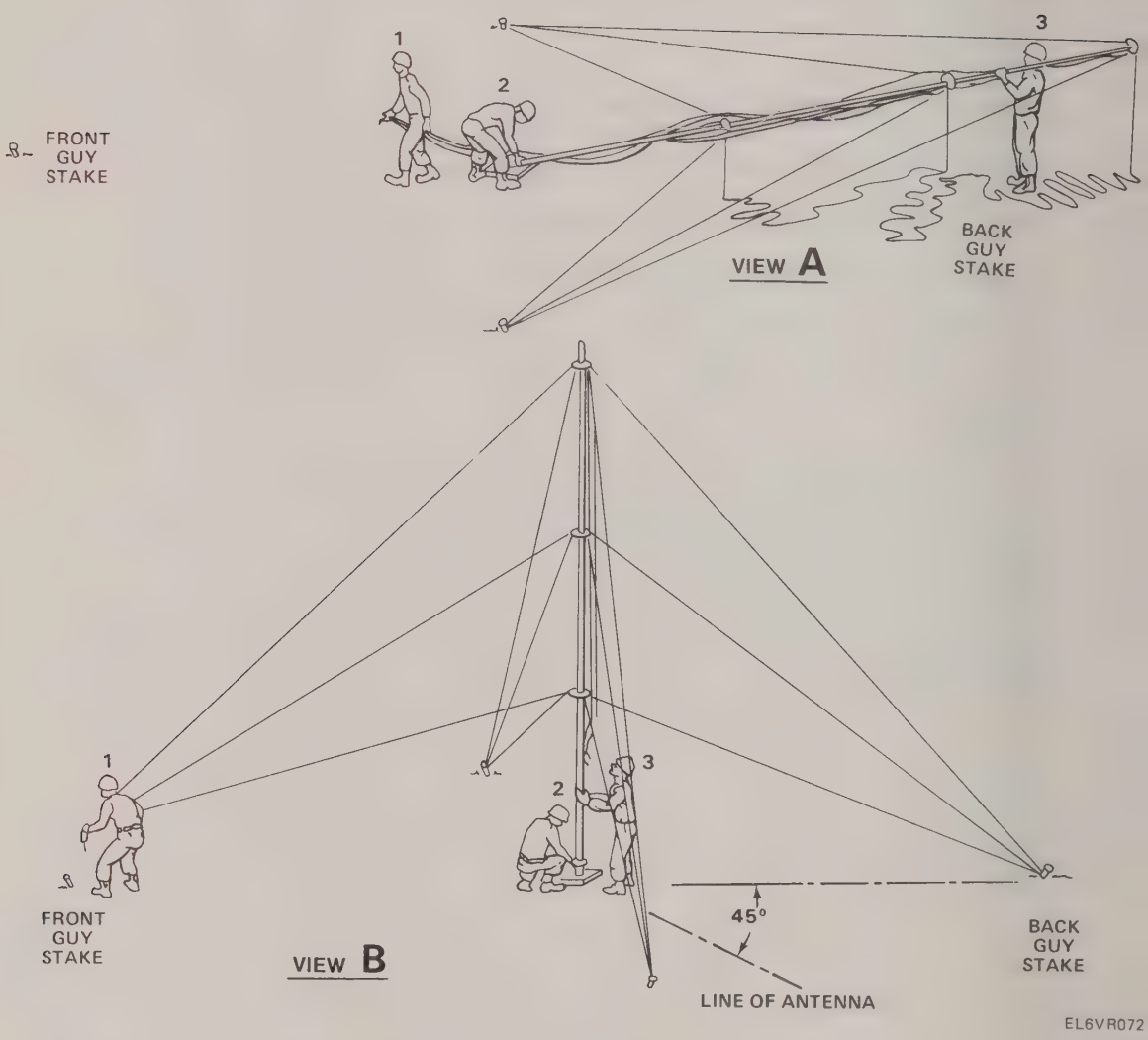
Fasten guy lines by snapping fastener at end of each guy line into one of four holes located 90 degrees apart on MX-378/U.

13. Fasten four 52-foot guy lines MX-383/GRA-4 (1) to top guy plate MX-378/U (2).
14. Fasten four 42-foot guy lines MX-381/GRA-4 (3) to center guy plate MX-378/U (4).
15. Fasten four 32-foot guy lines MX-382/GRA-4 (5) to bottom guy plate MX-378/U (6).
16. Connect three different lengths of right side guy lines (7) to right side guy stake (8).
17. Connect three different lengths of left side guy lines (9) to left side guy stake (10).
18. Tighten each side guy line installed in steps 16 and 17. Do not over tighten as antenna mast could bend.
19. Connect three different lengths of back guy lines (11) to back guy stake (12).
20. Position three front guy lines (13) pointing toward front guy state.
21. Fasten snap fastener (14) on pulley to unused hole in top guy plate MX-378/U (2).
22. Slip rope (15) through pulley and tie ends of rope near mast base to keep rope from running through pulley.

## 2-17. MAST AB-155/U ERECTION. (CONT)

ANTENNA ERECTION

Personnel Required: Three technicians




1. Technician (1) holds front guy lines and pulls steadily on them, keeping more tension on top guy line to bow mast slightly (view A).
2. Technician (2) takes a position near mast base and holds mast base in position.
3. Technician (3) takes position near top end of mast and raises it.
4. Technician (3) walks toward mast base raising mast as technician (1) pulls on guy lines.
5. Adjust guy lines until mast is vertical (view B).

**2-17. MAST AB-155/U ERECTION.** (CONT)

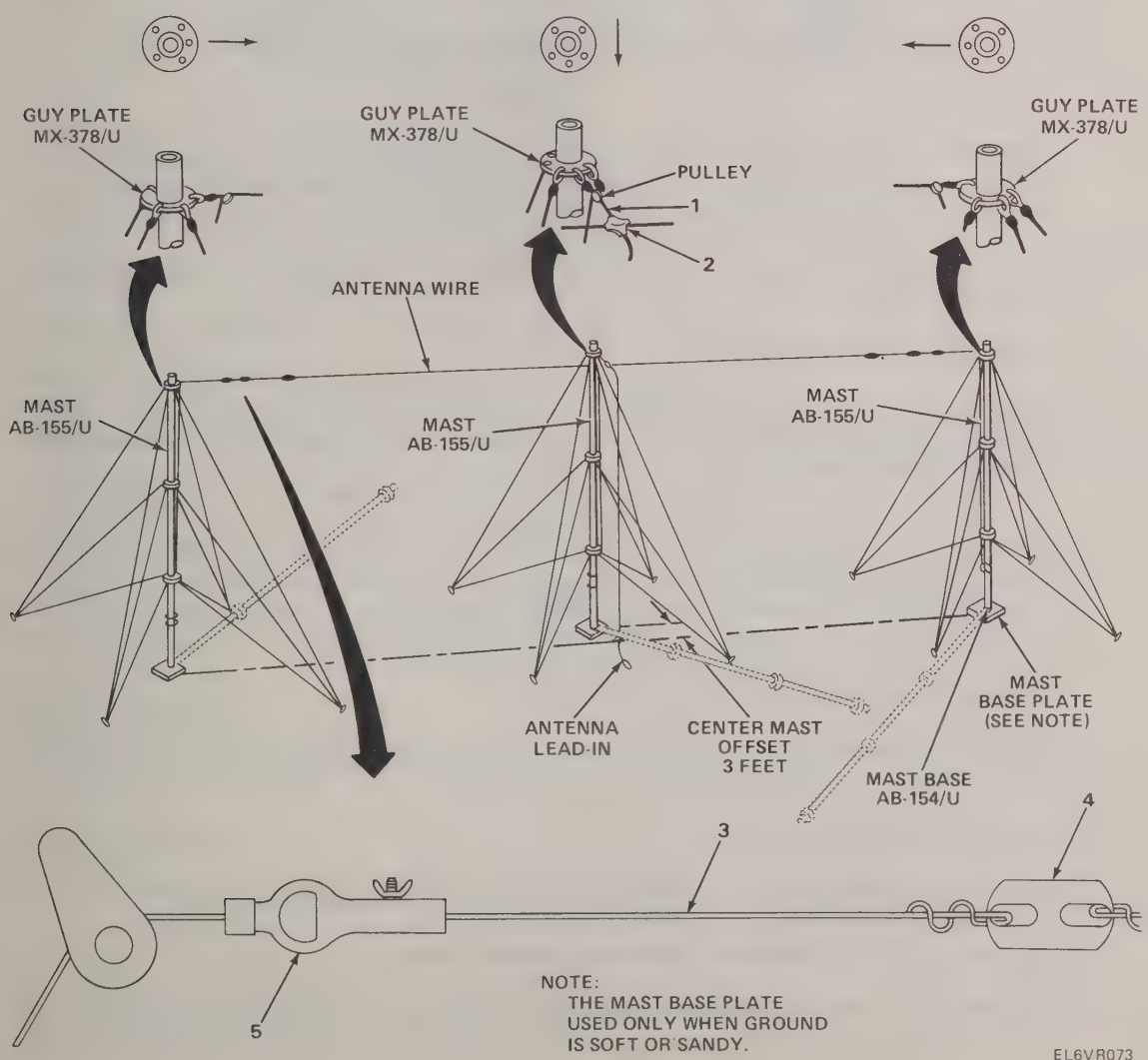
**NOTE**

When a guy line is tightened, opposite guy line may have to be loosened slightly to keep mast from bowing.

ANTENNA RAISING

When operating within frequency range of 2.0 to 4.0 MHz, length of antenna wire requires use of three 40-foot antenna masts AB-155/U. At frequencies above 4.0 MHz, only two antenna AB-155/U masts are required. Length of antenna should be positioned at right angles to direction of transmission and reception.

The dark lines illustrated below show position in which masts are assembled so halyard holes face in right direction.



**2-17. MAST AB-155/U ERECTION.** (CONT)

ANTENNA RAISING

**NOTE**

Do not do step 1 if two antenna masts are required.

1. Attach fastener on halyard MX-516/GRA-4 (1) to coaxial connector (2).
2. Cut a 15-inch piece of rope or wire (3).
3. Attach one end of antenna wire (3) to end strain insulator (4).
4. Attach free end of antenna wire (3) to halyard MX-516/GRA-4 (5).
5. Repeat steps 2, 3, and 4 for opposite end of antenna wire.
6. Pull antenna into position with halyards MX-516/GRA-4. Tie ropes to antenna masts.

**NOTE**

Antenna lead-in cable should be raised off ground on poles if possible. Raising lead-in cable from ground prevents damage. Antenna lead-in should be taped to both antenna mast and shelter to relieve tension on coaxial connector.

7. Connect antenna lead-in cable to OWR-DX-SEND DOUBLET ANTENNA connector located on roadside of shelter.

**2-18. CAMOUFLAGE PROCEDURES.**

General instructions for camouflage procedures are contained in TM 5-200. Specific procedures for camouflaging AN/GRC-122/142(*) shelters with radar scattering screen, when operating with one whip antenna, are given below:

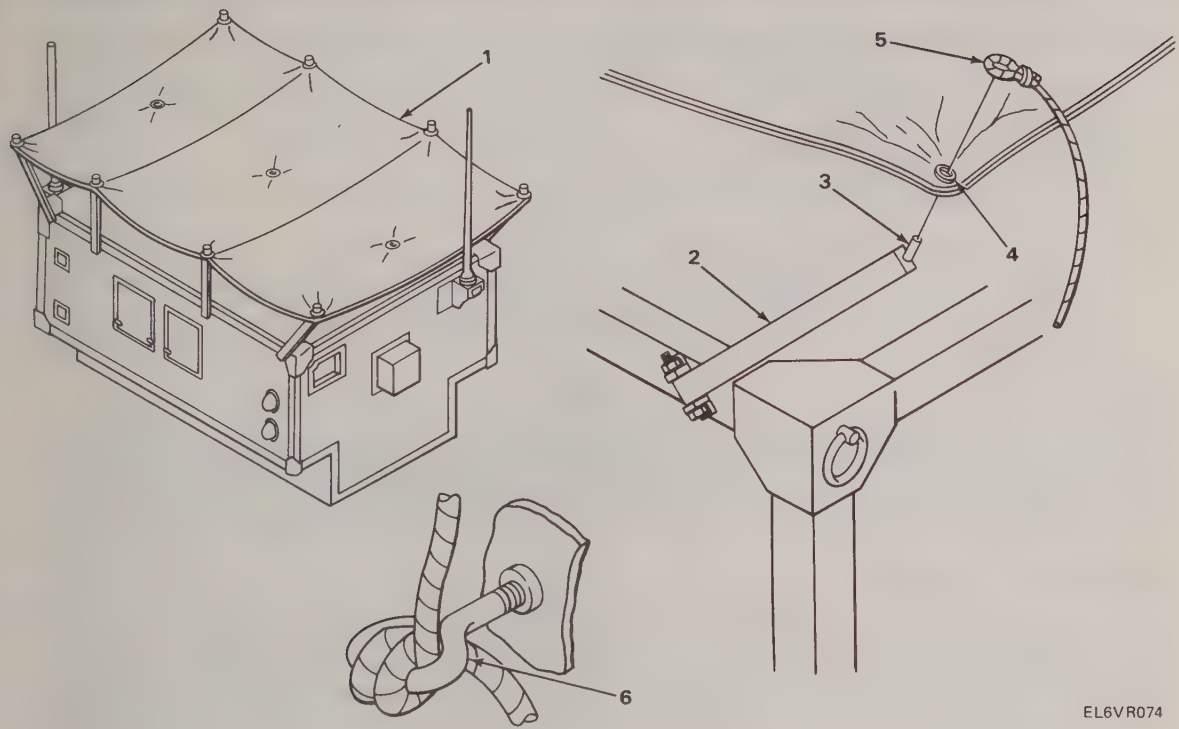
**CAUTION**

During combat or simulated combat conditions, make sure metal poles used to support camouflage netting material do not touch antenna. Metal poles should be positioned a minimum of 4 feet (1.22 m) away to avoid contact and prevent damage to equipment.

Do not cut nylon strings of netting.

1. Cut three quarters of a 16-inch (40 cm) diameter hole in garnish material (vinyl) in approximate location of antenna. Do not cut nylon strings of netting.
2. Open cut flap to expose netting.
3. Secure flap open with plastic tape (NSN 1080-00-108-1114) from repair kit.
4. Pass whip antenna through hole, positioning antenna in center.
5. When erecting poles to support camouflage screen, place poles at least 4 feet (1.22 m) from whip antenna.

## 2-19. SHADE TARPAULIN INSTALLATION AN/GRC-122/142(*) MODELS.




1. Position shade tarpaulin (1) over top of shelter.
2. Raise or insert corner curbside shade tarpaulin supports (2).
3. Engage support end (3) through shade tarpaulin eyelet (4) for each support.
4. Repeat steps 2 and 3 for remaining roadside shade tarpaulin supports.
5. Place loop end (5) of tarpaulin rope over support end (3) protruding through eyelets.

**NOTE**

Some tarpaulin ropes are attached to tarpaulin.

6. Tie tarpaulin ropes to tiedowns (6).

## 2-20. REMOTE EQUIPMENT INSTALLATION.

This paragraph covers installation procedures of the following components for remote operation.

Remote Control Box C-7279/GRC
Remote Control C-433/GRC
Remote Telephone Set TA-312/PT
Remote Handset H-33/PT
Remote Key Telegraph KY-116/U
Remote TTY TT-98/FG or AN/UGC-74A(V)3
Remote TTY TT-76A/GGC

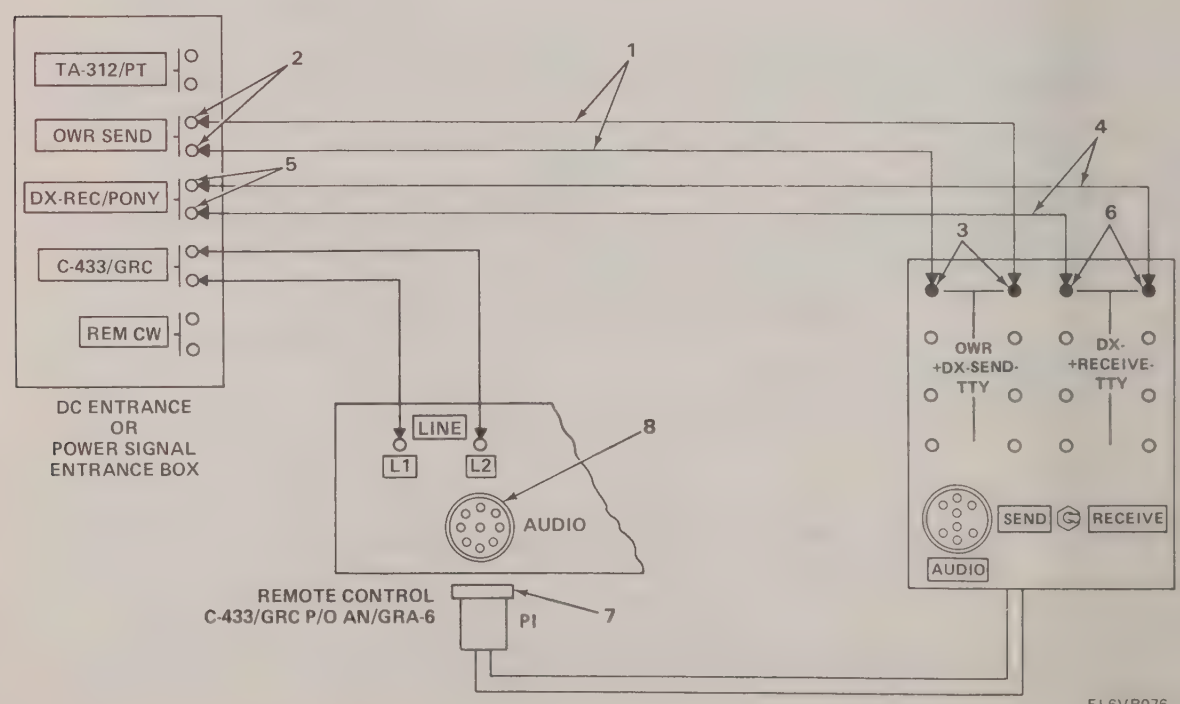
### NOTE

Remote operation may require removal of TT-98/FG or AN/UGC-74A(V)3 and TT-76(*)/GGC from shelter. Additional cables are required which are additionally authorized items.

Instructions for installation of remote units cover all configurations of AN/GRC-122/142(*) models. Shelter can be operated from a maximum distance of 1 mile away at a remote site. A 110 vac power source is required at remote site for tty operations. All remote tty's are additionally authorized components and are requisitioned through normal supply channels. Typical secure and nonsecure full-duplex remote equipment setups for all models are illustrated on pages 2-58 through 2-61.

REMOTE BOX C-7279/GRC

Remote box requires two pairs of field wires for connection to shelter, one pair of field wires for owr operation and an additional pair for duplex or pony operation. Only two tty's are shown connected to remote box. Remaining jacks on remote box provide for connection of additional tty's. All OWR-DX-SEND TTY and DX-RECEIVE TTY jacks are in series with each other. This arrangement allows a total of six tty's to be connected into each loop. Connect remote box as follows:



**2-20. REMOTE EQUIPMENT INSTALLATION.** (CONT)

1. Connect field wire (1) from shelter DC ENTRANCE BOX or POWER/SIGNAL ENTRANCE BOX OWR SEND terminals (2) to remote box OWR-DX-SEND TTY terminals (3).

**NOTE**

Do step 2 for AN/GRC-122(*) models using duplex or pony circuit capability.

2. Connect field wire (4) from DC ENTRANCE BOX or POWER/SIGNAL ENTRANCE BOX DX-REC/PONY terminals (5) to remote box DX-RECEIVE TTY terminals (6).

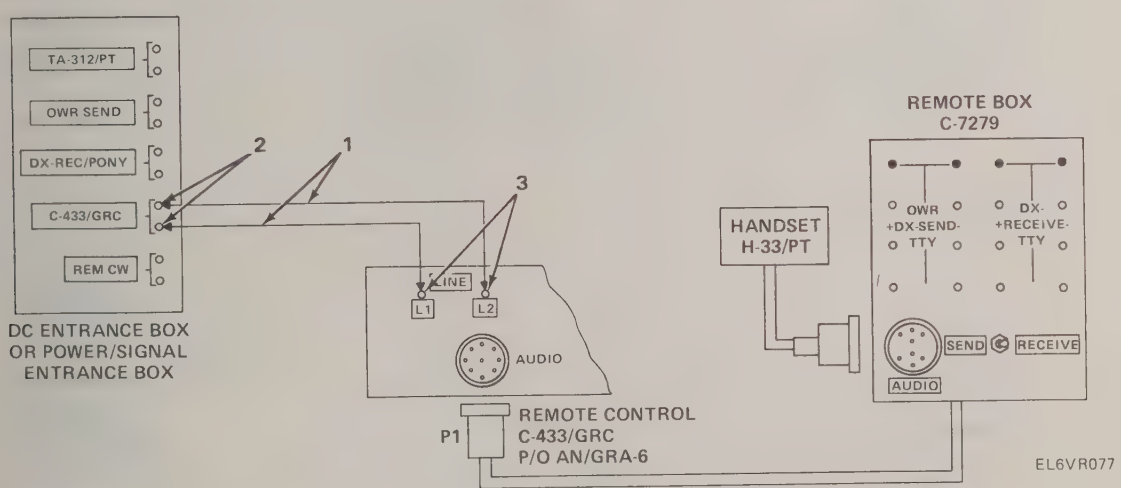
3. Connect pendant plug P1 (7) to remote control C-433/GRC AUDIO connector (8).

**NOTE**

During secure operations, remote box is bypassed by security equipment KW-7 and is used for voice communications only.

REMOTE CONTROL C-433/GRC

Remote control requires one pair of field wires for connection to shelter. Connect remote control as follows:




1. Connect field wires (1) from DC ENTRANCE BOX or POWER/SIGNAL ENTRANCE BOX C-433/GRC terminals (2) to remote control jacks L1 and L2 (3).

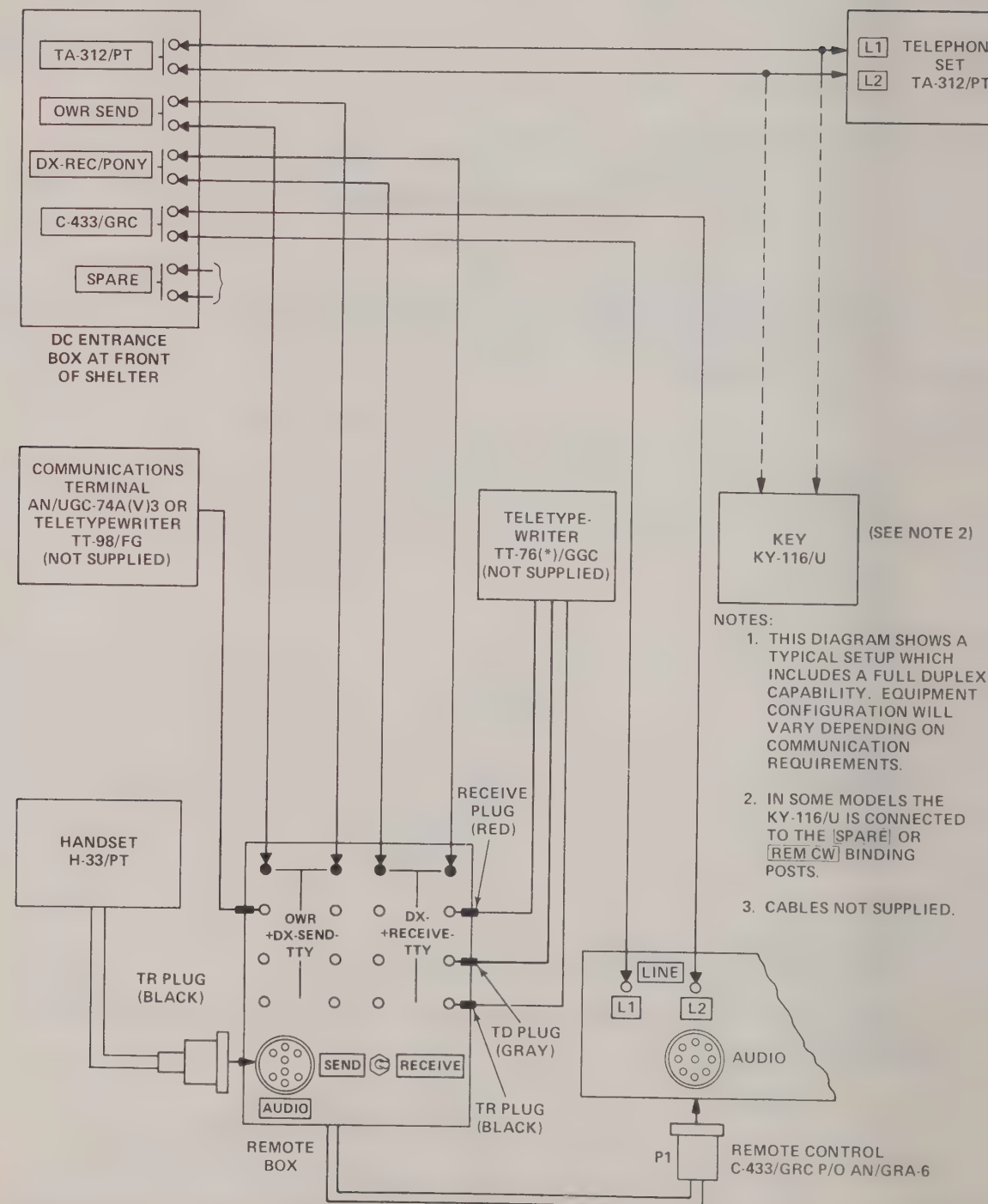
2. Mark remote control SELECTOR switch as follows: Left switch position 1 and middle switch position 2.

**NOTE**

For battery and accessory details, refer to TM 11-5038.

## 2-20. REMOTE EQUIPMENT INSTALLATION. (CONT)

NONSECURE RADIO TTY SETUP FOR AN/GRC-122/142 PLAIN AND C MODELS

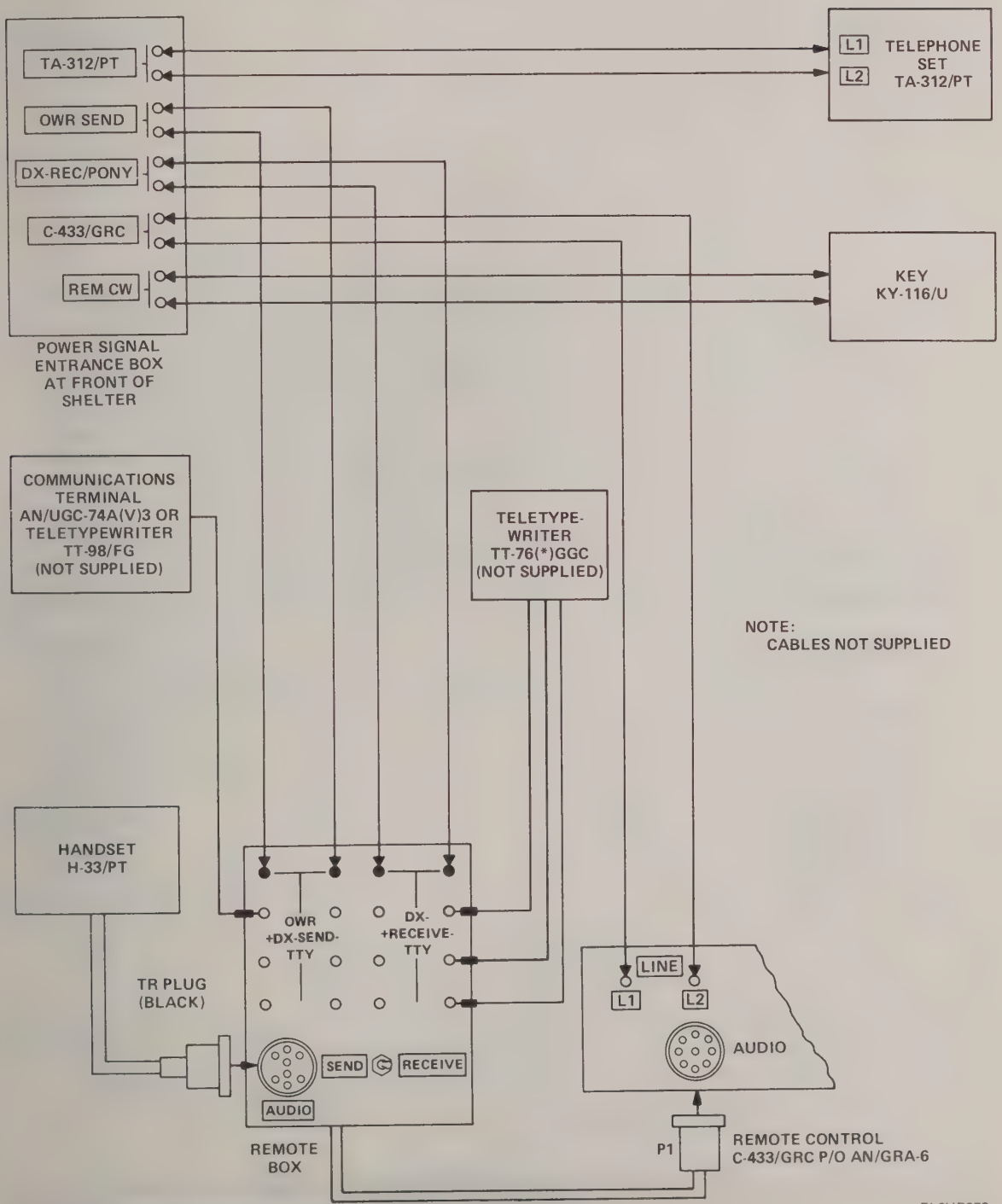



NONSECURE RADIO TTY SETUP FOR AN/GRC-122/142 PLAIN AND C MODELS

EL6VR078

## 2-20. REMOTE EQUIPMENT INSTALLATION. (CONT)

NONSECURE REMOTE SETUP FOR AN/GRC-122/142A, B, D, AND E MODELS

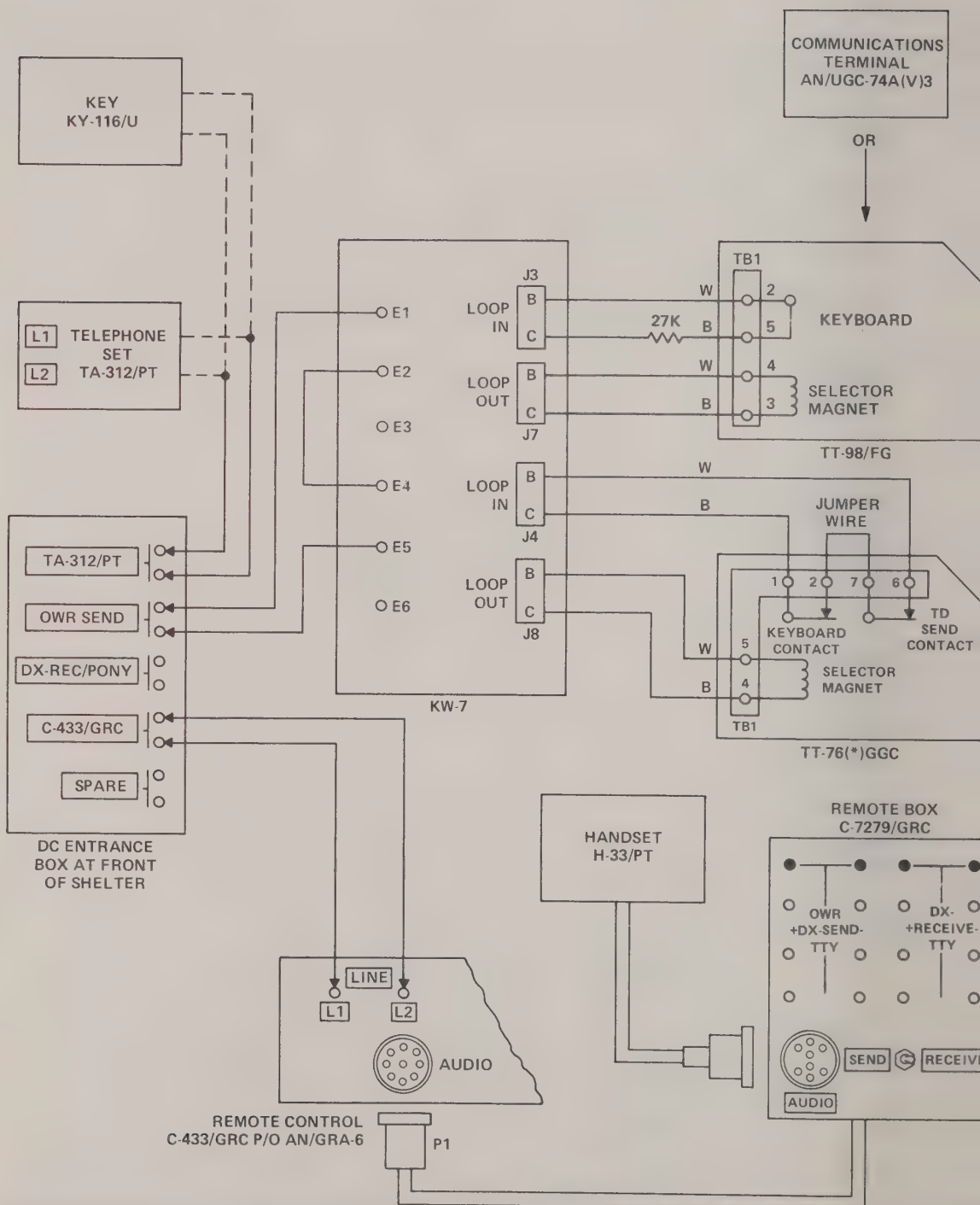



NONSECURE REMOTE SETUP FOR AN/GRC-122/142A, B, D, AND E MODELS

EL6VR079

## 2-20. REMOTE EQUIPMENT INSTALLATION. (CONT)

SECURE REMOTE SETUP FOR AN/GRC-122/142 PLAIN AND C MODELS

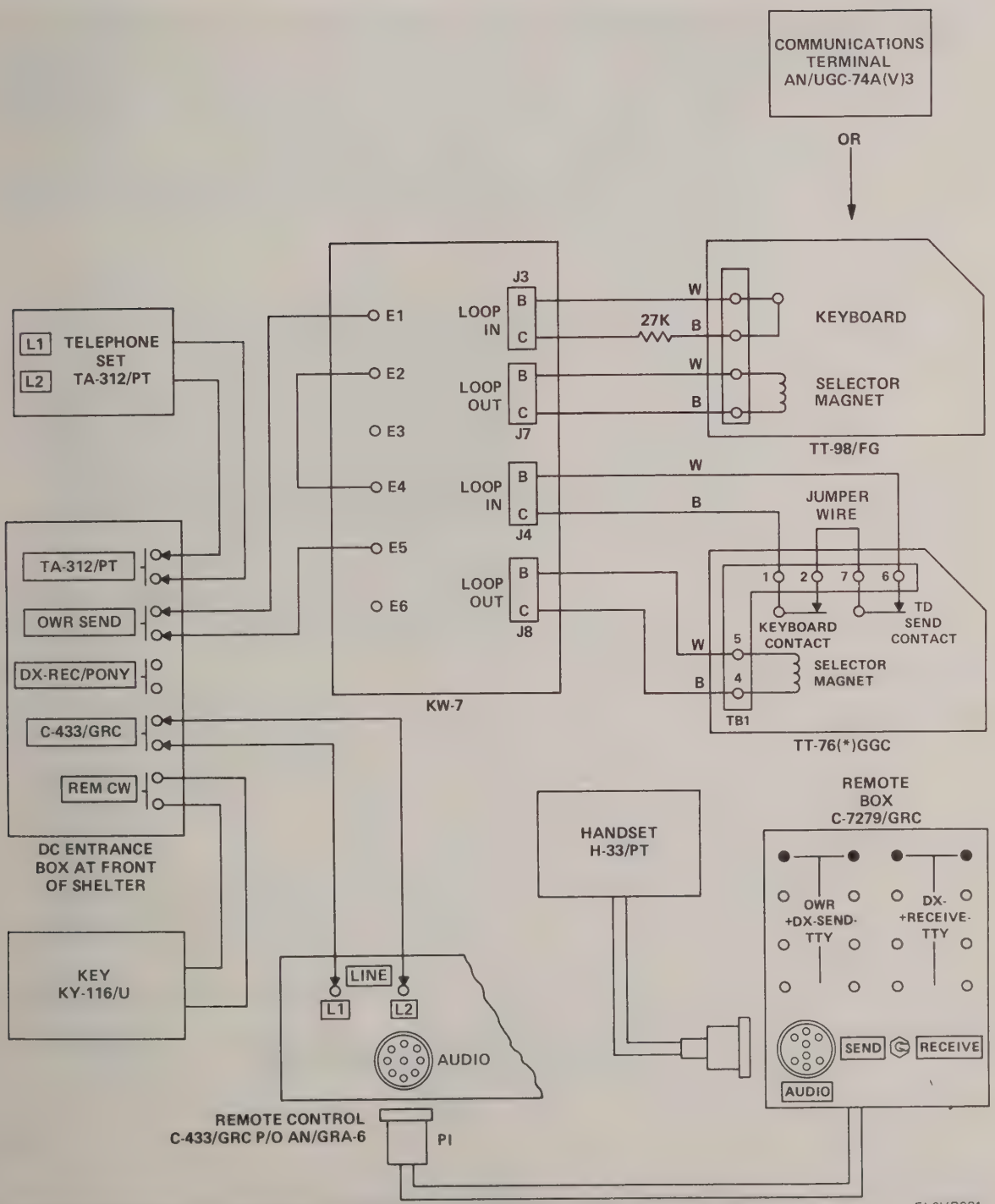



SECURE REMOTE SETUP FOR AN/GRC-122/142 PLAIN AND C MODELS

EL6VR080

## 2-20. REMOTE EQUIPMENT INSTALLATION. (CONT)

SECURE REMOTE RADIO TTY SETUP FOR AN/GRC-122/142A, B, D, AND E MODELS



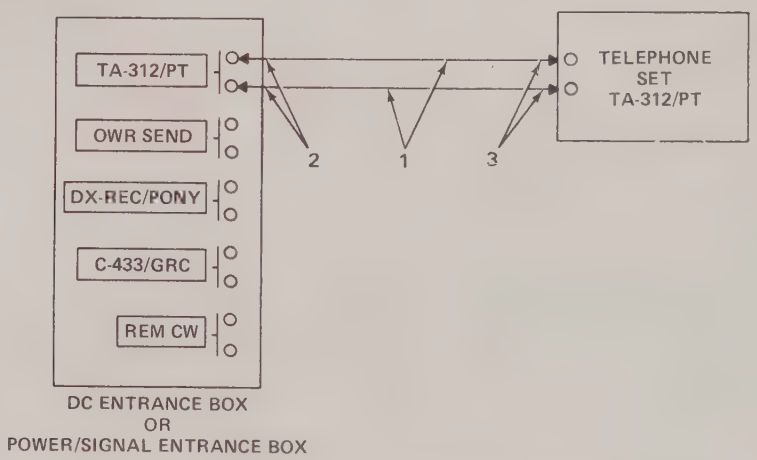

SECURE REMOTE SETUP FOR AN/GRC-122/142A, B, D AND E MODELS

EL6VR081

**2-20. REMOTE EQUIPMENT INSTALLATION.** (CONT)

REMOTE TELEPHONE SET TA-312/PT

Remote TA-312/PT requires one pair of field wires for connection to shelter. Connect remote TA-312/PT as follows:




EL6VR082

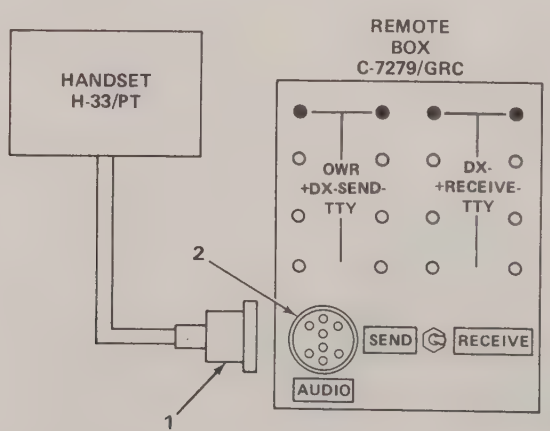
Connect field wires (1) from DC ENTRANCE BOX or POWER SIGNAL ENTRANCE BOX TA-312/PT terminals (2) to TA-312/PT terminals (3).

**NOTE**

If communication does not exist, reverse field wires.

REMOTE HANDSET H-33/PT

Connect remote handset as follows:




EL6VR083

Connect handset connector (1) to AUDIO receptacle (2) on remote box.

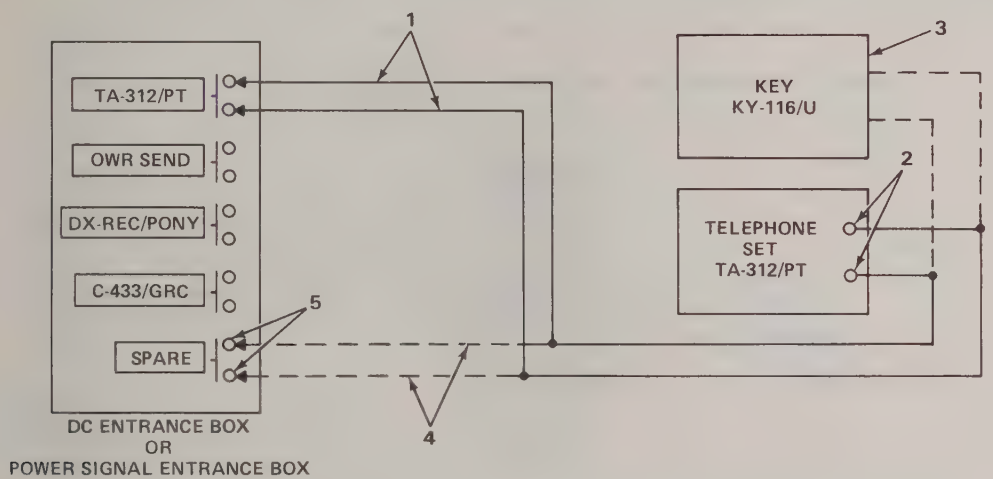
## 2-20. REMOTE EQUIPMENT INSTALLATION. (CONT)

REMOTE KEY TELEGRAPH KY-116/U

Remote key telegraph requires one pair of field wires for connection to shelter.

In AN/GRC-122/142 Plain and C models, TA-312/PT is disconnected and key telegraph is connected to DC ENTRANCE BOX TA-312/PT terminals. In later models SPARE terminals are used for connection of key telegraph.

In AN/GRC-122/142A, B, D, and E models, key telegraph is connected to POWER/SIGNAL ENTRANCE BOX REM CW terminals. Connect remote key telegraph as follows:




AN/GRC-122/142 Plain and C Models

Remove field wires (1) from TA-312/PT terminals (2) and connect to key telegraph (3).

### NOTE

In later models of AN/GRC-122/142 Plain and C, key telegraph can be connected to spare terminals for cw and TA-312/PT operation.

AN/GRC-122/142A, B, D, and E Models

Connect field wires (4) to POWER SIGNAL ENTRANCE BOX REM CW terminals (5) and key telegraph.

**2-20. REMOTE EQUIPMENT INSTALLATION.** (CONT)

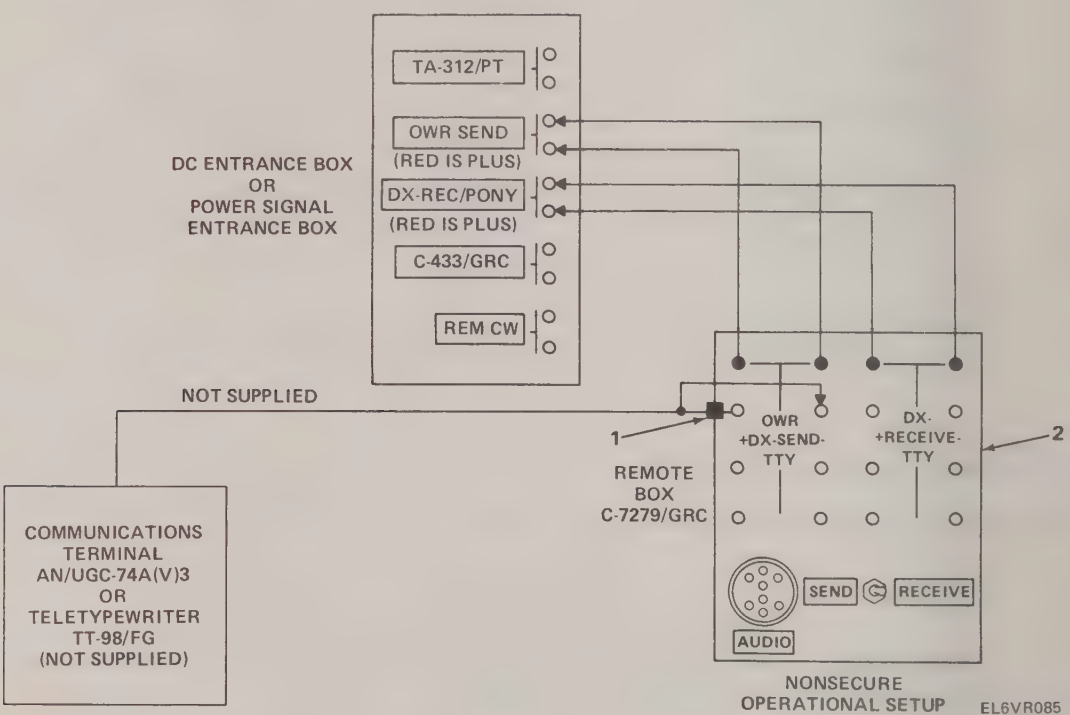
REMOTE TTY TT-98/FG OR COMMUNICATIONS TERMINAL AN/UGC-74A(V)3

TT-98/FG or AN/UGC-74A(V)3 is connected into system at remote box. Either one is plugged into an OWR-DX-SEND TTY jack of remote box. They can also be connected into duplex receive pony loop by inserting tty plugs into remote box DX-RECEIVE TTY jacks.

TT-98/FG selector magnet wiring must be checked prior to installation and set to same loop current as shelter (20 or 60 ma). Refer to paragraph 2-22 for loop current adjustments. Refer to TM 11-5815-200-12 for all initial unpacking, switch positions, and adjustments of TT-98/FG.

AN/UGC-74A(V)3 REC MODE switch must be checked prior to installation and set to same loop current as shelter (20 or 60 ma). See paragraph 2-22 for loop current adjustments. Refer to TM 11-5815-602-12 for all initial unpacking, switch positions, and adjustments of AN/UGC-74A(V)3.

Connect TT-98/FG or AN/UGC-74A(V)3 as given below:



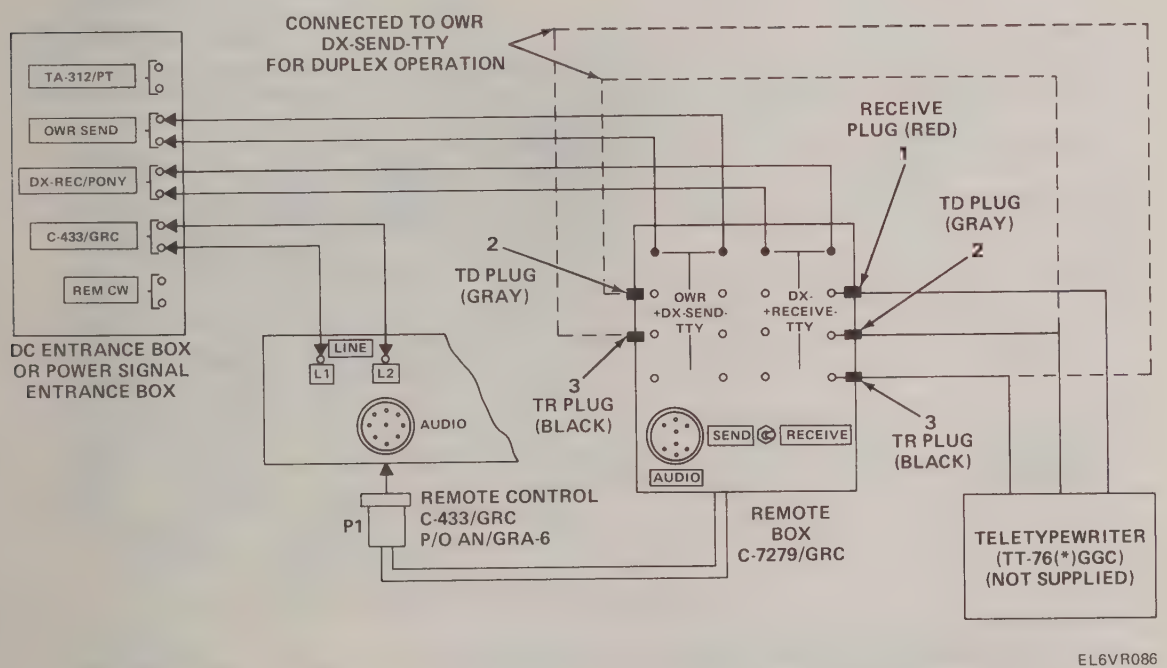

For nonsecure operation, plug TT-98/FG or AN/UGC-74A(V)3 cord (1) into OWR-DX-SEND TTY jack of remote box (2).

**2-20. REMOTE EQUIPMENT INSTALLATION.** (CONT)

REMOTE REPERFORATOR-TRANSMITTER TT-76(*)/GGC

Remote reperforator-transmitter TT-76(*)/GGC is connected into system at remote box. For owr and pony circuit operation, TT-76(*)/GGC plugs are plugged into remote box DX-RECEIVE TTY jacks. For duplex operation, TD (gray) plug and keyboard (black TR) plug are plugged into remote box OWR-DX-SEND TTY jacks, and receive (red) plug into DX-RECEIVE TTY jack.

TT-76(*)/GGC selector magnet wiring must be checked prior to installation and set to same loop current as shelter (20 or 60 ma). See paragraph 2-22 for loop current adjustments. Refer to TM 11-5815-238-10 or -20 for all initial unpacking, switch positions, and adjustments of TT-76(*)/GGC. Connect remote TT-76(*)/GGC as follows:




EL6VR086

OWR or Pony Circuit Operation

Connect three (red, gray, and black) plugs (1, 2 and 3) to remote box DX-RECEIVE TTY jacks.

Duplex Operation

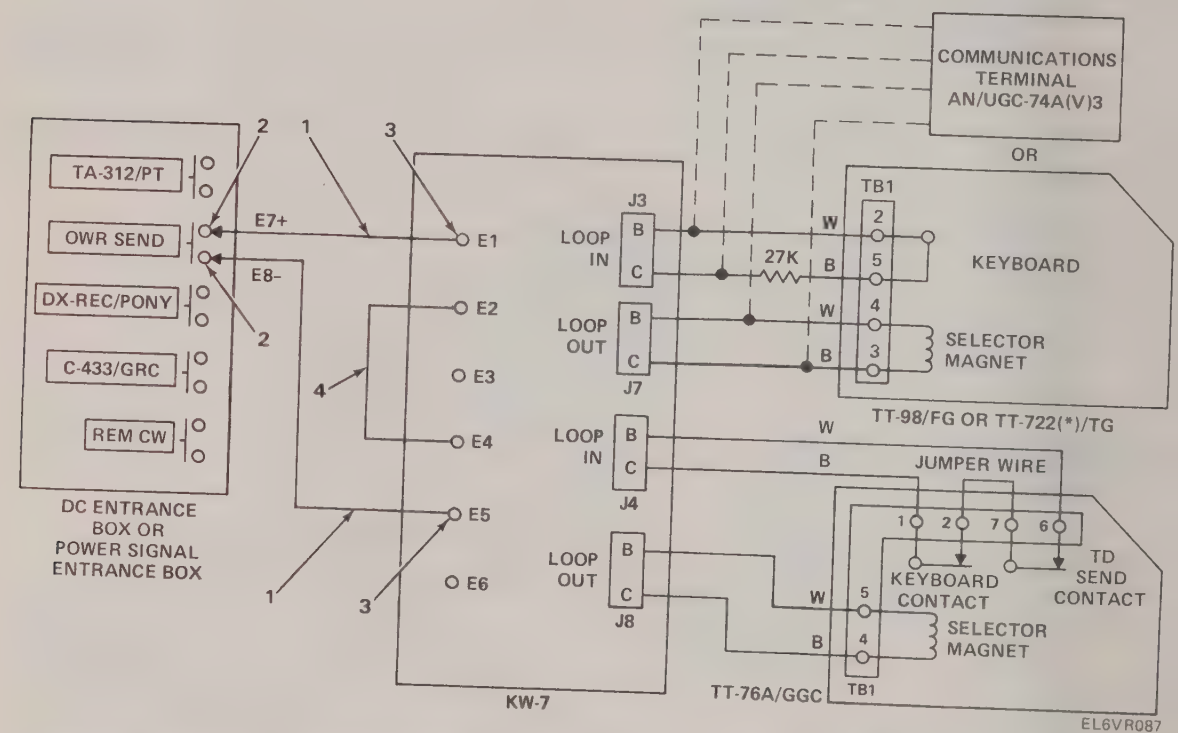
1. Connect two (gray and black) plugs (2 and 3) to remote box OWR-DX-SEND TTY jacks.
2. Connect red (receive) plug (1) to remote box DX-RECEIVE TTY jack.

**2-20. REMOTE EQUIPMENT INSTALLATION.** (CONT)

REMOTE SECURE TT-76(*)/GGC, TT-98/FG OR AN/UGC-74A(V)3

For remote secure operation, obtain the following additional components for TT-76(*)/GGC and TT-98/FG connection to remote box. Connect secure remote tty's as follows:

Cable W6 Loop In (NSN 5995-00-995-1770)
Cable W7 Loop Out (NSN 5995-00-995-1767)
Resistor 27 Kilohm (NSN 5905-00-299-2020)
AC Power Cable (Crypto) (NSN 5995-00-955-1766)




1. Connect field wires (1) from POWER SIGNAL ENTRANCE BOX E7 + and E8 – terminals (2) to KW-7 crypto set E1 and E5 terminals (3).

2. Connect a jumper (4) from KW-7 terminals E2 to E4.

3. Check for proper polarity by turning KW-7 BREAK FUNCTION ON and pressing KW-7 SEND switch. If polarity is correct, KW-7 will stay in SEND. If polarity is reversed, BREAK light will light and audible alarm will sound.

**2-20. REMOTE EQUIPMENT INSTALLATION.** (CONT)

REMOTE SECURE TT-76(*)/GGC, TT-98/FG OR AN/UGC-74A(V)3

**NOTE**

For KW-7 to tty cabling refer to illustration, TM 11-5815-200-12 and TM 11-5815-238-10 or -20.

Loop in circuit must include 27,000 ohm resistor to prevent garbling.

If selector magnets run open, loop out polarity is reversed.

Dummy plugs must be installed in unused loop-in and loop-out jacks of KW-7 if only one tty is installed.

REMOTE AN/UGC-74A(V)3

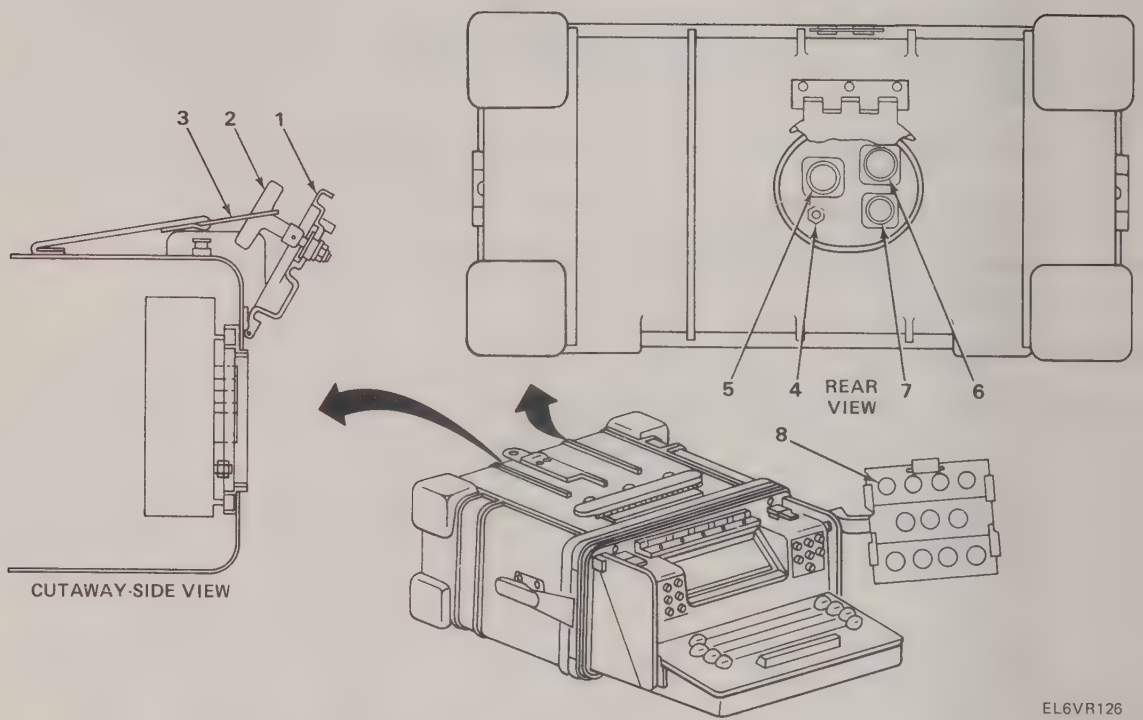
Preliminary starting procedures for AN/UGC-74A(V)3 will be done by operator at a remote site.

**WARNING**

Be sure POWER switch on AN/UGC-74A(V)3 is set to OFF to prevent electrical shock to personnel.

## 2-20. REMOTE EQUIPMENT INSTALLATION. (CONT)

REMOTE AN/UGC-74A(V)3 (CONT)




1. Open rear access door (1) by pulling door handle (2) down into horizontal position and rotating it one-quarter turn to right.
2. Secure rear access door (1) in open (raised) position by unsnapping retaining strap (3) from outer case cover and inserting rear panel door handle (2) into retaining strap slot.
3. Secure AN/UGC-74A(V)3 to a table or shelf mounting.
4. Connect an appropriate ground strap to chassis ground (4) and a good earth ground.

**NOTE**

To connect cables to connectors, press cable plug in and twist clockwise one-half turn.

5. Connect appropriate signal line to J1 clock and data connector (5).
6. Connect primary power cable to power source and J2 power connector (6).
7. Connect an appropriate 12 vdc power source or backup battery to J3 backup connector (7).
8. Install cardholder (8) (TM 11-5815-602-12).

## 2-21. SECURITY EQUIPMENT INSTALLATION.

To install security equipment, one or both dummy boxes J-2728/GRC-142 must be removed. In AN/GRC-122/142 Plain and C models, lower dummy box is in OWR-DX-SEND TTY loop and upper dummy box is in DX-RECEIVE loop. In AN/GRC-122/142A, B, D, and E models, upper curbside dummy box is in OWR-DX-SEND loop and lower roadside dummy box is in DX-RECEIVE pony loop. One or both dummy boxes are removed to install security equipment, depending on mode of operation. Follow procedures given below for installation of security equipment.

1. Disconnect banana plugs E1, E2, and E3 and connectors J1 and J2 from dummy box.
2. Unclamp 28 vdc connector W28P1 or W30P1 from side clamp of dummy box.
3. Loosen captive screws on both sides of dummy box and remove dummy box.
4. Connect a jumper wire on security equipment between E2 and E4.
5. Connect white banana plug to E1, black banana plug to E3, and blue banana plug to E5.
6. Connect shorting plugs to security equipment LOOP IN 2 (J4) and LOOP OUT 2 (J8) receptacles.
7. Connect plug removed from LOOP IN receptacle of dummy box to LOOP IN 1 (J3) receptacle.
8. Connect plug removed from LOOP OUT receptacle of dummy box to LOOP OUT 1 (J7) receptacles.
9. Connect free end of W28 (owr) or W30 (dx) cable to 24 VDC (J2) input.
10. For ac operation, use ac power cable supplied and connect to security equipment receptacle J1.

**NOTE**

All models do not have cables prewired to shelter; use cables supplied.

**2-21. SECURITY EQUIPMENT INSTALLATION.** (CONT)

**NOTE**

If security equipment is installed in shelter, similar equipment must be installed at remote site for capability of encoding and decoding secure messages.

TT-523(*)/GGC should always be installed when security equipment is installed. See appendix A for appropriate TM.

When using KW-7 at remote site, remove 28 vdc power supply from line.

**2-22. LOOP CURRENT TEST.**

Loop current must be checked after installation of all local and remote equipment to ensure proper tty operation. Loop current should also be checked when additional tty's are added to loop. The procedure given is for OWR-DX-SEND TTY loop or DX-RECEIVE pony loop. DX-RECEIVE loop is used only during duplex or pony circuit operation. Loop current can be set at 20 or 60 ma.

PRELIMINARY PROCEDURES:
Dc power connected to shelter (para 2-10).
All remote equipment (if used) installed (para 2-20).
All duplex equipment (AN/GRC-122(*) only) installed.
Security equipment not installed.
Perform preoperational procedures for AN/GRC-122/142(*) models (para 2-25).
All power switches set to OFF.

TT-76(*)/GGC

1. Raise TT-76(*)/GGC cover.
2. Remove modification (resistor) and replace spacing bar, and perform switch settings as given in TM 11-5815-283-10 or -20.
3. Check that SIGNAL/BIAS switch is set at 20 or 60 ma and SELECTOR MAGNET cable is plugged into 20 or 60 ma connector.
4. Lower dust cover.

TT-98/FG

1. Remove TT-98/FG and duplex TT-98/FG dust covers.
2. Set LINE SELECTOR switches to 20 or 60 ma.
3. Rotate LINE CURRENT INCREASE controls to midrange.
4. Close cover.

AN/UGC-74A(V)3

1. Unclamp cover and slide out AN/UGC-74A(V)3.
2. Check that 20/60 ma switch is set to 20 or 60 ma.

**2-22. LOOP CURRENT TEST.** (CONT)

3. Set switch box DC POWER setting to OFF.
4. Disconnect shorting bar between terminals 2 and 3.
5. Replace dust covers.

MODEM MD-522(*)/GRC

1. As applicable, set METER FUNCTION switch to DC LOOP NO. 1 (when using OWR-DX-SEND TTY loop) or DC LOOP NO. 2 (when using DX-RCV-PONY loop, AN/GRC-122(*) models only).

**NOTE**

Step 2 applies to AN/GRC-122/142 Plain and C models only.

2. Set control panel LOOP ADJ OWR-DX-SEND control and LOOP ADJ DX-RCV-PONY control at midrange.
3. Perform preoperational procedures (para 2-25).
4. Observe current indication on modem test meter for 20 or 60 ma. If 20 or 60 ma does not register, a loop current adjustment is necessary. Refer to a higher level of maintenance.

**2-23. SHELTER DOOR COMBINATION LOCK.**

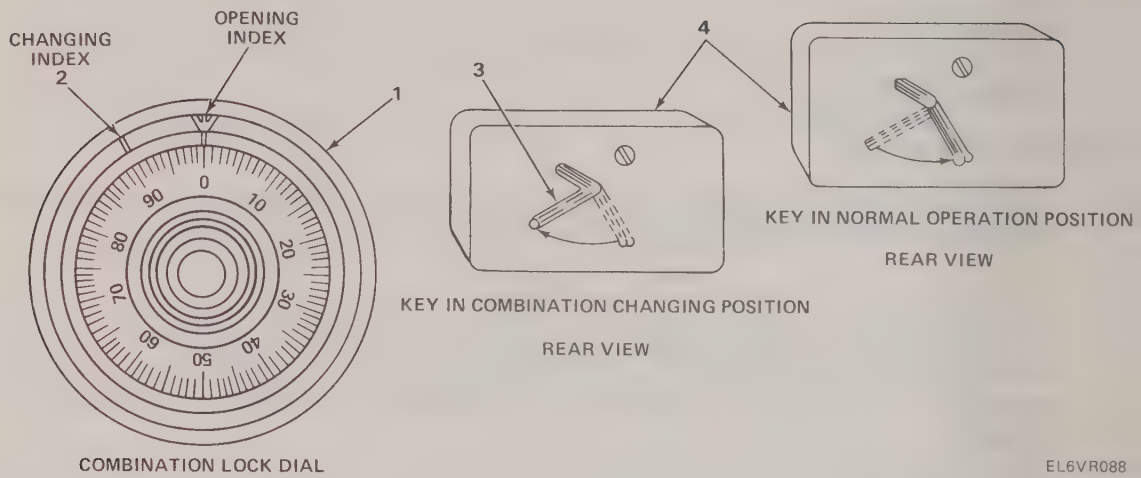
CHANGING SHELTER DOOR COMBINATION LOCK

Select a new combination using three numbers. Do not use numbers between 0 and 20 for last number of combination. For maximum security, do not use numbers ending in 5 or 0. Do not use numbers in rising or falling sequence such as 35-50-75 which is not as secure as 54-38-72.

**NOTE**

Lock leaves factory with all numbers of combination set at 50. If shelter already has an assigned combination, see page 2-73 for opening combination lock. When setting combination for first time, rotate dial clockwise four full turns and stop when 50 is alined with changing index mark.

## 2-23. SHELTER DOOR COMBINATION LOCK. (CONT)




When shelter has an assigned combination, dial combination and stop at last digit.

1. Hold dial (1) with last number of combination at changing index mark (2).
2. Insert changing key (3) into rear of lock (4).
3. Turn changing key (3) one-quarter turn clockwise and hold while doing steps 4 through 8.
4. Turn dial (1) clockwise four full turns and stop when first number of new combination is alined with changing index mark (2).
5. Turn dial (1) counterclockwise three full turns and stop when second number of new combination is alined with changing index mark (2).
6. Turn dial (1) clockwise two full turns and stop when third number of new combination is alined with changing index mark (2).
7. Hold dial (1) with last number of new combination at changing index mark (2).
8. Turn changing key (3) counterclockwise one-quarter turn to operation position.

**NOTE**

Lock is now set for new combination.

If dialing new combination does not open lock, refer to a higher level of maintenance. Try new combination several times to ensure proper operation before closing shelter door.

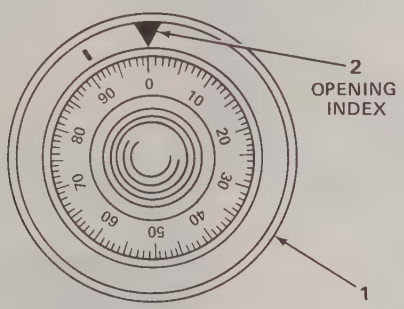
**2-23. SHELTER DOOR COMBINATION LOCK.** (CONT)

OPERATING SHELTER DOOR COMBINATION LOCK

Combination lock provides a means of locking shelter.

**NOTE**

If a selected number is turned beyond opening index mark, entire combination must be radiated. Turning dial back to regain combination will not work.




COMBINATION LOCK DIAL

EL6VR089

To Lock

Rotate dial (1) clockwise at least four full turns.

To Unlock Factory Setting

Lock is set at 50 when delivered from factory.

1. To unlock, turn dial (1) clockwise four full turns and stop when 50 is alined with opening index mark (2).
2. Turn dial (1) slowly counterclockwise until it stops.

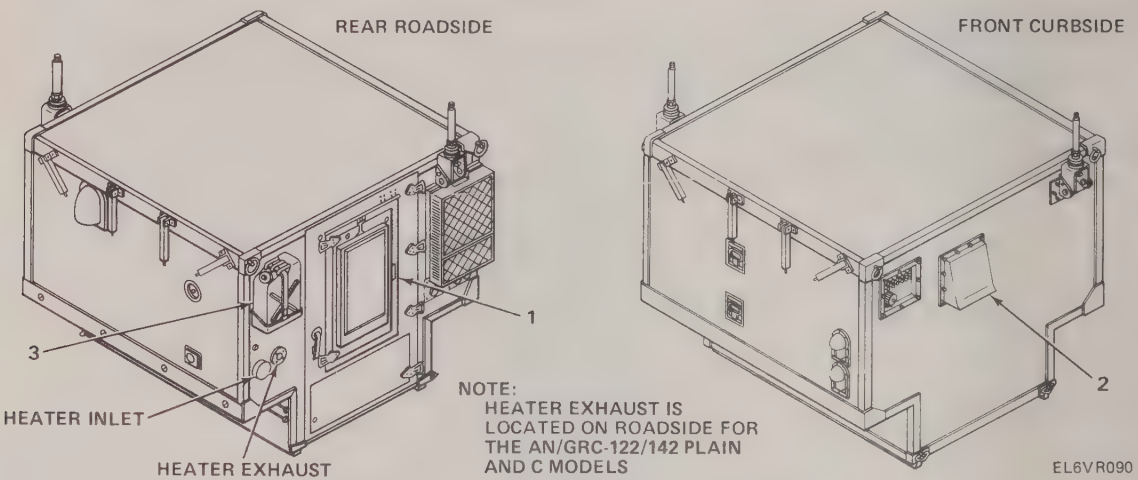
To Unlock

1. Turn dial (1) clockwise four full turns and stop when first number is alined with opening index (2).
2. Turn dial (1) counterclockwise three full turns and stop when second number is alined with opening index (2).
3. Turn dial (1) clockwise two full turns and stop when third number is alined with opening index (2).
4. Turn dial (1) slowly counterclockwise until it stops.

## 2-24. PREOPERATIONAL PROCEDURES.

After a complete shutdown or when starting equipment for operation, perform preoperational procedures that apply to your shelter configuration.

AIR INLETS AND OUTLETS AND GASOLINE CAN




1. Open air inlet cover (1).
2. Check that air inlet filters are clean.
3. Open blower outlet cover (2).

**WARNING**

Do not smoke or use open flame when checking or filling gasoline can. When pouring gasoline, always provide a metal to metal contact between fuel container and gasoline can to prevent injury to personnel.

**NOTE**

Heater inlet or exhaust covers are located on rear or roadside wall of shelter depending on model.

4. If heater is being used, open and secure heater inlet and exhaust covers.
5. Check fuel level in gasoline can (3).

WHIP OR DOUBLET ANTENNAS AND GROUND RODS

1. Check that whip antennas are in operating position, properly connected, and free of obstruction (para 2-11).
2. When doublet antenna is used, check that it is properly constructed and positioned correctly (para 2-13).
3. Check installation of ground rods and connection of ground strap (para 2-9).

**2-24. PREOPERATIONAL PROCEDURES.** (CONT)

TRUCK EXHAUST PIPE HOSE

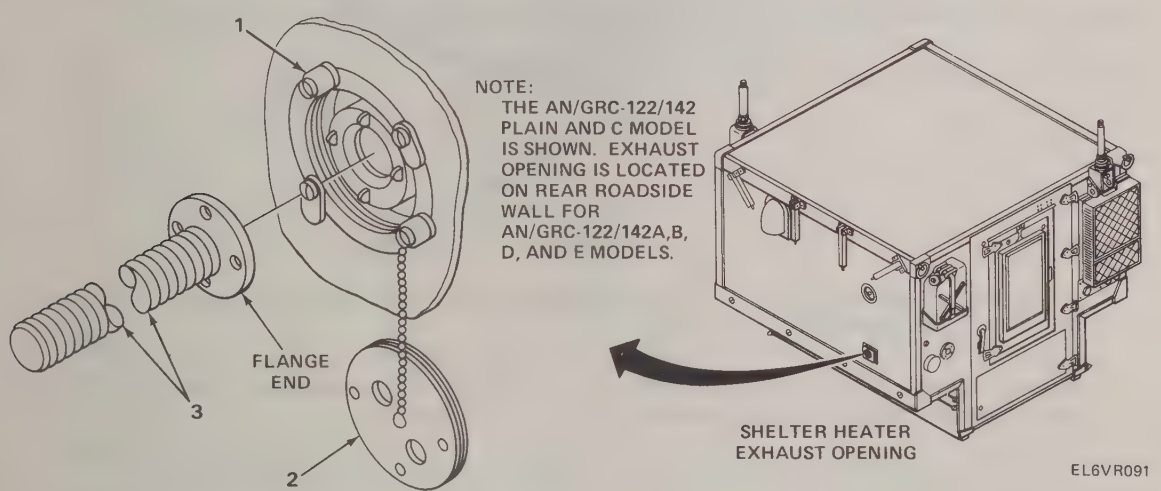
Truck exhaust pipe hose is a flexible steel hose. It is used when shelter is truck mounted to redirect exhaust gases away from shelter. Slide exhaust pipe hose onto truck exhaust pipe about 12 inches and direct truck exhaust gases away from shelter.

**WARNING**

After continued truck operation, exhaust pipe hose can become very hot. Allow cooling prior to handling to avoid getting burned.

HEATER EXHAUST HOSE

Heater exhaust hose is used when shelter is at halt and heat is required. Heater exhaust opening is located either on roadside or rear wall of shelter.




**NOTE**

On some models, exhaust cover is unscrewed.

1. Turn four fasteners (1) one-half turn, and remove cover (2).
2. Place flange end of heater exhaust hose (3) against heater exhaust opening.
3. Turn each of four flange fasteners (1) to secure heater hose to exhaust opening.
4. Direct exhaust gases away from shelter by positioning of exhaust hose.

## 2-24. PREOPERATIONAL PROCEDURES. (CONT)

POWER SOURCES

See paragraph 2-10 to connect power to shelter if power has been removed. Set all circuit breakers and equipment power switches to OFF as given in preliminary starting procedures below.

DC Operation

When using a vehicle power source, set distribution box AC POWER-DC POWER switch (AN/GRC-122/142 Plain and C models only) to DC POWER. Set power distribution panel AC-DC switch to DC (AN/GRC-122/142A, B, D, and E models only). Set DC MAIN circuit breaker to ON. Set vehicle throttle for 28-volt output from vehicle generator, by observing power distribution panel voltmeter.

When using an external dc power source, power source must have a 100 amp, 28 vdc capability with less than one percent ripple and better than two percent regulation.

AC Operation

Operation of all ac components requires an external power source of 60 amp, 115 volts, 60 Hz.

Remote tty operation requires a power source of 115 volts, 60 Hz.

FUEL HEATER

**WARNING**

Do not operate shelter exhaust fan when all-fuel heater is operating. This will prevent deadly fumes from being drawn into shelter.

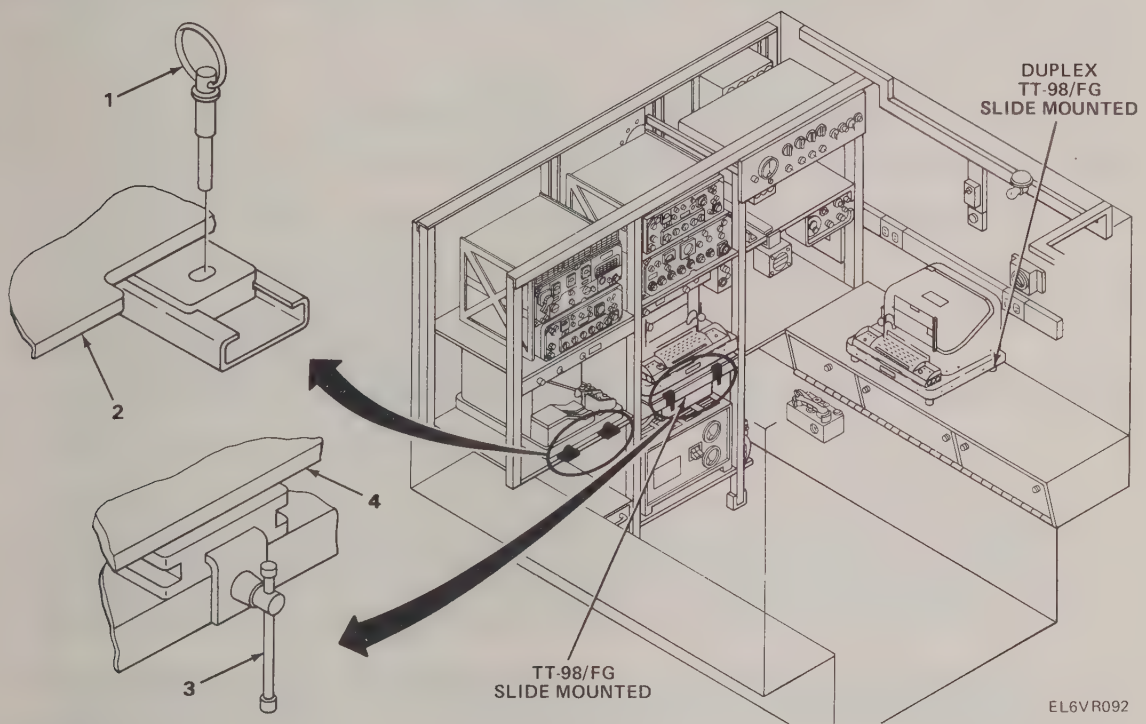
In shelters where AM-3349/GRC-106 vents air to outside of shelter, open rear door vent covers enough to prevent deadly fumes from being drawn into shelter.

If heat is required, maintenance personnel should check shelter all-fuel heater needle valve adjustment. Refer to TM 5-4520-211-14 Hupp or TM 5-4520-236-14 Hunter before operating heater.

**2-24. PREOPERATIONAL PROCEDURES.** (CONT)

TELETYPEWRITER SLIDES

Tty's are slide mounted in AN/GRC-122/142 Plain and C models only. They can be stored out of the way when not in use.




TT-76(*)/GGC

1. Remove two guide pins (1).
2. Slide tty (2) out into position.
3. Reinsert two guide pins (1).

TT-98/FG

1. Loosen two guide clamps (3).
2. Slide tty (4) out into position.
3. Retighten two guide clamps (3).

Duplex TT-98/FG (AN/GRC-122(*) models only).

Repeat steps 1, 2, and 3 for duplex TT-98/FG (located on curbside wall) as given for TT-76(*)/GGC.

**2-24. PREOPERATIONAL PROCEDURES.** (CONT)

TT-76(*)/GGC

Check that TT-76(*)/GGC motor speed is correct (refer to TM 11-5815-238-12).

TT-98/FG

Check that TT-98/FG motor speed is correct (refer to TM 11-5815-200-12).

COMMUNICATIONS TERMINAL AN/UGC-74A(U)3

Refer to TM 11-5815-602-12 for preoperational procedures.

**2-25. PRELIMINARY STARTING PROCEDURES.**

Before operation of AN/GRC-122/142(*) models, equipment must be preset. All preset switch positions given are set before any mode of operation and radio tuning.

**NOTE**

To conserve vehicle battery power, use ac only mode even though shelter is connected to a vehicle. Remove dc power from shelter by switching off power at power distribution panel and disconnecting power cable. When operating in ac mode, if voltmeter reads more than 115 vac ± 10 percent, check for proper connections to ac power source.

In dc mode of operation and under certain operating conditions, MAIN circuit breaker may kick out when all shelter components are energized. Turn off all components if this happens. To avoid this condition, power should be applied to components in the order given.

1. DC MAIN circuit breaker set to ON.
2. LIGHTS switch or switches set to ON.
3. OWR INVERTER set to ON.
4. DX INVERTER (duplex operation) set to ON.

There are 12 different configurations used in AN/GRC-122/142 (*) models. Use preset instructions for only those components that apply to shelter configuration being used.

**2-25. PRELIMINARY STARTING PROCEDURES.** (CONT)

Perform procedures listed below prior to preoperational equipment settings given in paragraph 2-26.

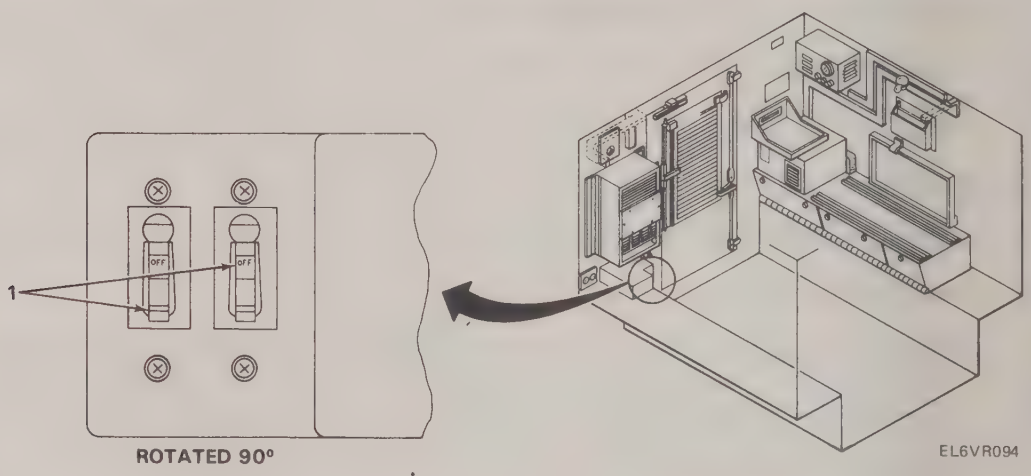
1. Ac entrance box circuit breakers set to OFF (AN/GRC-122/142 Plain and C models).
2. Air conditioner switch SW2 set to OFF (if applicable).
3. Seat TA-312/PT handset properly.
4. Security equipment POWER switch set to OFF.
5. Power distribution panel: All switches set to OFF.
6. Modem PRIMARY POWER switch set to OFF.
7. AN/UGC-74A(V)3 POWER switch set to OFF.
8. Power supply ON/OFF switch set to OFF.
9. TT-76(*)/GGC POWER switch set to OFF.
10. TT-98/FG POWER switch set to OFF.
11. RT-662/GRC SERVICE SELECTOR switch set to OFF. (Frequency windows show all zeros.)
12. Amplifier PRIM PWR switch set to OFF.
13. Fuel heater ON/OFF switch set to OFF.
14. Electric heater ON/OFF switch set to OFF.
15. Duplex AN/UGC-74A(V)3 POWER switch set to OFF.
16. Duplex TT-98/FG POWER switch set to OFF.
17. Duplex RT-662/GRC SERVICE SELECTOR switch set to OFF.

## 2-26. PREOPERATIONAL EQUIPMENT SETTINGS.

The preoperational equipment settings are divided into four groups: AN/GRC-122/142 Plain and C; AN/GRC-122/142A and B; AN/GRC-122/142D and E; and equipment settings common to all models. One of the first three groups contains equipment settings that must be made on your configuration. The fourth group is settings that are made for all models. First perform equipment settings for your particular configuration and then equipment settings common to all models.

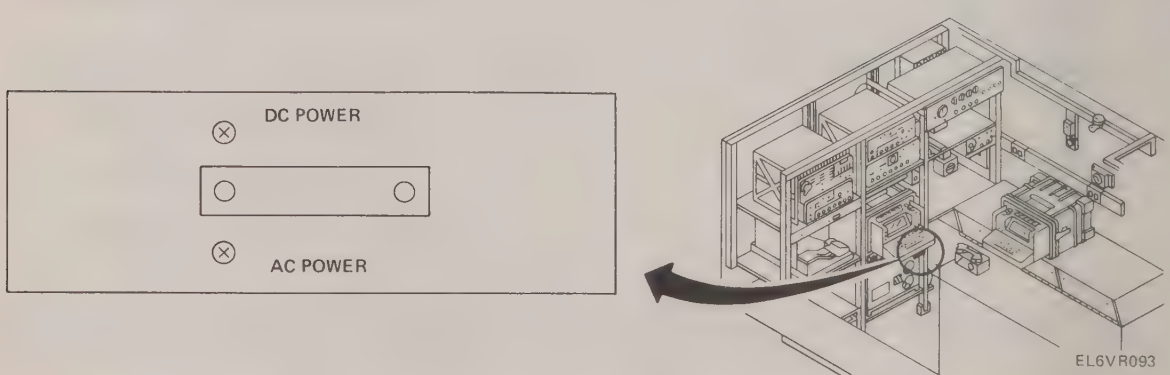
AN/GRC-122/142 PLAIN AND C MODELS

AC Entrance Box Circuit Breakers




When operating in ac mode only, set both circuit breakers (1) to ON and observe reading on ac voltmeter for 115 volt ± 10 percent.

Distribution Box AC Power-DC Power

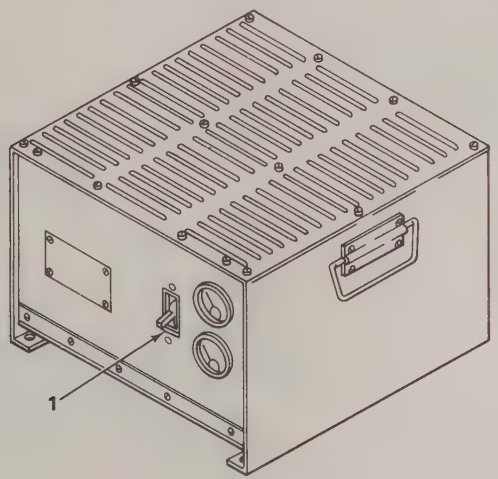



1. Set distribution box to DC POWER for dc operation and AC POWER for ac operation.
2. Set dc power supply to ON as shown on page 2-88.

**2-26. PREOPERATIONAL EQUIPMENT SETTINGS.** (CONT)

Power Supply PP-4763(*)/GRC

Power supply is used in ac operation only to supply dc power.



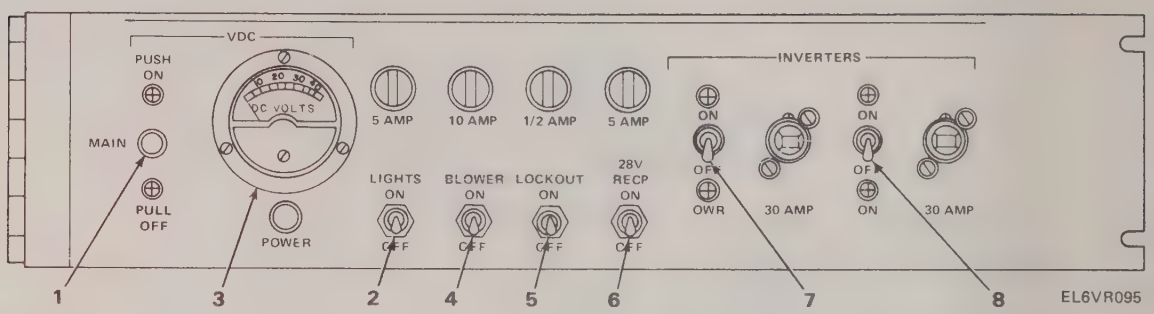

EL6VR100

Set power supply ON-OFF switch (1) to ON.

**2-26. PREOPERATIONAL EQUIPMENT SETTINGS.** (CONT)

AN/GRC-122/142 PLAIN AND C MODELS

Power Distribution Panel SB-3018/GRC-142




DC Operation

1. Set MAIN circuit breaker (1) to ON.
2. Set LIGHTS switch (2) to ON.

**NOTE**

For lights to work with shelter door open, blackout switch must be pulled out.

3. Observe DC VOLTS meter (3) for a 28-volt indication.

**NOTE**

Adjustment of vehicle throttle may be required to maintain 28 vdc for all modes of operation.

On power supply voltmeter, a low 28-volt indication in ac only mode indicates a low ac input to shelter. Check ac power meter on curbside wall for 115 vac indication.

4. Set BLOWER switch (4) to ON, as required to cool shelter.
5. Set LOCK-OUT switch (5) to ON.
6. Set 28 V RECP switch (6) to ON.
7. Set INVERTERS OWR switch (7) to OFF.
8. Set INVERTERS DX switch (8) to OFF.

AC Operation

1. Set MAIN circuit breaker (1) to OFF.
2. Set LIGHTS switch (2) to ON.

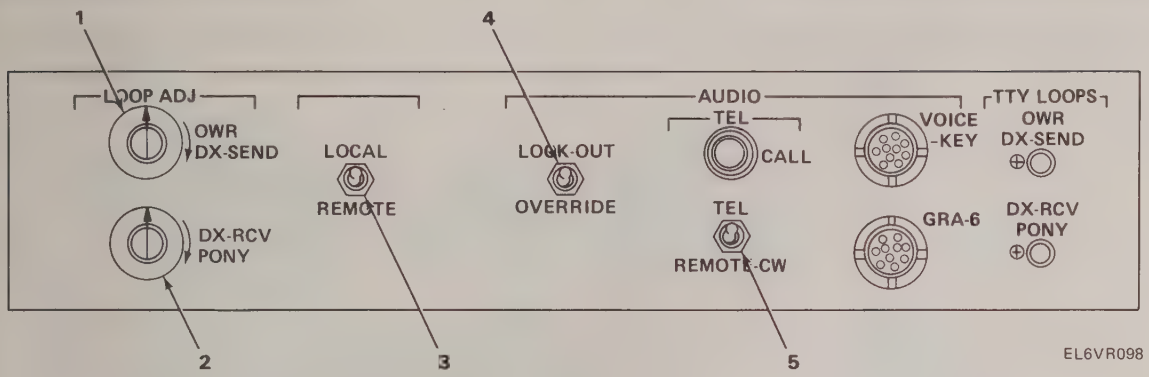
**NOTE**

For lights to work with shelter door open, blackout switch must be pulled out.

3. Set BLOWER switch (4) to ON, as required, to cool shelter.
4. Set LOCK-OUT switch (5) to ON.

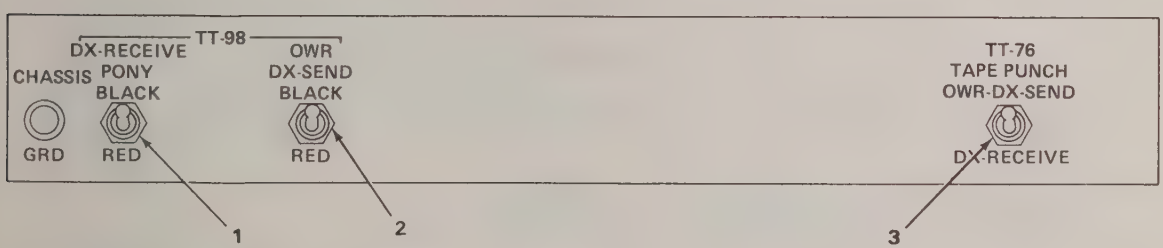
**2-26. PREOPERATIONAL EQUIPMENT SETTINGS.** (CONT)

Control Panel SA-1554/GRC-142




1. Turn LOOP ADJ OWR-DX-SEND control (1) to midrange.
2. Turn LOOP ADJ DX-RCV-PONY control (2) to midrange.
3. Set LOCAL-REMOTE switch (3) to LOCAL.
4. Set LOCK-OUT-OVERRIDE switch (4) to LOCK-OUT.
5. Set AUDIO TEL REMOTE-CW switch (5) to TEL (used on early models only).

Switch Box SA-1555/GRC-142

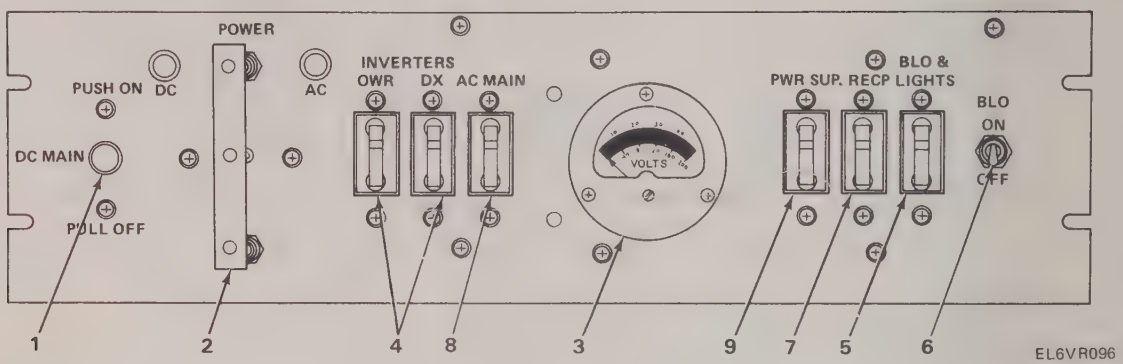



1. Set TT-98 DX-RECEIVE-PONY BLACK-RED switch (1) to BLACK.
2. Set TT-98 OWR-DX-SEND BLACK-RED switch (2) to BLACK.
3. Set TT-76 TAPE PUNCH OWR-DX-SEND/DX-RECEIVE switch (3) to OWR-DX-SEND.

## 2-26. PREOPERATIONAL EQUIPMENT SETTINGS. (CONT)

AN/GRC-122/142A AND B MODELS

Power Distribution Panel SB-3358/GRC-142




DC Operation

1. Set DC MAIN circuit breaker (1) to ON.
2. Set POWER switch (2) to DC position.
3. Observe VOLTS meter (3) for a 28-volt indication.
4. Set INVERTERS OWR and DX (AN/GRC-122(*) models only) circuit breaker (4) to ON.
5. Set BLO & LIGHTS circuit breaker (5) to ON.

**NOTE**

For lights to work with shelter door open, blackout switch must be pulled out.

Adjustment of vehicle throttle may be required to maintain 28 vdc for all modes of operation.

6. Set BLO ON-OFF switch (6) as required to cool shelter.
7. Set RECP circuit breaker (7) to ON (energizes 28-volt receptacle).

AC Operation

1. Set DC MAIN circuit breaker (1) to OFF.
2. Set POWER switch (2) to AC.
3. Set AC MAIN circuit breaker (8) to ON.
4. Observe VOLTS meter (3) for 115 vac ± 10 percent.
5. Set PWR SUP circuit breaker (9) to ON.

**NOTE**

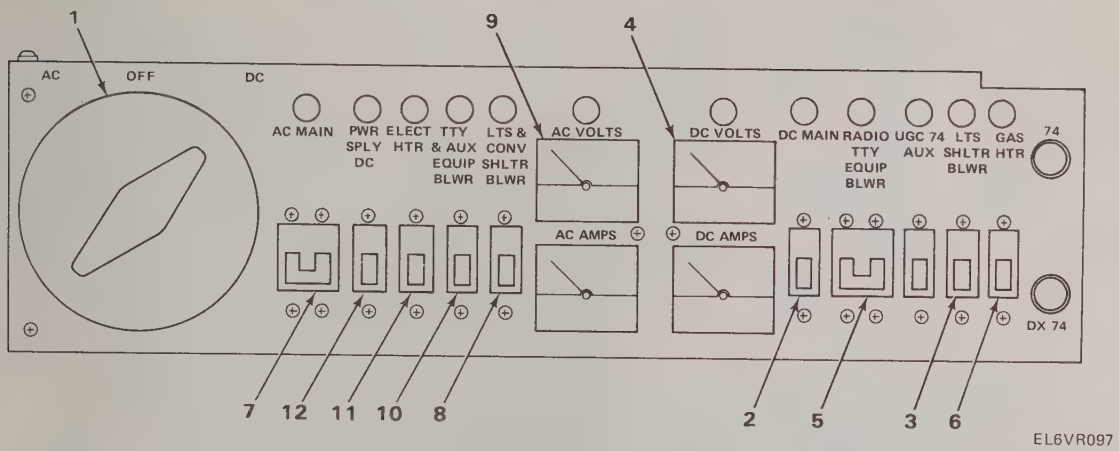
For lights to work with shelter door open, blackout switch must be pulled out.

6. Set dc power supply PP-4763(*)/GRC to ON (page 2-86).
7. Set BLO & LIGHTS circuit breaker (5) to ON.
8. Set BLO ON-OFF switch (6) as required to cool shelter.

**2-26. PREOPERATIONAL EQUIPMENT SETTINGS.** (CONT)

AN/GRC-122/142D AND E MODELS

Power Distribution Panel SC-F-960672




EL6VR097

DC Operation

1. Set AC-OFF-DC switch (1) to DC position.
2. Set DC MAIN circuit breaker (2) to ON.
3. Set LTS SHLTR BLWR circuit breaker (3) to ON.
4. Observe DC VOLTS meter (4) for 28-volt indication.
5. Set RADIO TTY EQUIP BLWR circuit breaker (5) to ON and observe DC VOLTS meter for 28-volt indication.
6. Set GAS HTR circuit breaker (6) to ON as required.

**NOTE**

Adjustment of vehicle throttle may be required to maintain 28 vdc for all modes of operation.

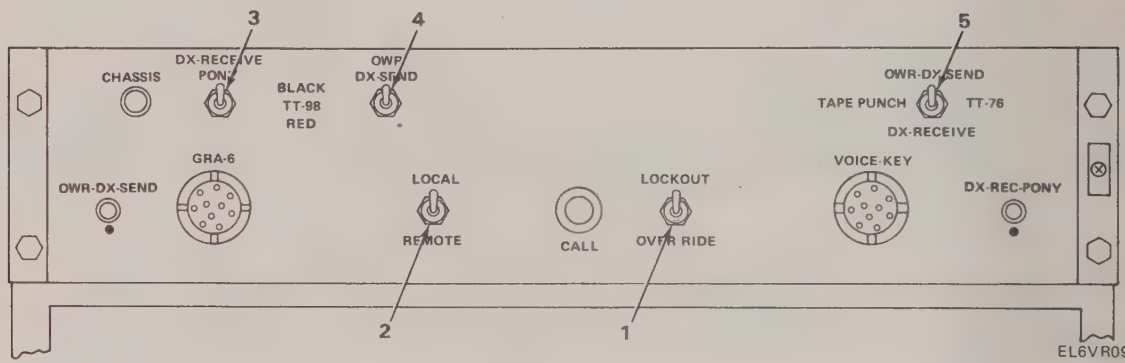
AC Operation

1. Set AC-OFF-DC switch (1) to AC position.
2. Set AC MAIN circuit breaker (7) to ON and observe AC VOLTS meter for 115 volt ± 10 percent indication.
3. Set LTS & CONV SHLTR BLWR circuit breaker (8) to ON.
4. Observe AC VOLTS meter (9) for 115 volt ± 10 percent indication.
5. Set TTY & CONV SHLTR BLWR circuit breaker (10) to ON.
6. Set ELECT HTR circuit breaker (11) to ON if required.
7. Set PWR SPLY DC circuit breaker (12) to ON.

**2-26. PREOPERATIONAL EQUIPMENT SETTINGS.** (CONT)

AN/GRC-122/142A, B, D, AND E MODELS

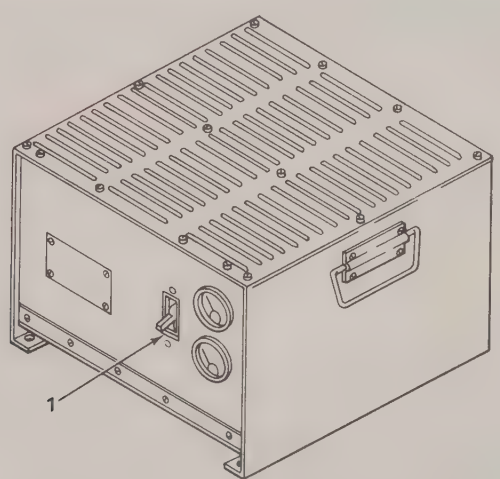
Switch Assembly SA-1650/GRC




1. Set LOCKOUT-OVER RIDE switch (1) to LOCKOUT.
2. Set LOCAL-REMOTE switch (2) to LOCAL.
3. Set TT-98 DX-RECEIVE PONY BLACK-RED switch (3) to BLACK.
4. Set TT-98 OWR-DX-SEND BLACK-RED switch (4) to BLACK.
5. Set TT-76/TAPE PUNCH/OWR-DX-SEND/DX-RECEIVE switch (5) to OWR-DX-SEND.

Power Supply PP-4763(*)/GRC

Power supply is used only in ac operation to supply dc power.



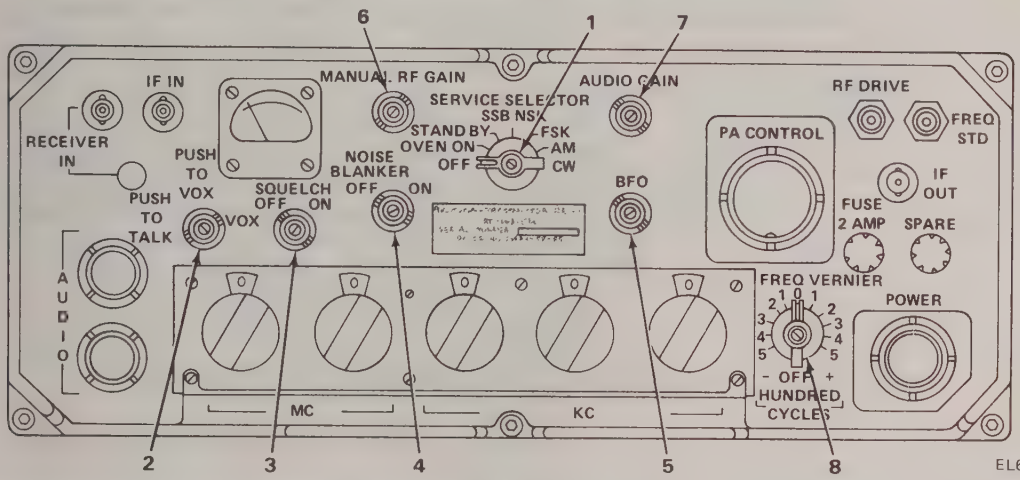

Set power supply ON-OFF switch (1) to ON and observe voltmeter for 28 vdc.

**2-26. PREOPERATIONAL EQUIPMENT SETTINGS.** (CONT)

EQUIPMENT SETTINGS COMMON TO ALL MODELS

Radio Receiver-Transmitter RT-662/GRC and Duplex RT-662/GRC

RT-662/GRC can be replaced with RT-834/GRC. All control settings are the same for RT-662/GRC, duplex RT-662/GRC (used in AN/GRC-122(*) models) and RT-834/GRC.




EL6VR101

1. Set SERVICE SELECTOR switch (1) to OVEN ON.

**NOTE**

Allow 10 minutes for RT-662/GRC to warm up.

2. Set VOX switch (2) to PUSH TO TALK.
3. Turn SQUELCH control (3) to OFF.

**NOTE**

If operating in a mode other than CW or FSK, SQUELCH control can be adjusted to operator's preference.

4. Set NOISE BLANKER switch (4) to OFF.

**NOTE**

Some models of RT-662/GRC do not contain NOISE BLANKER switch.

5. Turn BFO control (5) to midrange.
6. Turn MANUAL RF GAIN control (6) fully clockwise.
7. Turn AUDIO GAIN control (7) to midrange.
8. Set FREQUENCY VERNIER switch (8) to OFF.

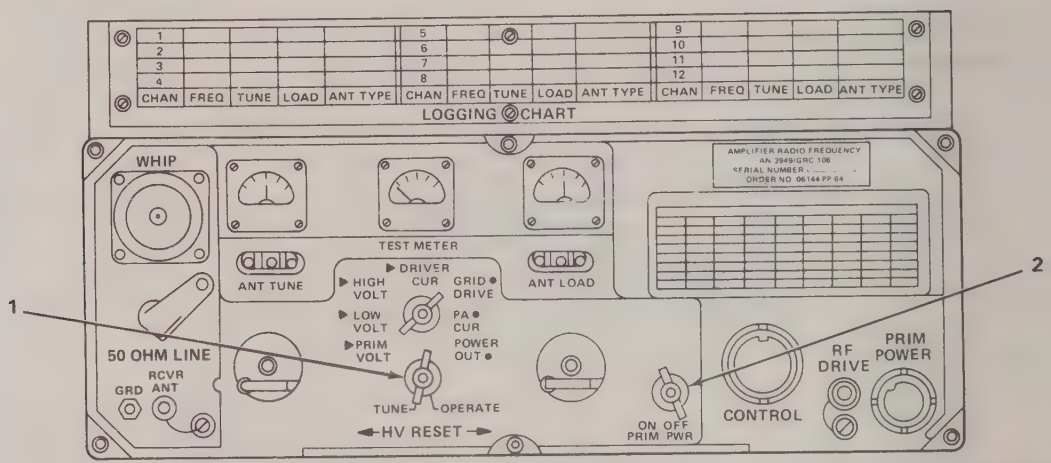
**CAUTION**

In duplex or owr operation (AN/GRC-122(*) models only), transmitting frequency of radio set must differ from receiving duplex RT-662/GRC frequency by 10 percent or 1 MHz. Tune duplex RT-662/GRC to desired frequency before keying radio set. This must be done even if RT-662/GRC is not turned on.

## 2-26. PREOPERATIONAL EQUIPMENT SETTINGS. (CONT)

EQUIPMENT SETTINGS COMMON TO ALL MODELS (CONT)

Amplifier AM-3349/GRC-106




EL6VR102

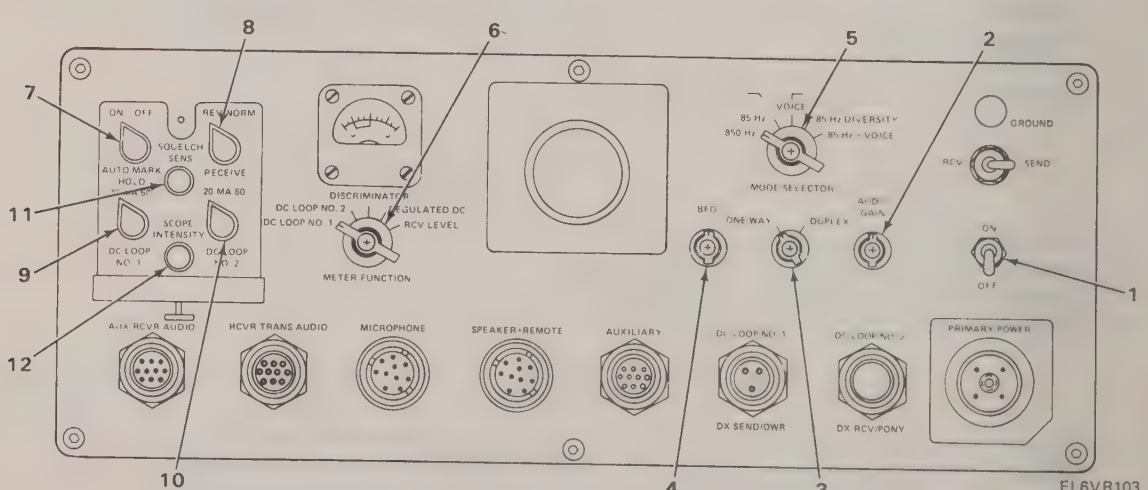
1. Set HV RESET switch (1) to OPERATE.

**CAUTION**

Use minimum turning force when setting ON-OFF PRIM PWR switch to avoid breaking switch shaft.

2. Set PRIM PWR switch (2) to OFF.

MODEM MD-522(*)/GRC




EL6VR103

**2-26. PREOPERATIONAL EQUIPMENT SETTINGS.** (CONT)

## CAUTION

Ensure modem RCV-SEND switch is set to RCV before energizing modem.

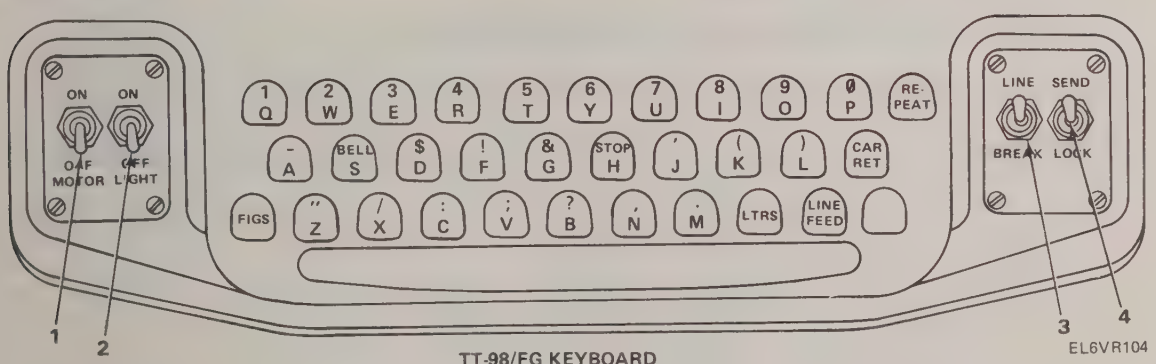
1. Set ON-OFF switch (1) to ON.
2. Turn AUDIO GAIN control (2) to midrange.
3. Set ONE WAY-DUPLEX switch (3) to ONE WAY.
4. Turn BFO control (4) to midrange.
5. Set MODE SELECTOR switch (5) to VOICE.
6. Set METER FUNCTION switch (6) to REGULATED DC and check for 20 vdc on meter.
7. Set AUTO MARK/HOLD switch (7) to ON.
8. Set RECEIVE-REV-NORM switch (8) to NORM.
9. Set DC LOOP NO. 1 switch (9) to 20 or 60 ma.
10. Set DC LOOP NO. 2 switch (10) to 20 or 60 ma.
11. Turn SQUELCH SENS fully counterclockwise.
12. Turn SCOPE INTENSITY control (12) to midrange.

## NOTE

If you have security equipment, install and energize secure equipment.

Teletypewriter TT-98/FG and Duplex TT-98/FG

All control settings are the same for TT-98/FG and duplex TT-98/FG. TT-98/FG is used in AN/GRC-122/142 Plain, A, and B models. An additional duplex TT-98/FG is used in AN/GRC-122 Plain, A, and B models.




TT-98/FG KEYBOARD

1. Set MOTOR switch (1) to OFF.
2. Set LIGHT switch (2) to OFF.
3. Set LINE-BREAK switch (3) to LINE.
4. Set SEND-LOCK switch (4) to SEND.

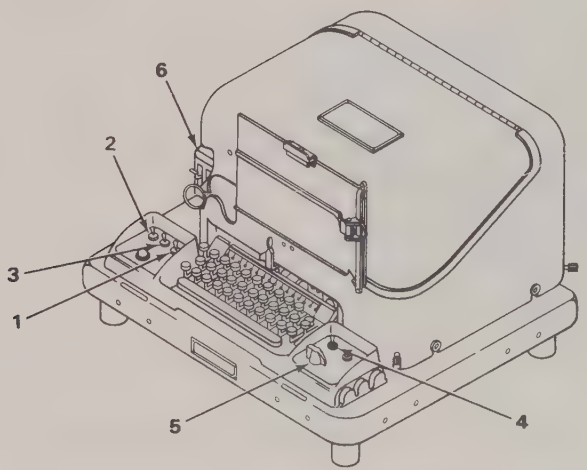
## NOTE

On TT-722(*)/TG set keyboard lock in forward position toward operator.

**2-26. PREOPERATIONAL EQUIPMENT SETTINGS.** (CONT)

EQUIPMENT SETTINGS COMMON TO ALL MODELS (CONT)

Teletypewriter TT-76(*)/GGC

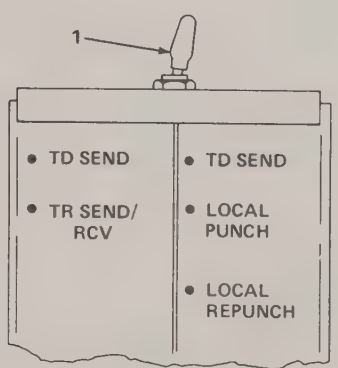



EL6VR105

1. Set POWER switch (1) to OFF.
2. Set MOTOR switch (2) to OFF.
3. Set LIGHT switch (3) to OFF.
4. Set KEYBOARD switch (4) to SEND.
5. Set SELECTOR switch (5) to 1.
6. Set START-STOP-FEED RETRACT lever (6) to FEED RETRACT.

Low-Level Signaling Device TT-523/GGC

Low-level signaling device is mounted to rear of TT-76(*)/GGC. It is used when operating in a secure mode.



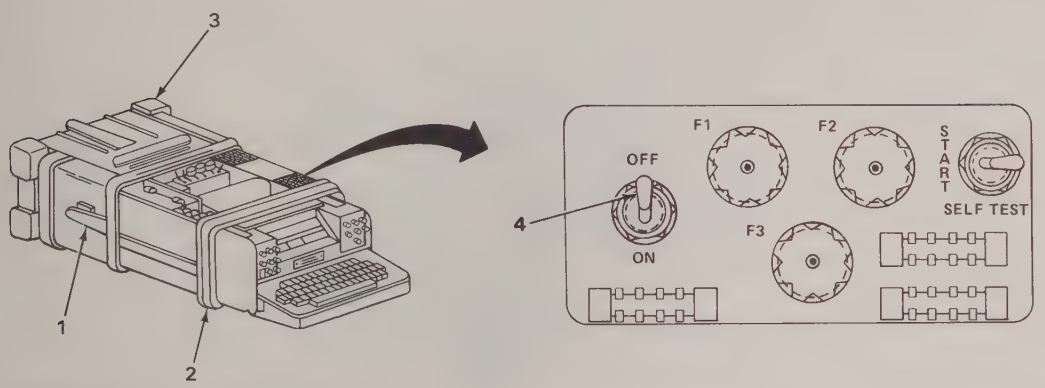

EL6VR106

Set TT-523/GGC switch (1) to TD SEND-TR SEND/RCV.

**2-26. PREOPERATIONAL EQUIPMENT SETTINGS.** (CONT)

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

AN/UGC-74A(V)3 is used in AN/GRC-122/142C, D, and E models.




EL6VR112

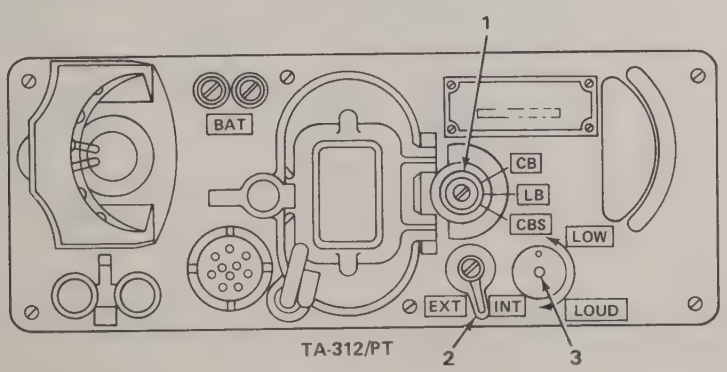
## CAUTION

When extending AN/UGC-74A(V)3, be careful not to break attaching cables that feed through rear of case.

1. Unlatch two case latches (1) and slide AN/UGC-74A(V)3 (2) from case (3).
2. Set ON-OFF switch (4) to OFF.
3. While AN/UGC-74A(V)3 is extended, do procedures given in paragraph 2-28.

Telephone Set TA-312/PT

A second TA-312/PT is supplied for remote operation. All controls and indicators are the same.




TA-312/PT

EL6VR113

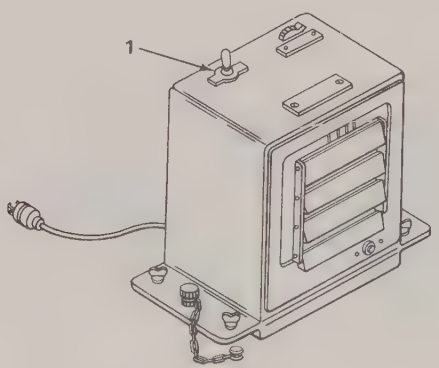
1. Set selector switch (1) to LB.
2. Set INT-EXT switch (2) to INT.
3. Turn LOUD control (3) fully clockwise.

**2-26. PREOPERATIONAL EQUIPMENT SETTINGS.** (CONT)

EQUIPMENT SETTINGS COMMON TO ALL MODELS (CONT)

Electric Heater

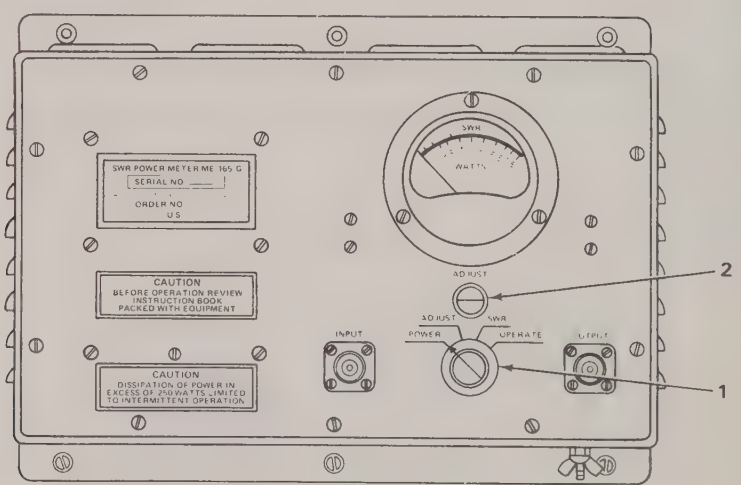
Electric heater is used in ac only mode of operation.




EL6VR114

Set heater ON-OFF switch (1) to OFF or ON as required.

Standing-Wave-Ratio Power Meter ME-165/G



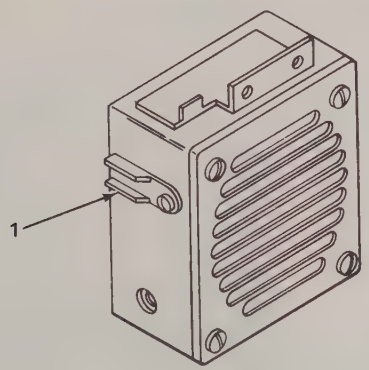

EL6VR116

1. Set function switch (1) to POWER.
2. Turn ADJUST knob (2) fully counterclockwise.

**2-26. PREOPERATIONAL EQUIPMENT SETTINGS.** (CONT)

Loudspeaker LS-166/U and Duplex LS-166/U

Duplex LS-166/U is used on AN/GRC-122(*) models. Control setting is the same.

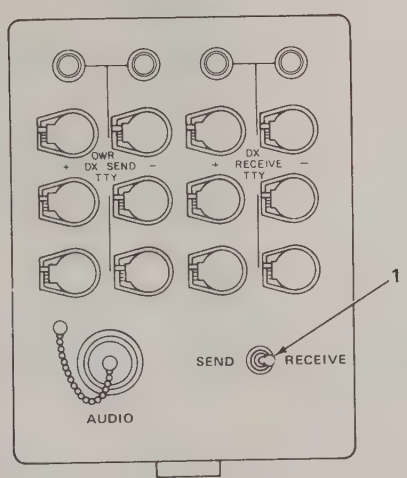



EL6VR115

Set VEHICLE-PACKSET switch (1) to VEHICLE.

Remote Control Box C-7279/GRC-142

Perform initial settings on remote box when performing remote operation.




EL6VR117

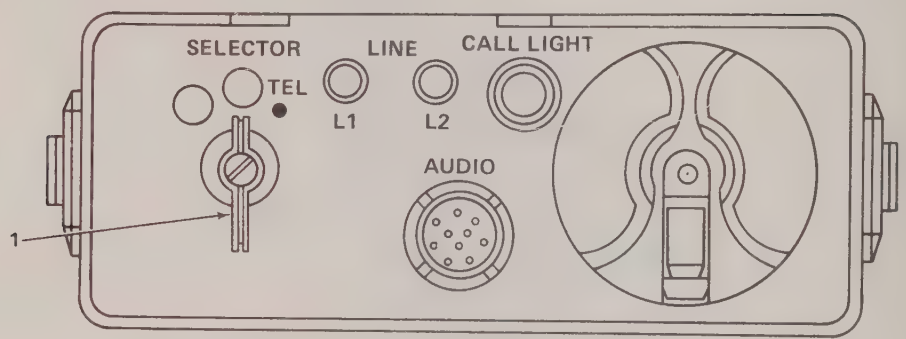
Set SEND-RECEIVE switch (1) to RECEIVE.

**2-26. PREOPERATIONAL EQUIPMENT SETTINGS.** (CONT)

EQUIPMENT SETTINGS COMMON TO ALL MODELS (CONT)

Remote Control C-433/GRC

Perform initial settings on remote control for remote operation.

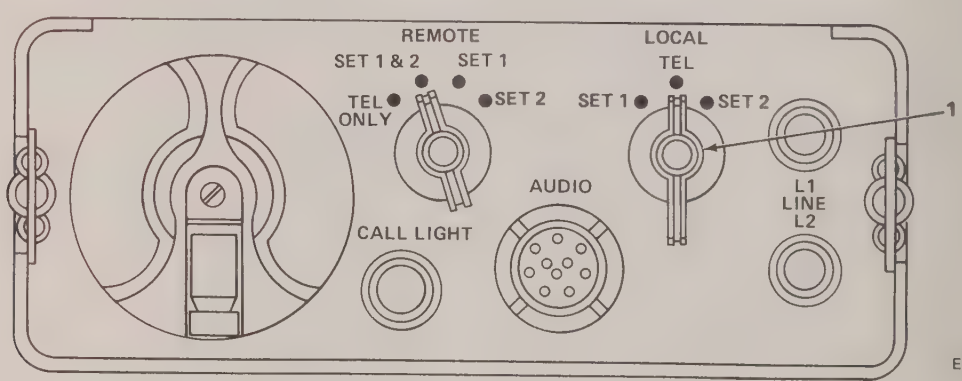



EL6VR118

Set SELECTOR switch (1) to TEL.

Local Control C-434/GRC

Perform initial settings on local control for remote operation.



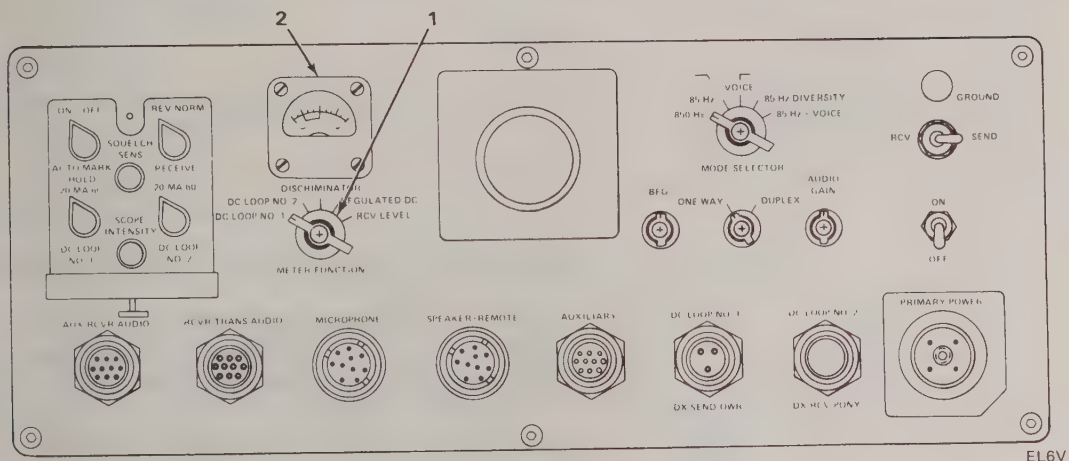

EL6VR119

Set LOCAL switch (1) to TEL ONLY.

## 2-27. PREOPERATIONAL EQUIPMENT CHECKS.

MODEM MD-522(*)/GRC REGULATED DC CHECK

Check that modem is receiving 28 vdc for proper operation as given below:



EL6VR120

1. Set METER FUNCTION switch (1) to REGULATED DC.
2. Check that 20 vdc is indicated on voltmeter (2).

### NOTE

If 20 vdc is not indicated on voltmeter, go to troubleshooting.

OWR-DX-SEND TTY LOOP CURRENT ADJUSTMENT

Check that owr loop current is 20 or 60 ma as given below.

### NOTE

If remote tty's are being used, set control panel LOCAL-REMOTE switch to REMOTE before performing adjustment.

1. Set METER FUNCTION switch (1) to DC LOOP NO. 1.
2. Check that 20 or 60 ma is indicated on meter (2).

### NOTE

If 20 or 60 ma is not indicated on meter, turn LOOP ADJ OWR-DX-SEND CONTROL, located on control panel, for a 20 or 60 ma indication. If control has no effect, go to troubleshooting.

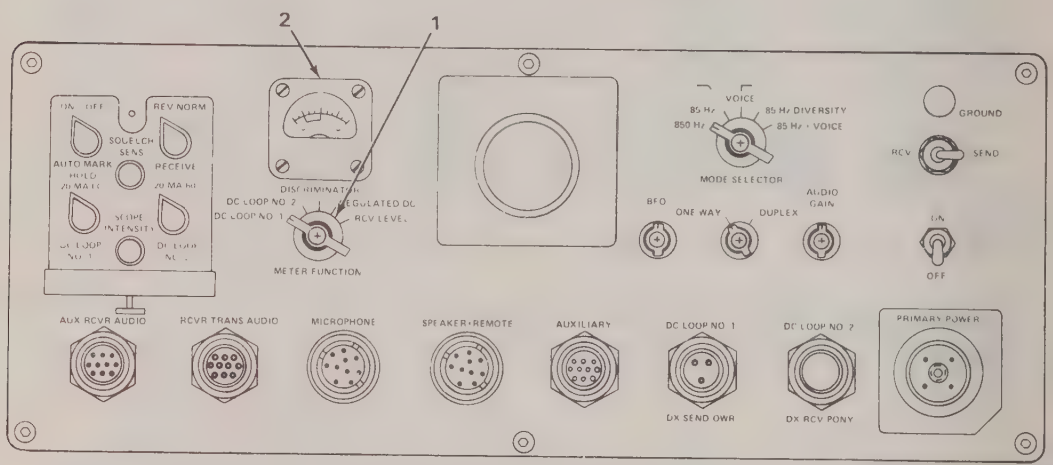
## 2-27. PREOPERATIONAL EQUIPMENT CHECKS. (CONT)

DX-RECEIVE-PONY LOOP CURRENT ADJUSTMENT (USED ON AN/GRC-122(*) MODELS ONLY)

Check that duplex pony loop current is 20 or 60 ma as given below.

### NOTE

If remote tty's are being used, set control panel LOCAL-REMOTE switch to REMOTE before performing adjustment.




EL6VR120

1. Set modem METER FUNCTION switch (1) to DC LOOP NO. 2.
2. Check that 20 or 60 ma is indicated on meter (2).

### NOTE

If 20 or 60 ma is not indicated on meter, turn LOOP ADJ DX-RCV-PONY control, located on control panel (on AN/GRC-122/142 Plain and C models only), for a 20 or 60 ma indication. If control has no effect, go to troubleshooting.

## 2-28. OPERATION AND SELF-TEST OF COMMUNICATIONS TERMINAL AN/UGC-74A(V)3.

AN/UGC-74A(V)3 system has three operational states and five nonoperational conditions.

Operational states are operator selectable. These states are the only states in which AN/UGC-74A(V)3 is capable of operating as a communications terminal.
The three operational states are:

Receive Only (RO)
Keyboard Send/Receive (KSR)
Intelligent Communication Terminal (ICT).

In each operational state, AN/UGC-74A(V)3 is capable of receiving messages. In KSR and ICT, AN/UGC-74A(V)3 is also capable of transmitting messages.

The five nonoperational conditions of AN/UGC-74A(V)3 are:

OFF Condition (POWER switch set to OFF)
Cold Start (power applied to terminal)
Operation Validation/State Determination (system initialization)
Battery Backup (prime power removed)
Self-Test (system readiness check).

A detailed description of operation, operational states, and their associated switch positions are given in TM 11-5815-602-12.

The following procedure is an example of AN/UGC-74A(V)3 installed in a link, with the link having specific requirements.

LINK REQUIREMENTS

Parity: Odd
State: ICT
Communications Interface: LO DATA
Data Format: NRC
Transmission Speed: 45.5
Communication Clock Source: Internal
Clock Edge: Positive (+)
Figure S/J: Not applicable in ASCII
Data Input: Noninverted data
No. of Stop Bits in Data Format: One
Data Character Set: BAUDOT

Refer to TM 11-5815-602-12 and set controls and switches of AN/UGC-74A(V)3 according to link requirements given.

**2-28. OPERATION AND SELF-TEST OF COMMUNICATIONS TERMINAL AN/UGC-74A(V)3.** (CONT)

OPERATION VALIDATION/STATE DETERMINATION CONDITION MESSAGE

Set POWER switch to ON. AN/UGC-74A(V)3 prints the following operation/state determination condition message:

SYSTEM INITIALIZED

SWITCH STATE = ICT
OPERATIONAL STATE = ICT
OPERATING CAPACITY = FULL
MODE = BAUDOT
BAUD RATE = 45.5
STOP BITS = 1
END OF LINE OPTION = 0D 0D 0A
SPACE OPTION = ON
LINE LENGTH = 80
LINE FEEDS = 1
RECEIVE ENVELOPE OPTION = :
TRANSMIT ENVELOPE OPTION = :
BELL OPTION = FIGURES S

Operator can verify switch positions, determined by link requirements, from printed message.

**NOTE**

To change to operation of AN/UGC-74A(V)3, set POWER switch to OFF, set applicable switches, then set POWER switch to ON.

SELF-TEST

In self-test condition, AN/UGC-74A(V)3 performs a series of tests on its circuitry, with operator assistance, to determine operational readiness of system. If at any time a test fails, system will (if possible) print out a fail message and cite assembly being tested at time of failure. All testing stops during self-test when a test fails, and operator must notify organizational maintenance. Perform self-test as given in TM 11-5815-602-12.

Perform lamp test and keyboard test as given in TM 11-5815-602-12.

To set parameters, refer to TM 11-5815-602-12.

## 2-29. TUNING PROCEDURE.

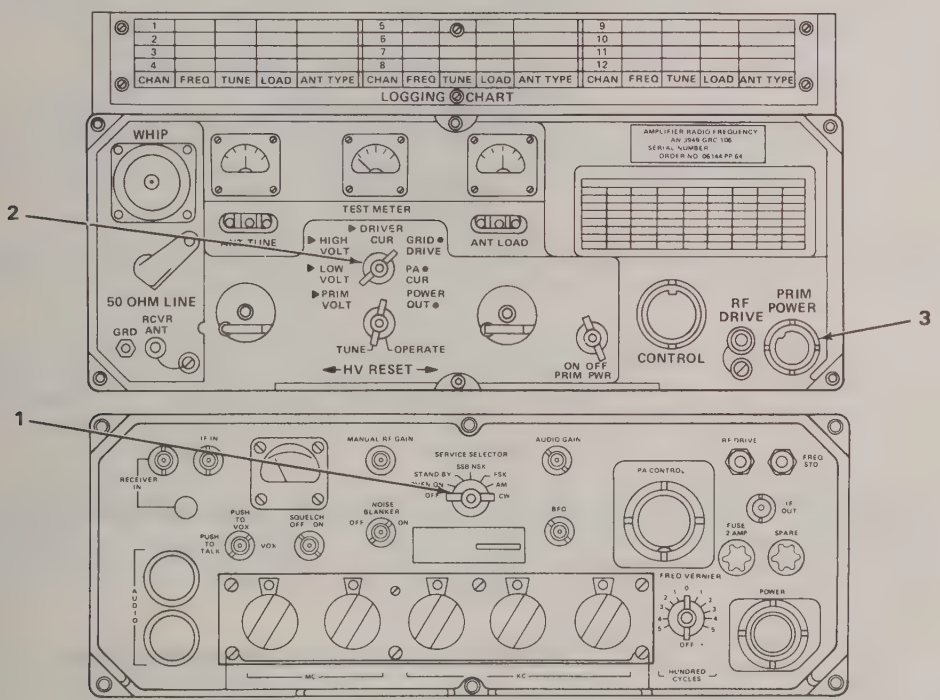
Tuning procedure given applies to any mode of operation (ssb nsk, fsk, am, or cw) for which radio operates. Transmitter tuning procedures given vary slightly when using whip or doublet antenna. Perform all preoperational equipment settings (para 2-26) and preoperational equipment checks (para 2-27) prior to tuning radio set. For tuning radio set to a desired operating frequency with doublet antenna, see page 2-103 and for whip antenna, proceed as follows:

TUNING PROCEDURE USING WHIP ANTENNA

### CAUTION

To prevent damage, do not key radio set until instructed.

Receiving frequency of duplex RT-662/GRC (AN/GRC-122(*) models only) must differ from radio set transmitting frequency by 10 percent or 1 MHz, whichever is greater. This applies even though duplex RT-662/GRC may not be turned on. Always tune radios before they are operated (keyed).




EL6VR121

1. Set RT-662/GRC SERVICE SELECTOR switch (1) to STANDBY.

### NOTE

Check that signal level meter goes to right.

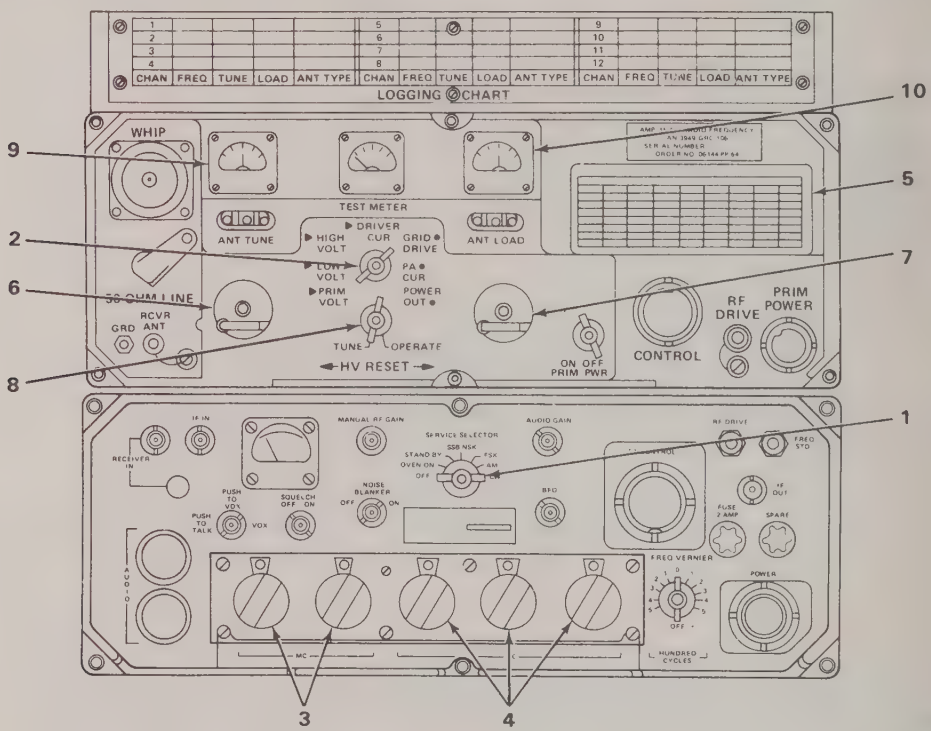
2. Set amplifier TEST METER switch (2) to PRIM VOLT.
3. Set amplifier PRIM PWR switch (3) to ON.

**2-29. TUNING PROCEDURE.** (CONT)

TUNING PROCEDURE USING WHIP ANTENNA (CONT)

## NOTE

Allow radio set 90 seconds to warm up. Observe that amplifier blowers are energized and signal level meter indicates to extreme right of meter scale. If blower or meter does not operate, refer to higher level of maintenance.




EL6VR122

4. Set RT-662/GRC SERVICE SELECTOR switch (1) to any mode of operation (SSB NSK, FSK, AM, or CW).

## NOTE

Check that RT signal level meter returns to extreme left of meter scale.

Check that modem test meter indicates within area of two dark green wedges. If meter does not indicate properly, return SERVICE SELECTOR switch to STANDBY for 90 seconds. If meter still does not indicate properly, refer to higher level of maintenance.

5. Set amplifier TEST METER switch (2) to PRIM VOLT.

6. Turn RT-662/GRC MHz (3) and kHz (4) controls, observing digits directly above, until desired operating frequency is reached.

**2-29. TUNING PROCEDURE.** (CONT)

7. Use antenna tuning and loading chart (5) according to selected operating frequency and type of antenna being used to obtain settings of ANT LOAD and ANT TUNE counters.

8. Adjust amplifier ANT TUNE control (6) to setting determined in step 6.

9. Adjust amplifier ANT LOAD control (7) to setting determined in step 6.

**CAUTION**

Be sure antenna is attached for proper loading to prevent damage to equipment.

When using HV RESET switch, it should not stay in TUNE position for more than 2 minutes. When more than 2 minutes are required, move HV RESET switch to OPERATE position and SERVICE SELECTOR switch to STANDBY, for a 5 minute cooling. After 5 minutes of cooling, reset controls to previous positions and continue with procedure.

**NOTE**

ANT TUNE and ANT LOAD controls will interact with each other. To center their meter needles, rotate controls slowly in direction opposite of meter needle deflection.

10. Set amplifier HV RESET switch (8) to TUNE. Wait for a deflection on ANT TUNE (9) and ANT LOAD (10) meters.

11. Adjust ANT TUNE control (6) and ANT LOAD control (7) for center scale meter readings. Adjust ANT LOAD control first.

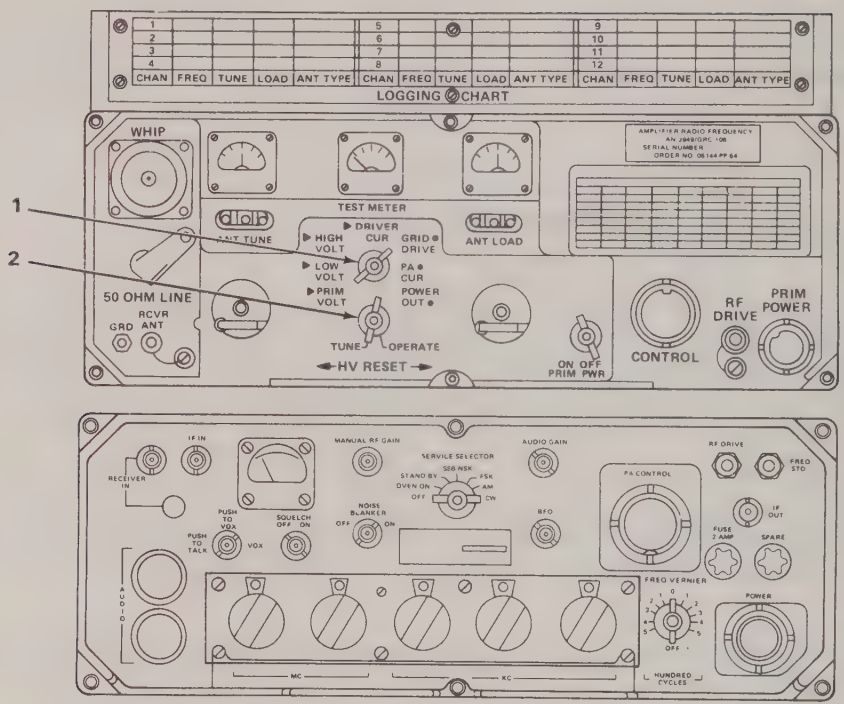
**NOTE**

Tuning amplifier is complete when simultaneous center scale readings are obtained on ANT TUNE and ANT LOAD meters. TEST METER needle indicates just below gray portion of scale. If meter needles will not indicate center scale, refer to TM 11-5820-520-12.

12. Perform steps 13 through 19 before 2 minute period is up.

## 2-29. TUNING PROCEDURE. (CONT)

TUNING PROCEDURE USING WHIP ANTENNA (CONT)




EL6VR123

13. Set amplifier TEST METER switch (1) to LOW VOLT. Check that TEST METER needle indicates within green portion of top scale. If indication is abnormal, refer to TM 11-5820-520-12.

14. Set amplifier TEST METER switch (1) to HIGH VOLT. Check that TEST METER needle indicates within green portion of top scale. If indication is abnormal, refer to TM 11-5820-520-12.

15. Set amplifier TEST METER switch (1) to DRIVER CUR. Check that TEST METER needle indicates within the two dark green wedges of top scale. If indication is abnormal, refer to TM 11-5820-520-12.

16. Set amplifier TEST METER switch (1) to GRID DRIVE. Check that TEST METER needle indicates just below (to the left of) gray portion of bottom scale. If indication is abnormal, refer to TM 11-5820-520-12.

**2-29. TUNING PROCEDURE.** (CONT)

17. Set amplifier TEST METER switch (1) to PA CUR. Check that TEST METER needle indicates just below (to the left of) gray portion of bottom scale. If indication is abnormal, refer to TM 11-5820-520-12.

18. Set amplifier TEST METER switch (1) to POWER OUT. Check that TEST METER needle indicates just below (to the left of) gray portion of scale. If indication is abnormal, refer to TM 11-5820-520-12.

19. Set amplifier HV RESET switch (2) to OPERATE.

**NOTE**

ANT TUNE and ANT LOAD counter setting should be logged on logging chart with a pencil when tuning has been completed. Logged settings can be used for future tuning references unless ANT TUNE and ANT LOAD meter needles indicate in red portion of scale during operation. If settings cannot be used, retune radio set.

Radio set is now properly tuned for any mode of operation using a whip antenna. To conserve power when receiving only, amplifier switch should be set to OFF. To resume operation, set amplifier PRIM PWR switch to ON. Set HV RESET switch to TUNE for 60 seconds, then set to OPERATE. Radio set is now ready for operation.

TUNING PROCEDURE USING DOUBLET ANTENNA

**CAUTION**

Be sure antenna is attached for proper loading to prevent damage to equipment.

When using HV RESET switch, it should not stay in TUNE position for more than 2 minutes. When more than 2 minutes are required, move HV RESET switch to OPERATE and SERVICE SELECTOR switch to STAND BY for a 5 minute cooling. After 5 minutes of cooling, reset controls to previous positions and continue with procedure.

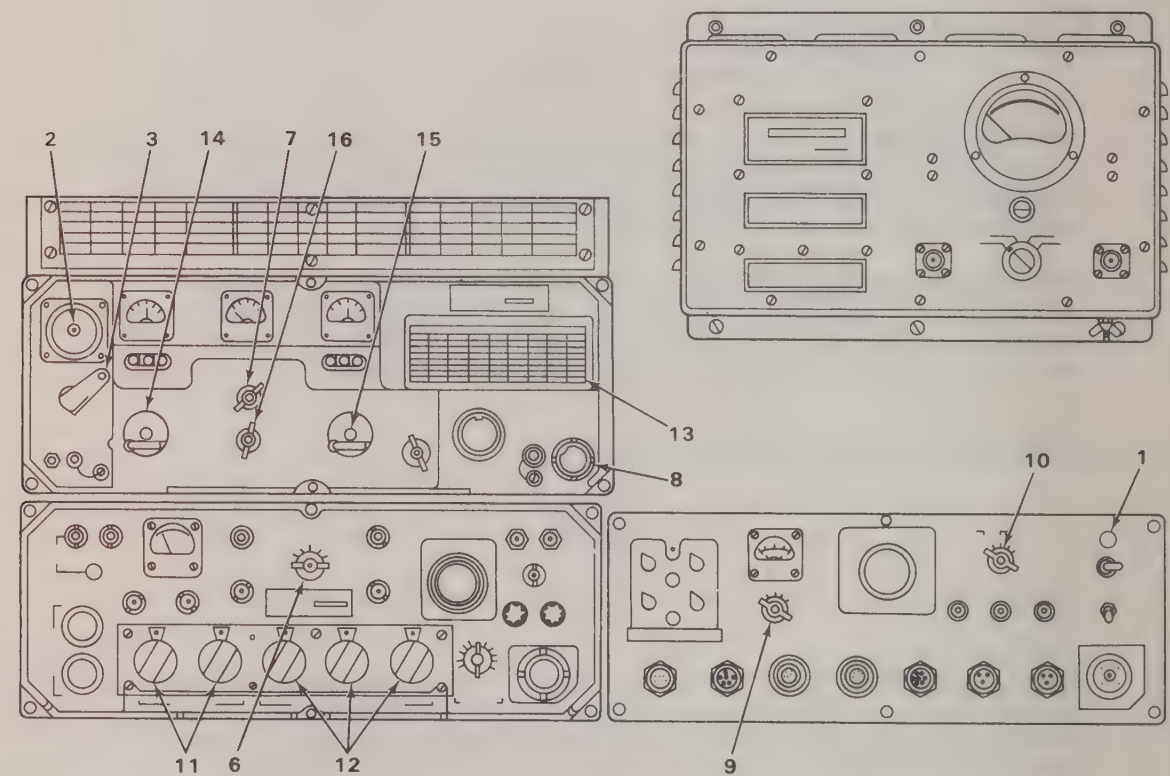
**NOTE**

ANT TUNE and ANT LOAD controls will interact with each other. To center meter needles, rotate controls slowly in direction opposite meter needle deflection.

**2-29. TUNING PROCEDURE.** (CONT)

TUNING PROCEDURE USING DOUBLET ANTENNA (CONT)

Antenna group AN/GRA-50 (doublet antenna) is used in place of whip antenna for greater range and reliability. When doublet antenna is used, tuning procedure requires use of standing wave ratio power meter ME-165/G mounted on left wall of shelter.




EL6VR124

1. Check that modem RCV-SEND switch (1) is set to RCV.
2. Connect doublet lead-in (free end of cable assembly RF CG-678/U) to doublet connector on shelter.
3. Disconnect whip antenna (2) from amplifier.

**CAUTION**

Keying radio set will cause damage to equipment if whip and doublet antennas are connected at same time.

2-29. **TUNING PROCEDURE.** (CONT)

4. Connect CG-2568A/U rf cable from input side of ME-165/G to 50 OHM LINE connector (3) on amplifier.

5. Set ME-165/G FUNCTION switch (4) to POWER.

6. Rotate ME-165/G ADJUST control (5) fully counterclockwise.

7. Set RT-662/GRC SERVICE SELECTOR switch (6) to STAND BY.

8. Set amplifier TEST METER switch (7) to PRIM VOLT.

9. Set amplifier PRIM PWR switch (8) to ON.

**NOTE**

Allow radio set 90 seconds to warm up. Observe that amplifier blowers are energized and that signal level meter indicates in extreme right portion of meter scale. If blower or meter does not operate, refer to higher level of maintenance.

10. Set RT-662/GRC SERVICE SELECTOR switch (6) to SSB NSK.

11. Set modem METER FUNCTION switch (9) to RCV level.

12. Set modem MODE SELECTOR switch (10) to VOICE.

13. Turn RT-662/GRC MHz (11) and kHz (12) controls, observing digits directly above, until desired operating frequency is reached.

14. Use antenna tuning and loading chart (13) according to selected operating frequency and type of antenna being used, to obtain settings of ANT LOAD and ANT TUNE counters.

15. Adjust amplifier ANT TUNE control (14) to setting determined in step 14.

16. Adjust amplifier ANT LOAD control (15) to setting determined in step 14.

**CAUTION**

Be sure antenna is attached for proper loading to prevent damage to equipment.

When using HV RESET switch it should not stay in TUNE position for more than 2 minutes. When more than 2 minutes are required, move HV RESET switch to OPERATE position and SERVICE SELECTOR switch to STAND BY, for a 5 minute cooling. After 5 minutes of cooling, reset controls to previous positions and continue with procedure.

**NOTE**

ANT TUNE and ANT LOAD controls will interact with each other. To center meter needles, rotate controls slowly in direction opposite meter needle deflection.

17. Set amplifier HV RESET switch (16) to TUNE. Wait for a deflection on ANT TUNE and ANT LOAD meters.

**2-29. TUNING PROCEDURE.** (CONT)

TUNING PROCEDURE USING DOUBLET ANTENNA (CONT)

18. Adjust ANT TUNE control and ANT LOAD control for center scale meter readings. Adjust ANT LOAD control first.

**NOTE**

Tuning amplifier is complete when simultaneous center scale readings are obtained on ANT TUNE and ANT LOAD meters. TEST METER needle indicates just below gray portion of scale. If meter needles will not indicate center scale, refer to TM 11-5820-520-12.

19. Perform steps 19 through 35 before 2 minute period is up.
20. Set amplifier TEST METER switch to LOW VOLT. Check that TEST METER needle indicates within green portion of top scale. If indication is abnormal, refer to TM 11-5820-520-12.
21. Set amplifier TEST METER switch to HIGH VOLT. Check that TEST METER needle indicates within green portion of top scale. If indication is abnormal, refer to TM 11-5820-520-12.
22. Set amplifier TEST METER switch to DRIVER CUR. Check that TEST METER needle indicates within the two dark green wedges of top scale. If indication is abnormal, refer to TM 11-5820-520-12.
23. Set amplifier TEST METER switch to GRID DRIVE. Check that TEST METER needle indicates just below (to the left of) gray portion of bottom scale. If indication is abnormal, refer to TM 11-5820-520-12.
24. Set amplifier TEST METER switch to PA CUR. Check that TEST METER needle indicates just below (to the left of) gray portion of bottom scale. If indication is abnormal, refer to TM 11-5820-520-12.
25. Set amplifier TEST METER switch to POWER OUT. Check that TEST METER needle indicates just below (to the left of) gray area of scale. If indication is abnormal, refer to TM 11-5820-520-12.

**NOTE**

Check that power meter has a reading of approximately 75 to 100 watts.

26. Set amplifier HV RESET switch to OPERATE.

**CAUTION**

Never turn ME-165/G FUNCTION switch when amplifier HV RESET switch is set to TUNE position.

**NOTE**

ANT TUNE and ANT LOAD counter setting should be logged on logging chart with a pencil when tuning has been completed. Logged settings can be used for future tuning references unless ANT TUNE and ANT LOAD meter needles indicate in red portion of scale during operation. If settings cannot be used, retune radio set.

Radio set is now properly tuned for any mode of operation using a doublet antenna. To conserve power when receiving only, amplifier switch should be set to OFF. To resume operation, set amplifier PRIM PWR switch to ON. Set HV RESET switch to TUNE for 60 seconds, then set to OPERATE. Radio set is now ready for operation.

**2-29. TUNING PROCEDURE.** (CONT)

27. Set RT-662/GRC SERVICE SELECTOR switch to CW.
28. Set modem RCV/SEND switch to SEND.
29. Readjust ANT TUNE and ANT LOAD controls so that ANT TUNE and ANT LOAD meter needles indicate in green (center) portion of scales.
30. Check that power meter indicates 200 watts ± 10 percent.
31. Set modem RCV/SEND switch to RCV.
32. Set power meter FUNCTION switch to OPERATE.
33. Set amplifier HV RESET switch to TUNE.
34. Readjust ANT TUNE and ANT LOAD controls so that ANT TUNE and ANT LOAD meter needles indicate in green (center) position of scales.
35. Turn amplifier HV RESET switch to OPERATE.
36. Set modem RCV/SEND switch to SEND.
37. Readjust ANT TUNE and ANT LOAD controls so that ANT TUNE and ANT LOAD meter needles indicate in green (center) position of scales.
38. Set modem RCV/SEND switch to RCV.
39. Turn power meter FUNCTION switch to ADJUST.
40. Set modem RCV/SEND switch to SEND.
41. Adjust power meter ADJUST control for full scale deflection. Do not exceed 600 mark.
42. Set modem RCV/SEND switch to RCV.
43. Set power meter FUNCTION switch to SWR.
44. Set modem RCV/SEND switch to SEND.
45. Check that indication on lower scale of power meter is in green area. (Green area indicates an acceptable VSWR.) This rating should not exceed 2:1.

**CAUTION**

Always unkey radio set before working on antenna system. Do not leave RCV/SEND switch in SEND longer than it takes to look at scale of power meter. Before making adjustment on antenna, evacuate shelter to prevent accidental keying of radio set.

Never apply keying power for more than 10 minutes while power meter is in POWER position and SERVICE SELECTOR switch on RT-662/GRC is in CW position.

**NOTE**

Incorrect reading usually indicates incorrect antenna length which requires physical correction of antenna wire.

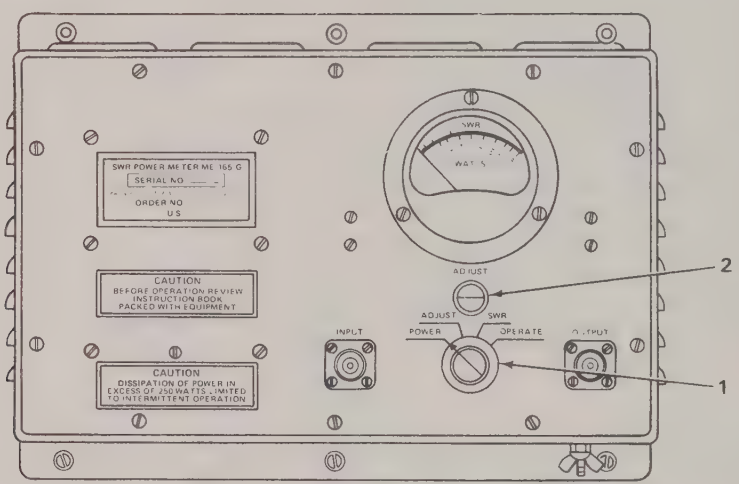
46. Set modem RCV/SEND switch to RCV.
47. Set power meter FUNCTION switch to OPERATE.
48. Set modem MODE SELECTOR switch to mode of operation desired.
49. Log ANT TUNE and ANT LOAD counter settings on logging chart for future tuning reference.

## 2-30. OPERATION DURING RADIO SILENCE AND OUTPUT POWER MEASUREMENT.

The procedures in this paragraph are performed to provide an operational shelter during radio silence. Output power measurement is used when no radio traffic is permitted and accidental keying of radio set may occur. Following are two procedures: operation with doublet antenna and operation with whip antenna. Perform these procedures in conjunction with applicable starting procedures (para 2-25) and radio tuning procedures (para 2-29).

POWER OUTPUT MEASUREMENT WITH DOUBLET ANTENNA

1. Perform applicable portions of preoperational procedures (para 2-24), and preoperational equipment settings (para 2-26).




EL6VR116

2. Set ME-165/G function switch (1) to POWER.
3. Turn ME-165/G ADJUST control (2) fully counterclockwise.
4. Perform tuning procedure (para 2-29).

### NOTE

When maintaining radio silence, disregard instructions to change setting of ME-165/G function switch from POWER position. Vswr measurements cannot be made during radio silence.

5. Perform desired mode of operation (Local OWR Operation, para 2-32 or Remote Operation, para 2-34).
6. ME-165/G meter indications for various modes of operation should be approximately as given below:

| MODE OF OPERATION | ME-165/G METER READING |
|---|---|
| CW | 200 watts |
| SSB Voice | 200 watts |
| Compatible AM. | 100 watts |
| FSK, or Voice Plus NSK | 200 watts |
| NSK | 200 watts |

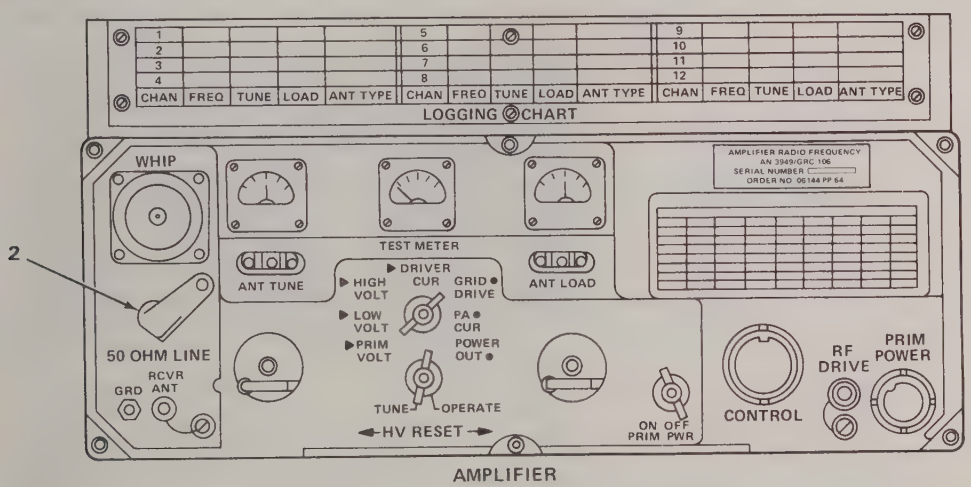
**2-30. OPERATION DURING RADIO SILENCE AND OUTPUT POWER MEASUREMENT.** (CONT)

POWER OUTPUT MEASUREMENT WITH WHIP ANTENNA

1. Perform applicable portions of preoperational procedures (para 2-24) and preoperational equipment settings (para 2-26).
2. Set ME-165/G function switch (1) to POWER.

## CAUTION

Do not change ME-165/G function switch from POWER position when performing this procedure. Changing function switch position removes load from transmitter and can damage equipment.




## WARNING

Dangerous voltages exist at amplifier 50 ohm line and whip antenna connectors. Care must be taken when working around these connectors to prevent electrical shock to personnel.

## CAUTION

When cable assembly CG-2568A/U is connected to amplifier, whip antenna must be disconnected to prevent equipment damage. This cable is located on roadside wall next to amplifier and terminates at power meter.

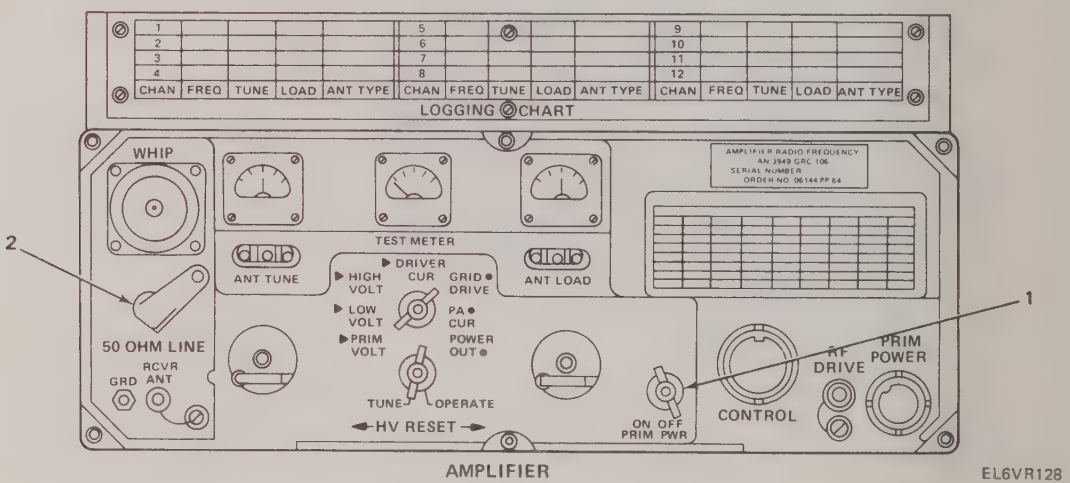
3. Disconnect whip antenna.
4. Connect cable assembly CG-2568A/U to amplifier 50 ohm line connector (2).
5. Perform tuning procedure (para 2-29) for whip antenna.
6. Perform desired mode of operation (Local OWR Operation, parâ 2-32 or Remote Operation, para 2-34).

**2-30. OPERATION DURING RADIO SILENCE AND OUTPUT POWER MEASUREMENT.** (CONT)

POWER OUTPUT MEASUREMENT WITH WHIP ANTENNA (CONT)

7. ME-165/G meter indications for various modes of operation should be approximately as given below:

| MODE OF OPERATION | ME-165/G METER READING |
|---|---|
| CW | 200 watts |
| SSB Voice | 200 watts (varies with voice input) |
| Compatible AM. | 100 watts (varies with voice input) |
| FSK, or Voice + NSK | 200 watts |
| NSK | 200 watts |




8. Set amplifier PRIM PWR switch (1) to OFF.

## WARNING

Dangerous voltages exist at amplifier 50 ohm line and whip antenna connectors. Care must be taken when working around these connectors to prevent electrical shock to personnel.

9. Disconnect cable assembly CG-2568A/U from 50 OHM LINE connector (2).

10. Reconnect whip antenna.

11. Perform tuning procedure (para 2-29) before attempting to transmit.

## 2-31. OPERATION.

Radio tty sets AN/GRC-122/142(*) may be operated either locally or remotely. Only owr operation is possible when operating AN/GRC-142(*) models. AN/GRC-122(*) models provide duplex (simultaneous transmission and reception) operation. Remote duplex voice operation of AN/GRC-122(*) models is not possible.

When operating AN/GRC-122(*) shelter, there are two RT-662/GRC radios. RT-662/GRC located on top rack, roadside front wall, is referred to as RT-662/GRC and is used mainly for owr operations. The second RT-662/GRC, located on top rack, center front wall, is referred to as duplex RT-662/GRC and is used mainly for duplex operations.

Always set modem RCV/SEND switch to RCV after message is sent.

Perform applicable operating procedure for mode of operation selected according to paragraphs 2-32 through 2-34.

## 2-32. LOCAL OWR OPERATION.

Perform applicable portions of preoperational procedures, equipment settings, equipment checks, and tuning procedure (para 2-24 through 2-29) before attempting any mode of local owr operation. For AN/GRC-122/142C, D, and E models, prepare AN/UGC-74 for operation (para 2-28).

The two modes of local owr operation are voice and tty operation. Perform operating procedure applicable to mode of local owr operation selected.

### NOTE

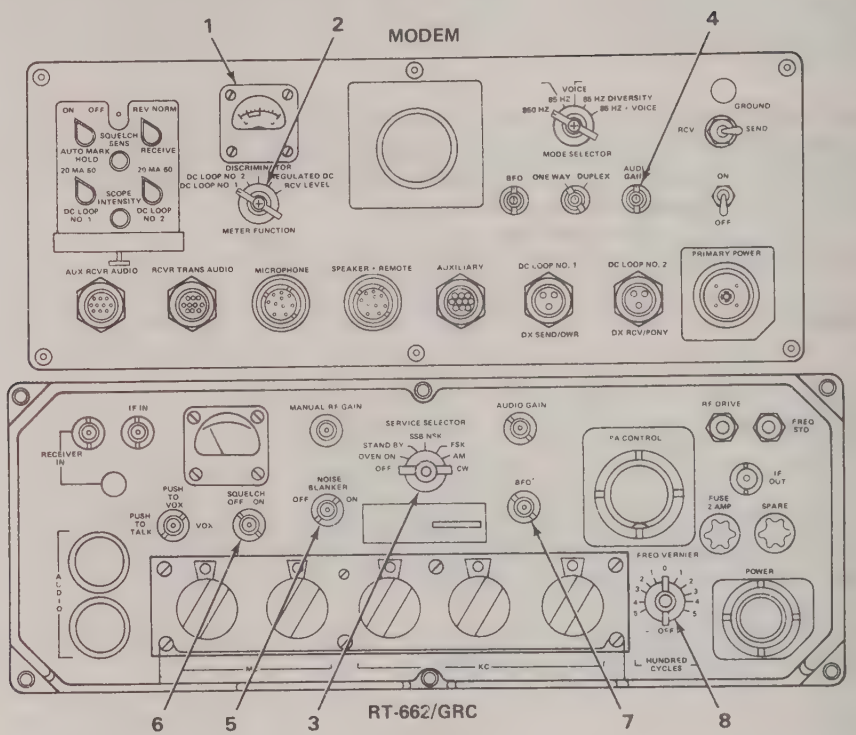
RT-662/GRC MANUAL RF GAIN control setting should not be altered unless RT-662/GRC is being operated in close proximity (10 miles or less) with another radio set. MANUAL RF GAIN control can then be rotated to some counterclockwise position that provides an indication on signal level meter that is roughly one or two divisions below full level indication of received signal strength. This will reduce background noise and minimize adjacent channel interference when not receiving a signal. Rotating MANUAL RF GAIN control counterclockwise makes RT-662/GRC less sensitive to receiving a signal. If operating frequency or location is changed, MANUAL RF GAIN control should be returned to its maximum clockwise position to ensure signals are not lost. MANUAL RF GAIN is not usually used when operating in a tty net.

Modem MD-522A/GRC automatic mark-hold circuit automatically switches tty to standby (mark-hold condition) when noise on incoming radio signal becomes so great that no meaningful information can be received. This circuit is energized by setting modem MARK-HOLD switch to ON.

Modem squelch circuit disables monitor speaker (connected to SPEAKER and REMOTE connector) when noise on incoming radio signal becomes so great that no meaningful information can be received. Squelch level is controlled by setting of SQUELCH SENS control.

## 2-32. LOCAL OWR OPERATION. (CONT)

LOCAL OWR CW, SSB VOICE, AND COMPATIBLE AM VOICE




EL6VR129

Setup Procedures

1. Check that modem test meter (1) indicates 20 vdc.

### NOTE

Audio output level of RT-662/GRC must be maintained within receive limits indicated on modem test meter to ensure proper modem operation. This level is indicated on modem test meter when modem METER FUNCTION switch is set to RCV LEVEL in any reception mode. If received level is not within receive limits, adjust RT-662/GRC AUDIO GAIN control for proper meter reading.

2. Set modem METER FUNCTION switch (2) to RCV LEVEL.

### NOTE

In cw mode, transmitted rf signal is 2 kHz higher than frequency indicated by RT-662/GRC MC and KC controls.

**2-32. LOCAL OWR OPERATION.** (CONT)

3. Set RT-662/GRC SERVICE SELECTOR switch (3) for mode of operation desired.

| SWITCH POSITION | OPERATION |
|---|---|
| CW | cw operation |
| SSB NSK | ssb voice operation |
| AM | compatible am. |

4. Adjust modem AUDIO GAIN control (4) for a comfortable listening level.

**NOTE**

If ignition-type (pulse) noise is heard in received signal, set RT-662/GRC NOISE BLANKER switch to ON. A 1 second automatic gain control (agc) delay occurs when NOISE BLANKER switch is set to ON. If noise blanking does not help reception, set NOISE BLANKER switch to OFF. Some models of RT-662/GRC do not contain a noise blanker switch.

5. Set RT-662/GRC NOISE BLANKER switch (5) to ON or OFF as required.

**NOTE**

If noise level is undesirable in absence of received signals, set RT-662/GRC SQUELCH switch to ON. In cw and fsk modes of operation, squelch is automatically disabled. When operating modem in nsk mode of operation, RT-662/GRC SQUELCH switch should be set to OFF. In am. or ssb mode of operation, with SQUELCH switch set to ON, audio output is not completely squelched with high noise levels. A low level of audio is always present to indicate that receiver portion of RT-662/GRC is operating.

6. Set RT-662/GRC SQUELCH switch (6) to ON or OFF as required.

Reception

**NOTE**

Audio output level of RT-662/GRC must be maintained within receive limits indicated on modem test meter to ensure proper modem operation. If received level is not within receive limits, adjust RT-662/GRC audio gain control for proper meter reading.

7. When receiving cw signals, adjust RT-662/GRC BFO control (7) for a clear tone.
8. When receiving ssb, compatible am., or cw signals from radio sets other than AN/GRC-106, adjust RT-662/GRC FREQ VERNIER control (8) for best possible reception.

Transmission

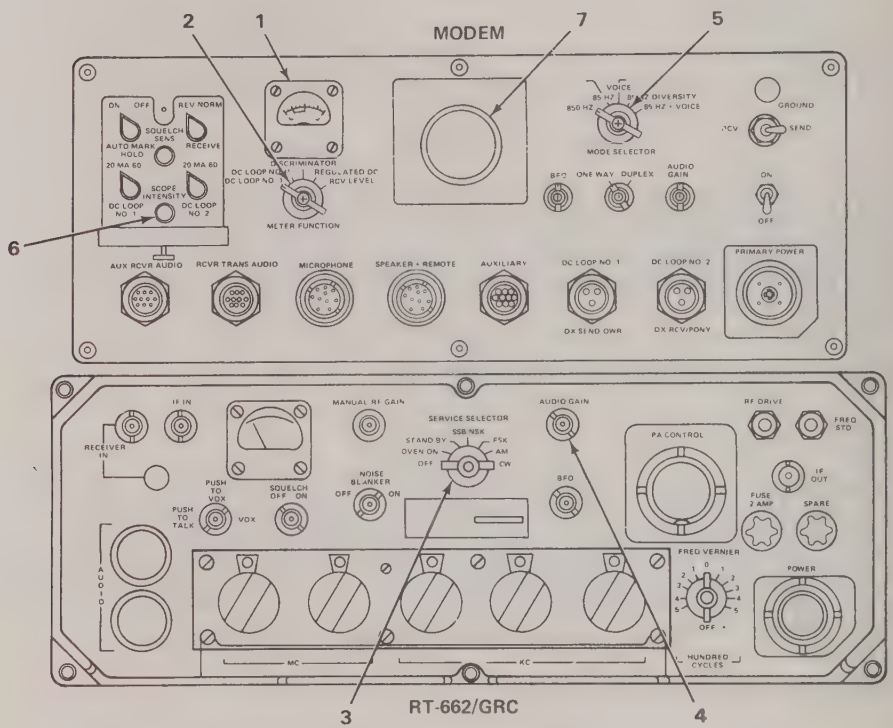
**NOTE**

Set LOCK-OUT OVERRIDE switch to OVERRIDE to transmit in steps 9 and 10.

9. To transmit ssb or compatible am., connect to switch assembly and operate microphone.
10. To transmit cw, connect to switch assembly and operate key telegraph.

## 2-32. LOCAL OWR OPERATION. (CONT)

LOCAL OWR TTY OPERATION, FSK (850 Hz), SSB NSK (85 Hz), 85 Hz DIVERSITY, OR 85 Hz + VOICE




EL6VR130

Setup Procedures

1. Check that modem test meter (1) indicates 20 vdc.

### NOTE

Audio output level of RT-662/GRC must be maintained within receive limits indicated on modem test meter to ensure proper modem operation. This level is indicated on modem test meter when modem METER FUNCTION switch is set to RCV LEVEL in any reception mode.

2. Set modem METER FUNCTION switch (2) to RCV LEVEL.

2-32. **LOCAL OWR OPERATION.** (CONT)

3. Set RT-662/GRC SERVICE SELECTOR switch (3) for mode of operation desired.

| SWITCH POSITION | OPERATION |
|---|---|
| SSB NSK | 85 Hz |
| SSB NSK | 85 Hz diversity |
| SSB NSK | 85 Hz + voice |
| FSK | 850 Hz |
| SSB NSK | 85 Hz |

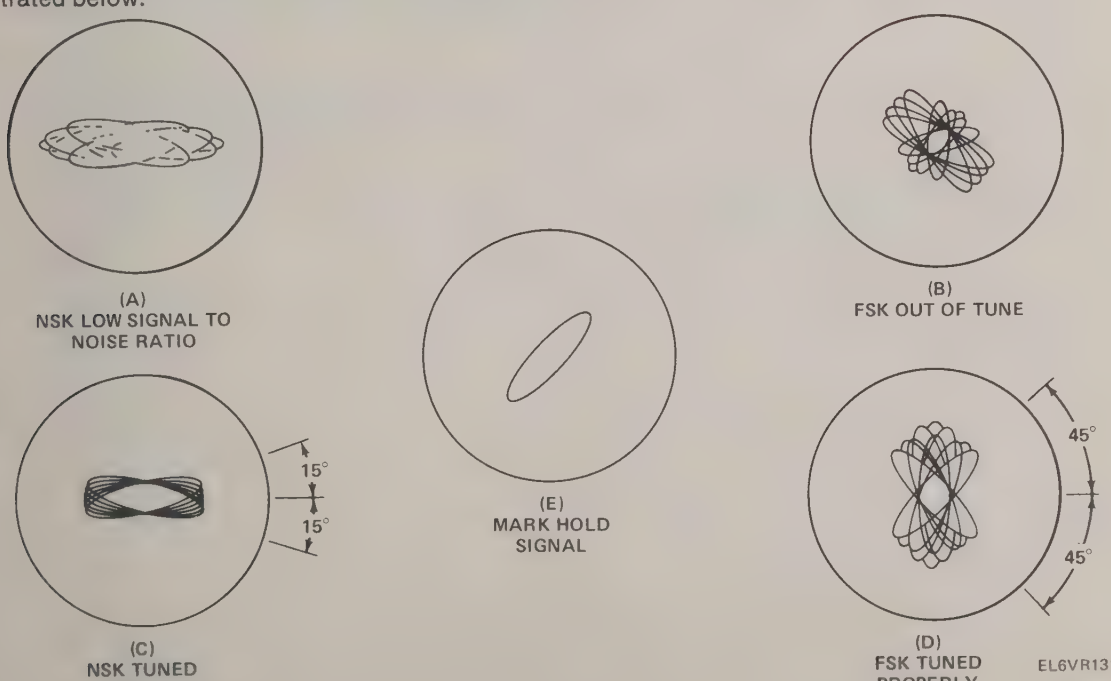
## CAUTION

Adjustment of RT-662/GRC AUDIO GAIN control for any indication to right of test meter RCV area will damage equipment.

4. Adjust RT-662/GRC AUDIO GAIN control (4) for modem test meter (1) needle indication within RCV level area.
5. Set modem MODE SELECTOR switch (5) for mode of operation desired.

| SWITCH POSITION | OPERATION |
|---|---|
| Voice | ssb nsk |
| 850 Hz | fsk operation |
| 85 Hz | nsk operation |
| 85 Hz DIVERSITY | nsk diversity |
| 85 Hz + VOICE | nsk plus voice |

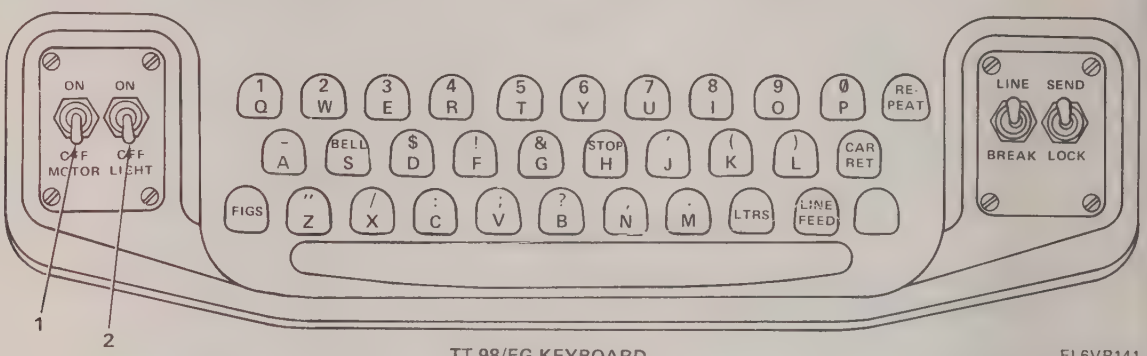
6. Set modem METER FUNCTION switch (2) to DC LOOP NO. 1 to monitor dc loop no. 1.
7. Adjust modem SCOPE INTENSITY control (6) for a clear indication on modem crt (7) as illustrated below.




CRT SIGNAL PATTERNS

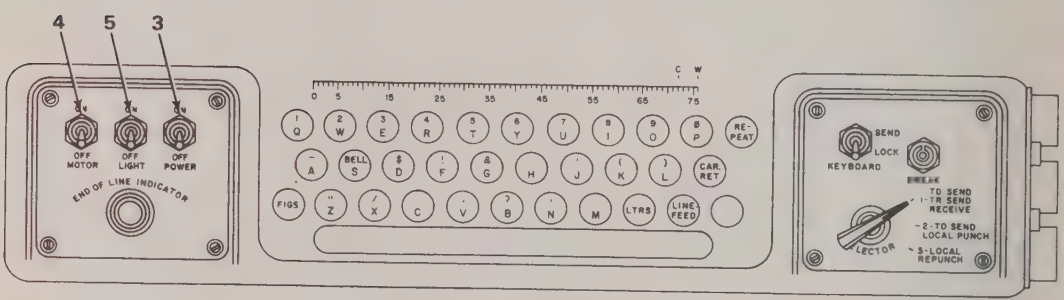
**2-32. LOCAL OWR OPERATION.** (CONT)

LOCAL OWR TTY OPERATION, FSK (850 Hz), SSB NSK (85 Hz), 85 Hz DIVERSITY, OR 85 Hz + VOICE (CONT)




TT-98/FG KEYBOARD

EL6VR141




TT-76(*)/GGC KEYBOARD

EL6VR152

8. Adjust modem BFO control for crt indication of two ellipses of equal amplitude for 850 Hz operation only.

9. When communicating with radio sets other than AN/GRC-106, adjust RT-662/GRC FREQ VERNIER control if necessary.

10. Adjust modem AUDIO GAIN control for a comfortable listening level.

**2-32. LOCAL OWR OPERATION.** (CONT)

Reception

**NOTE**

Audio output level of RT-662/GRC must be maintained within receive limits indicated on modem test meter to ensure proper modem operation. If received level is not within receive limits, adjust RT-662/GRC audio gain control for proper meter reading.

If operation and self-test on AN/UGC-74A(V)3 is completed (para 2-28), AN/UGC-74A(V)3 is ready for reception.

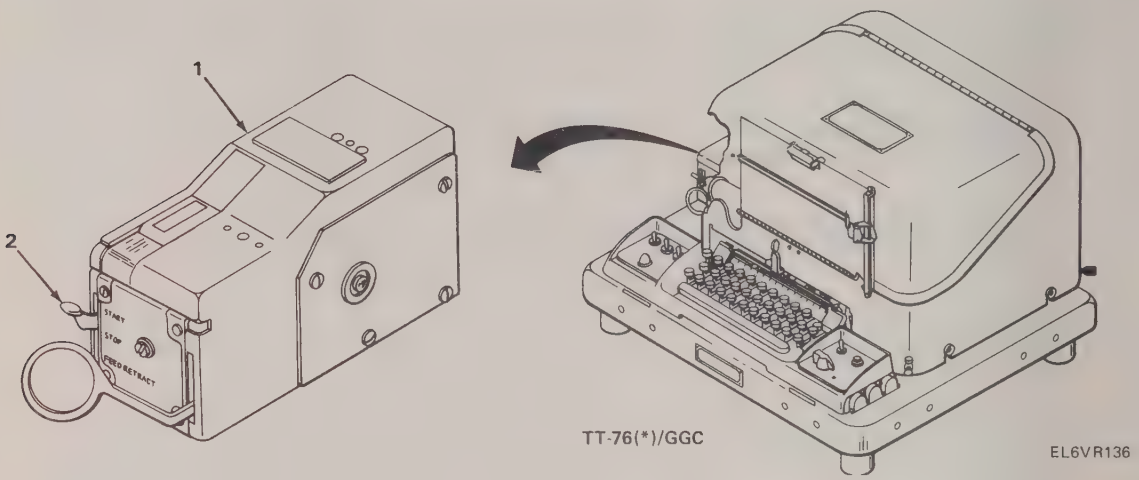
11. Set TT-98/FG MOTOR (1) and LIGHT (2) switches to ON to print page copy of received messages.

12. Set modem RECEIVE-REV/NORM switch to REV if garbled copy is received when operating in 850 Hz operation.

13. Set TT-76(*)/GGC POWER (3), MOTOR (4), and LIGHT (5) switches to ON, to make punched tape copy of received messages.

**2-32. LOCAL OWR OPERATION.** (CONT)

LOCAL OWR TTY OPERATION, FSK (850 Hz), SSB NSK (85 Hz), 85 Hz DIVERSITY, OR 85 Hz + VOICE (CONT)




Keyboard Transmission

**NOTE**

To transmit from TT-98/FG keyboard, do steps 14 and 15. To transmit from AN/UGC-74A(V)3 keyboard, do steps 14 and 16. To transmit from TT-76(*)/GGC keyboard, do steps 14 and 17. After a message is sent, always set modem RCV-SEND switch to RCV.

14. Set modem RCV-SEND switch to SEND.

15. Set TT-98/FG MOTOR and LIGHT switches to ON and operate keyboard.

16. Send message from AN/UGC-74A(V)3 as given in TM 11-5815-602-12.

17. Set TT-76(*)/GGC POWER, MOTOR, and LIGHT switches to ON and operate keyboard.

**2-32. LOCAL OWR OPERATION.** (CONT)

Punched Tape Transmission

18. Set TT-76(*)/GGC POWER, MOTOR, and LIGHT switches to ON.
19. Set TT-76(*)/GGC SELECTOR switch to position 2.
20. Insert prepared punched tape into TT-76(*)/GGC transmitter-distributor (1).
21. Repeat step 14.
22. Set TT-76(*)/GGC START-STOP-FEED RETRACT lever (2) to START.

**NOTE**

Always set modem RCV-SEND switch to RCV after message is sent.

It is not possible to receive nsk while transmitting voice, or transmit nsk while receiving voice during owr 85 Hz + voice operation.

85 Hz + Voice Transmission

23. Set modem MODE SELECTOR switch to 85 Hz + VOICE.
24. Set RT-662/GRC SERVICE SELECTOR switch to SSB NSK.
25. Perform procedures for reception, keyboard transmission, or punched tape transmission.

**NOTE**

Set LOCKOUT-OVERRIDE switch to OVERRIDE to transmit voice.

26. To transmit voice, connect microphone to switch assembly.

## 2-33. LOCAL DUPLEX OPERATION (AN/GRC-122(*) MODELS).

Perform applicable portions of preoperational procedures, equipment settings, and equipment checks (para 2-24 through 2-27) before attempting any mode of duplex operation. For AN/GRC-122C, D, and E models, prepare AN/UGC-74A(V)3 for operation (para 2-28).

The two modes of local duplex operation, are voice and tty operation. Perform operating procedure applicable to mode of local duplex operation selected.

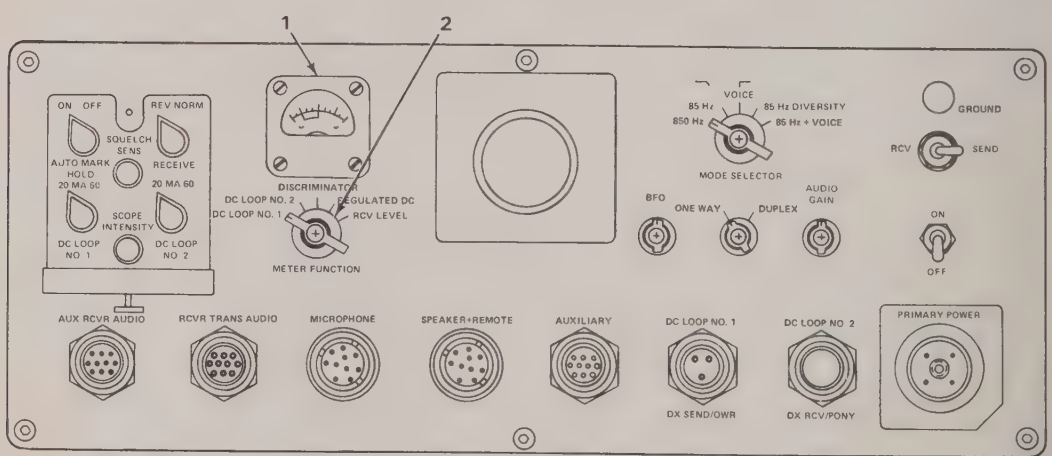
### NOTE

RT-662/GRC MANUAL RF GAIN control setting should not be altered unless RT-622/GRC is being operated in close proximity (10 miles or less) with another radio set. MANUAL RF GAIN control can then be rotated to some counterclockwise position that provides an indication on signal level meter that is roughly one or two divisions below full level indication of received signal strength. This will reduce background noise and minimize adjacent channel interference when not receiving a signal. Rotating MANUAL RF GAIN control counterclockwise makes RT-662/GRC less sensitive to receiving a signal. If operating frequency or location is changed, MANUAL RF GAIN control should be returned to its maximum clockwise position to ensure signals are not lost. MANUAL RF GAIN is not usually used when operating in a tty net.

Modem MD-522A/GRC automatic mark-hold circuit automatically switches tty to standby (mark-hold condition) when noise on incoming radio signal becomes so great that no meaningful information can be received. This circuit is energized by setting modem MARK-HOLD switch to ON.

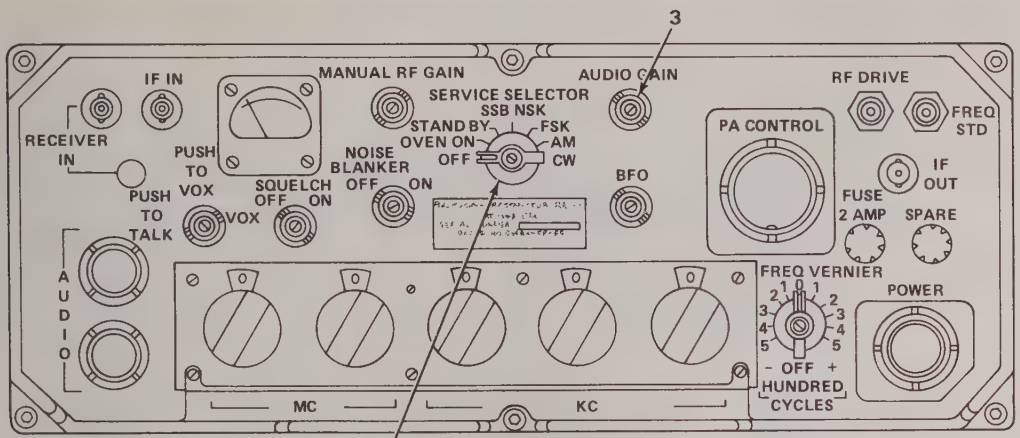
Modem squelch circuit disables monitor speaker (connected to SPEAKER and REMOTE connector) when noise on incoming radio signal becomes so great that no meaningful information can be received. Squelch level is controlled by setting of SQUELCH SENS control.

LOCAL DUPLEX CW, SSB VOICE, AND COMPATIBLE AM VOICE OPERATION




MODEM EL6VR137

## 2-33. LOCAL DUPLEX OPERATION (AN/GRC-122(*) MODELS). (CONT)




Setup Procedures

1. Check that modem test meter (1) indicates 20 vdc.

### NOTE

Audio output level of RT-662/GRC must be maintained within receive limits indicated on modem test meter to ensure proper modem operation. This level is indicated on modem test meter when modem METER FUNCTION switch is set to RCV LEVEL in any reception mode.

2. Set modem METER FUNCTION switch (2) to RCV LEVEL.

3. Adjust owr RT-662/GRC AUDIO GAIN control (3) completely counterclockwise.

### NOTE

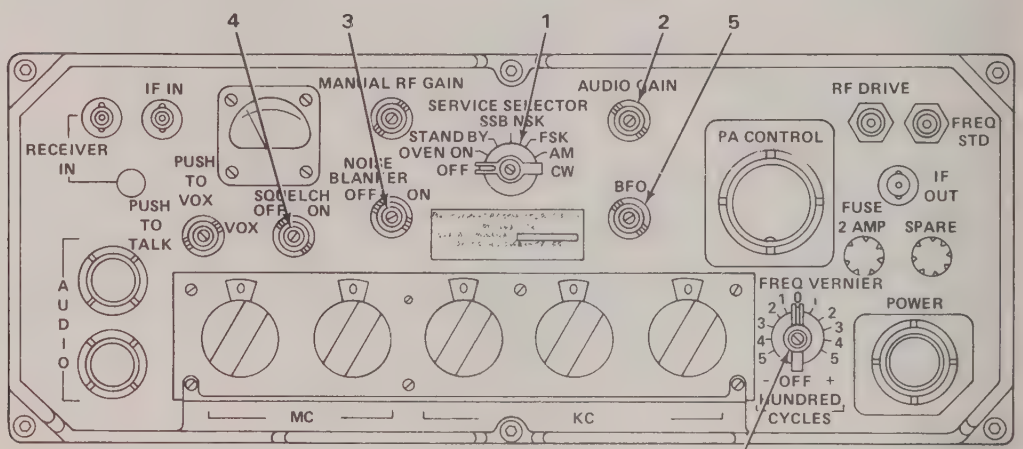
In cw mode, transmitted rf signal is 2 kHz higher than frequency indicated by RT-662/GRC MC and KC controls.

4. Set RT-662/GRC SERVICE SELECTOR switch (4) for mode of operation desired.

| SWITCH POSITION | OPERATION |
|---|---|
| CW | cw transmission |
| SSB NSK | ssb transmission |
| AM | compatible am. transmission |

**2-33. LOCAL DUPLEX OPERATION (AN/GRC-122(*) MODELS).** (CONT)

LOCAL DUPLEX CW, SSB VOICE, AND COMPATIBLE AM. VOICE OPERATION (CONT)




DUPLEX RT-662/GRC

EL6VR139

5. Set duplex RT-662/GRC SERVICE SELECTOR switch (1) to same setting as step 4.

6. Adjust modem AUDIO GAIN control (2) for a comfortable listening level.

## NOTE

If ignition-type (pulse) noise is heard in received signal, set duplex RT-662/GRC NOISE BLANKER switch to ON. A 1 second agc delay occurs when NOISE BLANKER switch is set to ON. If noise blanking does not help reception, set NOISE BLANKER switch to OFF. Some models of RT-662/GRC do not contain a noise blanker switch.

7. Set duplex RT-662/GRC NOISE BLANKER switch (3) to ON or OFF as required.

**2-33. LOCAL DUPLEX OPERATION (AN/GRC-122(*) MODELS).** (CONT)

**NOTE**

If noise level is undesirable in absence of received signals, set duplex RT-662/GRC SQUELCH switch to ON. In cw and fsk modes of operation, squelch is automatically disabled. In compatible am. or ssb mode of operation, with SQUELCH switch set to ON, audio output is not completely squelched during a period of high noise level. A low level of audio is always present to indicate that receiver portion of duplex RT-662/GRC is operating.

8. Set duplex RT-662/GRC SQUELCH switch (4) to ON or OFF as required.

Reception

**NOTE**

Audio output level of RT-662/GRC must be maintained within receive limits indicated on modem test meter to ensure proper modem operation. If received level is not within receive limits, adjust RT-662/GRC audio gain control for proper meter reading.

9. When receiving cw signals, adjust duplex RT-662/GRC BFO control (5) for a comfortable tone.

10. When receiving ssb, compatible am. or cw signals from radio sets other than AN/GRC-106, adjust RT-662/GRC FREQ VERNIER control (6) for best possible reception.

Transmission

**NOTE**

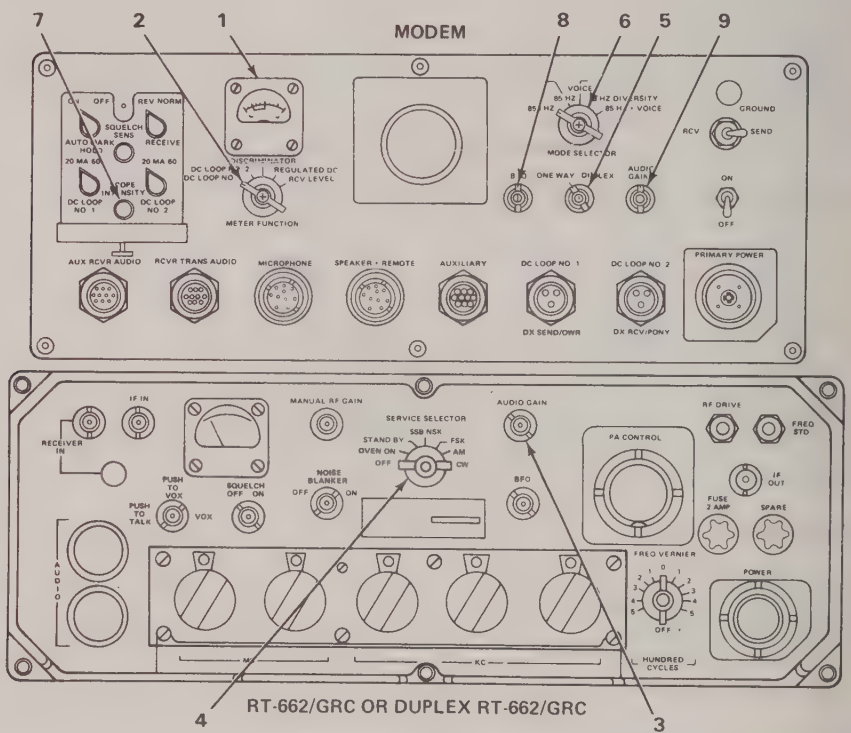
Set LOCKOUT OVERRIDE switch to OVERRIDE to transmit in steps 9 and 10.

11. To transmit ssb or compatible am. voice, connect and operate microphone.

12. To transmit cw, connect and operate key telegraph.

## 2-33. LOCAL DUPLEX OPERATION (AN/GRC-122(*) MODELS). (CONT)

LOCAL DUPLEX TTY OPERATION, FSK (850 Hz), SSB NSK (85 Hz), 85 Hz DIVERSITY, OR 85 Hz + VOICE




EL6VR1

Setup Procedures

1. Check that modem test meter (1) indicates 20 vdc.

**NOTE**

Audio output level of RT-662/GRC must be maintained within receive limits indicated on modem test meter to ensure proper modem operation. This level is indicated on modem test meter when modem METER FUNCTION switch is set to RCV LEVEL in any reception mode.

2. Set modem METER FUNCTION switch (2) to RCV LEVEL.

3. Adjust owr RT-662/GRC AUDIO GAIN control (3) completely counterclockwise.

**2-33. LOCAL DUPLEX OPERATION (AN/GRC-122(*) MODELS).** (CONT)

4. Set RT-662/GRC SERVICE SELECTOR switch (4) for mode of operation desired.

| SWITCH POSITION | OPERATION |
|---|---|
| SSB NSK | 85 Hz |
| SSB NSK | 85 Hz diversity |
| SSB NSK | 85 Hz + voice |
| FSK | 850 Hz |
| SSB NSK | 85 Hz |

5. Adjust duplex RT-662/GRC SERVICE SELECTOR switch (4) to same setting as step 4.

6. Set modem ONE WAY-DUPLEX switch (5) to DUPLEX.

**NOTE**

In the absence of received tty signal, modem MODE SELECTOR switch may be turned to VOICE to prevent tty's from running open.

7. Set modem MODE SELECTOR switch (6) for mode of operation desired.

| SWITCH POSITION | OPERATION |
|---|---|
| VOICE | SSB NSK |
| 850 Hz | fsk operation |
| 85 Hz | nsk operation |
| 85 Hz DIVERSITY | nsk diversity |
| 85 Hz + VOICE | nsk plus voice |

8. Set modem METER FUNCTION switch (2) to DC LOOP NO. 1 or DC LOOP NO. 2, to monitor dc loop no. 1 or dc loop no. 2.

9. Adjust modem SCOPE INTENSITY control (7) for a clear indication on modem crt as illustrated on page 2-115.

**NOTE**

Steps 10 and 14 apply to 850 Hz operation only. Use crt signal pattern illustration given on page 2-115 as a guide.

10. Adjust modem BFO control (8) for crt indication of two ellipses of equal amplitude (when receiving baudot code). If mark-hold signal is being received, only one ellipse will appear on crt screen.

11. Adjust modem AUDIO GAIN control (9) for a comfortable listening level.

## 2-33. LOCAL DUPLEX OPERATION (AN/GRC-122(*) MODELS). (CONT)

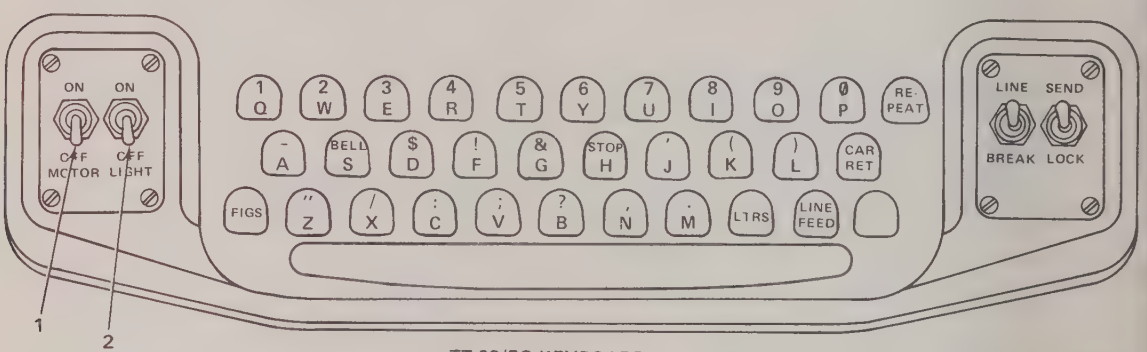
LOCAL DUPLEX TTY OPERATION FSK (850 Hz), SSB NSK (85 Hz), 85 Hz DIVERSITY, OR 85 Hz + VOICE (CONT)

Reception

### NOTE

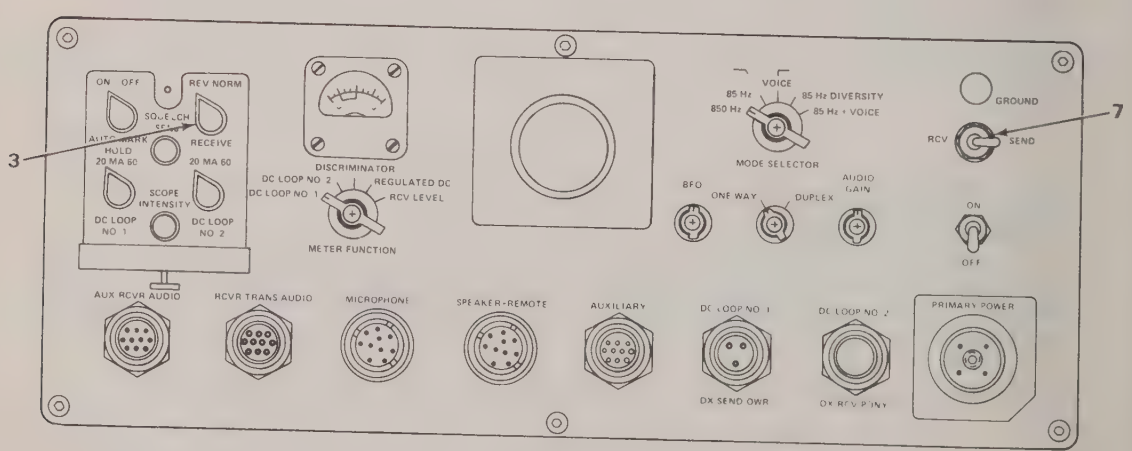
Audio output level of RT-662/GRC must be maintained within receive limits indicated on modem test meter to ensure proper modem operation. If received level is not within receive limits, adjust RT-662/GRC audio gain control for proper meter reading.

If operation and self-test on AN/UGC-74A(V)3 is completed (para 2-28), AN/UGC-74A(V)3 is ready for reception.



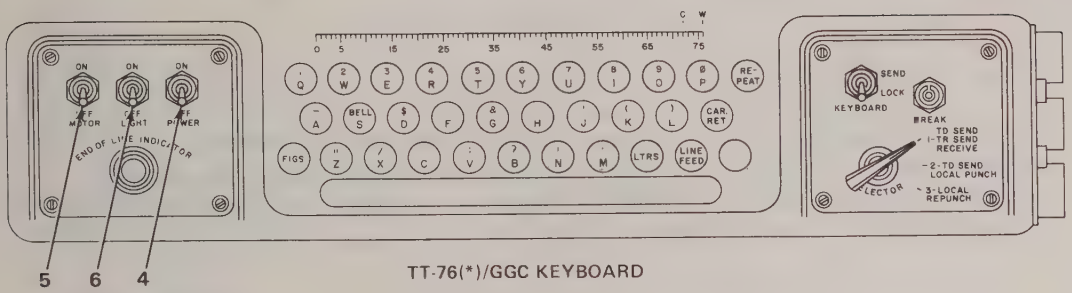

TT-98/FG KEYBOARD EL6VR141

12. Set duplex TT-98/FG MOTOR (1) and LIGHT (2) switches to ON, to print page copy of received message.




EL6VR142

**2-33. LOCAL DUPLEX OPERATION (AN/GRC-122(*) MODELS).** (CONT)




TT-76(*)/GGC KEYBOARD

EL6VR143

13. Set modem RECEIVE-REV/NORM switch (3) to REV if garbled copy is received when operating in 850 Hz operation.

**NOTE**

TT-76(*)/GGC is not able to receive for a punched tape copy unless TT-76 OWR-DX-SEND/DX-RECEIVE switch is set to DX-RECEIVE. This switch is located on Switch Assembly SA-1555/GRC-142 in AN/GRC-122 Plain and C models and Switch Assembly SA-1650/GRC in AN/GRC-122/142A, B, D, and E models.

14. Set switch assembly TT-76 OWR-DX-SEND/DX RECEIVE switch to DX RECEIVE.

15. Set TT-76(*)/GGC POWER (4), MOTOR (5), and LIGHT (6) switches to ON to make punched tape copy of received message.

Keyboard Transmission

**NOTE**

To transmit from TT-98/FG keyboard, do steps 16 and 17. To transmit from AN/UGC-74A(V)3, do steps 16 and 18. To transmit from TT-76(*)/GGC do steps 16, 19, and 20. After a message is sent, always set modem RCV-SEND switch to RCV.

16. Set modem RCV-SEND switch (7) to SEND.

17. Set TT-98/FG MOTOR (1) and LIGHT (2) switches to ON and operate keyboard.

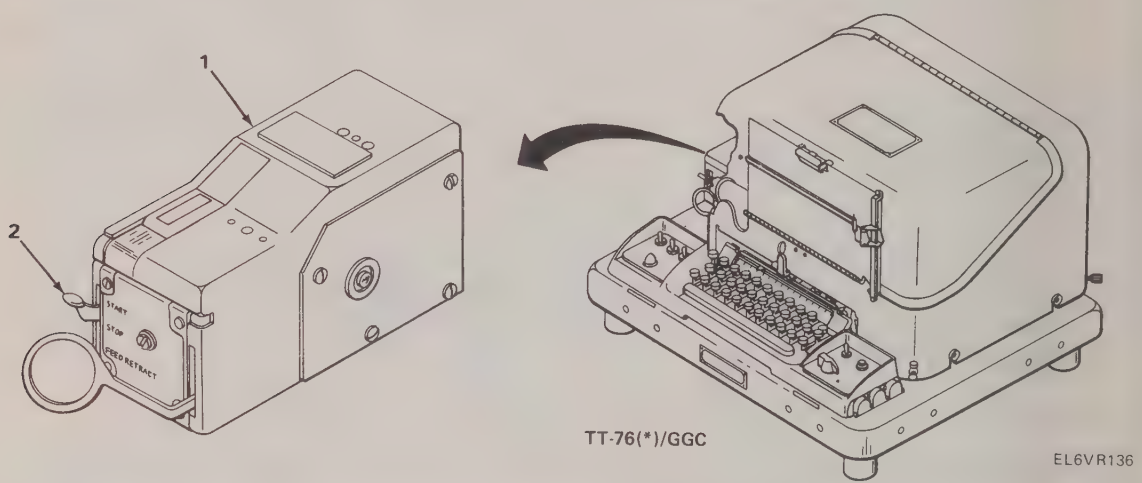
18. Send message from AN/UGC-74A(V)3 as given in TM 11-5815-602-12.

**2-33. LOCAL DUPLEX OPERATION (AN/GRC-122(*) MODELS).** (CONT)

LOCAL DUPLEX TTY OPERATION, FSK (850 Hz), SSB NSK (85 Hz), 85 Hz DIVERSITY, OR 85 Hz + VOICE (CONT)

## NOTE

TT-76(*)/GGC keyboard is not able to transmit when TT-76 OWR-DX-SEND/DX-RECEIVE switch is set to DX-RECEIVE. This switch is located on Switch Assembly SA-1555/GRC-142 in AN/GRC-122 Plain and C models and Switch Assembly SA-1650/GRC in AN/GRC-122A, B, D, and E models.




TT-76(*)/GGC

EL6VR136

19. Set switch assembly TT-76 OWR-DX-SEND/DX RECEIVE switch to DX SEND.
20. Set TT-76(*)/GGC POWER, MOTOR, and LIGHT switches to ON and operate keyboard.

## NOTE

After message is sent, always set modem RCV-SEND switch to RCV.

With TT-98/FG MOTOR switch set to ON, page copy of transmitted punched tape message is automatically printed.

Punched Tape Transmission (TD)

21. Insert prepared punched tape in TT-76(*)/GGC transmitter-distributor (1).
22. Set TT-76 OWR-DX-SEND/DX RECEIVE switch to DX RECEIVE.
23. Set modem RCV-SEND switch to SEND.
24. Set START-STOP-FEED RETRACT lever (2) to START.

**2-33. LOCAL DUPLEX OPERATION (AN/GRC-122(*) MODELS).** (CONT)

85 Hz + Voice Transmission and Reception

**NOTE**

If 85 Hz + voice operation is required, do steps 1 through 11 and set equipment switches for 85 Hz + VOICE operation. Do applicable procedures for reception, keyboard transmission, or punched tape transmission.

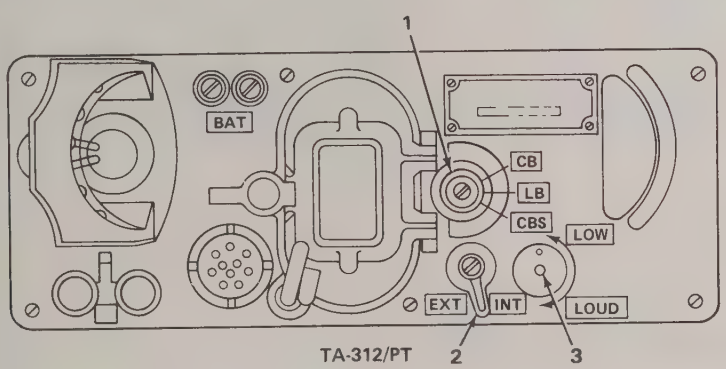
25. Press microphone push-to-talk switch and speak into microphone to transmit, and release push-to-talk switch to receive.

**2-34. REMOTE OPERATION.**

Perform applicable remote setup procedures for remote equipment (para 2-20). Owr operation is the same for all AN/GRC-122/142(*) models. Duplex and pony circuit operation applies to AN/GRC-122(*) models only. Before attempting any remote operations, set up shelter equipment for local owr mode of operation required (para 2-32).

REMOTE TELEPHONE OPERATION

Remote telephone operation requires two TA-312/PT's. In early models, remote Telephone Set TA-312/PT operation is not possible in cw operation. Remote box and AN/GRA-6 may also be used for remote telephone communications.




TA-312/PT

EL6VR145

1. Set local and remote TA-312/PT CIRCUIT SELECTOR switch (1) to LB.
2. Set local and remote TA-312/PT EXT-INT switch (2) to INT.
3. Set local and remote TA-312/PT buzzer volume control (3) for a comfortable listening level.
4. Signal local or remote operator for conversation.

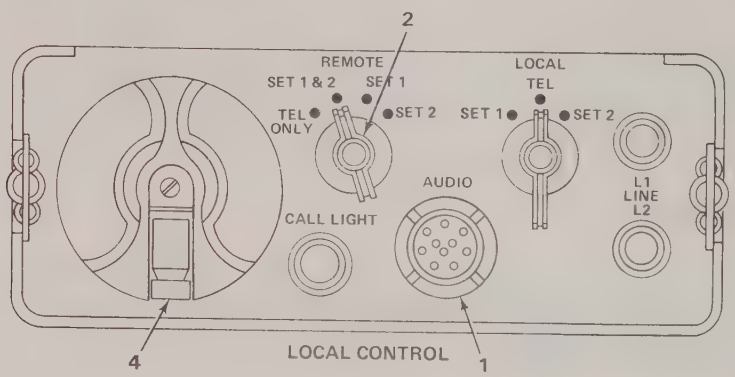
**NOTE**

During secure operation, TA-312/PT buzzer does not operate but shelter switch assembly call lamp flickers to indicate remote operator is calling.

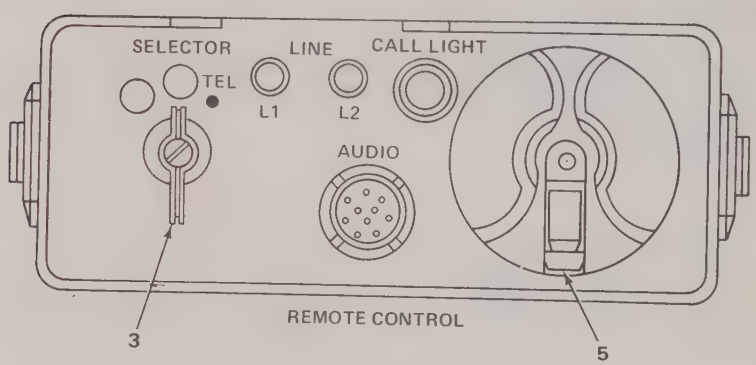
**2-34. REMOTE OPERATION.** (CONT)

REMOTE BOX AND AN/GRA-6 (CONTROL GROUP) TELEPHONE OPERATION

Remote box and control group are used as telephone link when setting up for any mode of remote radio operation.




EL6VR146




EL6VR147

1. In shelter, connect handset to local control AUDIO connector (1).
2. Set local control REMOTE switch (2) to TEL ONLY.
3. At remote site, set remote control SELECTOR switch (3) to TEL.

**NOTE**

Either local or remote operator can signal and talk to operator at opposite end by cranking local or remote control generator handcrank and speaking in to handset.

4. Rotate local (4) or remote (5) generator handcrank to signal operator at opposite end for conversation.

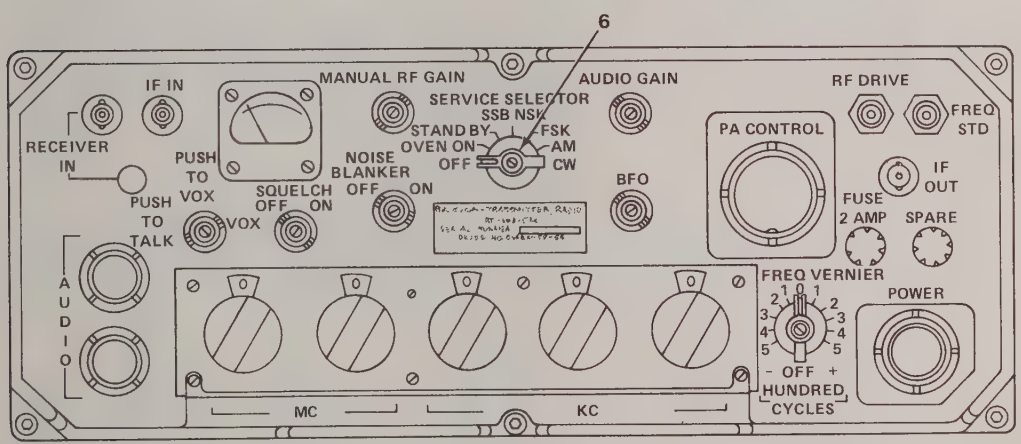
**2-34. REMOTE OPERATION.** (CONT)

REMOTE OWR CW, SSB VOICE, OR COMPATIBLE AM. VOICE OPERATION

## NOTE

Do step 1 for AN/GRC-122/142 Plain and C models. Do step 2 for AN/GRC-122/142A, B, D, and E models.

1. At shelter, set control panel SA-1554/GRC-142 TEL-REMOTE CW switch to REMOTE CW.
2. At shelter, set switch assembly SA-1650/GRC LOCAL-REMOTE switch to REMOTE.




RT-662/GRC

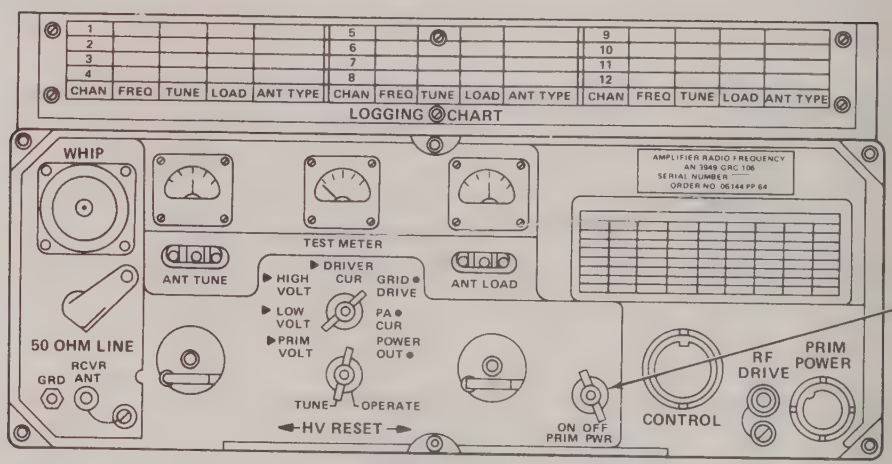
EL6VR148

3. At shelter, set RT-662/GRC SERVICE SELECTOR switch (6) for mode of operation required.

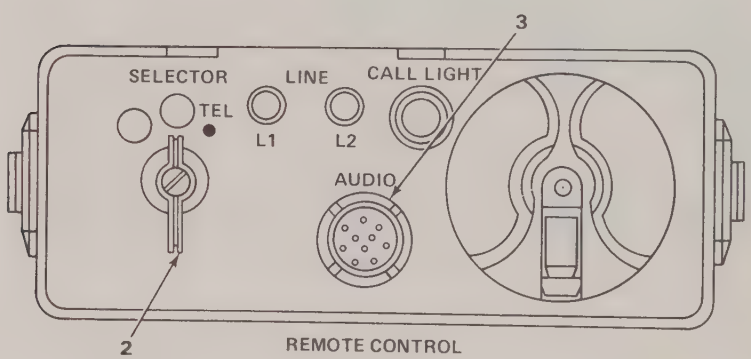
| SWITCH POSITION | OPERATION |
|---|---|
| CW | cw operation |
| SSB NSK | ssb voice operation |
| AM | compatible am. |

## 2-34. REMOTE OPERATION. (CONT)

REMOTE OWR CW, SSB VOICE, OR COMPATIBLE AM. VOICE OPERATION (CONT)




EL6VR149




EL6VR150

Transmission and Reception

4. To transmit voice at remote site, set remote control SELECTOR switch (2) completely counterclockwise and press microphone push-to-talk button.

### NOTE

If operator at shelter indicates radio set did not key, release microphone push-to-talk button and interchange field wire pair connections of line L1 and line L2 of remote control.

**2-34. REMOTE OPERATION.** (CONT)

5. To transmit cw, connect and operate key telegraph. To receive cw, connect headset to remote control AUDIO connector (3).

**NOTE**

Make sure modem RCV-SEND switch is set at RCV to prevent continuous keying of radio set.

REMOTE OWR FSK, SSB NSK, 85 Hz DIVERSITY, OR 85 Hz + VOICE OPERATION

Perform procedures for remote box and control group telephone operations given previously in this paragraph. Make sure polarity of dc loop current to remote box is correct (plus side of field wire pair to + terminal of remote box).

1. At shelter, set modem and RT-662/GRC controls for same mode of tty operation selected (local owr operation, para 2-32) for remote owr tty operation.

**WARNING**

An 80 vdc difference of potential exists between field wires when shelter switch assembly LOCAL-REMOTE switch is set to REMOTE. Care must be taken when handling field wire to prevent electrical shock to personnel.

**NOTE**

LOCAL-REMOTE switch is located on Switch Assembly SA-1554/GRC-142 in AN/GRC-122/142 Plain and C models and Switch Assembly SA-1650/GRC in AN/GRC-122/142A, B, D, and E models.

2. At shelter, set switch assembly LOCAL-REMOTE switch to REMOTE.

3. At shelter, check for proper tty dc loop no. 1 current (para 2-22) and adjust if necessary.

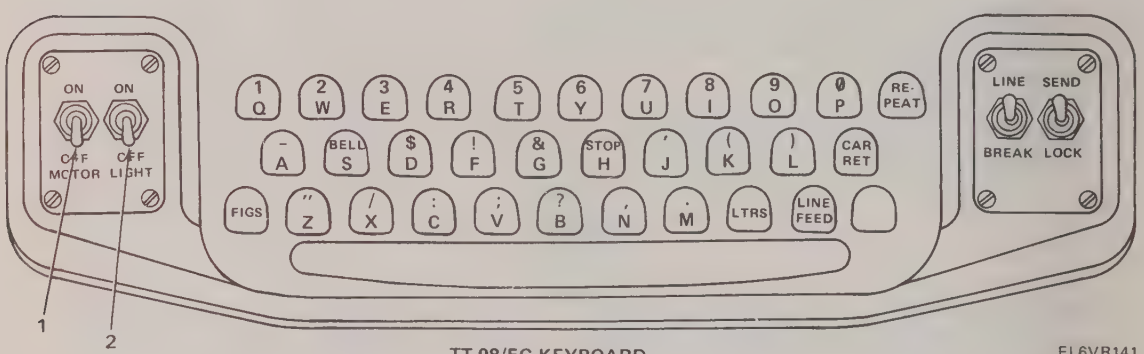
**2-34. REMOTE OPERATION.** (CONT)

REMOTE OWR FSK, SSB NSK, 85 Hz DIVERSITY, OR 85 Hz + VOICE OPERATION (CONT)

Monitoring Remote Site Transmission or Reception

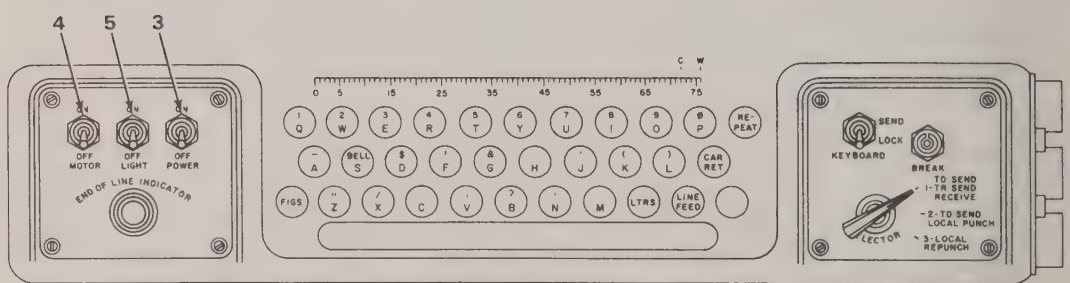
**NOTE**

To monitor remote site transmitted or received message on TT-98/FG, do step 4. To monitor remote site transmitted or received message on AN/UGC-74A(V)3, do step 5. For punched tape copy of remote site transmitted or received message on TT-76(*)/GGC, do step 6.




TT-98/FG KEYBOARD

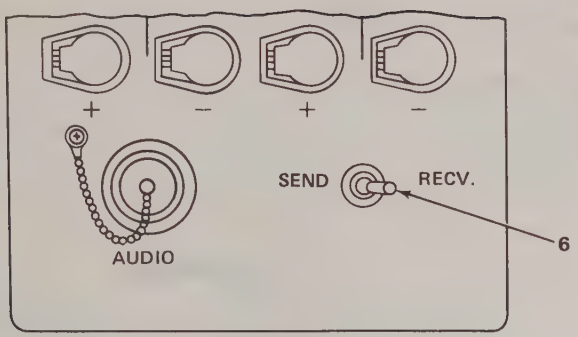
EL6VR141




TT-76(*)/GGC KEYBOARD

EL6VR152

**2-34. REMOTE OPERATION.** (CONT)




REMOTE BOX

EL6VR153

4. At shelter, set TT-98/FG MOTOR (1) and LIGHTS (2) switches to ON to print page copy of transmitted or received message.
5. If operation and self-test on AN/UGC-74A(V)3 is completed, AN/UGC-74A(V)3 will print page copy of transmitted or received message.
6. At shelter, set TT-76(*)/GGC POWER (3), MOTOR (4) and LIGHTS (5) switches to ON for punched tape copy of transmitted or received message.

Remote Reception

**NOTE**

To receive page copy at remote site on TT-98/FG, do step 7. To receive page copy at remote site on AN/UGC-74(V)3, do step 8. To receive punched tape copy at remote site on TT-76(*)/GGC, do step 9.

7. Set remote TT-98/FG MOTOR (1) and LIGHT (2) switches to ON, to print page copy of received message.
8. If operation and self-test on AN/UGC-74A(V)3 is completed, remote AN/UGC-74A(V)3 will print page copy of received message.
9. Set remote TT-76(*)/GGC POWER (3), MOTOR (4), and LIGHT (5) switches to ON for punched tape copy of received message.

Remote Keyboard Transmission

**NOTE**

To transmit from TT-98/FG keyboard, do steps 10 and 11. To transmit from AN/UGC-74A(V)3 keyboard do steps 10 and 12. To transmit from TT-76(*)/GGC keyboard do steps 10 and 13.

10. Set remote box SEND-RECEIVE switch (6) to SEND.
11. Set remote TT-98/FG MOTOR (1) and LIGHT (2) switches to ON and operate keyboard.
12. Send message from AN/UGC-74A(V)3 as given in TM 11-5815-602-12.
13. Set remote TT-76(*)/GGC POWER (3), MOTOR (4), and LIGHT (5) switches to ON and operate keyboard.

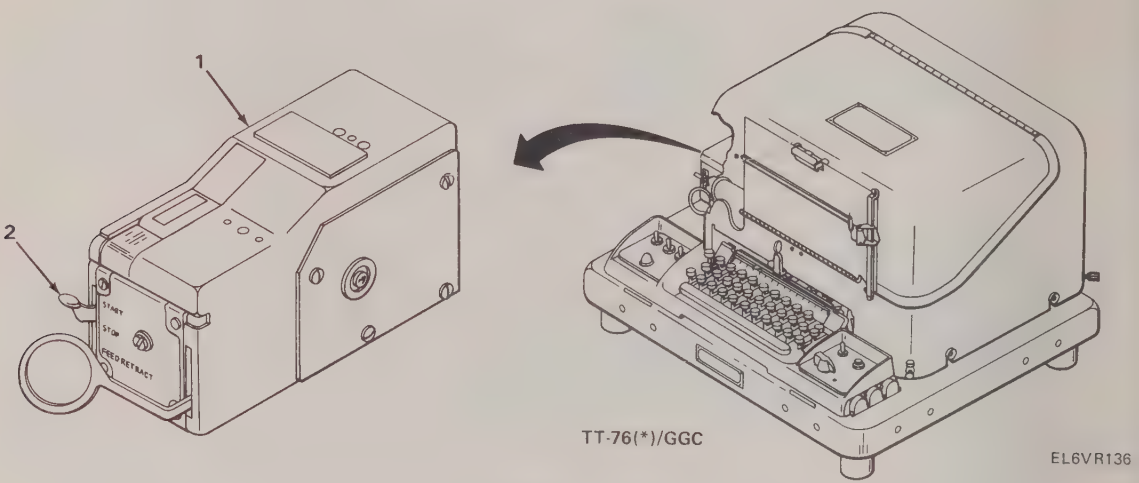
**NOTE**

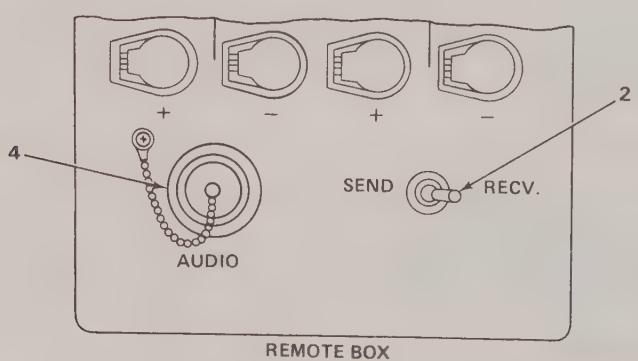
Punched tape copy of transmitted message is automatically made when transmitting from TT-76(*)/GGC keyboard.

**2-34. REMOTE OPERATION.** (CONT)

REMOTE OWR FSK, SSB NSK, 85 Hz DIVERSITY, OR 85 Hz + VOICE OPERATION (CONT)

Remote Punched Tape Transmission




14. Set remote TT-76(*)/GGC POWER, MOTOR, and LIGHT switches to ON.
15. Set remote TT-76(*)/GGC SELECTOR switch to position 2.
16. Insert prepared punched tape into remote TT-76(*)/GGC transmitter-distributor (1).
17. Set remote box SEND-RECEIVE switch (2) to SEND.
18. Set remote TT-76(*)/GGC START-STOP-FEED RETRACT switch (3) to START, to transmit message.
19. After message is sent, set TT-76(*)/GGC START-STOP-FEED RETRACT switch (3) to STOP.
20. Set remote box SEND-RECV switch to RECV.

85 Hz + Voice Remote Transmission and Reception

21. Connect microphone to remote box AUDIO connector (4).
22. Press microphone push-to-talk button to transmit voice and release push-to-talk button for voice reception.

**2-34. REMOTE OPERATION.** (CONT)

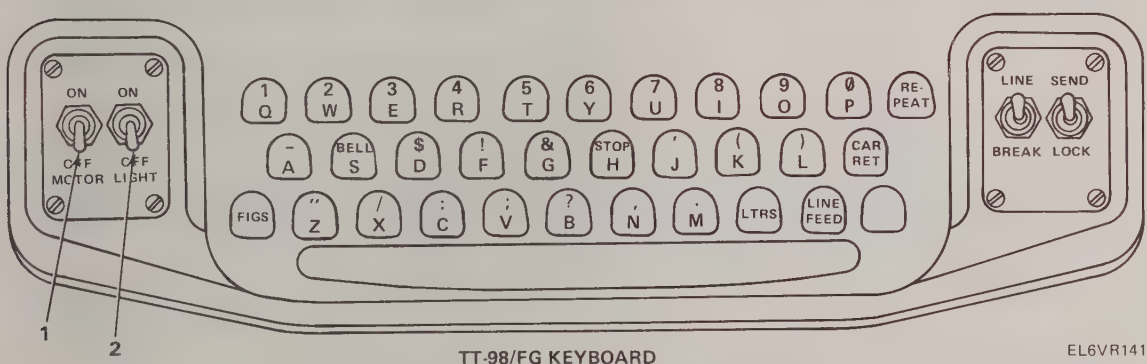
TTY ORDER WIRE (PONY CIRCUIT) OPERATION (AN/GRC-122(*) MODELS)

Tty order wire pony circuit is used in AN/GRC-122(*) models only. Tty order wire circuit provides tty communications over field wire between duplex TT-98/FG or AN/UGC-74A(V)3, located in shelter, and a remote TT-98/FG or AN/UGC-74A(V)3. If operation and self-test on AN/UGC-74A(V)3 is completed, no further switch adjustments are required to print page copy. If owr operation is required simultaneously with pony circuit operation, also perform local owr procedures (para 2-32) or remote owr procedures (para 2-34).

**NOTE**

LOCAL-REMOTE switch is located on Switch Assembly SA-1554/GRC-142 in AN/GRC-122/142 Plain and C models and Switch Assembly SA-1650/GRC in AN/GRC-122/142A, B, D, and E models.

1. At shelter, set switch assembly LOCAL-REMOTE switch to REMOTE.




TT-98/FG KEYBOARD

EL6VR141

Reception From Remote Site

**NOTE**

To receive page copy on TT-98/FG from remote site, do step 2. To receive page copy on AN/UGC-74A(V)3 from remote site, do step 3.

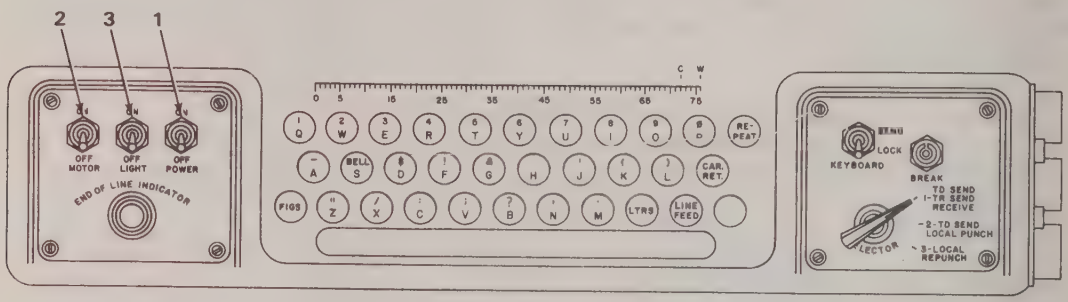
2. At shelter, set duplex TT-98/FG MOTOR (1) and LIGHT (2) switches to ON to print page copy of received message.

3. At shelter, if operation and self-test on AN/UGC-74A(V)3 is completed, AN/UGC-74A(V)3 will print page copy of received message.

**2-34. REMOTE OPERATION.** (CONT)

TTY ORDER WIRE (PONY CIRCUIT) OPERATION (AN/GRC-122(*) MODELS) (CONT)

Reception From Remote Site




TT-76(*)/GGC KEYBOARD

EL6VR156

## NOTE

TT-76(*)/GGC is not able to receive for punched tape copy unless TT-76 OWR-DX-SEND/DX RECEIVE switch is set to DX-RECEIVE. This switch is located on Switch Assembly SA-1555/GRC-142 in AN/GRC-122/142 Plain and C models and Switch Assembly SA-1650/GRC in AN/GRC-122/142 A, B, D, and E models.

4. At shelter, set TT-76 OWR-DX-SEND/DX RECEIVE switch to DX RECEIVE.

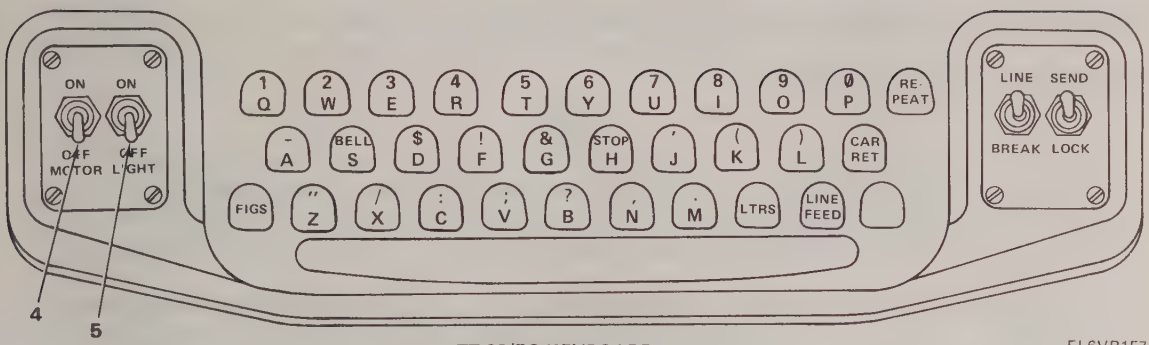
5. At shelter, set TT-76(*)/GGC POWER (1), MOTOR (2), and LIGHT (3) switches to ON for punched tape copy of message from remote site.

Transmission to Shelter

## NOTE

To transmit on (pony) TT-98/FG from remote site, do step 6. To transmit on (pony) AN/UGC-74A(V)3 from remote site, do step 7.

**2-34. REMOTE OPERATION.** (CONT)




TT-98/FG KEYBOARD

EL6VR157

6. At remote site, if operation and self-test on (pony) AN/UGC-74A(V)3 is complete, transmit message as given in TM 11-5815-602-12.

7. Set remote (pony) TT-98/FG MOTOR (4) and LIGHT (5) switches to ON and operate keyboard to transmit tty messages to shelter.

REMOTE DUPLEX FSK, SSB NSK, OR 85 Hz DIVERSITY OPERATION

Remote duplex tty operation is similar to local duplex operation except that duplex 85 Hz + voice operation is not possible from remote site. Perform remote box and control group telephone operations given in this paragraph. Make sure polarity of dc loop current to remote box is correct (positive side of field wire pair to + terminal of remote box).

1. At shelter, set RT-662/GRC, duplex RT-662/GRC, and modem controls for same mode of tty operation selected (local duplex operation para 2-33) for remote duplex tty operation.

**WARNING**

An 80 vdc difference in potential exists between field wires when shelter switch assembly LOCAL-REMOTE switch is set to REMOTE. Care must be taken when handling field wire to prevent electrical shock to personnel.

**NOTE**

LOCAL-REMOTE switch is located on Switch Assembly SA-1554/GRC-142 in AN/GRC-122 Plain and C models and Switch Assembly SA-1650/GRC in AN/GRC-122/142A, B, D, and E models.

2. At shelter, set switch assembly LOCAL-REMOTE switch to REMOTE.

3. At shelter, check for proper dc loop no. 1 and dc loop no. 2 currents (para 2-22) and adjust if necessary.

**2-34. REMOTE OPERATION.** (CONT)

REMOTE DUPLEX FSK, SSB NSK OR 85 Hz DIVERSITY OPERATION (CONT)

Monitoring Remote Transmission

**NOTE**

To monitor remote site transmitted message on TT-98/FG, do step 4. To monitor remote site transmitted message on AN/UGC-74A(V)3, do step 5. For punched tape copy of remote site transmitted message, do step 6.

4. At shelter, set TT-98/FG MOTOR and LIGHT switches to ON to print page copy of transmitted message.
5. If operation and self-test on AN/UGC-74A(V)3 is completed (para 2-28), AN/UGC-74A(V)3 will print page copy of transmitted message.
6. At shelter, set TT-76(*)/GGC POWER, MOTOR, and LIGHT switches to ON for punched tape copy of transmitted message.

Monitoring Remote Reception

**NOTE**

To monitor remote site received message on TT-98/FG, do step 7. To monitor remote site received message on AN/UGC-74A(V)3, do step 8. For punched tape copy of remote received message on TT-76(*)/GGC, do steps 9 and 10.

7. At shelter, set duplex TT-98/FG MOTOR and LIGHT switches to ON to print page copy of received message.
8. If operation and self-test on AN/UGC-74A(V)3 is completed (para 2-28), AN/UGC-74A(V)3 will print page copy of received message.

**NOTE**

TT-76(*)/GGC is not able to receive for punched tape copy unless TT-76 OWR-DX-SEND/DX-RECEIVE switch is set to DX-RECEIVE. This switch is located on Switch Assembly SA-1555/GRC-142 in AN/GRC-122 Plain and C models and Switch Assembly SA-1650/GRC in AN/GRC-122A, B, D, and E models.

9. At shelter, set TT-76 OWR-DX-SEND/DX-RECEIVE switch to DX-RECEIVE.
10. At shelter, set TT-76(*)/GGC POWER, MOTOR, and LIGHT switches to ON for punched tape copy of received message.

Remote Reception

**NOTE**

To receive page copy at remote site on TT-98/FG, do step 11. To receive page copy at remote site on AN/UGC-74A(V)3, do step 12. To receive punched tape copy of message on TT-76(*)/GGC, do steps 13 and 14.

11. At remote site, set remote duplex TT-98/FG MOTOR and LIGHT switches to ON, to print page copy of received message.

**2-34. REMOTE OPERATION.** (CONT)

12. At remote site, if operation and self-test on duplex AN/UGC-74A(V)3 is completed (para 2-28), AN/UGC-74A(V)3 will print page copy of received messages.

**NOTE**

TT-76(*)/GGC is not able to receive for punched tape copy unless TT-76 OWR-DX-SEND/DX-RECEIVE switch is set to DX-RECEIVE. This switch is located on Switch Assembly SA-1555/GR-142 in AN/GRC-122 Plain and C models and Switch Assembly SA-1650/GRC in AN/GRC-122A, B, D, and E models.

13. At shelter, set TT-76 OWR-DX-SEND/DX-RECEIVE switch to DX-RECEIVE.
14. At shelter, set TT-76(*)/GGC POWER, MOTOR, and LIGHT switches to ON, for punched tape copy of received message.

Remote Keyboard Transmission

**NOTE**

To transmit from remote TT-98/FG keyboard, do steps 15 and 16. To transmit from remote AN/UGC-74A(V)3 keyboard, do steps 15 and 17. To transmit from remote TT-76(*)/GGC keyboard, do steps 15, 18, and 19.

15. Set remote box SEND-RECEIVE switch to SEND.
16. Set remote TT-98/FG MOTOR and LIGHT switches to ON and operate keyboard.
17. Send message from AN/UGC-74A(V)3, as given in TM 11-5815-602-12.

**NOTE**

TT-76(*)/GGC is not able to transmit from keyboard unless TT-76 OWR-DX SEND/DX-RECEIVE switch is set to DX-SEND. This switch is located on Switch Assembly SA-1555/GRC-142 in AN/GRC-122 Plain and C models and Switch Assembly SA-1650/GRC in AN/GRC-122A, B, D, and E models.

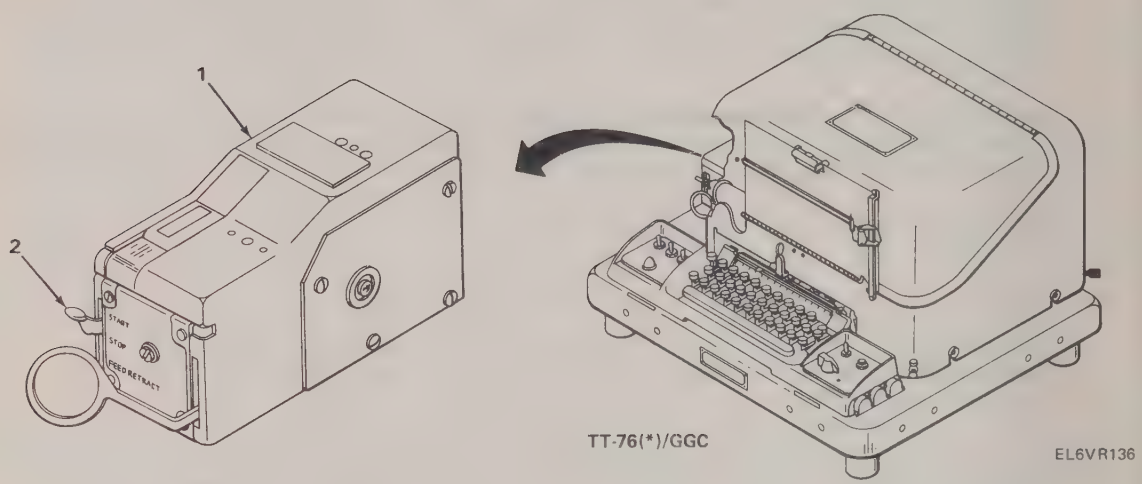
18. At shelter, set TT-76 OWR-DX-SEND/DX-RECEIVE switch to DX-SEND.
19. Set remote TT-76(*)/GGC POWER, MOTOR, and LIGHT to ON, and operate keyboard.

Remote Punched Tape Transmission (TD)

20. At shelter, set TT-76 OWR-DX-SEND/DX-RECEIVE switch to DX-SEND.
21. Set remote TT-76(*)/GGC POWER, MOTOR, and LIGHT switches to ON.
22. Set remote box SEND-RECEIVE switch to SEND.

**2-34. REMOTE OPERATION.** (CONT)

REMOTE DUPLEX FSK, SSB NSK, OR 85 Hz DIVERSITY OPERATION (CONT)




23. Insert prepared punched tape into remote TT-76(*)/GGC transmitter-distributor (1).
24. Set remote TT-76(*)/GGC START-STOP-FEED RETRACT lever (2) to START.
25. After message is sent, set remote box SEND-RECEIVE switch to STOP.
26. Set TT-76(*)/GGC START-STOP FEED RETRACT lever (2) to STOP.

**2-35. STOPPING PROCEDURES.**

AN/GRC-122/142(*) radio sets may be placed in standby or completely shut down. Perform standby procedure (para 2-36) when equipment is to be turned off for 1 hour or less. Perform complete shutdown procedures (para 2-37) when equipment is to be turned off for more than 1 hour. In an emergency, AN/GRC-122/142(*) shelters may be shut down immediately (para 2-38).

## 2-36. STANDBY PROCEDURES.

Standby operating state enables operator to be prepared for immediate operation. If shelter has been operating and standby condition is required, follow standby procedures. If operator desires a standby condition after shutdown, perform preoperational precedures (para 2-24), preoperational equipment settings (para 2-26), and standby procedures as listed below.

1. Set RT-662/GRC and duplex RT-662/GRC (used in AN/GRC-122(*) models only) SERVICE SELECTOR switch (2) to STANDBY.

**NOTE**

Allow amplifier 2 minutes of cooling, then set PRIM PWR switch to OFF.

2. Set modem MODE SELECTOR switch to VOICE.

**NOTE**

To set TT-98/FG and duplex TT-98/FG in standby, do step 3. AN/UGC-74A(V)3 automatically goes into standby by itself.

3. Set TT-98/FG and duplex TT-98/FG MOTOR switch to OFF.

4. Set TT-76(*)/GGC POWER and MOTOR switches to OFF.

5. Set power distribution panel INVERTERS OWR and INVERTERS DX (used in AN/GRC-122(*) models only) switches to OFF.

## 2-37. COMPLETE SHUTDOWN OF SHELTER.

Perform complete shutdown procedures when equipment is to be turned off for more than 1 hour.

1. Set MHz and kHz on RT-662/GRC or duplex RT-662/GRC to 0.

2. Set RT-662/GRC and duplex RT-662/GRC (used in AN/GRC-122(*) models only) SERVICE SELECTOR switch to STANDBY.

**NOTE**

Allow 2 minutes cooling period before performing step 3.

3. Set amplifier PRIM PWR switch to OFF.

4. Set RT-662/GRC SERVICE SELECTOR switch to OFF.

**NOTE**

Modem ON-OFF switch is only on MD-522A/GRC. To turn off MD-522/GRC, set MODE SELECTOR switch to PWR OFF.

To shut down TT-98/FG and duplex TT-98/FG, do step 5. To shut down AN/UGC-74A(V)3 or duplex AN/UGC-74A(V)3, do step 6.

**2-37. COMPLETE SHUTDOWN OF SHELTER.** (CONT)

5. Set TT-98/FG and duplex TT-98/FG (used in AN/GRC-122(*) models only) MOTOR and LIGHT switches to OFF.

6. Set AN/UGC-74A(V)3 and duplex AN/UGC-74A(V)3 (used in AN/GRC-122(*) models only) POWER ON/OFF switch to OFF.

7. Set TT-76(*)/GGC MOTOR, POWER, and LIGHT switches to OFF.

**NOTE**

When operating in ac operation only, set electric heater ON-OFF switch to OFF. If using all-fuel heater, set ON-OFF switch to OFF.

8. When using secure equipment, turn secure equipment off.

9. Set modem ON-OFF switch to OFF.

10. Set all power distribution panel switches to OFF.

**NOTE**

For AN/GRC-122/142 Plain and C models, do step 11.

11. Set ac entrance box circuit breakers (1) to OFF.

**2-38. EMERGENCY STOPPING.**

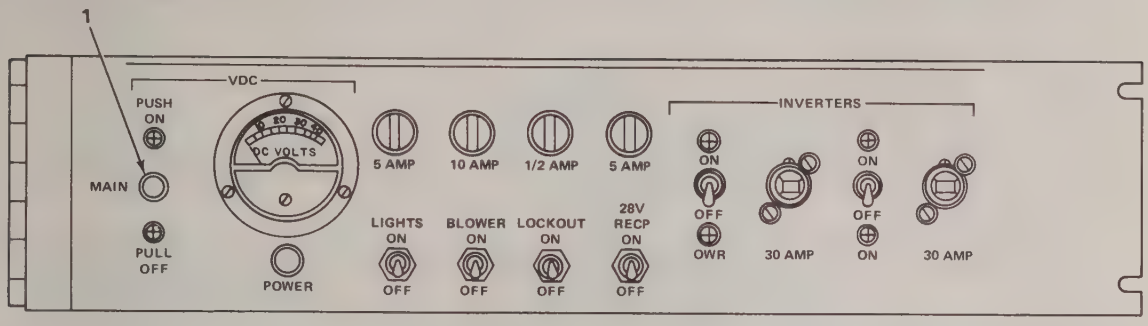
To shut down shelter in an emergency, do the following steps:

**NOTE**

For emergency stopping of AN/GRC-122/142 Plain and C models, do step 1 or 2. For emergency stopping of AN/GRC-122/142A and B models, do step 3 or 4. For emergency stopping of AN/GRC-122/142D and E models, do step 5.

**2-38. EMERGENCY STOPPING.** (CONT)

AN/GRC-122/142 PLAIN AND C MODELS



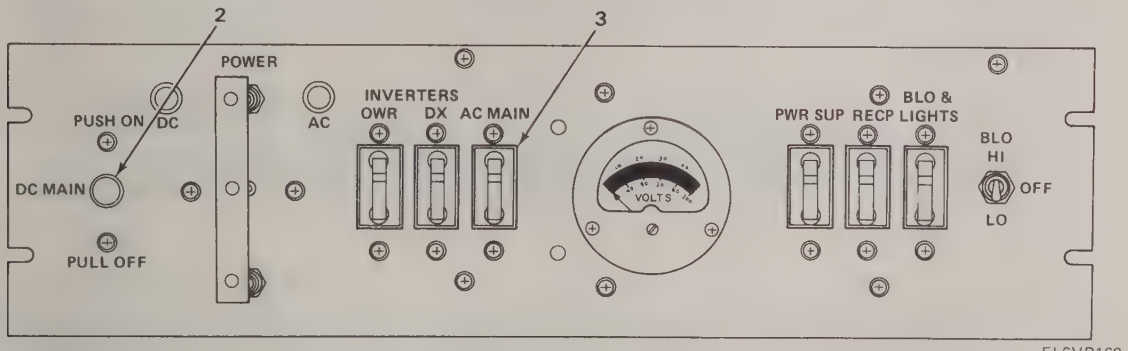

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## NOTE

When operating in dc mode, do step 1. When operating in ac mode, do step 2.

1. Pull MAIN circuit breaker (1) to OFF.
2. Set ac circuit breakers to OFF (page 2-8).

AN/GRC-122/142A AND B MODELS




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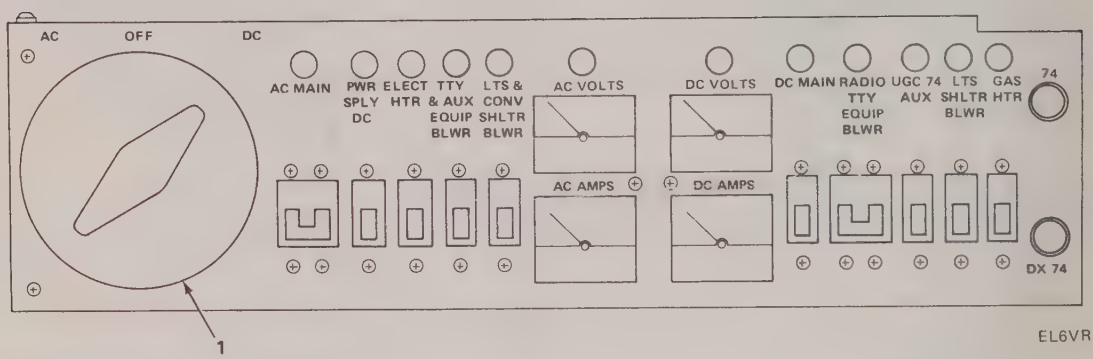
## NOTE

When operating in dc mode, do step 3. When operating in ac mode, do step 4.

3. Pull DC MAIN circuit breaker (2) to OFF.
4. Set AC MAIN circuit breaker (3) to OFF.

**2-38. EMERGENCY STOPPING.** (CONT)

AN/GRC-122/142D AND E MODELS




5. Set AC-OFF-DC switch (1) to OFF.

**2-39. PREPARATION FOR MOVEMENT.**

Perform procedures given below when AN/GRC-122/142(*) is being relocated or placed in storage.

REMOTE SETUP

Set all remote equipment power switches to OFF. Shut down generator or ac power source. Disconnect all interconnecting cables and install all connector and receptacle covers. Disconnect ground strap from AN/UGC-74A(V)3. Remove ground rod from ground. Remove tty's and/or AN/UGC-74A(V)3 from mounting and return to depot through normal supply channels. Store control group AN/GRA-6 components and ground rod in respective places in shelter.

SHELTER

Set all equipment power switches and power distribution panel switches to OFF except light switches. Loosen all tty slides and slide tty's into storage position (AN/GRC-122/142 Plain and C models only).

Remove all secure equipment and return to depot through normal supply channels.

Remove batteries from two TA-312/PT's and backup batteries from AN/UGC-74A(V)3 for prolonged storage or long distant shipment.

In hot climate, shade tarpaulin may be used. Remove shade tarpaulin and store in applicable place in shelter.

Remove signal wires from power/signal entrance box. Replace all receptacle and connector covers. Wind up signal wires on cable reels and store in shelter.

Remove locking pins and fold down whip antenna masts. Unscrew elements and store in canvas bags in shelter. Lock whip antenna bases in down position.

**2-39. PREPARATION FOR MOVEMENT.** (CONT)

If a doublet or dipole antenna is being used, disconnect lead-in cable from shelter. Lower antenna from antenna masts and disconnect lead-in cable. Disassemble antenna. Break down antenna masts and store antenna, lead-in cable, and masts in shelter.

**WARNING**

Exhaust hoses can be very hot. Allow to cool before removing to avoid being burned.

When shelter is truck mounted, remove fuel heater exhaust extension hose and truck exhaust extension hose and store in shelter.

If power is obtained from a generator or a commercial power source, set power source circuit breaker to OFF. Disconnect power cable from power source and from power/signal entrance box. Install connector and receptacle covers. Wind power cable onto cable reel and store in appropriate place in shelter.

Remove ground strap and ground rod and store in shelter.

Replace all receptacle and connector covers. Close and secure all ventilators and covers.

Secure all component items in cases, mountings, holders, or racks. Place miscellaneous items in storage cabinets.

Remove vehicle boarding ladder and secure in mounting place in shelter.

## Section IV OPERATION UNDER UNUSUAL CONDITIONS


| Subject | Para | Page |
|---|---|---|
| Operation at Low Temperatures | 2-40 | 2-148 |
| Operation in Desert Climate | 2-41 | 2-149 |
| Operation in Tropical Climate | 2-42 | 2-149 |
| Recognition and Identification of Jamming | 2-43 | 2-149 |
| Antijamming | 2-44 | 2-151 |

## 2-40. OPERATION AT LOW TEMPERATURES.

During cold weather operation, observe the following:

Do not operate teletypewriters below 32°F. Keep shelter interior at a minimum of 40°F to ensure proper teletypewriter operation.

Communications terminal AN/UGC-74A(V)3 can operate in extreme cold conditions (-25°F). During periods of extreme cold, AN/UGC-74A(V)3 can be covered with a blanket or insulating material to help retain heat generated within AN/UGC-74A(V)3.

**WARNING**

Operators must open multifuel heater air intake and exhaust covers, before operating heater, to prevent suffocation of personnel or equipment failure.

During arctic conditions, all-fuel heater will provide enough heat during mobile service to keep shelter warm as long as shelter exhaust fan is off and hood is blocked with an insulating material.

**CAUTION**

If exhaust fan hood on exterior wall of shelter has been blocked by material during cold conditions, material must be removed before operating exhaust fan to prevent equipment damage.

When operating shelter at halt and ac power is available, electric heater can be used. During extreme arctic conditions, two additional electric heaters are required to heat shelter. Existing shelter wiring will only accommodate one electric heater. Additional ac power from an external power source is required to operate additional heaters.

Extreme cold causes cables and wires to become hard, brittle, and difficult to handle. Be careful when handling cables and when connecting them to shelter so that kinks and unnecessary loops will not result in permanent damage. Make sure that receptacles, connectors, and binding posts on outside of shelter are free of frost, ice, and snow by replacing covers when not in use. Do not drag connectors across ground.

If AN/GRC-106 is to be shut down for 10 hours or less, set RT-662/GRC SERVICE SELECTOR switch to OVEN ON. For AN/GRC-122(*) models, also set duplex RT-662/GRC SERVICE SELECTOR switch to OVEN ON.

Allow a 10 minute warmup period before operating modem.

**WARNING**

When filling or servicing fuel system, do not smoke or use open flame in vicinity. When filling fuel can, always provide a metal to metal contact between the fuel container and fuel can as fuel flows over metallic surfaces.

Fill fuel can daily to prevent condensation.

Service fuel strainer in heater daily to remove water which will freeze in fuel system and render it inoperative. (Refer to TM 5-4520-211-14, Hupp, or TM 5-4520-236-14, Hunter.)

**2-40. OPERATION AT LOW TEMPERATURES.** (CONT)

**WARNING**

To avoid radio frequency burns where terrain conditions do not provide a good earth ground for shelter, stay in shelter or stand clear of vehicle and shelter when transmitting on whip antenna.

**2-41. OPERATION IN DESERT CLIMATES.**

In desert climates, connectors, receptacles, and binding posts are subject to damage from sand, dirt, and dust. Replace receptacle and connector covers when not in use. Do not drag or place open connector on ground. Interior of shelter may be kept cooler by installing shade tarpaulin and by operating air conditioner. To conserve power, keep shelter door closed and do not operate exhaust blower when operating air conditioner (AN/GRC-142, serial numbers 1 through 697 only). When equipment is not in use, be sure to close shelter door and all air inlets and outlets. This will keep dust and sand out of equipment.

**2-42. OPERATION IN TROPICAL CLIMATES.**

In tropical climates, equipment is subject to damage from moisture and fungi. Wipe all moisture and fungi from exterior of equipment with a lint-free cloth. Do not operate any units outside their weatherproof equipment cases for any extended period of time. Use air conditioner (AN/GRC-142 serial numbers 1 through 697 only) to maintain shelter interior temperature and humidity at normal level.

**2-43. RECOGNITION AND IDENTIFICATION OF JAMMING.**

It is likely that under real or simulated tactical conditions, receiver will be jammed by enemy. Enemy jamming is easily done by transmitting a strong signal on the same frequency as the desired signal, thereby making it difficult or impossible to hear the desired signal. Unusual noises or strong interference heard on RT-662/GRC may be enemy jamming, signals from a friendly station, noise from a local source, or RT-662/GRC may be defective.

**WARNING**

Dangerous voltages exist at amplifier 50 ohm line and whip antenna connectors. Be careful when working around antenna or antenna connectors. Radio frequency voltages as high as 10,000 volts exist at these points. Jewelry must be removed when working on equipment.

**2-43. RECOGNITION AND IDENTIFICATION OF JAMMING.** (CONT)

To determine whether or not interference is originating in RT-662/GRC, disconnect antenna at RT-662/GRC RECEIVER IN connector and short antenna connector to shelter. If interference continues, RT-662/GRC is defective. Enemy jamming signals may be continuous wave or modulated. A jamming signal may be intended to block a single frequency. This is called spot jamming. The enemy may use one or several transmitters to jam a block or band of frequencies. This method is called barrage jamming. Various methods of jamming are given below for operator recognition:

CONTINUOUS WAVE JAMMING

Cw jamming is transmitted as a steady carrier. This signal beats with another signal and produces a steady tone in the headset. Cw jamming signals may also be keyed by using a random on and off signal or using actual code characters, keyed at same rate or a little faster than signal being received.

MODULATED JAMMING

Modulated jamming signals may consist of noise, laughter, singing, music, various tones, or any unusual sound or a combination of these sounds. Various types of modulated signals are explained below.

Spark

This is one of the simplest, most effective, and easily produced jamming signals. This type of signal sounds very rough, raspy, and sometimes like an electric motor with sparking brushes running. This type of signal is very broad; therefore, it will interfere with a large number of communication channels.

Sweepthrough

This signal is the result of sweeping or moving a carrier back and forth across your frequency at a slow or rapid rate. Numerous signals of varying amplitude and frequency produce a sound like that of a low-flying airplane passing overhead. This type of jamming is effective over a broad range of frequencies. When it varies rapidly, it is effective against all types of voice signals.

Stepped Tones or Bagpipes

This signal usually consists of several separate tones. Tones are transmitted in the order of first increasing and then decreasing pitch, repeated over and over. The audible effect is like the sound of a Scottish bagpipe.

Noise

Noise is random both in amplitude and frequency. It is considered one of the better types of jamming similar to that heard when a receiver is not tuned to a station and volume or gain control is turned to maximum.

Gulls

This signal consists of a quick rise and slow fall of a variable audio frequency. The sound is similar to the cry of a seagull.

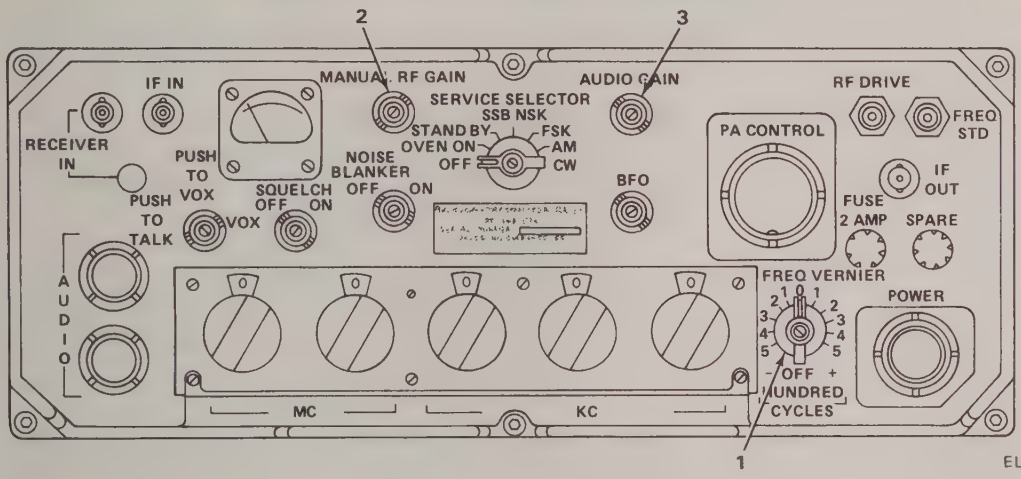
**2-43. RECOGNITION AND IDENTIFICATION OF JAMMING.** (CONT)

Tone

This signal consists of a single audio frequency of unvarying tone. It produces a steady howl in headset. Another use of tone is to vary it slowly. It produces a howling sound of varying pitch.

**2-44. ANTIJAMMING.**

When it is known that RT-662/GRC is being jammed, operator will notify immediate superior at once, and continue to operate equipment. To receive clearest jammed signal possible, follow steps listed below:




2. Detune RT-662/GRC by rotating FREQ VERNIER control (1) to either side of 0.

**NOTE**

Rotating FREQ VERNIER control may cause some separation of desired signal and jamming signal.

3. Vary RT-662/GRC MANUAL RF GAIN control (2).

**NOTE**

Rotating MANUAL RF GAIN control may reduce jammed signal enough to permit desired signal to be heard.

4. Vary modem AUDIO GAIN control.
5. Vary RT-662/GRC AUDIO GAIN control (3).

**CAUTION**

Rotating AUDIO GAIN control may raise level of desired signal enough to be heard. Increasing AUDIO GAIN control can damage modem.

6. If steps 2 to 5 do not provide sufficient signal separation for operation, change to an alternate frequency and alternate call signal as instructed by superior.

# CHAPTER 3

## MAINTENANCE


| Subject | Section | Page |
|---|---|---|
| Lubrication Instructions | I | 3-1 |
| Troubleshooting Procedures | II | 3-1 |
| Maintenance Procedures | III | 3-20 |


## Section I LUBRICATION INSTRUCTIONS

There are no lubrication instructions at the operator level of maintenance.

## Section II TROUBLESHOOTING PROCEDURES


| Subject | Para | Page |
|---|---|---|
| General | 3-1 | 3-1 |
| Symptom Index | 3-2 | 3-2 |
| Signal Cabling Diagrams | 3-3 | 3-4 |
| Troubleshooting | 3-4 | 3-8 |


### 3-1. GENERAL.

Troubleshooting is based on symptoms that may occur when shelter is in operation. A malfunction in an operating system may be discovered through built-in test meters, indicator lamps, or a distant operator.

The troubleshooting table does not list all problems which you may find. If your problem is not listed, or if troubleshooting steps do not solve your problem, refer to a higher level of maintenance.

When working on a problem, be sure to report your work on the forms shown in DA Pam 738-750.

To use troubleshooting table, first find your problem in the symptom index. The symptom index is organized in categories. Each category lists symptoms that may be encountered. The index will give you a page number on which you will find your problem and possible corrective action.

When troubleshooting, all controls should be set for normal owr operation (para 2-32). If equipment does not perform properly, refer to a higher level of maintenance.

Radio tty set is a communications system which is made up of two subsystems, radio system and tty system. Radio system consists of amplifier, RT-662/GRC and antenna. Tty system consists of modem, TT-98/FG or AN/UGC-74A(V)3, and TT-76(*)/GGC. All other components of the system either provide power or control for components. When a problem is encountered, first check that the problem is not caused by component power failure. Troubleshooting power failure is the simplest of troubleshooting procedures. Most power failures can be detected by checking associated equipment indicators.

For all troubleshooting procedures, it is assumed that the vehicular generating system or external power source is in good operating condition.

**3-1. GENERAL.** (CONT)

If AN/GRC-122/142(*) radio sets are operating in secure mode of operation and the problem is believed to be within security equipment, convert shelter to nonsecure mode of operation. If malfunction disappears when shelter is converted to nonsecure mode of operation, the problem may exist within security equipment.

When operating AN/GRC-122(*) radio sets in duplex mode of operation, turn off duplex equipment to determine which shelter component is related to the problem being encountered.

All troubleshooting procedures rely on the fact that equipment has been preset properly and radio set has been tuned properly. Always recheck switch positions to verify that failure is not caused by improper switch setting. Refer to foldouts in rear of manual to aid in troubleshooting power circuits. Use signal cabling diagrams given on pages 3-4 through 3-9 to locate cable connections between components believed to be malfunctioning and to aid in signal path and equipment interconnections.

**3-2. SYMPTOM INDEX.**


| | Page |
|---|---|
| OPERATION | |
| AUDIO TEL CALL lamp (AN/GRC-122/142 Plain and C models) or CALL lamp (AN/GRC-122/142A, B, D, and E models) does not light. (Call lamp operates only during secure operation) | 3-19 |
| Local duplex operation unsatisfactory | 3-19 |
| Low power output | 3-17 |
| No loop current | 3-15 |
| No reception in any mode of operation | 3-17 |
| No reception or no transmission in any mode of operation except duplex or pony circuit (AN/GRC-122(*) models only) | 3-18 |
| Radio tuning procedure cannot be accomplished | 3-16 |
| Remote duplex operation unsatisfactory | 3-20 |
| Remote telephone inoperative | 3-19 |
| Teletypewriter motor does not operate (TT-98/FG, AN/UGC-74A(V)3 or TT-76(*)/GGC) | 3-17 |
| Teletypewriter TT-98/FG, AN/UGC-74A(V)3 or TT-76(*)/GGC operation abnormal | 3-18 |
| Vswr too high, ME-165/G meter indicates in red area when doublet antenna is used | 3-17 |
| OWR OR DX INVERTERS | |
| Owr or dx inverter does not energize | 3-13 |
| Owr or dx inverter whines when energized (AN/GRC-122/142 Plain and C models) | 3-14 |

**3-2. SYMPTOM INDEX.** (CONT)


Page

POWER DISTRIBUTION PANEL (AN/GRC-122/142A, B, D, AND E MODELS)

AC VOLTS indicator lamp does not light and meter indicates ac voltage ..... 3-13
AC MAIN, INVERTER OWR, INVERTER DX, PWR SUP, or BLO & LIGHTS circuit breakers kick out ..... 3-13
DC VOLTS indicator lamp does not light and meter indicates 28 vdc ..... 3-12
DC MAIN circuit breaker kicks out (dc operation) ..... 3-11
AC VOLTS meter does not indicate voltage and AC VOLTS indicator lamp does not light (ac operation) ..... 3-12
DC VOLTS meter does not indicate voltage and DC VOLTS indicator lamp does not light (dc operation) ..... 3-12
Power distribution panel meter(s) does not indicate any voltage in ac or dc mode of operation ..... 3-13
RECP circuit breaker kicks out ..... 3-13

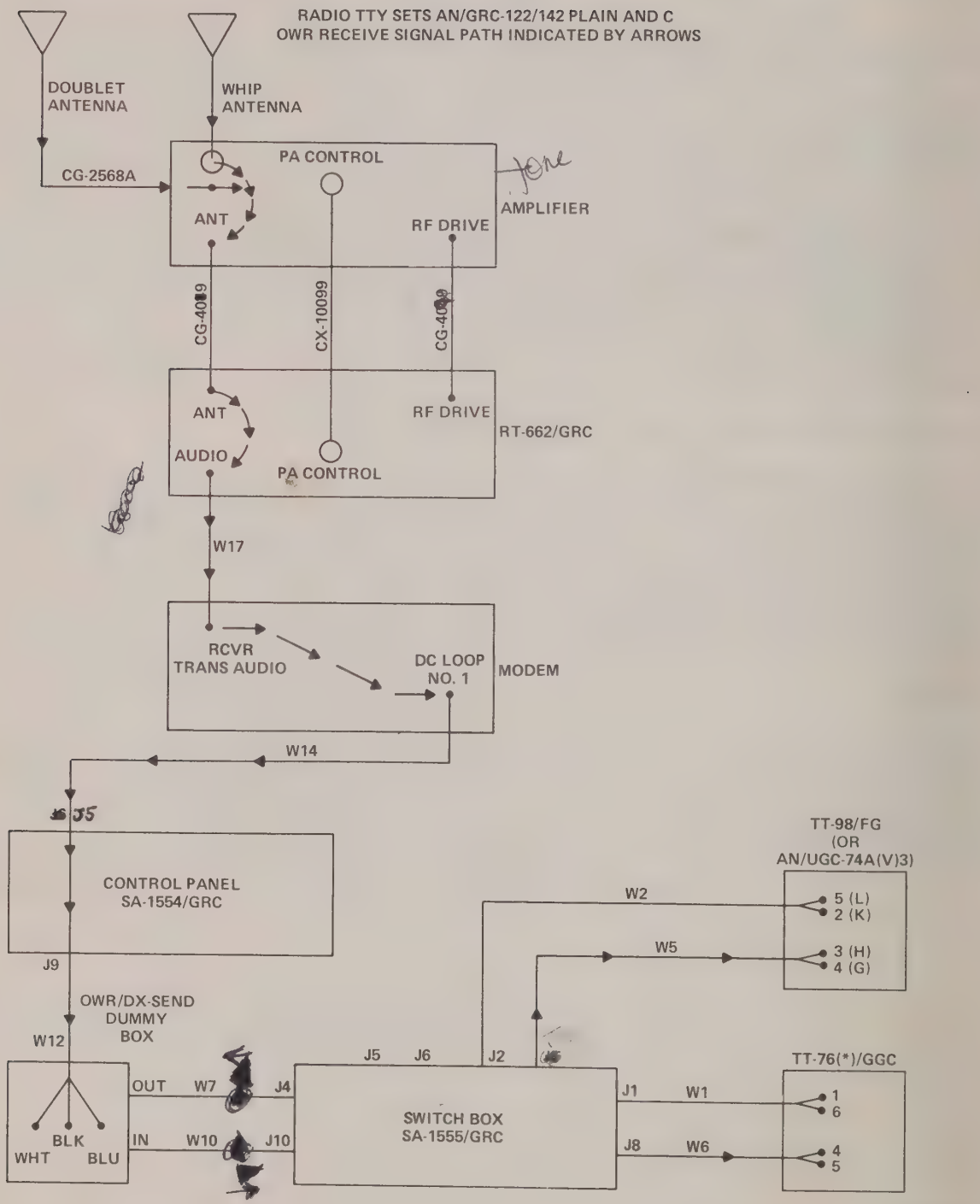
POWER DISTRIBUTION PANEL (AN/GRC-122/142 PLAIN AND C MODELS)

Ac voltmeter does not indicate any voltage ..... 3-10
Fuse holder glows ..... 3-11
Main circuit breaker kicks out ..... 3-10
POWER lamp does not light ..... 3-11
Power distribution panel meter does not indicate any voltage and POWER lamp does not light (dc operation) ..... 3-10
Power distribution panel dc meter does not indicate any voltage but POWER lamp does light ..... 3-11

SHELTER

All-fuel heater inoperative ..... 3-14
Air conditioner inoperative ..... 3-15
Blower inoperative ..... 3-14
Shelter lamp does not light ..... 3-14
Shelter lights inoperative ..... 3-14

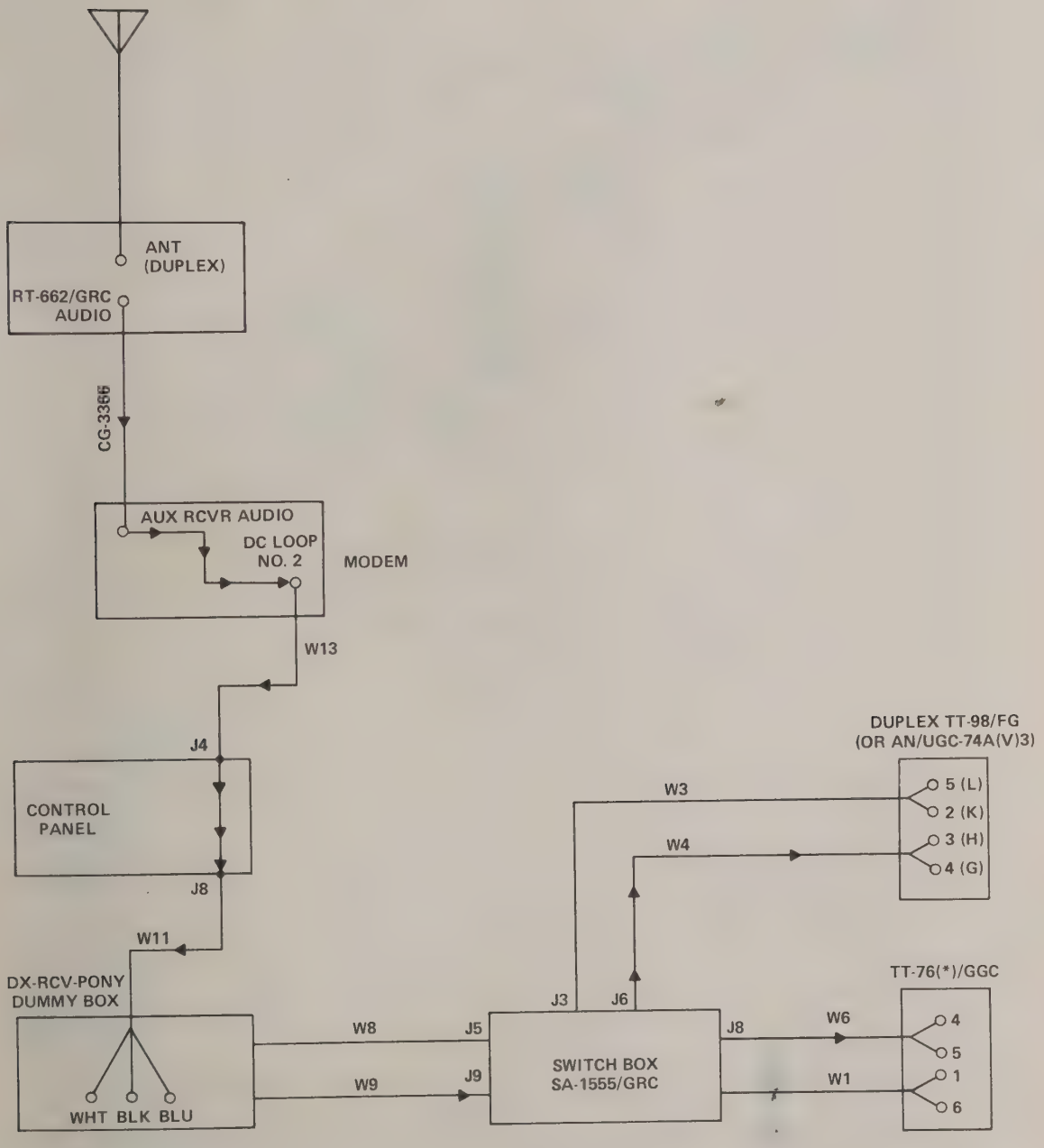
## 3-3. SIGNAL CABLING DIAGRAMS.




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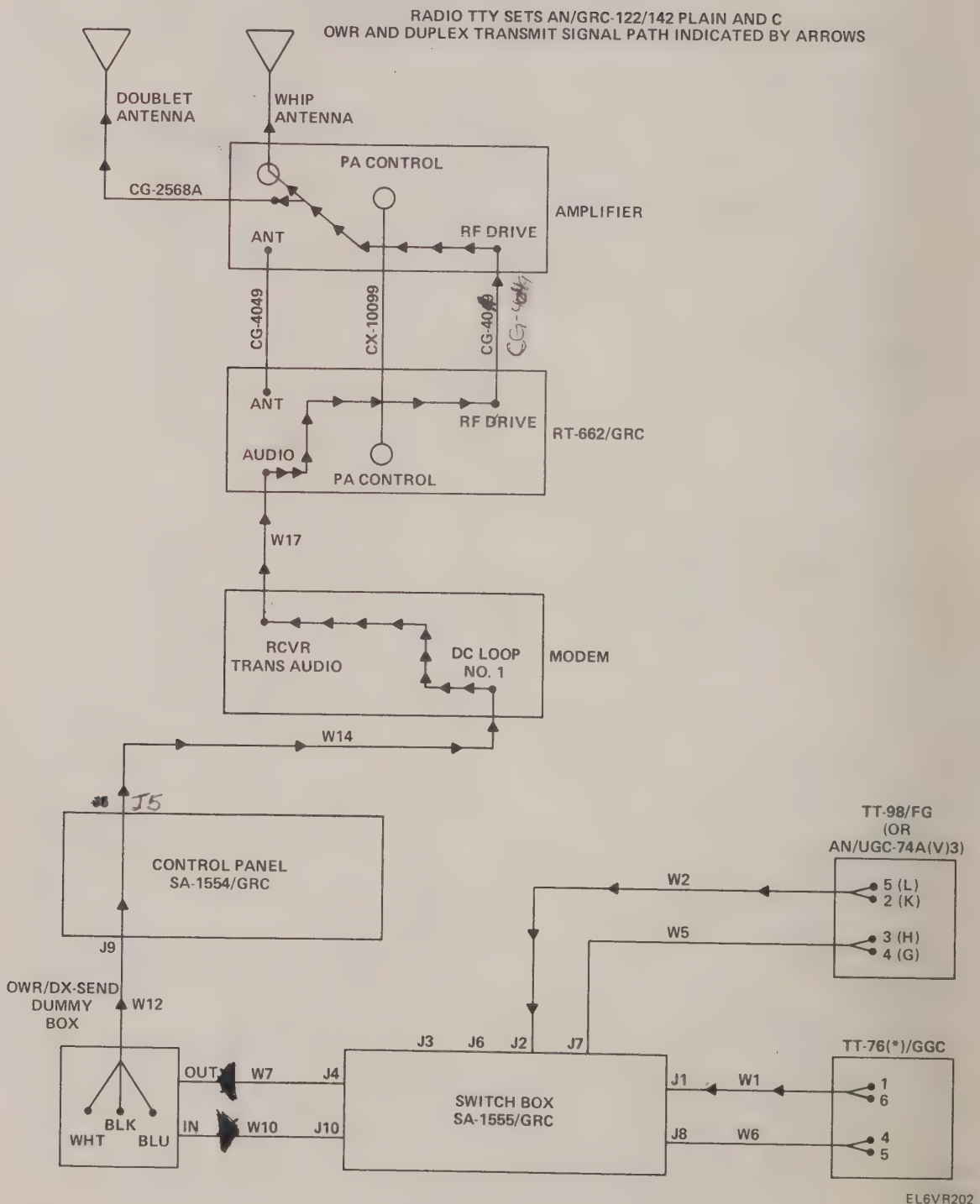
## 3-3. SIGNAL CABLING DIAGRAMS. (CONT)

RADIO TTY SETS AN/GRC-122/142 PLAIN AND C
DUPLEX RECEIVE SIGNAL PATH INDICATED BY ARROWS

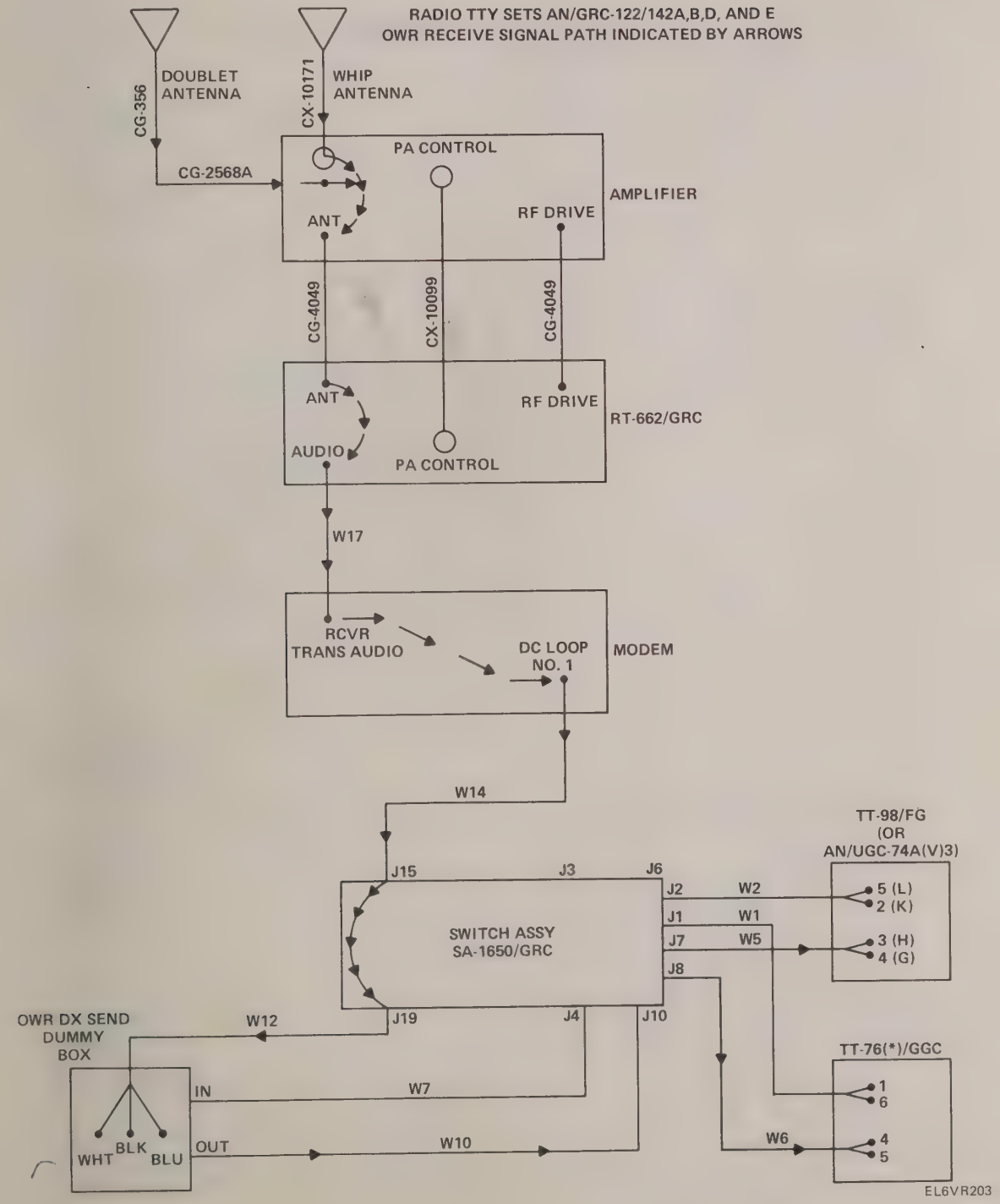



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## 3-3. SIGNAL CABLING DIAGRAMS. (CONT)

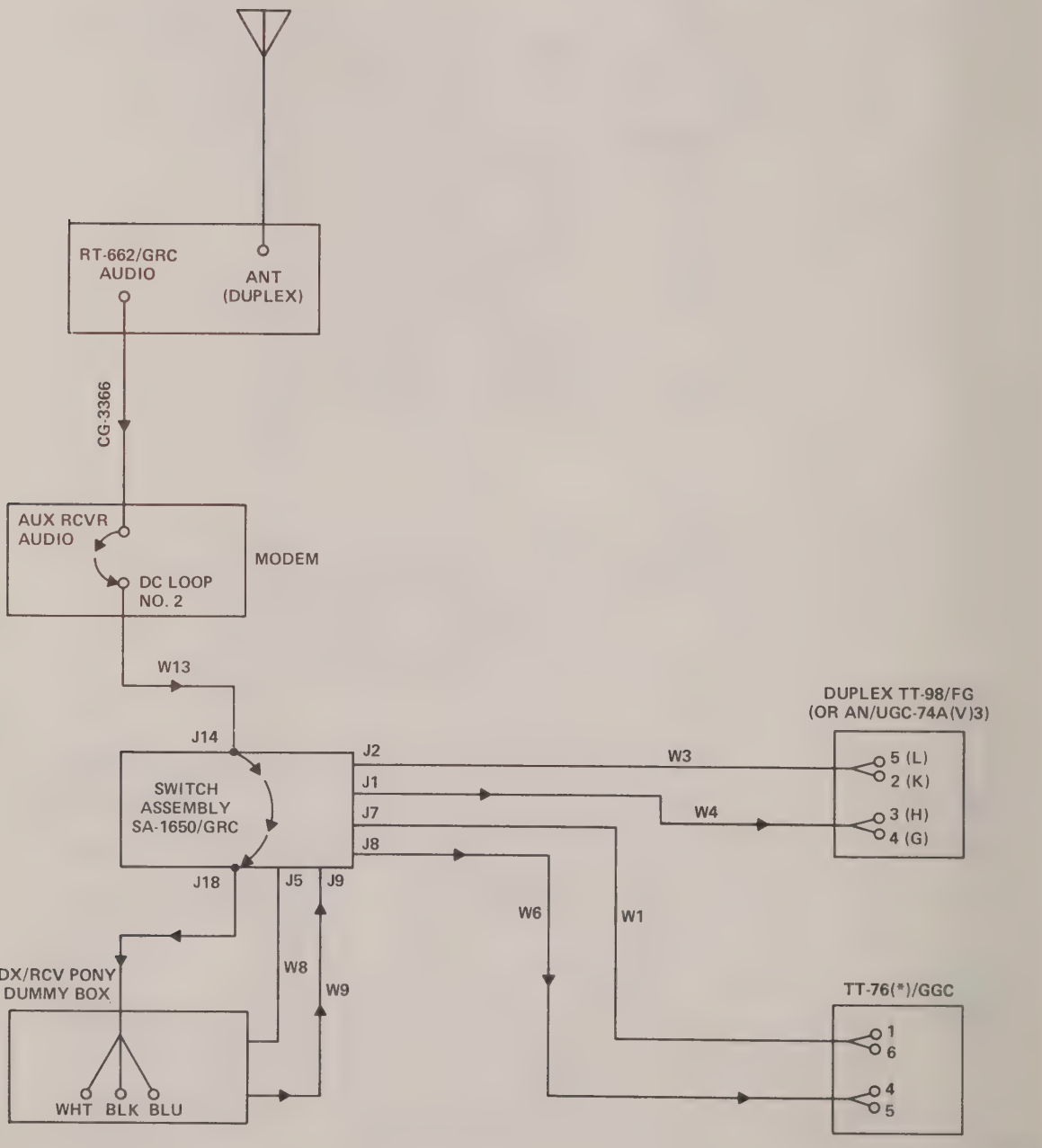


## 3-3. SIGNAL CABLING DIAGRAMS. (CONT)

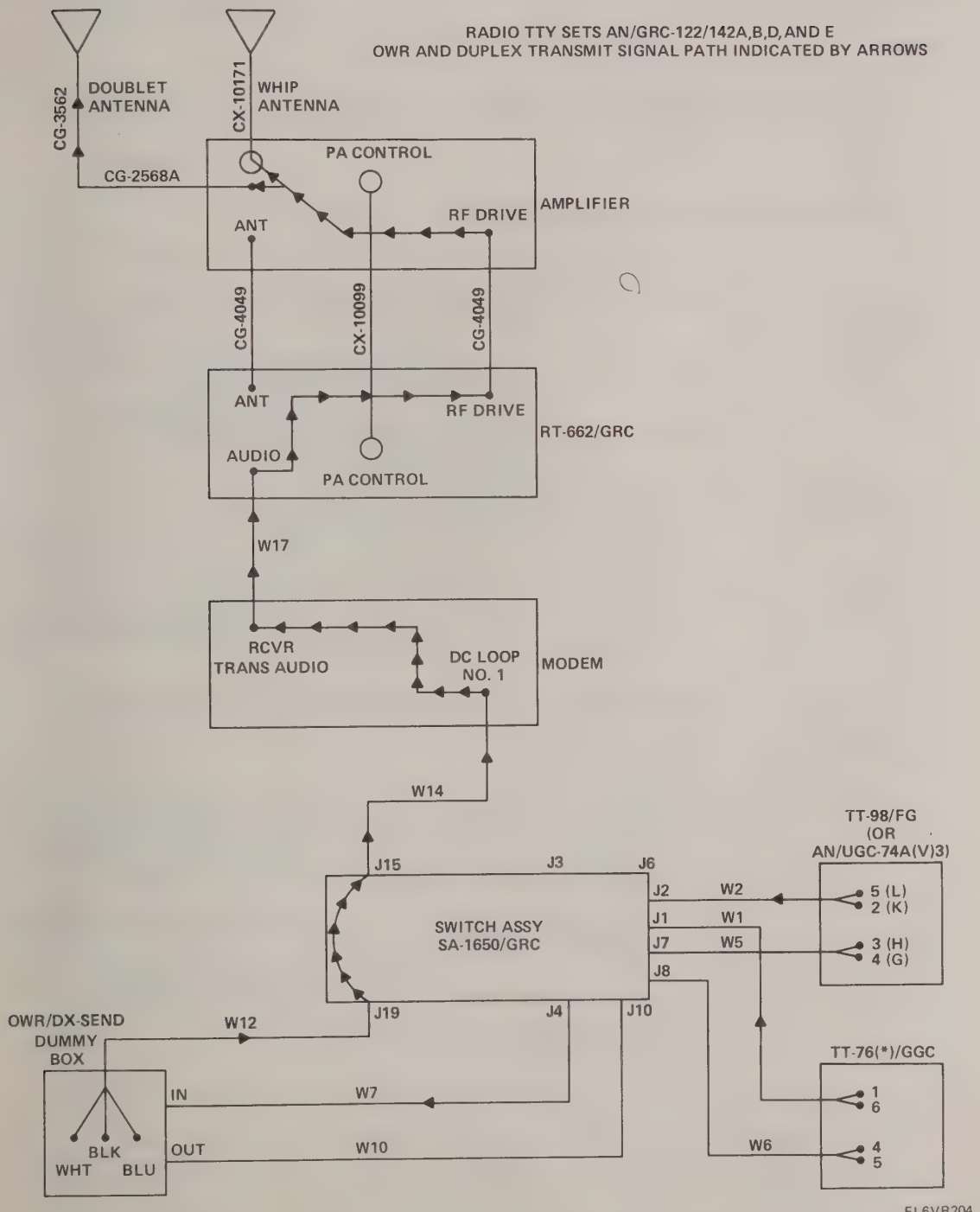


## 3-3. SIGNAL CABLING DIAGRAMS. (CONT)

RADIO TTY SETS AN/GRC-122/142A, B, D, AND E
DUPLEX RECEIVE SIGNAL PATH INDICATED BY ARROWS



## 3-3. SIGNAL CABLING DIAGRAMS. (CONT)



## 3-4. TROUBLESHOOTING.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

POWER DISTRIBUTION PANEL (AN/GRC-122/142 PLAIN AND C MODELS)

1. Main circuit breaker kicks out.

   Perform starting procedures (para 2-25).

   If problem persists, refer to a higher level of maintenance.

2. Power distribution panel meter does not indicate any voltage and POWER lamp does not light (dc operation).

   Step 1. Check for proper connection of power cable to dc entrance box.

   If power cable is improperly connected, reconnect (para 2-10).

   Step 2. Check for damaged power cable.

   If power cable is damaged, replace (para 2-10).

   Step 3. Check for proper connection of power cable to power source.

   a. If power cable is improperly connected to power source, reconnect (para 2-10).

   b. If problem persists, refer to a higher level of maintenance.

3. Ac voltmeter does not indicate any voltage.

   Check for 110 vac indication on ac voltmeter.

   a. If voltage is not present, check for proper connection of ac power cable to ac entrance box.

   b. If voltage is present, check dc power cord of power supply for proper connection to 25 amp outlet.

   c. If power cord is connected properly, refer to a higher level of maintenance.

**3-4. TROUBLESHOOTING.** (CONT)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

4. Power distribution panel dc meter does not indicate any voltage but POWER lamp does light.

   Check that components are operational.

   a. If components operate, meter is defective. Refer to a higher level of maintenance.

   b. If components do not operate, power distribution wiring is defective. Refer to a higher level of maintenance.

5. POWER lamp does not light (dc operation).

   Check for defective lamp.

   a. If lamp is defective, replace (para 3-4).

   b. If lamp is not defective, check for proper connection of power cable.

6. Fuse holder glows.

   Check for blown fuse.

   a. If fuse is defective, replace (para 3-13).

   b. If fuse is not defective, refer to a higher level of maintenance.

**NOTE**

If fuse continues to blow after being replaced, refer to a higher level of maintenance. If 28V RECP fuse blows, remove item plugged into 28-volt convenience outlet.

POWER DISTRIBUTION PANEL (AN/GRC-122/142A, B, D, AND E MODELS)

1. DC MAIN circuit breaker kicks out (dc operation).

   Perform starting procedures (para 2-25).

   If problem persists, refer to a higher level of maintenance.

**3-4. TROUBLESHOOTING.** (CONT)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

POWER DISTRIBUTION PANEL (AN/GRC-122/142A, B, D, AND E MODELS) (CONT)

2. DC VOLTS meter does not indicate voltage and DC VOLTS indicator lamp does not light (dc operation).

Step 1. Check for proper connection of power cable to power/signal entrance box.

If power cable is improperly connected, reconnect (para 2-10).

Step 2. Check for damaged power cable.

If power cable is damaged, replace (para 2-10).

Step 3. Check for proper connection of power cable to power source.

a. If power cable is improperly connected to power source, reconnect (para 2-10).

b. If power cable is properly connected, refer to a higher level of maintenance.

3. DC VOLTS indicator lamp does not light and meter indicates 28 vdc.

Check for defective lamp.

a. If lamp is defective, replace (para 3-11 and 3-12).

b. If lamp is not defective, refer to a higher level of maintenance.

4. AC VOLTS meter does not indicate voltage and AC VOLTS indicator lamp does not light (ac operation).

Step 1. Check for proper connection of power cable to power/signal entrance box.

If power cable is improperly connected, reconnect (para 2-9).

Step 2. Check for damaged power cable.

If power cable is damaged, replace (para 2-9).

Step 3. Check for proper connection of power cable to power source.

a. If power cable is improperly connected to power source, reconnect (para 2-9).

**3-4. TROUBLESHOOTING.** (CONT)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

b. If power cable is properly connected, refer to a higher level of maintenance.

5. AC VOLTS indicator lamp does not light and meter indicates ac voltage.

Check for defective lamp.

a. If lamp is defective, replace (para 3-11 and 3-12).

b. If lamp is not defective, refer to a higher level of maintenance.

6. Power distribution panel meter(s) does not indicate any voltage in ac or dc mode of operation.

Check that components are operational.

a. If components are operational, panel meter (2) is defective. Refer to a higher level of maintenance.

b. If components are not operational, power distribution wiring is defective. Refer to a higher level of maintenance.

7. AC MAIN, INVERTER OWR, INVERTER DX, PWR SUP, or BLO & LIGHTS circuit breakers kick out.

Check for overload condition.

Reset. If circuit breaker(s) continues to kick out, refer to a higher level of maintenance.

8. RECP circuit breaker kicks out.

Check for overload condition.

Reset. If circuit breaker continues to kick out remove equipment plugged into associated outlet and refer to a higher level of maintenance.

OWR OR DX INVERTERS

1. Owr or dx inverter does not energize.

Check for loose cable connection.

If cable connections are tight, refer to a higher level of maintenance.

**3-4. TROUBLESHOOTING.** (CONT)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

OWR OR DX INVERTERS (CONT)

2. Owr or dx inverter whines when energized (AN/GRC-122/142 Plain and C models).

Check for loose cable connection.

If cable connections are tight, refer to a higher level of maintenance.

SHELTER

1. Shelter lamp does not light.

Check for defective lamp.

If lamp is defective, replace (para 3-4).

2. Shelter lights inoperative.

Step 1. Check that blackout bypass switch is in correct position.

Set blackout bypass switch to correct position.

Step 2. Check that lights circuit breaker is set to ON.

Set lights circuit breaker to ON.

3. Blower inoperative.

Step 1. Check that blower circuit breaker is set to ON.

If blower circuit breaker is set to OFF, set to ON.

Step 2. Check that blower power cord is plugged into receptacle.

a. If blower plug is not plugged into receptacle, plug in.

b. If blower plug is plugged into receptacle, refer to a higher level of maintenance.

4. All-fuel heater inoperative.

Step 1. Check thermostat for proper setting.

Set thermostat to proper setting.

**3-4. TROUBLESHOOTING.** (CONT)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 2. Check fuel level.

If fuel level is low, refill heater.

Step 3. Check for damaged or leaking fuel lines.

a. If fuel lines are damaged or leaking, refer to a higher level of maintenance.

b. If fuel lines are in good condition, heater is defective. Refer to a higher level of maintenance.

5. Air conditioner inoperative.

Step 1. Check air conditioner thermostat for proper setting.

If thermostat is set improperly, set to desired temperature.

Step 2. Check that AC circuit breaker is set to ON.

If circuit breaker is set to OFF, set to ON.

Step 3. Check for loose power cable.

a. If power cable is improperly connected, reconnect (para 2-9).

b. If power cord is properly connected, refer to a higher level of maintenance.

OPERATION

1. No loop current.

Step 1. Check that modem ON-OFF switch is set to ON.

If switch is set to OFF, set to ON.

**3-4. TROUBLESHOOTING.** (CONT)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

OPERATION (CONT)

1. No loop current. (Cont)

Step 2. Check for 20 vdc (para 2-27).

If 20 vdc is not present, check dc power indication on power distribution panel.

Step 3. For local operation, check that all cable connections are tight and properly connected.

a. If any cables are loose or improperly connected, reconnect.

b. If cables are connected properly, refer to a higher level of maintenance.

Step 4. For remote operation, set LOCAL REMOTE switch to LOCAL.

a. If loop current is restored, trouble is in remote installation. Check for broken field wires or loose cable connections.

b. If problem persists, refer to a higher level of maintenance.

2. Radio tuning procedure cannot be accomplished.

Step 1. Check for loose or improper cable connections.

If cable connections are loose or improperly connected, reconnect.

Step 2. Check for blown fuse in RT-662/GRC.

If fuse is blown, replace, refer to TM 11-5820-520-12.

Step 3. Check for improper antenna installation (para 2-11).

If antenna is improperly set up, reconstruct.

Step 4. Check for a defective amplifier, refer to TM 11-5820-520-12.

If problem persists, refer to a higher level of maintenance.

**3-4. TROUBLESHOOTING.** (CONT)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

3. Vswr too high, ME-165/G meter indicates in red area when doublet antenna is used.

   Check that doublet antenna is installed properly (para 2-13).

   a. If doublet antenna is improperly set up, reconstruct.

   b. If problem persists, refer to a higher level of maintenance.

4. Low power output.

   Check for defective amplifier, refer to TM 11-5820-520-12.

   If problem persists, refer to a higher level of maintenance.

5. No reception in any mode of operation.

   Step 1. Check that all cables are properly connected.

   If any cables are loose or improperly connected, reconnect.

   Step 2. Check for defective RT-662/GRC, refer to TM 11-5820-520-12.

   If RT-662/GRC is defective, refer to a higher level of maintenance.

   Step 3. Check for defective modem, refer to TM 11-5805-387-15-1 or -2.

   If problem persists, refer to a higher level of maintenance.

6. Teletypewriter motor does not operate (TT-98/FG, AN/UGC-74A(V)3 or TT-76(*)/GGC).

   Step 1. Check for proper connection of power cable.

   If power cable is loose or improperly connected, reconnect (para 2-10).

   Step 2. Check for defective tty, refer to TM 11-5815-200-12 (TT-98/FG), TM 11-5815-602-12 (AN/UGC-74A(V)3), or TM 11-5815-238-10 and -20 (TT-76(*)/GGC).

   If problem persists, refer to a higher level of maintenance.

**3-4. TROUBLESHOOTING.** (CONT)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

OPERATION (CONT)

7. Teletypewriter TT-98/FG, AN/UGC-74A(V)3 or TT-76(*)/GGC operation abnormal.

Step 1. Check that all cable connections are tight and properly connected.

If cables are loose or improperly connected, reconnect (para 2-10).

Step 2. Check for defective tty, refer to TM 11-5815-200-12 (TT-98/FG), TM 11-5815-602-12 (AN/UGC-74A(V)3), or TM 11-5815-238-10 and -20 (TT-76(*)/GGC).

If tty is defective, refer to a higher level of maintenance.

Step 3. Check for defective modem, refer to TM 11-5805-387-15-1 or -2.

If problem persists, refer to a higher level of maintenance.

8. No reception or no transmission in any mode of operation except duplex or pony circuit (AN/GRC-122(*) models only).

Step 1. Check that shelter equipment is operational (para 2-27).

a. If local operation is satisfactory, see troubleshooting procedures for remote operation.

b. If local operation is not satisfactory, follow troubleshooting procedures applicable to local operation except for duplex or pony circuit.

Step 2. Check that remote equipment is properly installed (para 2-20).

If equipment is not properly installed, install properly (para 2-20).

Step 3. Check H-33/PT or KY-116/U by replacing with a known good unit.

If H-33/PT or KY-116/U is defective, replace.

Step 4. Check local and remote controls, refer to TM 11-5038.

If problem persists, refer to a higher level of maintenance.

**3-4. TROUBLESHOOTING.** (CONT)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

9. Remote telephone inoperative.

Step 1. Check for loose, broken, or improperly connected field wires.

If field wires are loose, improperly connected, or broken, reconnect or repair.

Step 2. Check for defective TA-312/PT, refer to TM 11-5805-201-12.

If problem persists, refer to a higher level of maintenance.

10. AUDIO TEL CALL lamp (AN/GRC-122/142 Plain and C models) or CALL lamp (AN/GRC-122/142A, B, D, and E models) does not light. (Call lamp operates only during secure operation.)

Step 1. Check for proper polarity of field wires.

Reverse field wires.

Step 2. Check for defective lamp.

If lamp is bad, replace (para 3-8).

11. Local duplex operation unsatisfactory.

Step 1. Check for defect in send circuit by performing procedures given in Operation, symptoms 1 through 9 for radio set, modem, or associated tty.

If equipment defect persists, refer to a higher level of maintenance.

Step 2. Check for a defect in receive circuit by checking all interconnecting cables to associated duplex equipment.

If cables are loose or not properly connected, reconnect.

Step 3. Check for defective duplex RT-662/GRC, refer to TM 11-5820-520-12.

If duplex defective, refer to a higher level of maintenance.

Step 4. Check for defective duplex TT-98/FG, refer to TM 11-5815-200-12.

If duplex is defective, refer to a higher level of maintenance.

Step 5. Check for defective modem, refer to TM 11-5805-387-15-1 or -2.

If problem persists, refer to a higher level of maintenance.

**3-4. TROUBLESHOOTING.** (CONT)

| MALFUNCTION<br>TEST OR INSPECTION<br>CORRECTIVE ACTION |
|---|
| OPERATION (CONT) |
| 12. Remote duplex operation unsatisfactory. |
| Step 1. Check local duplex operation. |
| a. If local duplex operation is defective, check procedures given in Operation, symptom 11. |
| b. If local duplex operation is satisfactory, go to steps 2 and 3. |
| Step 2. Check that all field wires are properly connected. |
| If field wires are improperly connected or polarity is incorrect, reconnect (para 2-34). |
| Step 3. Check for defective remote box or remote tty. |
| If remote box or remote tty is defective, refer to a higher level of maintenance. |

## Section III MAINTENANCE PROCEDURES


| Subject | Para | Page |
|---|---|---|
| General | 3-5 | 3-21 |
| Cleaning | 3-6 | 3-21 |
| Incandescent Lamp Replacement | 3-7 | 3-22 |
| Fluorescent Lamp and Starter Replacement | 3-8 | 3-22 |
| Cold-Start Lamp Replacement | 3-9 | 3-24 |
| Cleaning of Shelter Door Air Filter | 3-10 | 3-24 |
| Switch Assembly Indicator Lamp Replacement (AN/GRC-122/142A, B, D, and E Models) | 3-11 | 3-25 |
| Control Panel Indicator Lamp Replacement (AN/GRC-122/142 Plain and C Models) | 3-12 | 3-26 |
| Power Distribution Panel SB-3018/GRC-142 Power Indicator Lamp Replacement (AN/GRC-122/142 Plain and C Models) | 3-13 | 3-27 |
| Power Distribution Panel SB-3358/GRC Indicator Lamp Replacement (AN/GRC-122/142A and B Models) | 3-14 | 3-28 |
| Power Distribution Panel SB-F-960672 Indicator Lamp Replacement (AN/GRC-122/142D and E Models) | 3-15 | 3-29 |
| Power Distribution Panel SB-3018/GRC-142 Fuse Replacement (AN/GRC-122/142 Plain and C Models) | 3-16 | 3-30 |

## 3-5. GENERAL.

All operator maintenance of shelter, will be given in this section.

For component equipment operation and shutdown procedures, see chapter 2, section III.

Resources required are not listed unless they apply to the procedure.

Personnel required are listed only if the task requires more than one technician. If personnel are not listed, one technician can do the task.

Normal standard equipment condition to start a maintenance task is power off. Equipment condition is not listed unless some other condition is required.

Operator maintenance of individual components contained in AN/GRC-122/142(*) models can be found in their appropriate technical manuals listed below:

| Component | TM |
|---|---|
| Modem Radio Teletypewriter MD-522(*)/GRC | TM 11-5805-387-15-1 |
| Radio Set AN/GRC-106 | TM 11-5820-520-12 |
| Control Group AN/GRA-6 | TM 11-5038 |
| Teletypewriter Reperforator-Transmitter TT-76(*)/GGC | TM 11-5815-238-10 or -20 |
| Duplex Teletypewriter TT-98/FG | TM 11-5815-200-12 |
| Terminal, Communications AN/UGC-74A(V)3 | TM 11-5815-602-12 |
| Heater, Space, Fuel Oil and Gasoline: 15,000 BTU/HR Output, DC 24V (Hupp Model MH15133C-1) | TM 5-4520-211-14 |
| Air Conditioner, Wall or Base Mounted, Air Cooled; Self Contained, Electric Motor Driven; 6,000 BTU/HR, 115V, 1 Phase, 2 Wire, 50/60 Cycle (Redmonson Model CE-6A-60A) | TM 5-4120-289-15 |
| Telephone Set TA-312/PT | TM 11-5820-201-12 |
| Power Supplies PP-4763/GRC and PP-4763A/GRC | TM 11-5820-765-12 |

## 3-6. CLEANING.

Inspect exteriors of all components contained in shelter. All surfaces should be free of dust, dirt, grease, and fungi. A mild soap or detergent and water may be used for most general cleaning including walls, floors, and door air filters. Use a dry, clean, lint-free cloth to remove dust or dirt.

**WARNING**

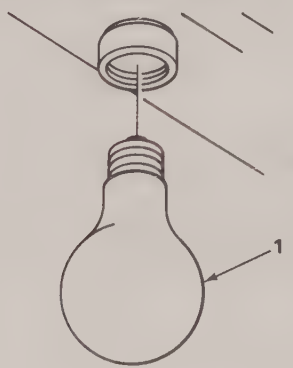
Fumes of TRICHLOROTRIFLUOROETHANE are poisonous. Provide adequate ventilation whenever you use TRICHLOROTRIFLUOROETHANE. Do not use solvent near heat or open flame. TRICHLOROTRIFLUOROETHANE will not burn, but heat changes the gas into poisonous, irritating fumes. DO NOT breathe fumes or vapors. TRICHLOROTRIFLUOROETHANE dissolves natural skin oils. DO NOT get solvent on your skin. Use gloves, sleeves, and an apron which solvent cannot penetrate. If solvent is taken internally, consult a physician immediately.

To remove grease, dirt, and fungi, moisten (do not soak) a cloth with TRICHLOROTRIFLUOROETHANE. To remove ground-in dirt, dampen a brush with TRICHLOROTRIFLUOROETHANE. After cleaning, wipe dry with a clean cloth.

## 3-7. INCANDESCENT LAMP REPLACEMENT.

Incandescent lamps are installed on upper roadside and curbside walls in AN/GRC-122/142 Plain, A, B, and C models. Replacement is the same for all models.

MATERIALS/PARTS: Incandescent lamp NSN 6240-00-155-8651




EL6VR172

REMOVAL

Remove incandescent lamp (1).

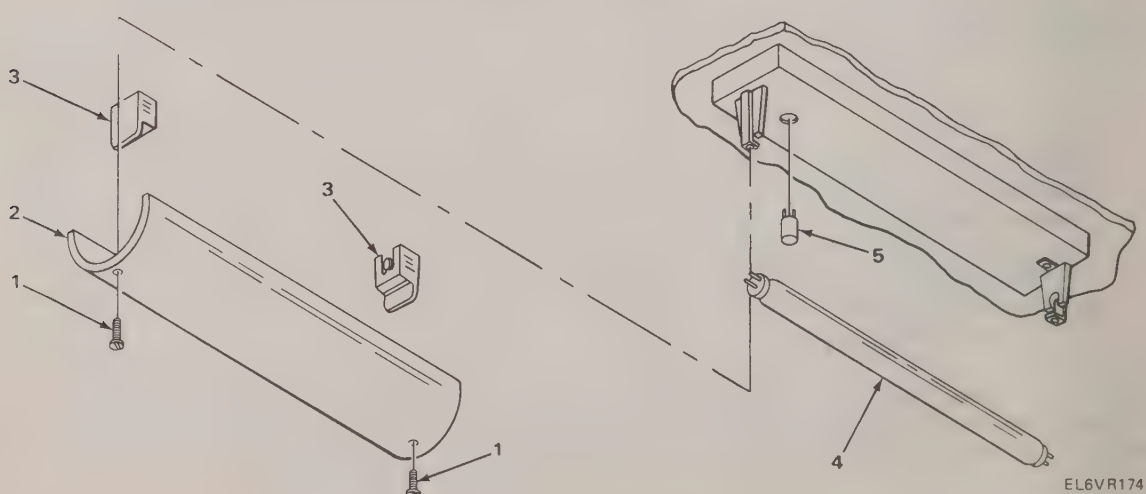
INSTALLATION

Install new 28-volt incandescent lamp.

## 3-8. FLUORESCENT LAMP AND STARTER REPLACEMENT.

Fluorescent lamps are installed in AN/GRC-122/142D and E models only. Replacement is the same for all models.

MATERIALS/PARTS: Fluorescent lamp, NSN 6240-00-152-2996
Fluorescent starter, NSN 6250-00-194-4794




EL6VR174

**3-8. FLUORESCENT LAMP AND STARTER REPLACEMENT.** (CONT)

**WARNING**

Handle fluorescent lamp tubes carefully to avoid breakage. Cuts from broken fluorescent lamps heal slowly and have a great risk of infection.

LAMP REMOVAL

1. Using screwdriver, remove screws (1) and cover (2).
2. Unsnap fluorescent locks (3) on ends of lampholder by pulling downward.
3. Grasp each end of fluorescent lamp (4) firmly and turn one-half turn to aline pins on ends of lamp with slots in lampholder. Pull down and out.

LAMP INSTALLATION

1. Grasp each end of new fluorescent lamp (4) firmly. Aline pins on ends of lamp with slots in lampholder. Lift lamp into lampholder and turn lamp one-half turn until it locks into place.
2. Position fluorescent locks (3) on each end of lampholder and push up to snap into place.
3. Position cover (2) on lamp fixture and secure with screws (1).

STARTER REMOVAL

1. Using screwdriver, remove screws (1) and cover (2).
2. Unsnap fluorescent locks (3) on ends of lampholder by pulling downward.
3. Grasp each end of fluorescent lamp (4) firmly and turn one-half turn to aline pins on ends of lamp with slots in lampholder. Pull down and out.
4. Push starter (5) in, turn to right, and pull out.

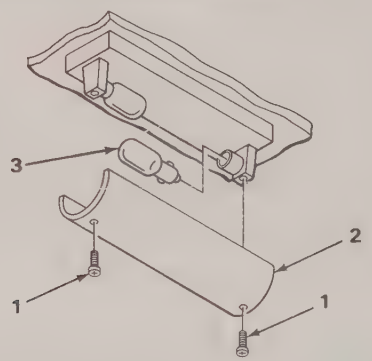
STARTER INSTALLATION

1. Push starter (5) in and turn to left.
2. Grasp each end of fluorescent lamp (4) firmly. Aline pins on ends of lamp with slots in lampholder. Lift lamp into lampholder and turn lamp one-half turn until it locks into place.
3. Position fluorescent locks (3) on each end of lampholder and push up to snap into place.
4. Position cover (2) on lamp fixture and secure with screws (1).

### 3-9. COLD-START LAMP REPLACEMENT.

Incandescent cold-start lamps are installed in AN/GRC-122/142D and E models only. Replacement is the same for all models.

MATERIALS/PARTS: Incandescent lamp, NSN 6240-00-155-8653




EL6VR175

REMOVAL

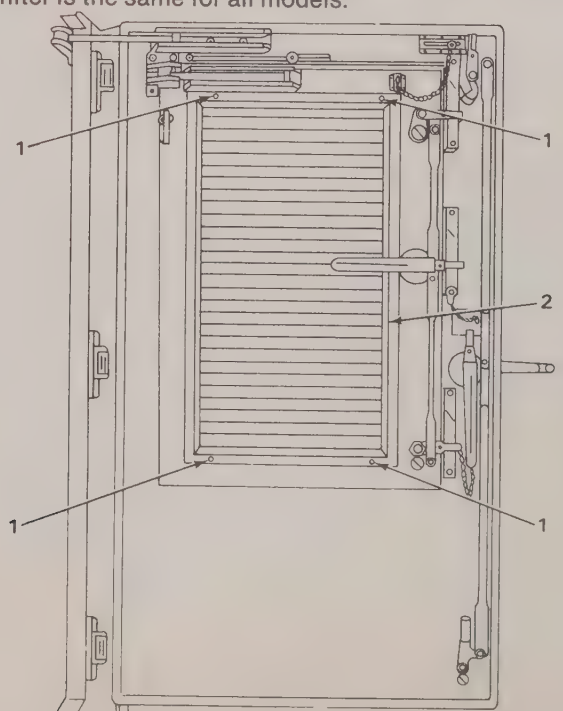
1. Using screwdriver, remove screws (1) and cover (2).
2. Press lamp (3) in, turn counterclockwise and remove.

INSTALLATION

1. Insert new lamp (3) in socket. Press in and turn clockwise until lamp locks into place.
2. Position cover (2) on light fixture and secure with screws (1).

### 3-10. CLEANING OF SHELTER DOOR AIR FILTER.

AN/GRC-122/142 models are contained in two different shelters, S-250/G and S-318(*)/G. Removal of shelter door air filter is the same for all models.




EL6VR176

**3-10. CLEANING OF SHELTER DOOR AIR FILTER.** (CONT)

REMOVAL

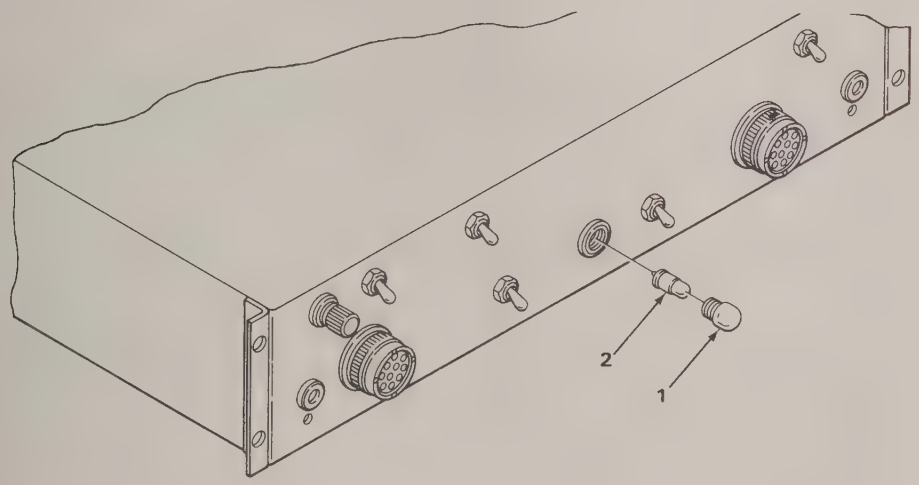
1. Using screwdriver, remove four screws (1).
2. Remove louvered section (2) of door.
3. Remove filter from louvered section (2) of door.
4. Wash filter in soapy water and air dry.

INSTALLATION

1. Place filter onto louvered section (2) of door.
2. Place louvered section (2) with filter on door.
3. Using screwdriver, install four screws.

**3-11. SWITCH ASSEMBLY INDICATOR LAMP REPLACEMENT (AN/GRC-122/142A, B, D, AND E MODELS).**

MATERIALS/PARTS: Lamp, type 327




EL6VR195

REMOVAL

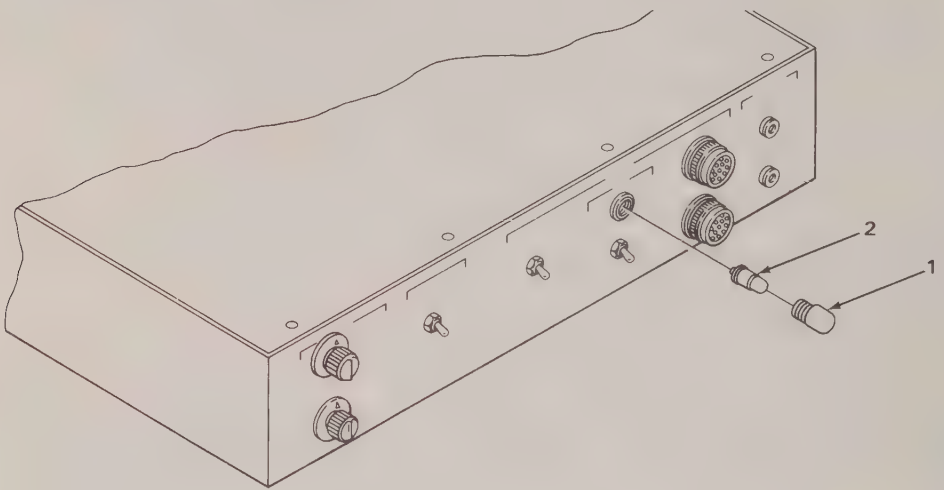
1. Remove lens (1) by turning counterclockwise.
2. Remove lamp (2) by pushing it in and turning counterclockwise.

INSTALLATION

1. Install new lamp (2) by pushing it in and turning clockwise.
2. Install lens (1).

## 3-12. CONTROL PANEL INDICATOR LAMP REPLACEMENT (AN/GRC-122/142 PLAIN AND C MODELS).

MATERIALS/PARTS: Lamp, NE-51




EL6VR196

REMOVAL

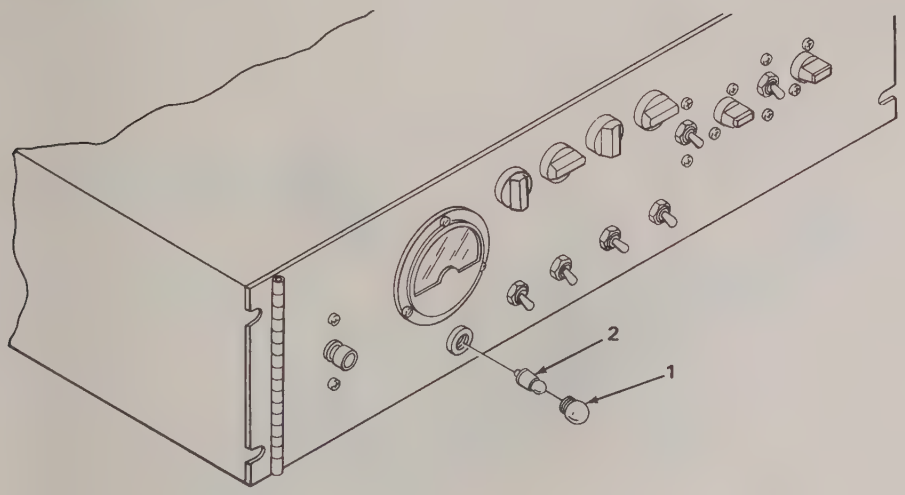
1. Remove lens (1) by turning counterclockwise.
2. Remove lamp (2) by pushing it in and turning counterclockwise.

INSTALLATION

1. Install new lamp (2) by pushing it in and turning clockwise.
2. Install lens (1).

## 3-13. POWER DISTRIBUTION PANEL SB-3018/GRC-142 POWER INDICATOR LAMP REPLACEMENT (AN/GRC-122/142 PLAIN AND C MODELS).

MATERIALS/PARTS: Lamp, type 327




EL6VR197

REMOVAL

1. Remove lens (1) with lamp (2) by turning counterclockwise.
2. Remove lamp (2) from lens (1).

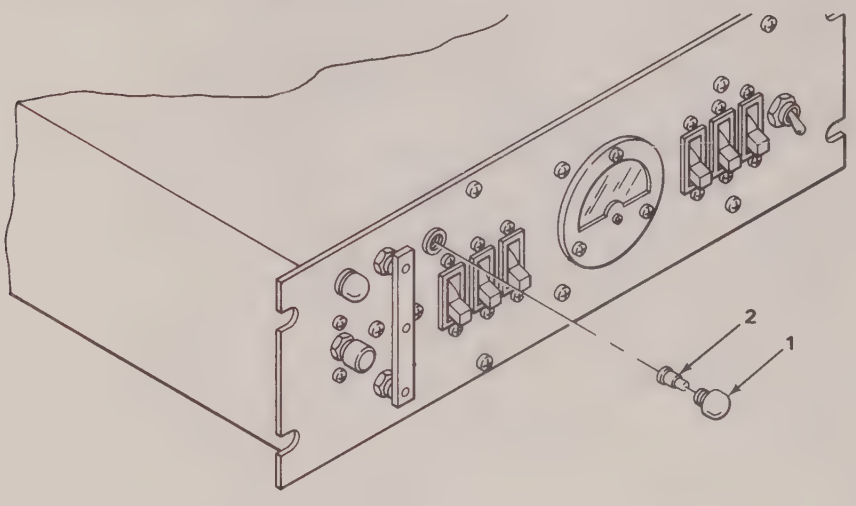
INSTALLATION

1. Insert new lamp (2) into lens (1).
2. Install lens (1).

## 3-14. POWER DISTRIBUTION PANEL SB-3358/GRC INDICATOR LAMP REPLACEMENT (AN/GRC-122/142A and B MODELS).

Indicator lamp replacement is typical for ac or dc indicator lamps. Only ac lamp replacement is shown.

MATERIALS/PARTS: Lamp, MS25237-327




EL6VR198

REMOVAL

1. Remove lens (1) with lamp (2) by turning counterclockwise.
2. Remove lamp (2) from lens (1).

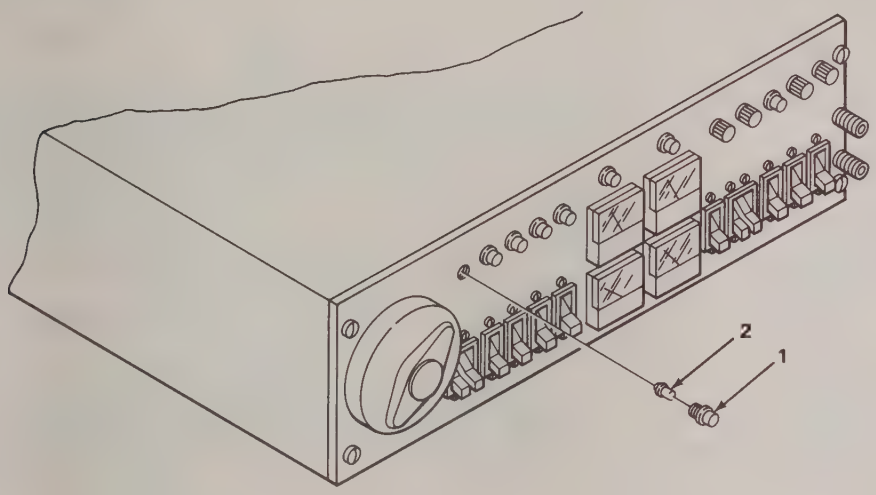
INSTALLATION

1. Insert lamp (2) into lens (1).
2. Install lens (1).

## 3-15. POWER DISTRIBUTION PANEL SB-F-960672 INDICATOR LAMP REPLACEMENT (AN/GRC-122/142D AND E MODELS).

Indicator lamp replacement is typical for all indicator lamps. Only one is shown.

MATERIALS/PARTS: Lamp




EL6VR199

REMOVAL

1. Remove lens (1) by turning counterclockwise.
2. Remove lamp (2) by pushing it in and turning counterclockwise.

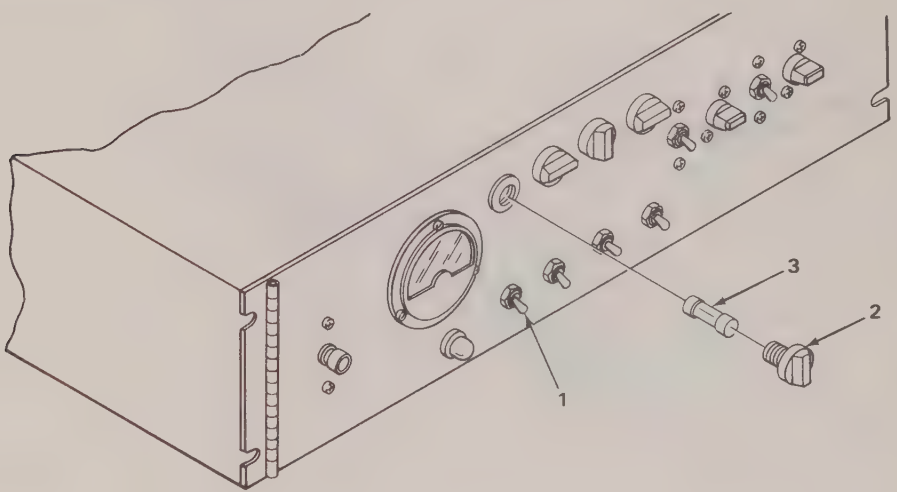
INSTALLATION

1. Install lamp (2) by pushing it in and turning clockwise.
2. Install lens (1).

### 3-16. POWER DISTRIBUTION PANEL SB-3018/GRC-142 FUSE REPLACEMENT (AN/GRC-122/142 PLAIN AND C MODELS).

Power distribution panel fuse replacement is typical for all power distribution panel fuses. Only one is shown.

MATERIALS/PARTS: Fuse




EL6VR200

**WARNING**

Set MAIN PUSH ON-PULL OFF circuit breaker to OFF to prevent electrical shock to personnel.

REMOVAL

1. Set LIGHTS switch (1) to OFF.
2. Remove fuse holder (2) with fuse (3) by turning counterclockwise.
3. Remove fuse (3) from fuse holder (2).

INSTALLATION

1. Insert new fuse (3) in fuse holder (2).
2. Install fuse holder (2) with fuse (3) into front panel.

# APPENDIX A

## REFERENCES

### A-1. SCOPE.

This appendix lists all forms, service bulletins, technical manuals, technical bulletins, regulations, and field manuals.

### A-2. FORMS.

| | |
|---|---|
| Recommended Changes to Equipment Technical Publications | DA FORM 2028-2 |
| Equipment Inspection and Maintenance Worksheet (Ed Jan 64 WILL BE USED) (S&I USAAGPC. BaH. Md. 21220 ONLY) | DA FORM 2404 |
| Discrepancy in Shipment Report (Short Title DISPEP) (Ed Jul 71 WILL BE USED) | SF FORM 361 |
| Report of Discrepancy (ROD) | SF FORM 364 |
| Quality Deficiency Report (Category 11) | SF FORM 368 |

### A-3. PAMPHLETS.

| | |
|---|---|
| Index of Technical Publications | DA FORM 310-1 |
| The Standard Army Publications System (STARPUBS) | DA PAM 310-10-2 |
| The Army Maintenance Management System (TAMMS) | DA PAM 738-750 |

### A-4. REGULATIONS.

| | |
|---|---|
| Reporting of Transportation Discrepancies in Shipments (RCS MTMC-54 (R1)) NASUPINST 4610.33B; AFR 75-18: MCO P4610.19C; DLAR 4500.15) | AR 55-38 |
| Identification and Distribution of DA Publications and Issue of Agency and Command Administration Publications | AR 310-2 |
| Reporting of Item and Packaging Discrepancies (DLAR 4140.55; NAVMATINST 4355.73A; AFR 400-54: MCO 4430.3F) | AR 735-11-2 |

### A-5. PAMPHLETS.

| | |
|---|---|
| Index of Technical Publications | DA PAM 310-1 |
| The Standard Army Publications System (STARPUBS) | DA PAM 310-10-2 |
| The Army Maintenance Management System (TAMMS) | DA PAM 738-750 |

### A-6. TECHNICAL BULLETINS.

| | |
|---|---|
| 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 (TO 31P5-1-1) | TB SIG 291 |
| Identification of Radioactive Items in the Army Supply System | TB 43-0116 |
| Field Instructions for Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters | TB 43-0118 |

**A-6. TECHNICAL BULLETINS.** (CONT)

| | |
|---|---|
| Instructions for Safe Handling and Identification of US Army Communications, Electronics Command Managed Radioactive Items in the Army Supply System | TB 43-0122 |
| Maintenance and Repair Procedures for Shelters, Electrical Equipment S-141/G and SO141B/G (NSN 5410-00-752-9698), S-144/G, S-144A/G, S-144B/G, S-144C/G and S-144D/G (5410-00-542-2532), S-250/G (5410-00-999-4935), S-250/G (Shielded) (5410-00-489-6076), S-280/G (5410-00-999-5269), S-280A/G (5410-00-999-6022), S-280B/G (5410-00-117-2868), S-280B/G (Shielded) (5410-00-001-4093), S-280C/G and S-318/G (5410-00-763-2339) and S-318A/G (5410-00-116-7086) | TB 43-0124 |

**A-7. TECHNICAL MANUALS.**

| | |
|---|---|
| Camouflage Materials | TM 5-200 |
| Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual: Air Conditioner, Wall or Base Mounted, Air Cooled; Self-Contained, Electric Motor Driven; 6,000 BTU/HR, 115V, 1 Phase, 2 Wire, 50/60 Cycle (Red-manson Model CE-6A-60A) (NSN 4210-00-926-1161) and 208V, 3 Phase, 4 Wire, 400 Cycle (Redmanson Model CE-6A-400A) (4120-00-926-1162) | TM 5-4120-289-15 |
| Operator's, Organizational, Direct Support, General Support and Depot Maintenance Manual (including Repair Parts and Special Tools List) for Heater, Space, Fuel Oil and Gasoline: 15,000 Btu/Hr Output, DC 24V (Hupp Model MH15B3C-1) (FSN 4520-878-9393) | TM 5-4520-211-14 |
| Operator's, Organizational, Direct and General Support Maintenance Manual for Heater, Space, Multifuel W/Blower 15,000 Btu/Hr (Hunter-Model UH-48C, Type 1) (NSN 4520-01-010-0316) | TM 5-4520-239-14 |
| Organizational Direct Support Maintenance Manual (Including Repair Parts and Special Tools List): Can, Gasoline, Military, Steel, 5-Gal (FSN 7240-222-3088); Can, Water, Military, Steel, 5-Gal (7240-242-6153); Can, Water, Military, Aluminum, 5-Gal (7240-242-3767); Can, Water, Military, Plastic, 5-Gal (7240-089-3827); and, Case, Military Water Can (7240-125-9061) | TM 10-7200-200-13 |
| Control Group AN/GRA-6 (TO 16-30GRA6-5) | TM 11-5038 |
| Organizational, Direct Support, General Support, and Depot Maintenance Repair Parts and Special Tool Lists: Shelter Electrical Equipment S-318/G | TM 11-5410-212-15P |
| Operator's and Organizational Maintenance Repair Parts and Special Tools List for Shelter, Electrical Equipment S-250/G (NSN 5410-00-999-4935) | TM 11-5410-214-12P |
| Operator and Organizational Maintenance Manual: Telephone Set, TA-312/PT (NSN 5805-00-543-0012) (TO 31W1-2DT-291) | TM 11-5805-201-12 |
| Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual; Modem, Radio Teletypewriter MD-522/GRC (NSN 5815-00-999-5277) | TM 11-5805-387-15-1 |
| Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual: Radio Teletypewriter Modem, MD-522/GRC (NSN 5815-00-919-4800) | TM 11-5805-387-15-2 |
| Organizational Repair Parts List: Modem, Radio Teletypewriter MD-522A/GRC | TM 11-5805-387-20P-2 |

**A-7. TECHNICAL MANUALS.** (CONT)

| | |
|---|---|
| Operator's and Organizational Maintenance Manual: Teletypewriter Sets, AN/FGC-20 (NSN 5815-00-503-2652), AN/FGC-20X (5815-00-392-7743), AN/FGC-21 (5815-00-503-2653), AN/FGC-66 (5815-00-817-9277), AN/FGC-159 and AN/FGC-159X (5815-00-561-7964), AN/FGC-160 (5815-00-025-9036), AN/FGC-177 (5815-01-017-3780), AN/UGC-4 (5815-00-557-5970), AN/UGC-29 (5815-00-082-4199), AN/UGC-29X (5815-00-032-4200) and Teleprinter, TT-259/FG (5815-00-688-8761) (TO 31W4-2FGC20-31) | TM 11-5815-200-12 |
| Operator's and Organizational Maintenance Manual for Teletypewriter Sets AN/PGC-1 (NSN 5815-00-198-5963) and AN/PGC-3 (5815-01-012-8773); Teletypewriters TT-4A/TG, TT-4B/TG, TT-4C/TG (5815-00-198-4438), TT-335/TG (5815-00-878-8449), TT-537/TG (5815-00-926-7378), TT-698/TG, TT-698A/TG, TT-698B/TG (5815-01-008-9628), TT-722/TG, and TT-722A/TG (5815-01-017-9172) | TM 11-5815-206-12 |
| Operator's Manual for Teletypewriter Sets, AN/GGC-3 (NSN 5815-00-503-3309), AN/GGC-3A (5815-00-581-9751), AN/GGC-53 (5815-01-012-8772), AN/GGC-53A (5815-00-017-0956) and Teletypewriter Reperforator-Transmitters, TT-76/GGC (5815-00-503-2760) TT-76A/GGC, TT-76B/GGC and TT-76C/GGC (5815-00-503-6061), TT-699/GGC (5815-01-012-8446), TT-699A/GGC, TT-699B/GGC and TT-699C/GGC (5815-01-017-9166) | TM 11-5815-238-10 |
| Organizational Maintenance for Teletypewriter Sets, AN/GGC-3 (NSN 5815-00-503-3309, AN/GGC-3A (5815-00-581-9751), AN/GGC-53 (5815-01-012-8772), AN/GGC-53A (5815-00-017-0956) and Teletypewriter Reperforator-Transmitters, TT-76/GGC (5815-00-503-2760) TT-76A/GGC, TT-76B/GGC and TT-76C/GGC (5815-00-503-6061), TT-699/GGC (5815-01-012-8446), TT-699A/GGC, TT-699B/GGC and TT-699C/GGC (5815-01-017-9166) | TM 11-5815-238-20 |
| Hand Receipt Manual Covering and Item/Components of End Item (COE1) Basic Issue Items (BII) and Additional Authorization List for Radio Teletypewriter Sets, AN/GRC-122 (NSN 5815-00-401-9719) AN/GRC-122A (NSN 5815-00-167-7998) AN/GRC-122B (NSN 5815-00-937-5295) AN/GRC-122C (NSN 5815-01-095-1211) AN/GRC-122D (NSN 5815-01-096-0428) AN/GRC-122E (NSN 5815-01-095-1212) AN/GRC-142 (NSN 5815-00-401-9720) AN/GRC-142A (NSN 5815-00-168-1556) AN/GRC-142B (NSN 5815-00-443-5511) AN/GRC-142C (NSN 5815-01-100-6815) AN/GRC-142D (NSN 5815-01-104-7264) AN/GRC-142E (NSN 5815-01-095-6258) | TM 11-5815-334-10-HR |
| Organizational Maintenance Repair Parts and Special Tools List for Radio Teletypewriter Sets AN/GRC-122 and AN/GRC-122A (5815-00-401-9719), AN/GRC-122B (NSN 5815-00-937-5295), AN/GRC-142 and AN/GRC-142A (5815-00-401-9720), AN/GRC-142B (NSN 5815-00-443-5511) and AN/GRC-142C (5815-01-100-6815) | TM 11-5815-334-20P |
| Operator's Organizational, Direct Support, General Support, and Depot Maintenance Manual: Device, Low-Level Signaling TT-523/GGC (NSN 5815-00-937-6146) and TT-523A/GGC (NSN 5815-00-999-3048) | TM 11-5815-338-15 |
| Operator's and Organizational Maintenance Manual for Terminal, Communications AN/UGC-74A(V)3 (NSN 5815-01-062-8194) | TM 11-5815-602-12 |

**A-7. TECHNICAL MANUALS.** (CONT)

| | |
|---|---|
| Direct Support and General Support Maintenance Manual: Terminal, Communications AN/UGC-74A(V)3 (NSN 5815-01-062-8194) | TM 11-5815-602-34 |
| Operator's Manual Radio Set AN/GRR-7 | TM 11-5820-201-10 |
| Operator's, Organizational, Direct Support and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools) for Masts AB-155/U (FSN 5820-251-2366), AB-155A/U (5985-507-6261), and AB-155B/U (5985-732-5146) | TM 11-5820-251-14P |
| Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual: Antenna Group AN/GRA-50 (NSN 5985-00-892-0758) | TM 11-5820-467-15 |
| Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools) for Antenna Group AN/GRA-50 (NSN 5985-00-892-0758) | TM 11-5820-467-24P |
| Organizational Maintenance Repair Parts and Special Tool Lists for Control Group AN/GRA-6 (NSN 5820-00-644-4554) | TM 11-5820-489-20P |
| Operator's and Organizational Maintenance Manual: Radio Sets AN/GRC-106 (NSN 5820-00-402-2263) and AN/GRC-106A (NSN 5820-00-223-7548) | TM 11-5820-520-12 |
| Operator's and Organizational Maintenance Manual: Power Supplies PP-4763/GRC (NSN 5820-00-937-7690) and PP-4763A (5820-00-113-9768) | TM 11-5820-765-12 |
| Operator's, Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools Lists Dynamic Loudspeaker LS-166/U (FSN 5965-243-640) | TM 11-5965-222-14P |
| Operator's, Organizational, Field and Depot Maintenance Repair Parts and Special Tool Lists: Handset H-111/U | TM 11-5965-244-15P |
| Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual: Motor-Generator PU-724/G (NSN 6125-00-617-1435) | TM 11-6125-252-15 |
| Operator's and Organizational Maintenance Manual: Multimeters AN/URM-105 and AN/URM-105C (Including Multimeters ME-77/U and ME-77C/U | TM 11-6625-203-12 |
| Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual: Standing-Wave-Ratio Power Meter ME-165/G (NSN 6625-00-682-4464) | TM 11-6625-333-15 |
| Procedures for Destruction of Electronic Material to Prevent Enemy Use (Electronics Command) | TM 750-244-2 |

**A-8. FIELD MANUALS.**

| | |
|---|---|
| First Aid for Soldiers | FM 21-11 |

# APPENDIX B

## COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LIST

## Section I INTRODUCTION

### B-1. SCOPE.

This appendix lists components of end item and basic issue items for the radio sets AN/GRC-122/142(*), to help you inventory items required for safe and efficient operation.

### B-2. GENERAL.

The components of End Item and Basic Issue Items lists are divided into the following sections:

a. Section II. Components of End Item. This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the terminal set in operation and to perform emergency repairs. Although packed and shipped separately, Basic Issue Items must be with the terminal set during operation and whenever it is transferred between property accounts. This manual is your authority to request/requisition replacement Basic Issue Items, based on TOE/MTOE authorization of the end item.

### B-3. EXPLANATION OF COLUMNS.

The following provides an explanation of columns found in the tabular listings:

a. Column 1, Illus No. (Illustration Number). This column indicates the number of the illustration in which the item is shown.

b. Column 2, National Stock Number. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

**B-3. EXPLANATION OF COLUMNS.** (CONT)

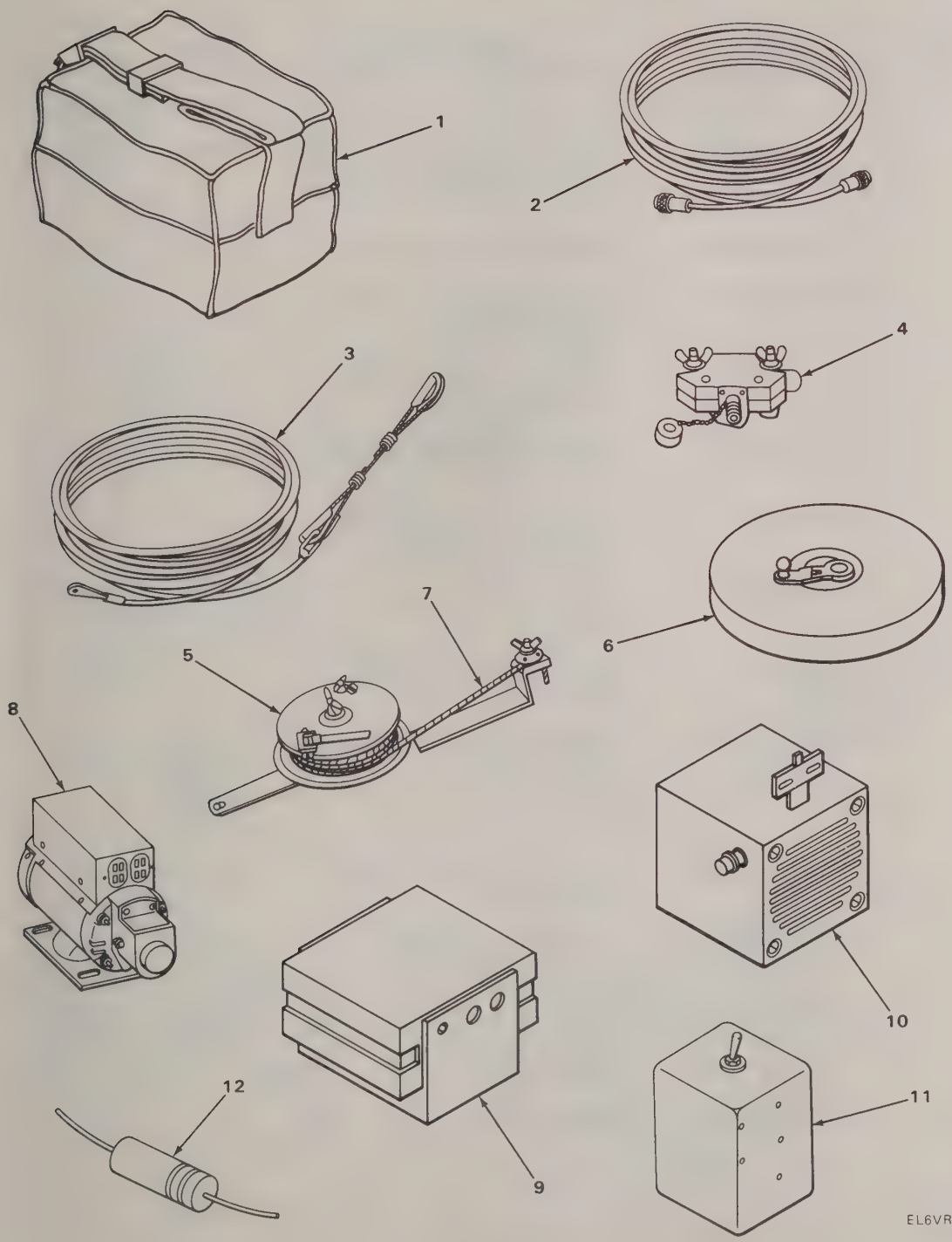
c. Column 3, Description. Indicates the Federal item name and if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number. If item needed differs on different models of equipment, the model is shown under the "Usable On" heading in this column. The codes are identified as:

| CODE | USED ON |
|---|---|
| PAA | All AN/GRC-122(*) Models |
| PAB | Model AN/GRC-122 |
| PAC | Model AN/GRC-122A |
| PAD | Model AN/GRC-122B |
| PAE | Model AN/GRC-122C |
| PAF | Model AN/GRC-122D |
| PAG | Model AN/GRC-122E |
| PAH | All AN/GRC-142(*) Models |
| PAI | Model AN/GRC-142 |
| PAJ | Model AN/GRC-142A |
| PAK | Model AN/GRC-142B |
| PAL | Model AN/GRC-142C |
| PAM | Model AN/GRC-142D |
| PAN | Model AN/GRC-142E |
| PAO | All models |

d. Column 4, U/M (Unit of Measure). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (ea, in., pr).

e. Column 5, Qty Req'd (Quantity Required). Indicates the quantity of the item authorized to be used with/on the equipment.

## Section II COMPONENTS OF END ITEM

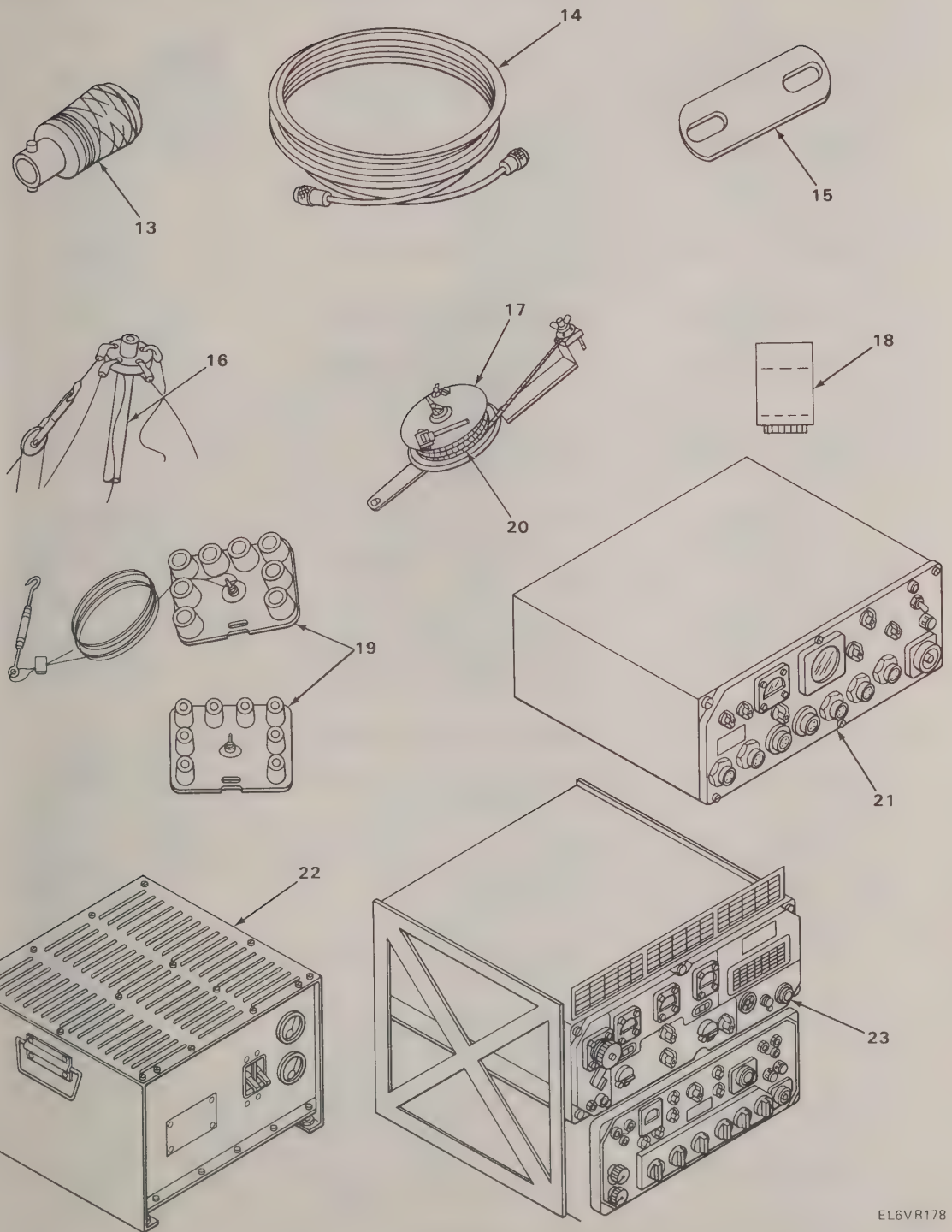


**COMPONENTS OF END ITEM** (CONT)

| (1) ILLUS NO. | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION FSCM AND PART NUMBER | USABLE ON CODE | (4) U/M | (5) QTY REQ'D |
|---|---|---|---|---|---|
| | 5985-00-892-0758 | ANTENNA GROUP AN/GRA-50 (80058) PPL-1898 CONSISTING OF: | PAO | EA | 1 |
| 1 | 6115-00-498-3973 | BAG BG-175 (80063) GBG1003 | | EA | 1 |
| 2 | 5995-00-823-2176 | CABLE ASSEMBLY CG-687/U (80058) SM-D-198099 | | EA | 1 |
| 3 | 5985-00-893-1438 | HALYARD MX-2706/G (80058) SM-C-198100 | | EA | 2 |
| 4 | 5970-00-405-8223 | INSULATOR IL-4/GRA-4 (80058) SC-DL-135499 | | EA | 1 |
| 5 | 5895-00-896-3179 | REELING MACHINE RC-432/G (80058) SM-D-198096 | | EA | 2 |
| 6 | 5210-00-891-6077 | TAPE MEASURING (81349) MIL-T-55371 | | EA | 1 |
| 7 | 5985-00-757-2130 | WIRE ASSEMBLY CX-7303/G (80058) SC-DL-198104 | | EA | 2 |
| 8 | 6125-00-617-1435 | INVERTER, MOTOR GENERATOR PU-724/G (80058) SM-D-114304 | PAB,PAC PAD,PAE PAI,PAJ PAK,PAL | EA | 2* |
| 9 | 6130-01-092-5998 | INVERTER PU-724A/G (80058) SM-D-937454 | PAF,PAG PAM,PAN | EA | 2* |
| 10 | 5965-00-243-6420 | LOUDSPEAKER, DYNAMIC LS-166/U (80058) MIL-L-12632 | PAO | EA | 2 |
| 11 | 5815-00-999-3048 | LOW-LEVEL SIGNALING DEVICE TT-523( )/GGC (80058) SC-DL-603719 | PAO | EA | 1 |
| 12 | 5905-00-407-2388 | RESISTOR 5600 OHMS | PAO | EA | 1 |

*One half the quantity is used in AN/GRC-142 models.

## COMPONENTS OF END ITEM (CONT)

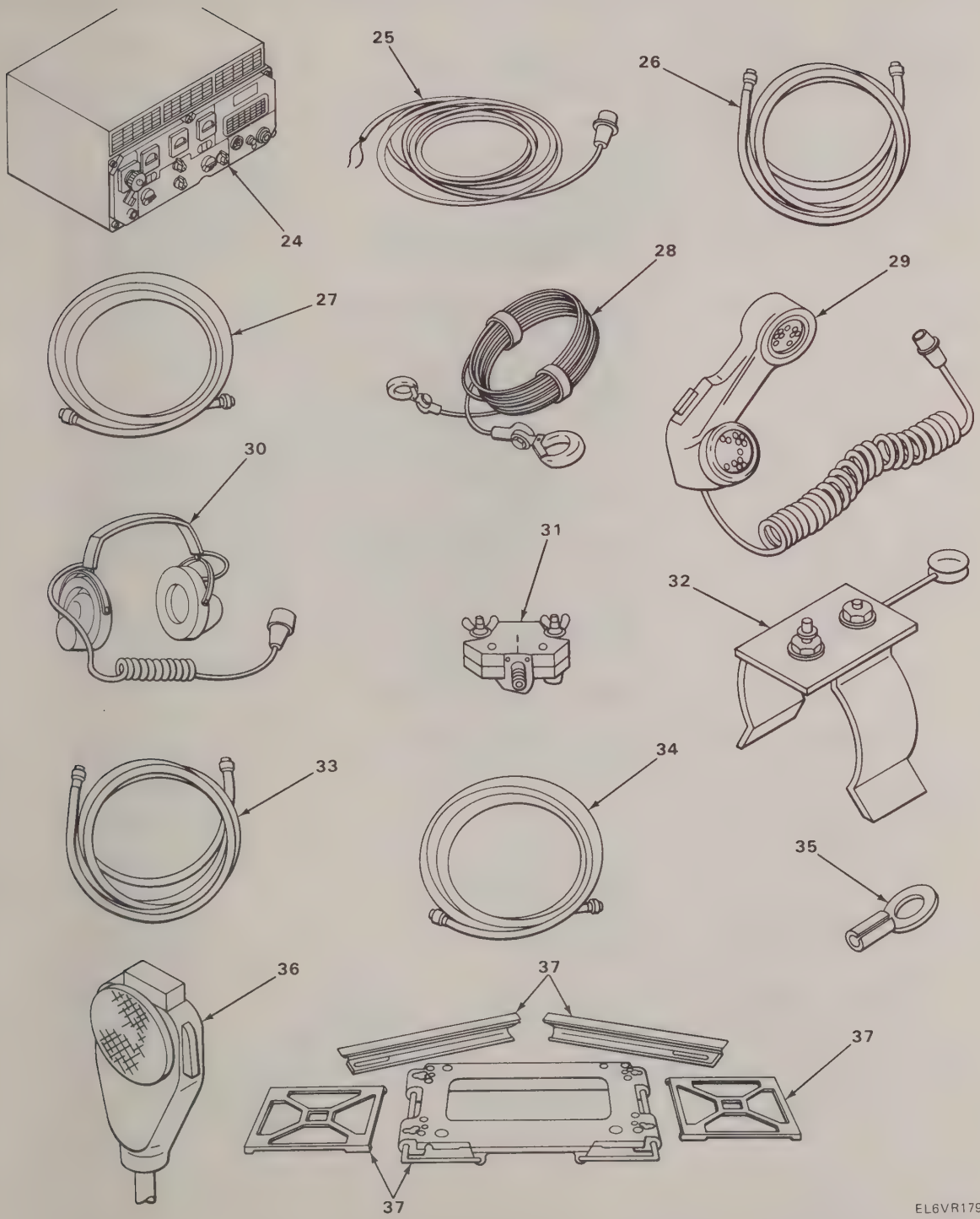


**COMPONENTS OF END ITEM** (CONT)

| (1) ILLUS NO. | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION FSCM AND PART NUMBER | USABLE ON CODE | (4) U/M | (5) QTY REQ'D |
|---|---|---|---|---|---|
| | 5985-00-507-6261 | MAST ASSEMBLY AB-155/U (80058) PPL-1270 CONSISTING OF: | PAO | EA | 6* |
| 13 | 5935-00-643-9875 | ADAPTER, RF UG-29B/U (80058) MS 90576-29B | | EA | 1 |
| 14 | 5995-00-521-0309 | CABLE ASSEMBLY CG-55C/U | | EA | 1 |
| | | OR | | | |
| 14 | 5995-00-752-1362 | CABLE ASSEMBLY CG-692A/U (80063) SC-D-7881 | | EA | 1 |
| 15 | 5970-00-405-8971 | INSULATOR (81349) MIL-I-23264/20 | | EA | 12 |
| 16 | | MASTS | | EA | 8 |
| 17 | 8130-00-656-1090 | REEL, CABLE RC-435 (80058) SC-DL-69296 | | EA | 1 |
| 18 | 5940-01-006-4487 | SPLICE, SPLIT BOLT BURGANDY KS-90 OR EQUIVALENT (09922) S-10-S | | EA | 18 |
| 19 | | CARRING DEVICE MX-38/GRA-4 | | EA | 6 |
| 20 | 6145-00-128-8695 | WIRE, COPPER STRANDED #14 AWG (500 FT) (81348) QQW 343 | | EA | 1 |
| 21 | 5815-00-919-4800 | MODEM, RADIO TELETYPEWRITER MD-522A/GRC (80058) SM-D-583326 | PAO | EA | 1 |
| | | OR | | | |
| 21 | 5815-00-999-5277 | MODEM, RADIO TELETYPEWRITER MD-522/GRC (80058) | PAO | EA | 1 |
| 22 | 5820-00-337-7690 | POWER SUPPLY PP-4763( )/GRC (80058) BS030-50PPX2 | PAO | EA | 1 |
| 23 | 5820-00-402-2263 | RADIO SET AN/GRC-106 (80058) MIL-R-55002 CONSISTING OF: | PAO | EA | 1 |
| | | OR | | | |
| 23 | 5820-00-223-7548 | RADIO SET AN/GRC-106A (80058) PPL4467 CONSISTING OF: | PAO | EA | 1 |

*One half the quantity is used in AN/GRC-142 models.

## COMPONENTS OF END ITEM (CONT)

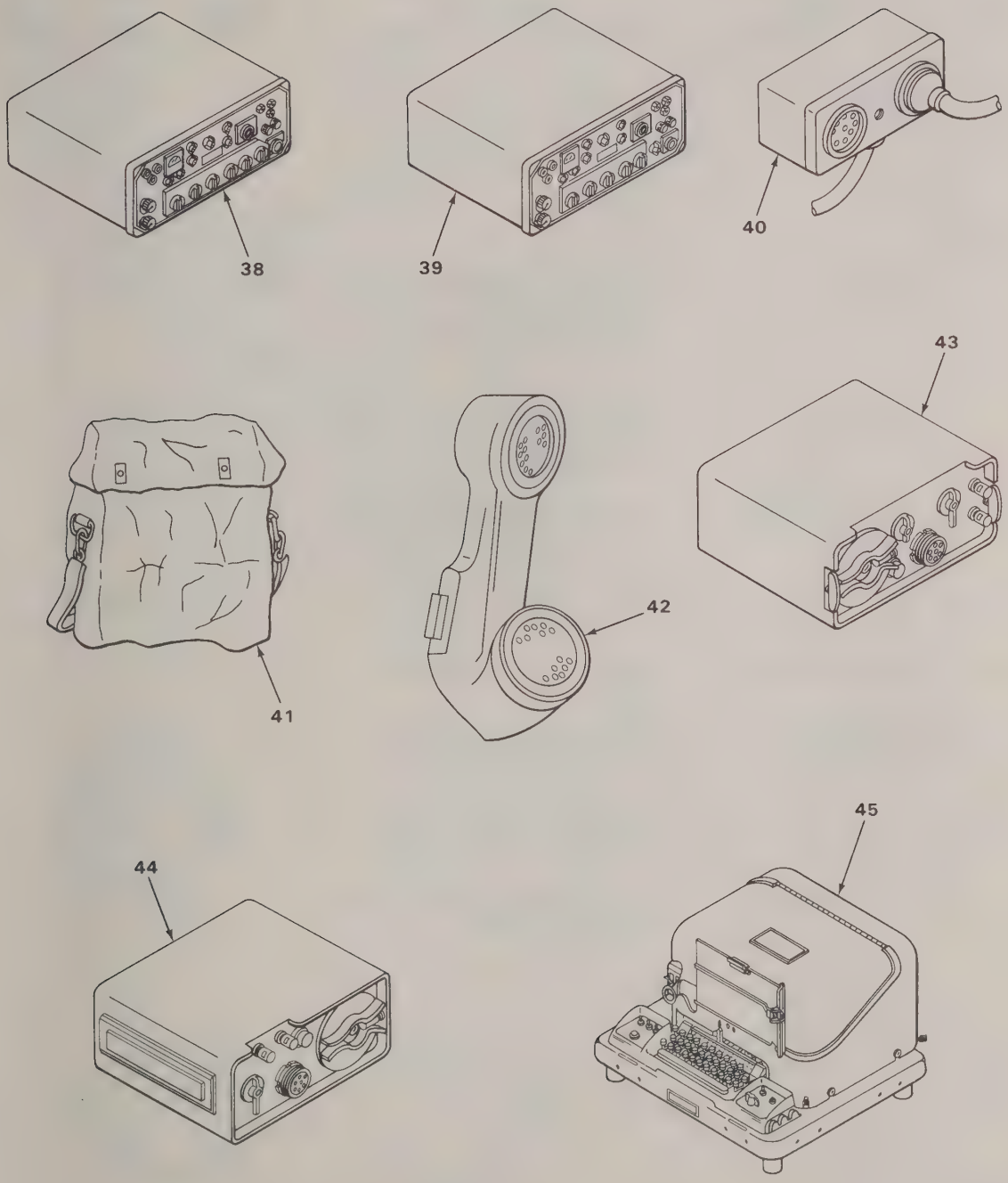


**COMPONENTS OF END ITEM** (CONT)

| (1) ILLUS NO. | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION FSCM AND PART NUMBER | USABLE ON CODE | (4) U/M | (5) QTY REQ'D |
|---|---|---|---|---|---|
| 24 | 5820-00-078-4771 | AMPLIFIER, RF AM-3349/GRC-106 (80058) SM-D-502000 | | EA | 1 |
| 24 | 5995-00-177-4501 | CABLE, SPECIAL PURPOSE CX-1852/U (80058) SC-C-72385 | | EA | 1 |
| 26 | 5995-00-578-6353 | CABLE ASSEMBLY RF CG-409( )/U (80058) SC-C-72385 | | EA | 2 |
| 27 | 5995-00-985-8005 | CABLE ASSEMBLY SPECIAL PURPOSE, ELECTRICAL CX-10099 (80058) SC-DL-502753 | | EA | 1 |
| 28 | 5340-00-286-2491 | CLAMP, ROPE (80063) SC-B-19491A | | EA | 2 |
| 29 | 5965-00-163-9947 | HANDSET H-33( )/PT (81349) MIL-H-11134 | | EA | 1 |
| 30 | 5965-00-226-2915 | HEADSET, ELECTRICAL H-227/U (81349) MIL-E-55119 | | EA | 2* |
| 31 | 5970-00-498-3745 | INSULATOR (80063) SC-D-4779 | | EA | 4 |
| 32 | 5805-00-503-3395 | KEY, TELEGRAPH KY-116/U (80058) SC-DL-45824 | | EA | 1 |
| 33 | 6150-00-170-5573 | LEAD (80063) SC-B-27840 | | EA | 1 |
| 34 | 5995-00-985-8014 | LEAD, ELECTRICAL CX-10171/U (80058) SM-C-502182 | | EA | 1 |
| 35 | 5940-00-838-2984 | LUG, TERMINAL (80063) SM-B-500422 | | EA | 4 |
| 36 | 5965-00-892-0722 | MICROPHONE M-2913/U (80058) MIL-M-11193 | | EA | 1 |
| 37 | 5820-00-078-5614 | MOUNTING MT-3140/GRC-106 (80058) SM-D-500797 | | EA | 2 |

*One half the quantity is used in AN/GRC-142 models.

## COMPONENTS OF END ITEM (CONT)



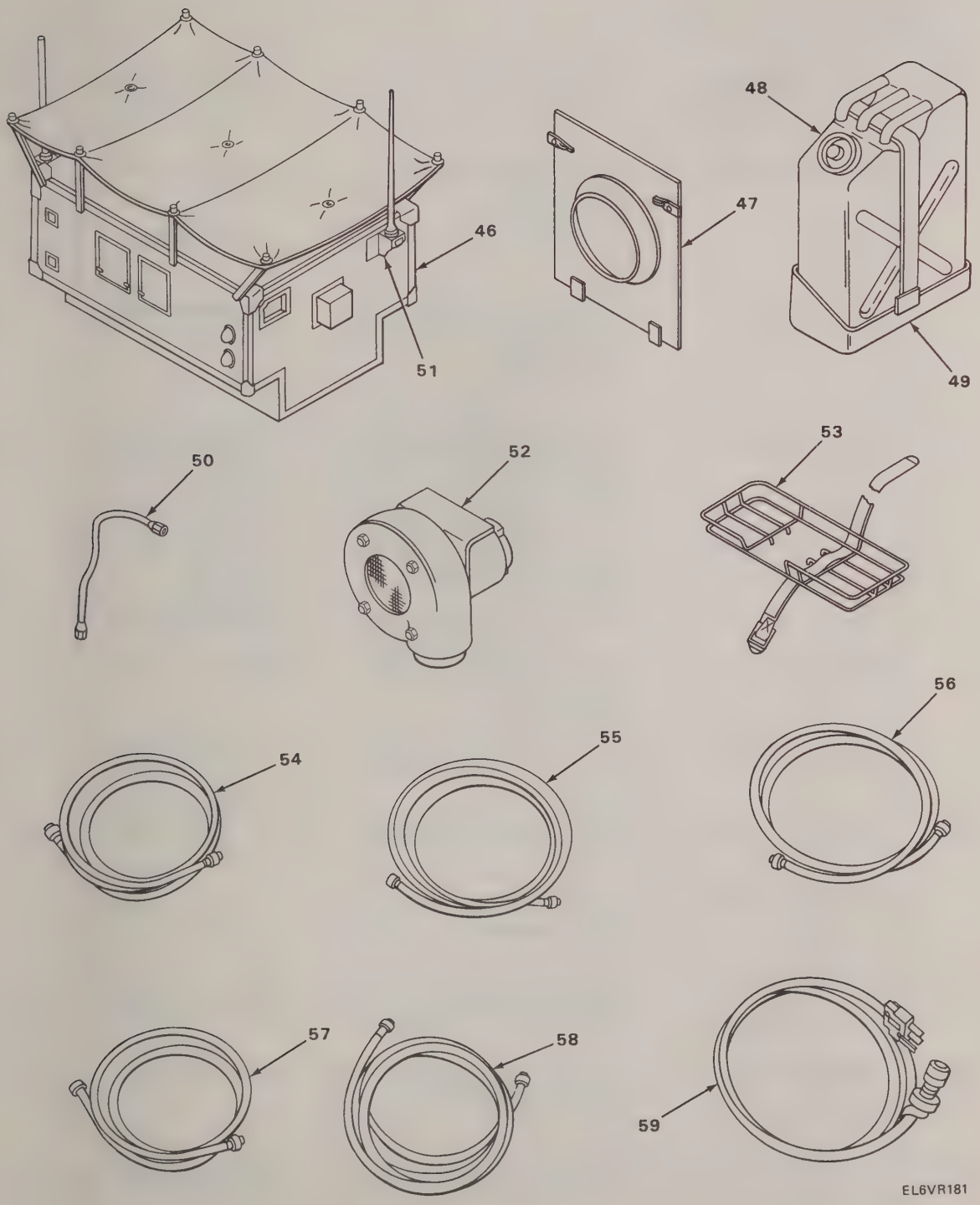

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**COMPONENTS OF END ITEM** (CONT)

| (1) ILLUS NO. | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION FSCM AND PART NUMBER | USABLE ON CODE | (4) U/M | (5) QTY REQ'D |
|---|---|---|---|---|---|
| 38 | 5820-00-078-4766 | RECEIVER-TRANSMITTER, RADIO (80058) RT-662/GRC SM-D-500011 (AN/GRC-106 ONLY) | PAO | EA | 2* |
| | | OR | | | |
| 39 | 5820-00-935-0033 | RECEIVER-TRANSMITTER, RADIO (80058) RT-834/GRC SC-DL-501092 (AN/GRC-106A ONLY) | PAO | EA | 2* |
| | 5820-00-644-4554 | REMOTE CONTROL GROUP (80058) AN/GRA-6 SC-DL-41747 CONSISTING OF: | PAO | EA | 1 |
| 40 | 5820-00-511-4319 | INTERCONNECTING BOX J-654/G (80058) SC-DL-85578 | | EA | 1 |
| 41 | 5820-00-404-6885 | BAG CW-189/GR (80058) SC-DL-40635 | | EA | 1 |
| 42 | 5965-00-163-9947 | HANDSET H-33( )PT (81349) MIL-H-11134 | | EA | 1 |
| 43 | 5820-00-170-4781 | LOCAL CONTROL C-434/GRC (81349) MIL-R-13028 | | EA | 1 |
| 44 | 5820-00-170-5171 | REMOTE CONTROL C-433/GRC (81349) MIL-R-13028 | | EA | 1 |
| 45 | 5815-00-553-6061 | REPERFORATOR-TRANSMITTER TT-76( )/GRC (80058) SM-D-134701 | | EA | 1 |

*One half the quantity is used in AN/GRC-142 models.

## COMPONENTS OF END ITEM (CONT)



**COMPONENTS OF END ITEM** (CONT)

| (1) ILLUS NO. | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION FSCM AND PART NUMBER | USABLE ON CODE | (4) U/M | (5) QTY REQ'D |
|---|---|---|---|---|---|
| 46 | 5411-00-432-2342 | SHELTER FACILITY (80058) S-504/GRC-142 CONSISTING OF: | PAB,PAE, PAI,PAL | EA | 1 |
| | | OR | | | |
| 46 | 5411-00-432-7296 | SHELTER FACILITY (80058) S-504A/GRC-142A CONSISTING OF: | PAC,PAF, PAJ,PAM | EA | 1 |
| | | OR | | | |
| 46 | 5411-00-432-2342 | SHELTER FACILITY (80058) S-502/GRC-142B CONSISTING OF: | PAD,PAG, PAK,PAN | EA | 1 |
| 47 | 5410-01-070-3781 | ADAPTER ASSEMBLY FOR AIR CONDITIONING (80063) SC-D-681087 | PAC,PAD, PAF,PAG, PAJ,PAK, PAM,PAN | EA | 2 |
| | 7420-00-935-3272 | ADAPTER KIT, F/FUEL CAN (80063) PLSMA603812 CONSISTING OF: | PAO | EA | 1 |
| 48 | 7240-00-222-3088 | CONTAINER, GAS CAN (81349) MIL-6-1283 | | EA | 1 |
| 49 | 2590-00-473-6331 | HOLDER, F/GAS CAN (96906) MS 53052-1 | | EA | 1 |
| 50 | 4720-00-595-0453 | HOSE ASSEMBLY (88044) AN6270-450092 | | EA | 1 |
| 51 | 5985-00-937-6719 | ANTENNA MOUNTING SUPPORT ASSEMBLY (80063) SM-D-603560 | PAO | EA | 1 |
| 51 | 5985-00-937-6718 | ANTENNA MOUNTING SUPPORT ASSEMBLY (80063) SM-D-603561 | PAO | EA | 1 |
| 52 | | BLOWER ASSEMBLY (MODIFIED) SC-D-960736 | PAF,PAG, PAM,PAN | EA | 1 |

**COMPONENTS OF END ITEM** (CONT)

| (1) ILLUS NO. | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION FSCM AND PART NUMBER | USABLE ON CODE | (4) U/M | (5) QTY REQ'D |
|---|---|---|---|---|---|
| 52 | | BLOWER ASSEMBLY (MODIFIED) SC-D-960736-1 | PAF,PAG, PAM,PAN | EA | 1 |
| 53 | 5805-00-089-4003 | BOX, TELEPHONE (80063) SM-D-603209 | | EA | 1 |
| 54 | 5995-00-494-8261 | CABLE ASSEMBLY CG-2568A SC-DL-612865 (6 FT, 6 IN.) | PAC,PAD, PAF,PAG, PAJ,PAK, PAM,PAN | EA | 1 |
| 54 | 5995-00-935-0248 | CABLE ASSEMBLY CG-2568A/U (80058) (5 FT, 6 IN.) | PAB,PAE, PAI,PAL | EA | 1 |
| 54 | 5995-00-937-8458 | CABLE ASSEMBLY CG-3366/U (80058) CG 3366V1-6 (18 IN.) | PAC,PAD, PAF,PAG, PAJ,PAK, PAM,PAN | EA | 1 |
| 54 | 5995-00-494-8260 | CABLE ASSEMBLY CG-3562/G (80058) SM-C-613284 (17 IN.) | PAC,PAD, PAF,PAG, PAJ,PAK, PAM,PAN | EA | 1 |
| 54 | 5995-00-935-0389 | CABLE ASSEMBLY CX-2340A (80058) (9 FT) | PAB,PAE, PAI,PAL | EA | 1 |
| 54 | 5995-00-935-0393 | CABLE ASSEMBLY CX-3384/U (80058) SM-C-603140 (1 FT, 5 IN.) | PAB,PAE, PAI,PAL | EA | 1 |
| 54 | 5995-00-682-3315 | CABLE ASSEMBLY CX-4541 (80058) 30X204977 (3 FT, 1 IN.) | PAO | EA | 2 |
| 54 | 5995-00-889-0899 | CABLE ASSEMBLY CX-4541/U (80058) SC-D-48461 (3 FT) | PAF,PAG, PAM,PAN | EA | 1 |
| 54 | 5995-01-012-3629 | CABLE ASSEMBLY CX-10463/GRC-142 (80058) SM-C-603917 (15 FT) | PAO | EA | 1 |
| 54 | 5995-00-937-8620 | CABLE ASSEMBLY CX-10507/G (80058) SM-C-603101 (4 FT, 5 IN.) | PAF,PAG, PAM,PAN | EA | 1 |

**COMPONENTS OF END ITEM** (CONT)

| (1) ILLUS NO. | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION FSCM AND PART NUMBER | USABLE ON CODE | (4) U/M | (5) QTY REQ'D |
|---|---|---|---|---|---|
| 54 | 5995-00-453-9428 | CABLE ASSEMBLY CX-10507/G (80058) SC-DL-612825 (9 FT) | PAC,PAD, PAF,PAG, PAJ,PAK, PAM,PAN | EA | 1 |
| 54 | 5995-00-937-8621 | CABLE ASSEMBLY CX-10508/G (80058) SM-C-603102 (6 FT) | PAB,PAC, PAD,PAI, PAJ,PAK | EA | 1 |
| 55 | 5995-00-937-8622 | CABLE ASSEMBLY CX-10509/G (80058) SM-C-603103 (12 FT, 3 IN.) | PAB,PAC, PAD,PAI, PAJ,PAK | EA | 1 |
| 55 | 5995-00-937-8623 | CABLE ASSEMBLY CX-10510/G (80058) SM-C-60314 (11 FT, 7 IN.) | PAB,PAC, PAD,PAI, PAJ,PAK | EA | 1 |
| 56 | 5995-00-937-8624 | CABLE ASSEMBLY CX-10511/G (80058) SM-C-603105 (5 FT, 1 IN.) | PAB,PAC, PAD,PAI, PAJ,PAK | EA | 1 |
| 56 | 5995-00-937-8625 | CABLE ASSEMBLY CX-10512/G (80058) PL-SM-A603885 (9 FT, 6 IN.) | PAB,PAE, PAI,PAL | EA | 1 |
| 56 | 5995-00-453-9433 | CABLE ASSEMBLY CX-10512/G (80058) SC-DL-612830 (10 FT) | PAC,PAD, PAF,PAG, PAJ,PAK, PAM,PAN | EA | 1 |
| 56 | 5995-00-935-2545 | CABLE ASSEMBLY CX-10513/G (80063) SC-DL-612831 (7 FT, 6 IN.) | PAO | EA | 1 |
| 56 | 5995-00-937-8626 | CABLE ASSEMBLY CX-10513/G (80058) PL-SM-A603885 (9 FT, 6 IN.) | PAO | EA | 1 |
| 56 | 5995-00-935-2542 | CABLE ASSEMBLY CX-10514/G (80063) SM-C-603109 (6 FT, 9 IN.) | PAO | EA | 1 |
| 56 | 5995-00-937-8627 | CABLE ASSEMBLY CX-10514/G (80063) PL-SM-A-603110 (9 FT) | PAO | EA | 1 |

**COMPONENTS OF END ITEM** (CONT)

| (1) ILLUS NO. | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION FSCM AND PART NUMBER | USABLE ON CODE | (4) U/M | (5) QTY REQ'D |
|---|---|---|---|---|---|
| 56 | 5995-00-937-8460 | CABLE ASSEMBLY CX-10515/G (80058) SM-C-603889 (6 FT) | PAO | EA | 1 |
| 56 | 5995-00-935-0396 | CABLE ASSEMBLY CX-10515/G (80058) PL-SM-A-603889 (7 FT) | PAO | EA | 1 |
| 56 | 5995-00-937-8461 | CABLE ASSEMBLY CX-10516/G (80058) PL-SM-A603891 (4 FT) | PAO | EA | 1 |
| 56 | 5995-00-937-8467 | CABLE ASSEMBLY CX-10517/G (80058) PL-SM-A603896 (4 FT) | PAO | EA | 1 |
| 57 | 5995-00-937-8462 | CABLE ASSEMBLY CX-10518/G (80058) SM-C-603893 (6 FT) | PAO | EA | 1 |
| 57 | 5995-00-937-8463 | CABLE ASSEMBLY CX-10519/G (80058) SM-C-603895 (6 FT) | PAO | EA | 1 |
| 57 | 5995-00-937-8464 | CABLE ASSEMBLY CX-10520/G (80058) PL-SM-A603896 (4 FT) | PAO | EA | 1 |
| 57 | 5995-00-937-8628 | CABLE ASSEMBLY CX-10521/G (80058) (10 FT, 4 IN.) | PAO | EA | 1 |
| 57 | 5995-00-937-8841 | CABLE ASSEMBLY CX-10522/G (80058) PL-SM-A-603899 (6 FT) | PAO | EA | 1 |
| 57 | 5995-00-937-8048 | CABLE ASSEMBLY CX-10523/G (80058) SM-C-603903 (6 FT) | PAO | EA | 1 |
| 57 | 5995-00-494-9602 | CABLE ASSEMBLY CX-10523/G (80058) SC-DL-612849 (6 FT, 6 IN.) | PAO | EA | 1 |
| 57 | 5995-00-248-4467 | CABLE ASSEMBLY CX-10523/G (80058) PL-SM-A603921 (9 FT, 4 IN.) | PAO | EA | 1 |
| 57 | 5995-00-453-9427 | CABLE ASSEMBLY CX-10524/G (80058) SC-DL-612852 (5 FT) | PAC,PAD, PAF,PAG, PAJ,PAK, PAM,PAN | EA | 1 |
| 57 | 5995-00-937-8844 | CABLE ASSEMBLY CX-10524/G (80058) SM-C-603130 (8 FT, 8 IN.) | PAO | EA | 1 |

**COMPONENTS OF END ITEM** (CONT)

| (1) ILLUS NO. | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION FSCM AND PART NUMBER | USABLE ON CODE | (4) U/M | (5) QTY REQ'D |
|---|---|---|---|---|---|
| 57 | 5995-00-937-8843 | CABLE ASSEMBLY CX-10525/G (80063) SM-D-603908 (10 FT) | PAB,PAE, PAI,PAL | EA | 1 |
| 57 | 5995-00-937-8842 | CABLE ASSEMBLY CX-10525/G (80058) PL-SM-A603907 (8 FT) | PAB,PAE, PAI,PAL | EA | 1 |
| 57 | 5995-00-937-8631 | CABLE ASSEMBLY CX-10526/G (80058) SM-C-603909 (3 FT) | PAB,PAE, PAI,PAL | EA | 1 |
| 57 | 5995-00-453-9429 | CABLE ASSEMBLY CX-10526/G (80058) SC-DL-612856 (4 FT) | PAC,PAD, PAF,PAG, PAJ,PAK, PAM,PAN | EA | 1 |
| 57 | 5995-00-937-8614 | CABLE ASSEMBLY CX-10527/G (80058) SM-C-603911 (3 FT, 1 IN.) | PAO | EA | 1 |
| 57 | 5995-00-935-0398 | CABLE ASSEMBLY CX-10527/G (80058) SM-C-603134 (3 FT, 4 IN.) | PAO | EA | 1 |
| 57 | 5995-00-937-8832 | CABLE ASSEMBLY CX-10528/G (80058) (6 FT, 8 IN.) | PAO | EA | 1 |
| 57 | 5995-00-937-8834 | CABLE ASSEMBLY CX-10529/G (80058) SM-C-603120 (2 FT) (SERIAL NO. 1 THRU 697 ONLY) | PAB,PAE, PAI,PAL | EA | 1 |
| 57 | 5995-00-937-8833 | CABLE ASSEMBLY CX-10530/G (80058) (9 FT, 10 IN.) | PAO | EA | 1 |
| 57 | 5995-00-935-0397 | CABLE ASSEMBLY CX-10530/G (80058) (10 FT, 5 IN.) | PAO | EA | 1 |
| 57 | 5995-00-789-3622 | CABLE ASSEMBLY CX-10531/G (80058) (10 FT, 5 IN.) | PAO | EA | 1 |
| 57 | 5995-00-935-2513 | CABLE ASSEMBLY CX-10532/G (80058) SM-C-603923 (4 FT, 7 IN.) | PAO | EA | 1 |
| 57 | 5995-00-937-8617 | CABLE ASSEMBLY CX-10533/G (80058) PL-SM-A603913 (15 FT, 8 IN.) | PAO | EA | 1 |

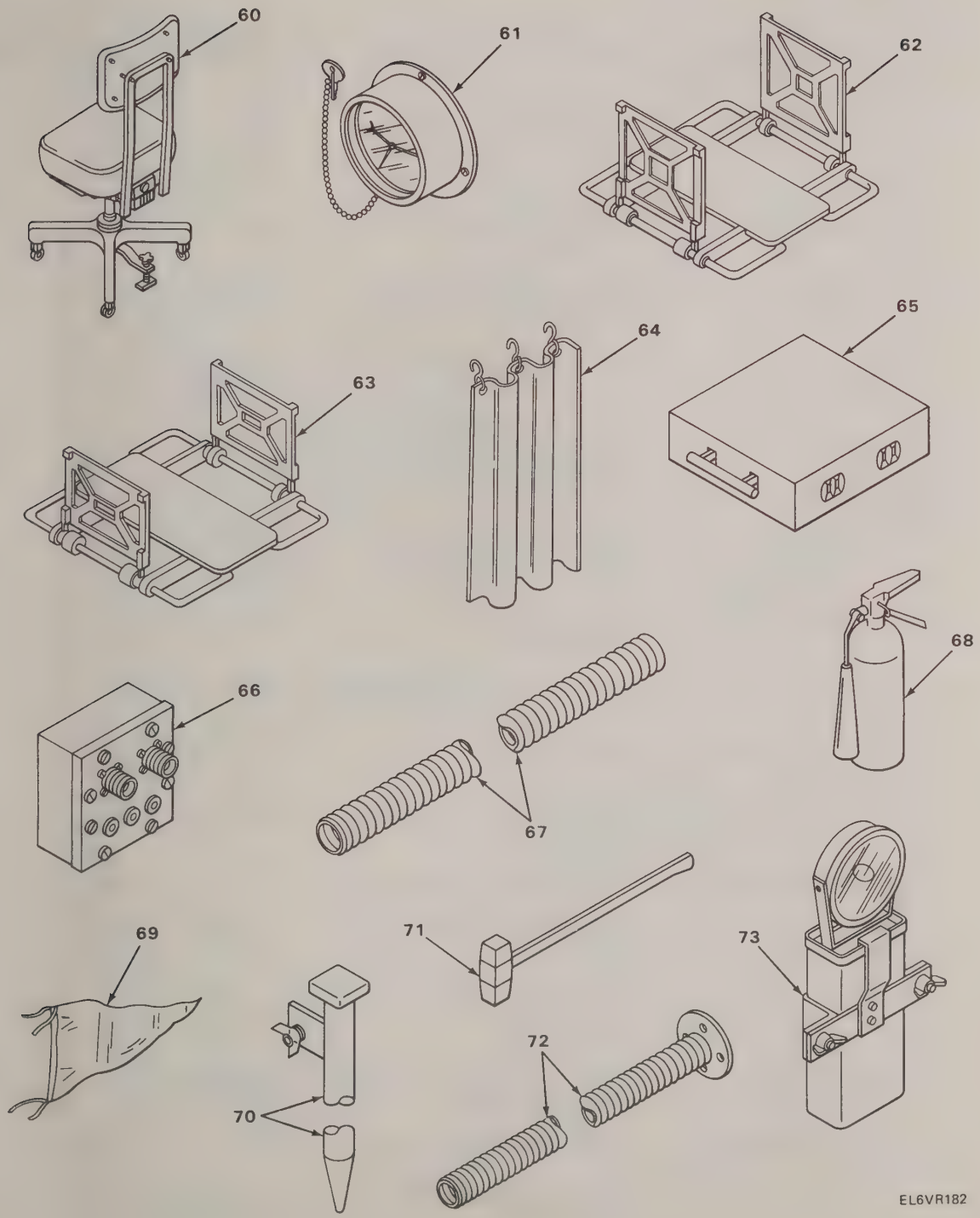
**COMPONENTS OF END ITEM** (CONT)

| (1) ILLUS NO. | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION FSCM AND PART NUMBER | USABLE ON CODE | (4) U/M | (5) QTY REQ'D |
|---|---|---|---|---|---|
| 57 | 5995-00-937-8613 | CABLE ASSEMBLY CX-10534/G (80058) SM-C-603136 (16 FT, 8 IN.) | PAO | EA | 1 |
| 57 | 5995-00-089-4497 | CABLE ASSEMBLY CX-10551/U (80063) SM-C-603147 (14 FT, 2 IN.) | PAB,PAE, PAI,PAL | EA | 1 |
| 57 | 5995-00-935-2534 | CABLE ASSEMBLY CX-10614/G (80058) SM-C-603905 (4 FT, 8 IN.) | PAO | EA | 1 |
| 57 | 5995-00-935-2535 | CABLE ASSEMBLY CX-10614/G (80058) SM-C-603137 (6 FT, 2 IN.) | PAB,PAE, PAI,PAL | EA | 1 |
| 57 | 5995-00-935-2537 | CABLE ASSEMBLY CX-10616/G (80058) SC-C-603146 (4 FT, 2 IN.) | PAO | EA | 1 |
| 57 | 5995-00-935-2538 | CABLE ASSEMBLY CX-10617/G (80058) SM-B-603148 (4 1/2 IN.) | PAO | EA | 1 |
| 57 | 5995-00-935-5236 | CABLE ASSEMBLY CX-10951/G (80063) SM-C-612898 (50 FT) | PAO | EA | 1 |
| 57 | 5995-00-246-4478 | CABLE ASSEMBLY CX-11992/G (80063) SM-C-613151 (5 FT) | PAC,PAD, PAF,PAG, PAJ,PAK, PAM,PAN | EA | 1 |
| 57 | 5995-00-144-0048 | CABLE ASSEMBLY CX-11992/G (80058) SM-D-613139 (9 FT) | PAC,PAD, PAF,PAG, PAJ,PAK, PAM,PAN | EA | 1 |
| 57 | 5995-00-246-4476 | CABLE ASSEMBLY CX-11994/G (80058) SM-C-613151 (3 FT, 8 IN.) | PAC,PAD, PAF,PAG, PAJ,PAK, PAM,PAN | EA | 1 |
| 57 | 5995-00-177-4678 | CABLE ASSEMBLY CX-12330/G (80058) SC-DL-61336J (1 FT) | PAC,PAD, PAF,PAG, PAJ,PAK, PAM,PAN | EA | 1 |

**COMPONENTS OF END ITEM** (CONT)

| (1) ILLUS NO. | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION FSCM AND PART NUMBER | USABLE ON CODE | (4) U/M | (5) QTY REQ'D |
|---|---|---|---|---|---|
| 57 | 5995-00-165-3728 | CABLE ASSEMBLY SC-C-446368 (80063) (9 IN.) | PAO | EA | 1 |
| 58 | | CABLE ASSEMBLY, AC POWER SC-D-960630-002 (1 FT) | PAF,PAG, PAM,PAN | EA | 1 |
| 58 | | CABLE ASSEMBLY, AC POWER SC-D-960630-006 (8 FT) | PAF,PAG, PAM,PAN | EA | 1 |
| 58 | | CABLE ASSEMBLY, AC POWER SC-D-960027-000 | PAE,PAL | EA | 1 |
| 58 | | CABLE ASSEMBLY, AC POWER SC-D-960027-003 | PAE,PAL | EA | 1 |
| 58 | | CABLE ASSEMBLY, SIGNAL SC-D-960624-000 (6 FT) | PAF,PAG, PAM,PAN | EA | 1 |
| 58 | | CABLE ASSEMBLY, SIGNAL FRONT SC-D-960624-005 | PAE,PAL | EA | 1 |
| 58 | | CABLE ASSEMBLY, SIGNAL SC-D-960625-004 | PAE,PAF, PAG,PAL, PAM,PAN | EA | 1 |
| 59 | 5995-01-114-9697 | CABLE ASSEMBLY, BATTERY SC-D-960025-001 (2 FT) | PAE,PAF, PAG,PAL, PAM,PAN | EA | 1 |
| 59 | | CABLE ASSEMBLY, BATTERY SC-D-960025-003 (4 FT) | PAF,PAG, PAM,PAN | EA | 1 |
| 59 | | CABLE ASSEMBLY, POWER SC-D-960628-006 (8 FT) | PAF,PAG, PAM,PAN | EA | 1 |
| 59 | | CABLE ASSEMBLY, POWER SC-D-960628-022 | PAF,PAG, PAM,PAN | EA | 1 |

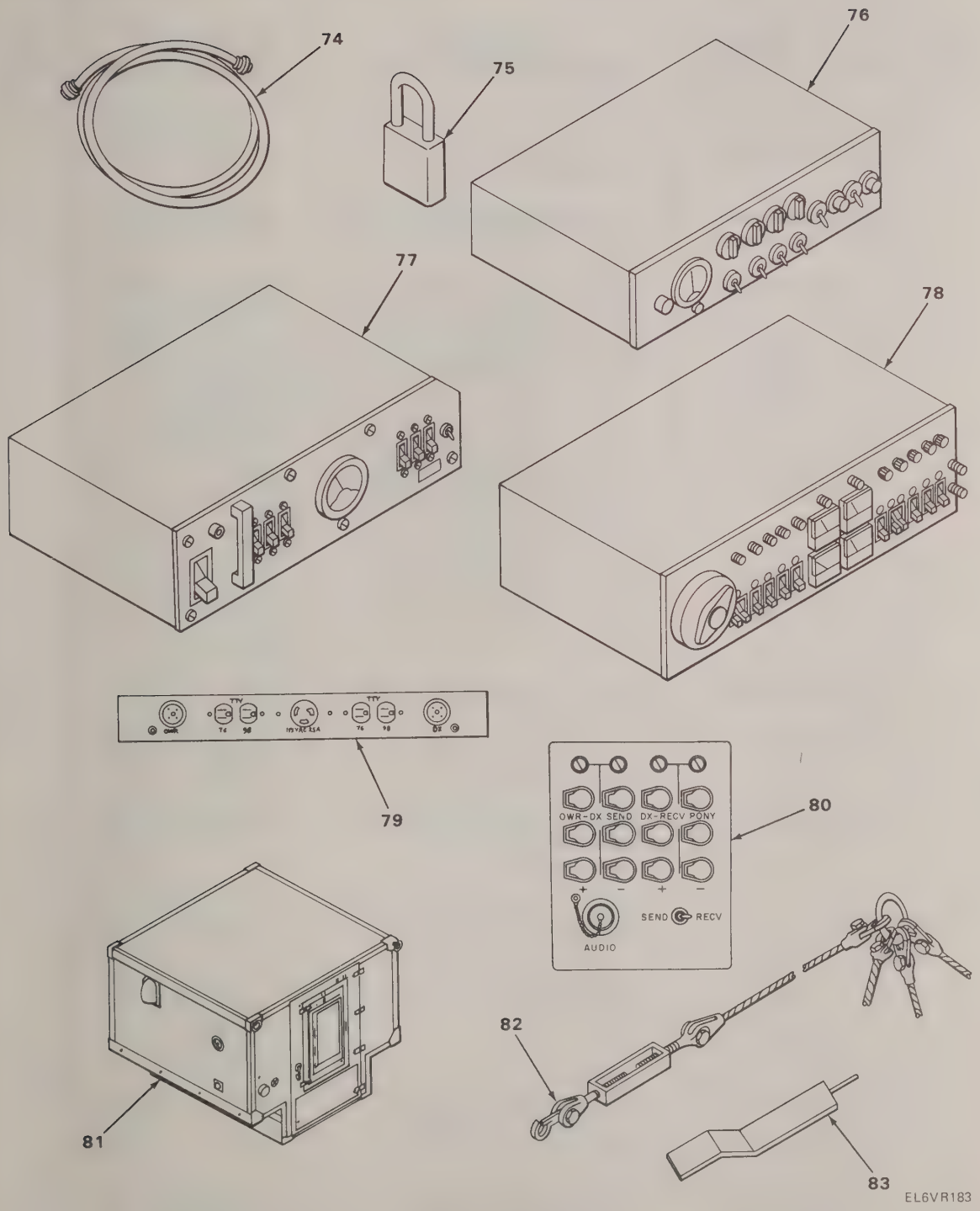
## COMPONENTS OF END ITEM (CONT)



**COMPONENTS OF END ITEM** (CONT)

| (1) ILLUS NO. | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION FSCM AND PART NUMBER | USABLE ON CODE | (4) U/M | (5) QTY REQ'D |
|---|---|---|---|---|---|
| 60 | 7110-00-438-4659 | CHAIR (80063) SM-D-613130 | PAO | EA | 1 |
| 61 | 6645-00-410-2395 | CLOCK 1.5 V | PAO | EA | 1 |
| 62 | 5820-00-226-5727 | CROSS BAR, LONG (80063) SM-C-50068 | PAO | EA | 4 |
| 63 | 5820-00-078-5615 | CROSS BAR, SHORT (80063) SC-DL-502745 | PAO | EA | 2 |
| 64 | 7230-00-937-7409 | CURTAIN SM-C-603260 | PAB,PAE, PAI,PAL | EA | 1 |
| 65 | 6110-00-089-7348 | DISTRIBUTION BOX, AC-DC J-2276/GRC-142 (80058) SM-D-603784 | PAB,PAE, PAI,PAL | EA | 1 |
| 66 | 5815-00-926-7377 | DUMMY BOX J-2728/GRC-142 (80058) SC-DL-603317 | PAO | EA | 2 |
| 67 | 4720-00-937-7088 | EXHAUST HOSE (80063) SM-C-603459 | PAO | EA | 2 |
| 68 | 4210-00-555-8837 | FIRE EXTINGUISHER W/BRACKET (81349) MIL-E-52031 | PAO | EA | 1 |
| 69 | 8345-00-937-5532 | FLAG, SAFETY | PAO | EA | 2 |
| 70 | 5975-00-224-5260 | GROUND ROD MX-148/G (80058) SC-D-14158 | PAO | EA | 2 |
| 71 | 5120-00-265-7462 | HAMMER (81348) GGG-H-86 | PAO | EA | 1 |
| 72 | | HEATER HOSE EXHAUST SM-C-613248 | PAC,PAF, PAJ,PAM | EA | 1 |
| 72 | | HEATER HOSE EXHAUST SM-C-613229 | PAD,PAG, PAK,PAN | EA | 1 |
| 72 | 4720-00-89-2635 | HOSE ASSEMBLY FOR EXHAUST (80063) SM-C-603557 | PAB,PAE, PAI,PAL | EA | 1 |
| 73 | 6230-00-729-9614 | LANTERN (80063) SC-C-539491 | PAO | EA | 1 |
| | | HOLDER, BATTERY BOX SC-D-960667 | PAF,PAG, PAM,PAN | EA | 1 |

## COMPONENTS OF END ITEM (CONT)



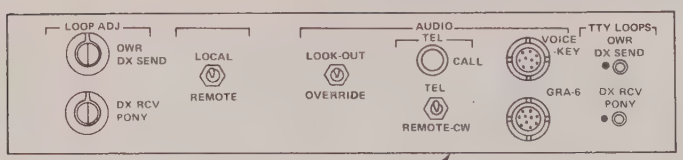
**COMPONENTS OF END ITEM** (CONT)

| (1) ILLUS NO. | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION FSCM AND PART NUMBER | USABLE ON CODE | (4) U/M | (5) QTY REQ'D |
|---|---|---|---|---|---|
| 74 | 5995-00-935-2539 | LEAD CX-10618 (80058) PL-SM-A603693 (4 FT, 4 IN.) | PAB,PAE, PAI,PAL | EA | 1 |
| 74 | 5995-00-089-7798 | LEAD CX-10760/U (80058) (6 FT, 2 IN.) | PAB,PAE, PAI,PAL | EA | 1 |
| 74 | 5995-00-089-7799 | LEAD CX-10761/U (80058) SM-B-603823 (6 FT) | PAB,PAE, PAI,PAL | EA | 1 |
| 74 | | LEAD, SC-C-613152 | PAC,PAD, PAF,PAG, PAJ,PAK, PAM,PAN | EA | 1 |
| 74 | 5995-00-935-2536 | LEAD, ELECTRICAL CX-10615/G (80058) SM-B-603149 (4 FT, 8 IN.) | PAO | EA | 1 |
| 75 | 5340-00-582-2741 | PADLOCK (81348) FF-P-101 | PAB,PAC, PAE,PAG, PAI,PAJ, PAL,PAM | EA | 1 |
| 75 | 5340-00-682-1508 | PADLOCK (80063) SM-D-555531-1 | PAD | EA | 2 |
| 76 | 6110-00-937-6439 | PANEL SB-3018/GRC-142 (80058) SM-D-602937 | PAB,PAE, PAI,PAL | EA | 1 |
| 77 | 6110-00-228-8570 | PANEL, POWER DISTRIBUTION SB-3358/GRC (80058) SM-D-613063 | PAC,PAD, PAJ,PAK | EA | 1 |
| 78 | | PANEL, POWER DISTRIBUTION (80063) SC-F-960672 | PAF,PAG, PAM,PAN | EA | 1 |
| 79 | | POWER TERMINAL ASSEMBLY SM-D-613267 | PAC,PAD, PAF,PAG, PAJ,PAK, PAM,PAN | EA | 1 |
| 80 | 5815-00-937-5973 | REMOTE CONTROL BOX C-7279/GRC-142 (80058) SC-DL-603308 | PAO | EA | 1 |
| 81 | 5410-00-489-6076 | SHELTER S-250/G (80063) DLSMB650123 | PAD,PAG, PAK,PAN | EA | 1 |

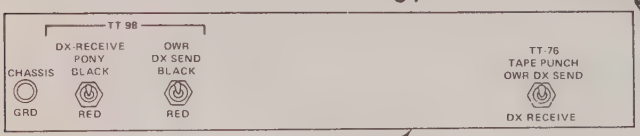
**COMPONENTS OF END ITEM** (CONT)

| (1) ILLUS NO. | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION FSCM AND PART NUMBER | USABLE ON CODE | (4) U/M | (5) QTY REQ'D |
|---|---|---|---|---|---|
| 81 | 5410-00-763-2239 | SHELTER (80058) S-318/G | PAB,PAE, PAI,PAL | EA | 1 |
| 81 | 5410-00-116-7086 | SHELTER S-318/G (80063) SC-DL-564650J | PAC,PAF, PAJ,PAM | EA | 1 |
| 82 | 3940-00-115-6380 | SLING ASSEMBLY | PAO | EA | 1 |
| 83 | 5815-01-108-9180 | SUPPORT ARM FOR TARPAULIN (80063) SM-C-685215 | PAC,PAD, PAF,PAG, PAJ,PAK, PAM,PAN | EA | 1 |

## COMPONENTS OF END ITEM (CONT)



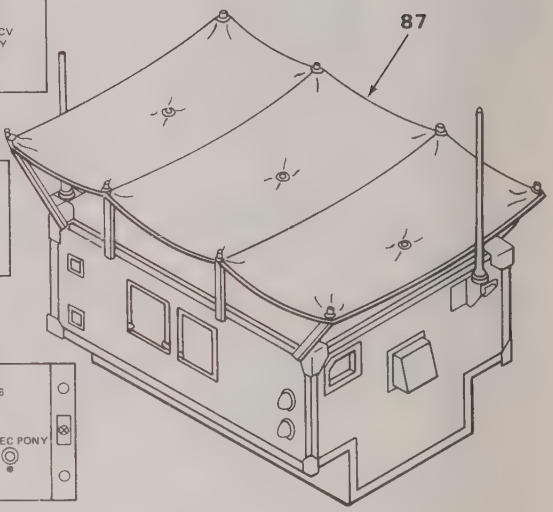

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85



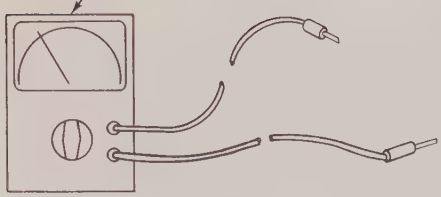

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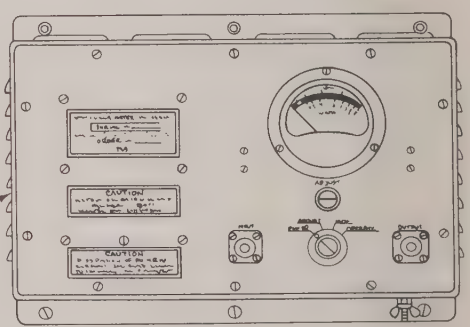
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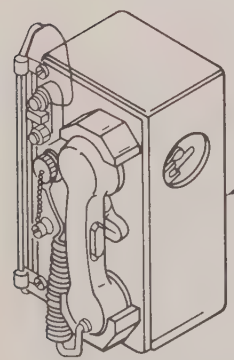
89



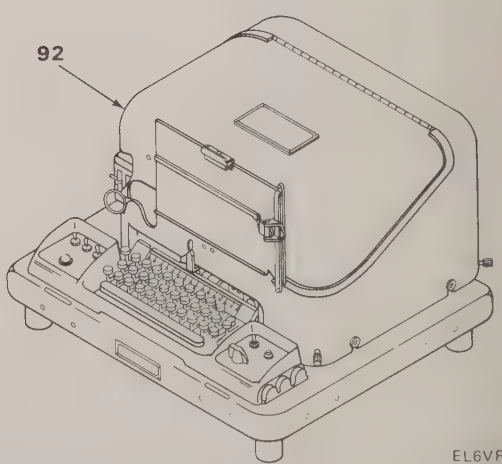
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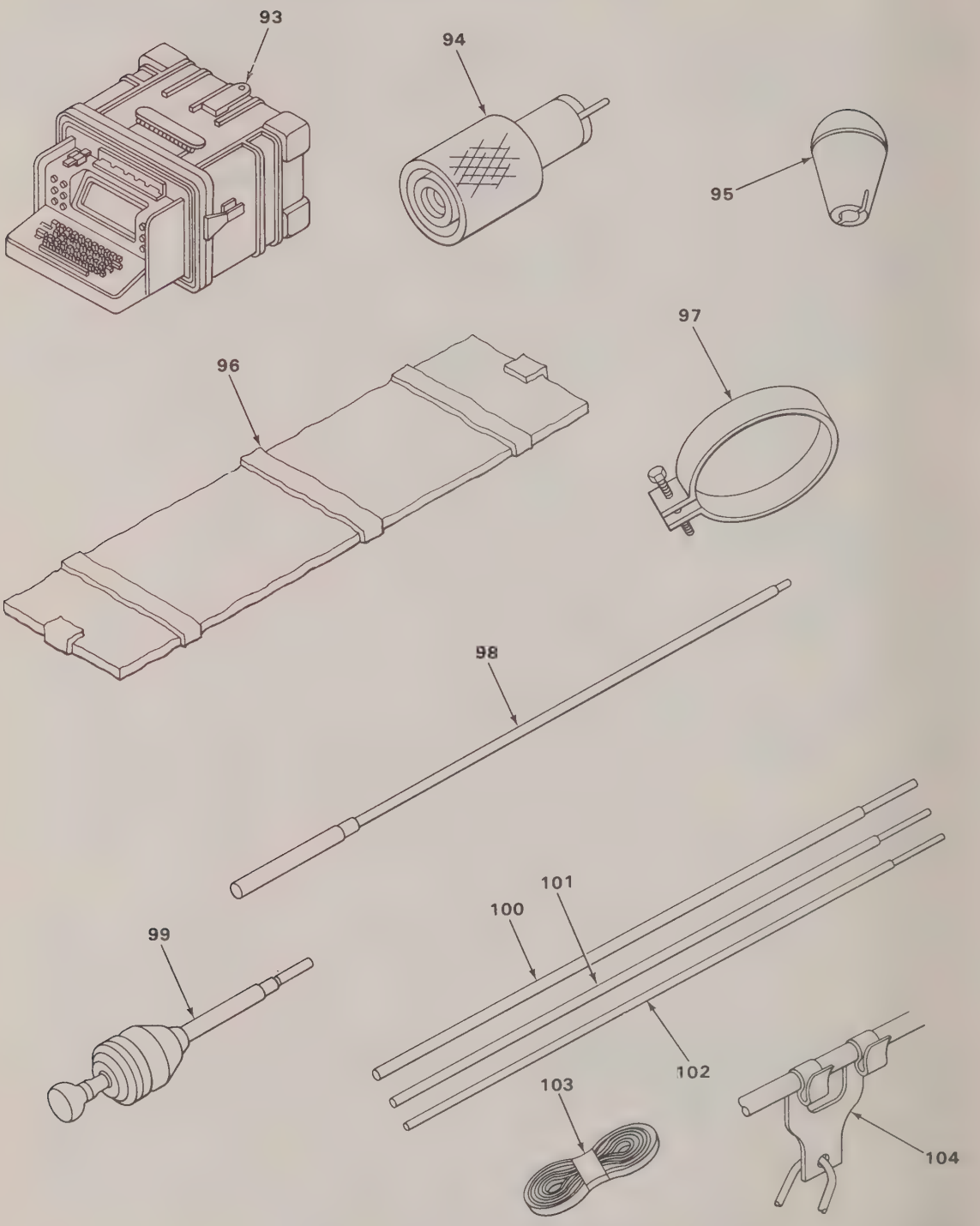
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**COMPONENTS OF END ITEM** (CONT)

| (1) ILLUS NO. | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION FSCM AND PART NUMBER | USABLE ON CODE | (4) U/M | (5) QTY REQ'D |
|---|---|---|---|---|---|
| 84 | 5815-00-937-6113 | SWITCH ASSEMBLY SA-1554/GRC-142 (80058) SM-R-602945 | PAB,PAE, PAI,PAL | EA | 1 |
| 85 | 5930-00-937-5352 | SWITCH ASSEMBLY SA-1555/GRC-142 (80058) SM-D-602953 | PAB,PAE, PAI,PAL | EA | 1 |
| 86 | 5815-00-220-5255 | SWITCH ASSEMBLY SA-1650/GRC (80058) SM-D-613051 | PAC,PAD, PAF,PAG, PAJ,PAK, PAM,PAN | EA | 1 |
| 87 | 5820-00-937-5530 | TARPAULIN, SHADE (80063) SM-D-603394 | PAO | EA | 1 |
| 88 | 4010-00-937-0790 | WIRE ROPE (80063) SM-C-564739 GR1 | PAO | EA | 1 |
| 89 | 4010-00-937-0791 | WIRE ROPE (80063) SM-C-564739 GRII | PAO | EA | 2 |
| 89 | 4010-00-937-0792 | WIRE ROPE (80063) SM-C-564739 GRIII | PAO | EA | 1 |
| 90 | 6625-00-682-4464 | STANDING WAVE RATIO-POWER METER ME-165/G (80058) | PAO | EA | 1 |
| 91 | 5805-00-543-0012 | TELEPHONE SET TA-312/PT (80058) MIL-T-14358 | PAO | EA | 2 |
| 92 | 5815-00-503-2764 | TELETYPEWRITER TT-98( )/FG (80058) MIL-T-11750 | PAB,PAC, PAD,PAI, PAJ,PAK | EA | 2* |
| | | OR | | | |
| 92 | 5815-01-017-9172 | TELETYPEWRITER TT-722( )/TG (80058) | PAB,PAC, PAD,PAI, PAJ,PAK | EA | 2* |

*One half the quantity is used in AN/GRC-142 models.

## COMPONENTS OF END ITEM (CONT)

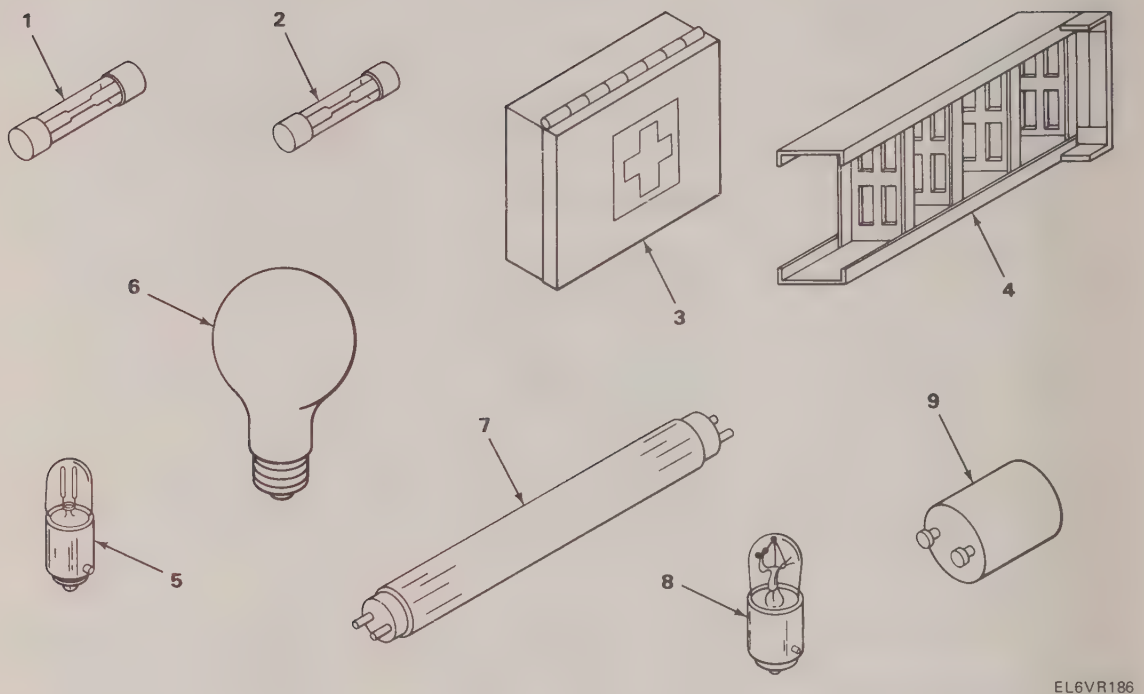


**COMPONENTS OF END ITEM** (CONT)

| (1) ILLUS NO. | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION FSCM AND PART NUMBER | USABLE ON CODE | (4) U/M | (5) QTY REQ'D |
|---|---|---|---|---|---|
| 93 | 5815-01-062-8194 | TERMINAL, COMMUNICATIONS AN/UGC-74A(V)3 (80058) SM-E-915600 | PAE,PAL PAF,PAM PAG,PAN | EA | 2* |
| | | WHIP ANTENNA CONSISTING OF: | | | |
| 94 | 5935-00-259-0205 | ADAPTER CONNECTOR UG-204/U (80058) MIL-A-55-339/20 | PAO | EA | 1 |
| 94 | 5935-00-847-2600 | ADAPTER, CONNECTOR UG-306B/U (81349) MS35368-306B | PAO | EA | 1 |
| 95 | 5985-00-930-7223 | ANTENNA TIP ASSEMBLY (80063) SC-C-446046 | PAO | EA | 3 |
| 96 | 5820-00-200-2329 | BAG CW-206/GR (80058) SC-DL-23003 | PAO | EA | 1 |
| 97 | 5820-00-571-1828 | CLAMP (80063) SM-B-356781 | PAO | EA | 2* |
| 98 | 5820-00-078-4769 | COVER, ANTENNA (80063) SM-D-500428 | PAO | EA | 2* |
| 99 | 5820-00-078-4770 | MAST BASE AB-652/GR (80058) AB652UR | PAO | EA | 2* |
| 100 | 5985-00-199-8831 | MAST SECTION MS-116A (80063) SC-D-12521 | PAO | EA | 6* |
| 101 | 5985-00-115-7149 | MAST SECTION MS-117A (80063) SC-D-12521 | PAO | EA | 2* |
| 102 | 5985-00-238-7474 | MAST SECTION MS-118A (80063) SC-D-12521 | PAO | EA | 2* |
| 103 | 4020-00-073-3276 | ROPE (81349) MIL-C-43588 (40 FT) | PAO | EA | 1 |
| 104 | 5820-00-908-6416 | ANTENNA TIEDOWN KIT (80063) SC-C-446180 | PAO | EA | 4 |

*One half the quantity is used in AN/GRC-142 models.

## Section III BASIC ISSUE ITEMS



**BASIC ISSUE ITEMS** (CONT)

| (1) ILLUS NO. | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION FSCM AND PART NUMBER | USABLE ON CODE | (4) U/M | (5) QTY REQ'D |
|---|---|---|---|---|---|
| 1 | 5920-00-727-1452 | FUSE 10 AMP FO3B32V10A (81349) MIL-F-15160-03 | PAO | EA | 5 |
| 1 | 5920-00-199-9498 | FUSE 1/2 AMP FO2B250V1/2A (81349) MIL-F-15160/2 | PAO | EA | 10 |
| 1 | 5920-00-229-1312 | FUSE 1/16 AMP (FOR TT-98/FG) (81349) MIL-5-15160/2 | PAB,PAC, PAD,PAI, PAJ,PAK | EA | 3 |
| 1 | 5920-00-131-9817 | FUSE 1.6A 125V (FOR TT-722( )/TG) (64959) SM-B-342103 | PAB,PAC, PAD,PAI, PAJ,PAK | EA | 2 |
| 1 | 5920-00-296-0451 | FUSE 1/8 AMP FO2A250V 1/8A (FOR TT-722( )/TG) (81349) MIL-F-15160/2 | PAB, PAC, PAD,PAI, PAJ,PAK | EA | 3 |
| 1 | 5920-00-280-4960 | FUSE 2A 250V FO2A250V2A (81349) MIL-F-15160/2 FOR AN/GRC-106 AND AN/GRC-106, -106A, AND MD-522/GRC | PAO | EA | 10 |
| 1 | 5920-00-881-4144 | FUSE 2A 250V (FOR TT-76( )/ GGC) (81535) BTL65626A | PAO | EA | 2 |
| 1 | 5920-00-228-7882 | FUSE 2A (FOR TT-98/FG) (81349) MIL-F-15160/2 | PAO | EA | 1 |
| 2 | 5920-00-851-9476 | FUSE 5A FO2B32V5A (81349) MIL-F-15160 | PAO | EA | 10 |
| 2 | 5920-00-342-5828 | FUSE 10A 250V FO3G10ROB (81349) | PAC,PAD, PAF,PAG, PAJ,PAK, PAM,PAN | EA | 1 |
| 2 | 5920-00-755-3656 | FUSE 30A FO3B32V30A (81349) MIL-F-15160-03 | PAO | EA | 10 |
| 3 | 6545-00-922-1200 | KIT, FIRST AID (80063) SM-D-539483 | PAO | EA | 1 |
| 4 | 2540-00-846-8483 | LADDER MX-3543/G (80063) SC-D-147189 | PAO | EA | 1 |

**BASIC ISSUE ITEMS** (CONT)

| (1) ILLUS NO. | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION FSCM AND PART NUMBER | USABLE ON CODE | (4) U/M | (5) QTY REQ'D |
|---|---|---|---|---|---|
| 5 | 6240-00-223-9100 | LAMP, GLOW (FOR AN/GRA-6) (81349) M15098-10-001 | PAO | EA | 2 |
| 6 | 6240-00-155-8651 | LAMP, INCANDESCENT 30V 25W (08108) MS15586-7 | PAF,PAG, PAM,PAN | EA | 2 |
| 6 | 6240-00-617-1717 | LAMP, INCANDESCENT (FOR TT-76( )/GGC) (08806) MS15617A | PAB,PAC, PAD,PAE, PAI,PAJ, PAK,PAL | EA | 1 |
| 6 | 6240-00-892-6102 | LAMP 120V 10W (FOR TT-722( )/TG) (08108) | PAB,PAC, PAD,PAI, PAJ,PAK | EA | 1 |
| 6 | 6240-00-155-8651 | LAMP 30V 25W (08108) MS15586-7 | PAO | EA | 1 |
| 6 | 6240-00-155-8706 | LAMP 6 – 8V 0.15A (FOR TT-76( )/GGC (06840) MS15571-2 | PAO | EA | 1 |
| 7 | 6240-00-152-2996 | FLUORESCENT LAMP | PAF,PAG, PAM,PAN | EA | 2 |
| 8 | 6240-00-155-8653 | INCANDESCENT COLD START LAMP | PAF,PAG, PAM,PAN | EA | 2 |
| 9 | 6250-00-194-4294 | FLUORESCENT LAMP STARTER | PAF,PAG, PAM,PAN | EA | 2 |

# APPENDIX C

## ADDITIONAL AUTHORIZATION LIST

## Section I INTRODUCTION

### C-1. SCOPE.

This appendix lists additional items you are authorized for the support of the radio set.

### C-2. GENERAL.

This list identifies items that do not have to accompany the terminal set and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

### C-3. EXPLANATION OF LISTING.

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name, under the type of document (ie CTA, MTOE, TDA, or JTA) which authorizes the items to you. If item required differs for different models of this equipment, the model is shown under the "Usable On" heading in the description column. These codes are identified as follows:

| CODE | USED ON |
|---|---|
| PAA | All AN/GRC-122(*) Models |
| PAB | Model AN/GRC-122 |
| PAC | Model AN/GRC-122A |
| PAD | Model AN/GRC-122B |
| PAE | Model AN/GRC-122C |
| PAF | Model AN/GRC-122D |
| PAG | Model AN/GRC-122E |
| PAH | All AN/GRC-142(*) Models |
| PAI | Model AN/GRC-142 |
| PAJ | Model AN/GRC-142A |
| PAK | Model AN/GRC-142B |
| PAL | Model AN/GRC-142C |
| PAM | Model AN/GRC-142D |
| PAN | Model AN/GRC-142E |
| PAO | All models |

## Section II ADDITIONAL AUTHORIZATION LIST

| (1) NATIONAL STOCK NUMBER | (2) DESCRIPTION FSCM & PART NUMBER | USABLE ON CODE | (3) U/M | (4) QTY AUTH |
|---|---|---|---|---|
| 4120-00-730-7072 | AIR CONDITIONER, 6000 BTU COOLING 1250W HEATING 110VAC, 60HZ, 20 AMPERES. USED WITH AN/GRC-142 S/N 1 THRU 697 ONLY (FSC 06534, CE 6A-60) | | EA | 1 |
| 6135-01-034-2239 | BATTERY BA-5598/U (80058) | PAE,PAF, PAG,PAL, PAM,PAN | EA | 2 |
| 6135-00-120-1020 | BATTERY, DRY BA-30/U (80063) MIL-B-18-9 | PAO | PG | 8 |
| 6135-00-125-5256 | BATTERY, DRY BA-414/U (80063) MIL-B-18 | PAO | EA | 1 |
| 6115-00-738-6340 | GENERATOR SET, GASOLINE ENGINE DRIVEN TRAILER MOUNTED PU-620/M (80058) MIL-P-52557 | PAO | EA | 1 |
| 4520-00-177-6198 | HEATER, ELECTRIC (81349) MIL-H-52641 | PAO | EA | 1 |
| 4520-00-878-9393 | HEATER, MULTI-FUEL (81349) MIL-H-52204 THERMOSTAT P/O MULTI-FUEL HEATER SM-D-613001-1 | PAO | EA | 1 |
| 5815-00-553-6061 | REPERFORATOR-TRANSMITTER TT-76( )/GRC (80058) SM-D-134701 | PAO | EA | 1 |
| 5815-00-503-2764 | TELETYPEWRITER TT-98( )/FG (80058) MIL-T-11750 | PAB,PAC, PAD,PAI, PAJ,PAK | EA | 1 |
| 5815-01-062-8194 | TERMINAL, COMMUNICATIONS AN/UGC-74A(V)3 (80058) SM-E-915600 | PAE,PAF, PAG,PAL, PAM,PAN | EA | 1 |
| 6625-01-139-2512 | MULTIMETER AN/PSM-45 OR EQUIVALENT | PAO | | |

# APPENDIX D

## EXPENDABLE SUPPLIES AND MATERIALS LIST

## Section I INTRODUCTION

### D-1. SCOPE.

This appendix lists expendable supplies and materials you will need to operate and maintain Radio Set AN/GRC-122/142(*). These items are authorized to you by CTA 50-970, Expendables Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

### D-2. EXPLANATION OF COLUMNS.

a. Column 1, Item Number. This number is assigned to the entry in the listing, and is referenced in the narrative instructions to identify the material (eg, Use Cleaning Compound, Item 5, app E).

b. Column 2, Level. This column identifies the lowest level of maintenance that requires the listed item.

C – Operator/Crew
O – Organizational Maintenance/Aviation Unit Maintenance
F – Direct Support Maintenance/Aviation Intermediate Maintenance
H – General Support Maintenance

c. Column 3, National Stock Number. This is the National stock number assigned to the item. Use it to request or requisition the item.

d. Column 4, Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parentheses followed by a part number.

e. Column 5, U/M.(Unit of Measure). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (eg, ea, in., pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

## Section II EXPENDABLE SUPPLIES AND MATERIALS LIST

| (1) ITEM NUMBER | (2) LEVEL | (3) NATIONAL STOCK NUMBER | (4) DESCRIPTION (FSCM) | (5) U/M |
|---|---|---|---|---|
| 1 | O | 8020-00-721-9657 | BRUSH, PAINT, 2 IN. (81848) MB-451 | EA |
| 2 | O | 8305-00-222-2433 | CLOTH, CHEESECLOTH (81348) CCCC 660 | EA |
| 3 | O | 8010-00-111-7937 | PAINT, FOREST GREEN ALKYD ENAMEL TB-43-0118 (81349) MILE-52-798A | GAL. |
| 4 | C | | PAPER, FANFOLD, SINGLE PLY | BX |
| 5 | C | | PAPER, FANFOLD, 3-PLY | BX |
| 6 | C | 7530-00-223-7966 | PAPER, ROLL, SINGLE-PLY (81348) | RL |
| 7 | C | 7530-00-223-7966 | PAPER TELETYPEWRITER (81348) UU-P-577 | EA |
| 8 | C | 7510-00-281-5234 | PENCIL NUMBER 2 (81348) SS-P-166 | DOZ |
| 9 | C | 7510-00-082-2648 | RIBBON, PRINTING, TELETYPEWRITER (81348) DDD-R-306 | EA |
| 10 | C | 7510-00-923-0252 | RIBBON, TELETYPEWRITER (80063) SM-B-765911 | EA |
| 11 | O | 5970-00-816-6056 | TAPE, ELECTRICAL INSULATING; LOW TEMPERATURE P295 (99742) | YD |
| 12 | O | 8315-00-290-8306 | TAPE, REINFORCED | YD |
| 13 | C | 7530-00-634-6237 | TAPE, TELETYPEWRITER PAPER (81348) UU-T-137 | EA |
| 14 | C | 7920-00-965-5700 | TOWEL, MACHINERY (81348) CCC-C-444 | EA |
| 15 | C | 6850-00-105-3084 | TRICHLOROTRIFLUOROETHANE 16 OZ CAN (18596) | OZ |

# INDEX


| Subject | Page |
|---|---|
| **A** | |
| Additional authorization list | C-1 |
| Air inlets and outlets and gasoline can | 2-74 |
| Antenna Group AN/GRA-50 installation | 2-38 |
| Antenna tip cap installation | 2-37 |
| Antenna wire length chart | 2-47 |
| Antijamming | 2-151 |
| **C** | |
| Camouflage procedures | 2-54 |
| Changing shelter door combination lock | 2-71 |
| Cleaning | 3-21 |
| Cleaning of shelter door air filter | 3-24 |
| Cold-start lamp replacement | 3-24 |
| Communications Terminal AN/UGC-74A(V)3, operation and self-test | 2-97 |
| Complete shelter weights | 1-25 |
| Complete shutdown of shelter | 2-143 |
| Components of end item and basic issue items list | B-1 |
| Consolidated index of Army publications and blank forms | 1-2 |
| Control panel indicator lamp replacement (AN/GRC-122/142 Plain and C models) | 3-26 |
| **D** | |
| Dc and ac power connection | 2-34 |
| Description and use of operator's controls and indicators | 2-1 |
| General | 2-1 |
| Description of controls and indicators for: | |
| AN/GRC-122/142 Plain and C models | 2-2 |
| Ac entrance box | 2-10 |
| Ac entrance box circuit breakers | 2-8 |
| Ac voltmeter | 2-12 |
| Control Panel SA-1554/GRC-142 | 2-3 |
| Dc entrance box | 2-10 |
| Distribution Box J-2776/GRC-142 | 2-8 |
| Low-Level Signaling Device TT-523/GGC | 2-7 |
| Power Distribution Panel SB-3018/GRC-142 | 2-2 |
| Remote box | 2-6 |
| Standing Wave Ratio Meter ME-165/G | 2-9 |
| Switchbox SA-1555/GRC-142 | 2-5 |
| AN/GRC-122/142A, B, D, and E models | 2-12 |
| Lighting controls | 2-25 |
| Low-Level Signaling Device TT-523/GGC | 2-22 |
| Power Distribution Panel SB-3358/GRC-142 (AN/GRC-122/142A and B models only) | 2-12 |
| Power Distribution Panel SC-F-960672 (used in AN/GRC-122/142D and E models only) | 2-14 |
| Power/signal entrance box | 2-24 |

# INDEX (CONT)


Subject — Page

D (CONT)

AN/GRC-122/142A, B, D, and E models (Cont)
Power terminal assembly (used on AN/GRC-122/142A and B models only) ..... 2-19
Power terminal assembly (used on AN/GRC-122/142D and E models) ..... 2-20
Remote box ..... 2-23
Shelter exhaust blower switch ..... 2-25
Standing Wave Ratio Meter ME-165/G ..... 2-21
Switch Assembly SA-1650/GRC ..... 2-16
Destruction of Army electronics materiel to prevent enemy use ..... 1-2
Differences between models ..... 1-23
Dipole antenna assembly ..... 2-41
Discrepancy in shipment report (DISREP) ..... 1-2
Duplex operation ..... 1-36
AN/GRC-122 Plain and C models ..... 1-36
Receive ..... 1-36
Transmit ..... 1-36
AN/GRC-122A, B, D, and E models ..... 1-38
Receive ..... 1-38
Transmit ..... 1-38

E

Emergency stopping ..... 2-144
Equipment characteristics, capabilities, and features ..... 1-5
Capabilities and features ..... 1-5
Characteristics ..... 1-5
Equipment data ..... 1-24
Equipment description ..... 1-5
Erecting AB-155(*)/U with Tripod Adapter AB-1089/U ..... 2-44
Expendable supplies and materials list ..... D-1

F

Fluorescent lamp and starter replacement ..... 3-22
Fuel heater ..... 2-76

G

General information ..... 1-1
Glossary ..... 1-4
Ground rod installation ..... 2-31

H

Hand receipt (-HR) manuals ..... 1-2
Heater exhaust hose ..... 2-75
How to use this manual ..... ii

# INDEX (CONT)


| Subject | Page |
|---|---|
| **I** | |
| Incandescent lamp replacement | 3-22 |
| Installation of: | |
| Antenna Group AN/GRA-50 | 2-38 |
| Antenna tip cap | 2-37 |
| Ground rod | 2-31 |
| Remote equipment | 2-56 |
| Security equipment | 2-69 |
| Shade tarpaulin | 2-55 |
| Whip antenna | 2-34 |
| Introduction | 1-1 |
| **J** | |
| Jamming, recognition and identification of | 2-149 |
| **L** | |
| List of abbreviations | 1-3 |
| Local duplex operation (AN/GRC-122(*) models) | 2-120 |
| Local owr cw operation | |
| AN/GRC-122/142(*) models | 1-33 |
| Receive | 1-33 |
| Transmit | 1-33 |
| Local owr operation | 2-111 |
| Local owr radio teletypewriter operation | |
| AN/GRC-122/142 Plain and C models | 1-30 |
| Receive | 1-30 |
| Transmit | 1-30 |
| AN/GRC-122/142A, B, D, and E models | 1-31 |
| Receive | 1-31 |
| Transmit | 1-31 |
| Local owr voice operation | |
| AN/GRC-122/142(*) models | 1-32 |
| Receive | 1-32 |
| Transmit | 1-32 |
| Local owr voice plus teletypewriter (NSK) operation | |
| AN/GRC-122/142 Plain and C models | 1-34 |
| Receive | 1-34 |
| Transmit | 1-34 |
| AN/GRC-122/142A, B, D, and E models | 1-35 |
| Receive | 1-35 |
| Transmit | 1-35 |
| Location and description of major components | 1-6 |
| AN/GRC-122/142 Plain and C models | |
| Exterior roadside and rear wall | 1-7 |
| Front and curbside wall | 1-8 |

# INDEX (CONT)


| Subject | Page |
|---|---|
| **L (CONT)** | |
| AN/GRC-122/142 Plain and C models (Cont) | |
| Rear and roadside wall | 1-11 |
| AN/GRC-122/142A and B models | |
| Front and curbside wall | 1-12 |
| Rear and roadside wall | 1-15 |
| AN/GRC-122/142D and E models | |
| Front and curbside wall | 1-16 |
| Rear and roadside wall | 1-19 |
| AN/GRC-122/142A, B, D, and E models | |
| Exterior curbside and front wall | 1-21 |
| Exterior roadside and rear wall | 1-20 |
| AN/GRC-122/142(*) models | |
| Interior | 1-22 |
| Loop current test | 2-70 |
| Lubrication instructions | 3-1 |
| **M** | |
| Maintenance | 3-1 |
| Maintenance forms, records, and reports | 1-1 |
| Mast AB-155/U erection | 2-48 |
| **N** | |
| Nomenclature cross-reference list | 1-3 |
| **O** | |
| Operating instructions | 2-1 |
| Operation | 2-111 |
| Operation at low temperatures | 2-148 |
| Operation during radio silence and output power measurement | 2-108 |
| Operation in desert climates | 2-149 |
| Operation in tropical climates | 2-149 |
| Operation | |
| Duplex | 1-36 |
| AN/GRC-122 Plain and C models | 1-36 |
| AN/GRC-122A, B, D, and E models | 1-36 |
| Local duplex (AN/GRC-122(*) models) | 2-120 |
| Local owr | 2-111 |
| Local owr cw | |
| AN/GRC-122/142(*) models | 1-33 |
| Local owr radio teletypewriter | |
| AN/GRC-122/142 Plain and C models | 1-30 |
| AN/GRC-122/142A, B, D, and E models | 1-31 |
| Local owr voice | |
| AN/GRC-122/142(*) models | 1-32 |

# INDEX (CONT)


| Subject | Page |
|---|---|
| **O (CONT)** | |
| Local owr voice plus teletypewriter (NSK) | |
| AN/GRC-122/142 Plain and C models | 1-34 |
| AN/GRC-122/142A, B, D, and E models | 1-35 |
| Remote | 2-129 |
| Remote cw | |
| AN/GRC-122/142 Plain and C models | 1-42 |
| AN/GRC-122/142A, B, C, and E models | 1-43 |
| Remote field telephone | |
| AN/GRC-122/142(*) models | 1-39 |
| Remote owr teletypewriter | |
| AN/GRC-122/142(*) models | 1-41 |
| Remote owr voice | |
| AN/GRC-122/142(*) models | 1-40 |
| Teletypewriter order wire (pony circuit) | |
| AN/GRC-122 Plain and C models | 2-137 |
| AN/GRC-122A, B, D, and E models | 2-137 |
| Operation under unusual conditions | 2-147 |
| Operation under usual conditions | 2-29 |
| Operator maintenance procedures | 3-20 |
| General | 3-21 |
| Operator Preventive Maintenance Check and Services | 2-26 |
| **P** | |
| Power Distribution Panel SB-3018/GRC-142 power indicator lamp replacement (AN/GRC-122/142 Plain and C models) | 3-27 |
| Power Distribution Panel SB-3358/GRC indicator lamp replacement (AN/GRC-122/142A and B models) | 3-28 |
| Power Distribution Panel SB-F-960672 indicator lamp replacement (AN/GRC-122/142D and E models) | 3-29 |
| Power Distribution Panel SB-3018/GRC-142 fuse replacement (AN/GRC-122/142 Plain and C models) | 3-30 |
| Power output measurement with doublet antenna | 2-108 |
| Power output measurement with whip antenna | 2-109 |
| Power requirements | 1-24 |
| Power sources | 2-76 |
| Preliminary Starting Procedures | 2-78 |
| Preoperational equipment checks | 2-95 |
| Preoperational equipment settings | 2-80 |
| Ac entrance box circuit breakers | 2-80 |
| Amplifier AM-3349/GRC-106 | 2-88 |
| Communications Terminal AN/UGC-74A(V)3 | 2-91 |
| Control Panel SA-1554/GRC-142 | 2-83 |
| Distribution box ac power – dc power | 2-80 |
| Electric heater | 2-92 |
| Local Control C-434/GRC | 2-94 |
| Loudspeaker LS-166/U and duplex LS-166/U | 2-93 |
| Low-Level Signaling Device TT-523/GGC | 2-90 |

# INDEX (CONT)


| Subject | Page |
|---|---|
| **P (CONT)** | |
| Preoperational equipment settings (Cont) | |
| Modem MD-522(*)/GRC | 2-88 |
| Power Distribution Panel SB-3018/GRC-142 | 2-82 |
| Power Distribution Panel SB-3358/GRC-142 | 2-84 |
| Power Distribution Panel SC-F-960672 | 2-85 |
| Power Supply PP-4763(*)/GRC | 2-81, 2-86 |
| Radio Receiver-Transmitter RT-662/GRC and duplex RT-662/GRC | 2-87 |
| Remote Control Box C-7279/GRC-142 | 2-93 |
| Remote Control C-433/GRC | 2-94 |
| Standing Wave Ratio Power Meter ME-165/G | 2-92 |
| Switch Assembly SA-1650/GRC | 2-86 |
| Switch Box SA-1555/GRC-142 | 2-83 |
| Telephone Set TA-312/PT | 2-91 |
| Teletypewriter TT-98/FG and duplex TT-98/FG | 2-89 |
| Teletypewriter TT-76(*)/GGC | 2-90 |
| Preoperational procedures | 2-74 |
| Preparation for movement | 2-146 |
| Preventive maintenance checks and services, operator (PMCS) | 2-26 |
| General | 2-26 |
| **R** | |
| Recognition and identification of jamming | 2-151 |
| References | A-1 |
| Remote cw operation | |
| AN/GRC-122/142 Plain and C models | 1-42 |
| Receive | 1-42 |
| Transmit | 1-42 |
| AN/GRC-122/142A, B, C, and E models | 1-43 |
| Receive | 1-43 |
| Transmit | 1-43 |
| Remote equipment installation | 2-56 |
| Remote field telephone operation | |
| AN/GRC-122/142(*) models | 1-39 |
| Receive | 1-39 |
| Transmit | 1-39 |
| Remote operation | 2-129 |
| Remote owr teletypewriter operation | |
| AN/GRC-122/142(*) models | 1-41 |
| Receive | 1-41 |
| Transmit | 1-41 |
| Remote owr voice operation | |
| AN/GRC-122/142(*) models | 1-40 |
| Receive | 1-40 |
| Transmit | 1-40 |

# INDEX (CONT)


Subject — Page

R (CONT)

Replacement of:
- Cold-start lamp ... 3-24
- Control panel indicator lamp (AN/GRC-122/142 Plain and C models) ... 3-26
- Fluorescent lamp and starter ... 3-22
- Incandescent lamp ... 3-22
- Power Distribution Panel SB-3018/GRC-142 power indicator lamp (AN/GRC-122/142 Plain and C models) ... 3-27
- Power Distribution Panel SB-3358/GRC indicator lamp (AN/GRC-122/142A and B models) ... 3-28
- Power Distribution Panel SB-F-960672 indicator lamp (AN/GRC-122/142D and E models) ... 3-29
- Power Distribution Panel SB-3018/GRC-142 fuse (AN/GRC-122/142 Plain and C models) ... 3-30
- Switch assembly indicator lamp (AN/GRC-122/142A, B, D, and E models) ... 3-25

Reporting equipment improvement recommendations (EIRs) ... 1-2
Report of packaging and handling deficiencies ... 1-1
Reports of maintenance and unsatisfactory equipment ... 1-1

S

Scope ... 1-1
Security classification markings ... 1-4
Security equipment installation ... 2-69
Shade tarpaulin installation ... 2-55
Shelter door combination lock ... 2-71
Shelter exterior dimensions ... 1-25
Site and shelter requirements ... 2-30
Standby procedures ... 2-143
Stopping procedures ... 2-142
Switch assembly indicator lamp replacement (AN/GRC-122/142A, B, D, and E models) ... 3-25
Symptom index ... 3-2
System planning ... 2-29

T

Technical principles of operation ... 1-29
- General ... 1-29

Teletypewriter order wire (pony circuit)
- AN/GRC-122 Plain and C models ... 1-44
  - Receive ... 1-44
  - Transmit ... 1-44
- AN/GRC-122A, B, D, and E models ... 1-45
  - Receive ... 1-45
  - Transmit ... 1-45

Teletypewriter slides ... 2-77
Terminal, communications AN/UGC-74A(V)3 ... 1-26

# INDEX (CONT)


| Subject | Page |
|---|---|
| **T** (CONT) | |
| Troubleshooting | 3-8 |
| Troubleshooting procedures | 3-1 |
| General | 3-1 |
| Truck exhaust pipe hose | 2-75 |
| Tuning procedure | 2-99 |
| Using whip antenna | 2-99 |
| Using doublet antenna | 2-103 |
| **V** | |
| Vehicle boarding ladder | 2-30 |
| **W** | |
| Whip antenna installation | 2-34 |
| Whip or doublet antennas and ground rods | 2-74 |

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BE EXACT PIN-POINT WHERE IT IS

| PAGE NO | PARAGRAPH | FIGURE NO | TABLE NO |
|---|---|---|---|
| 33 | | | |
| 44 | | 19 | |
| 45 | | | |

**IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:**

For item 2, change the NSN to read: 5835-00-134-9186.
Reason: Accuracy.

Identify the cover on the junction box (item no. 5).
Reason: It is a separate item and is not called out on figure 19.

Add the cover of the junction box as an item in the listing for figure 19.
Reason: Same as above

SAMPLE

PRINTED NAME GRADE OR TITLE AND TELEPHONE NUMBER
SSG I. M. DeSpirit of 999-1776

SIGN HERE I. M. DeSpirit

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

P S --IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

TEAR ALONG PERFORATED LINE

REVERSE OF DA FORM 2028-2

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FOLD BACK

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POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

SAMPLE

Commander
US Army Communications-Electronics Command
and Fort Monmouth
ATTN: AMSEL-ME-MP
Fort Monmouth, New Jersey 07703-5007

TEAR ALONG PERFORATED LINE

**RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS**




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FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

| PUBLICATION NUMBER | PUBLICATION DATE | PUBLICATION TITLE |
|---|---|---|
| TM 11-5815-334-10 | 5 Mar 85 | Radio Teletypewriter Sets |

BE EXACT . . . PIN-POINT WHERE IT IS

| PAGE NO | PARA-GRAPH | FIGURE NO | TABLE NO |
|---|---|---|---|
| | | | |

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|---|---|---|---|
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Fort Monmouth, New Jersey 07703-5007

By Order of the Secretary of the Army:

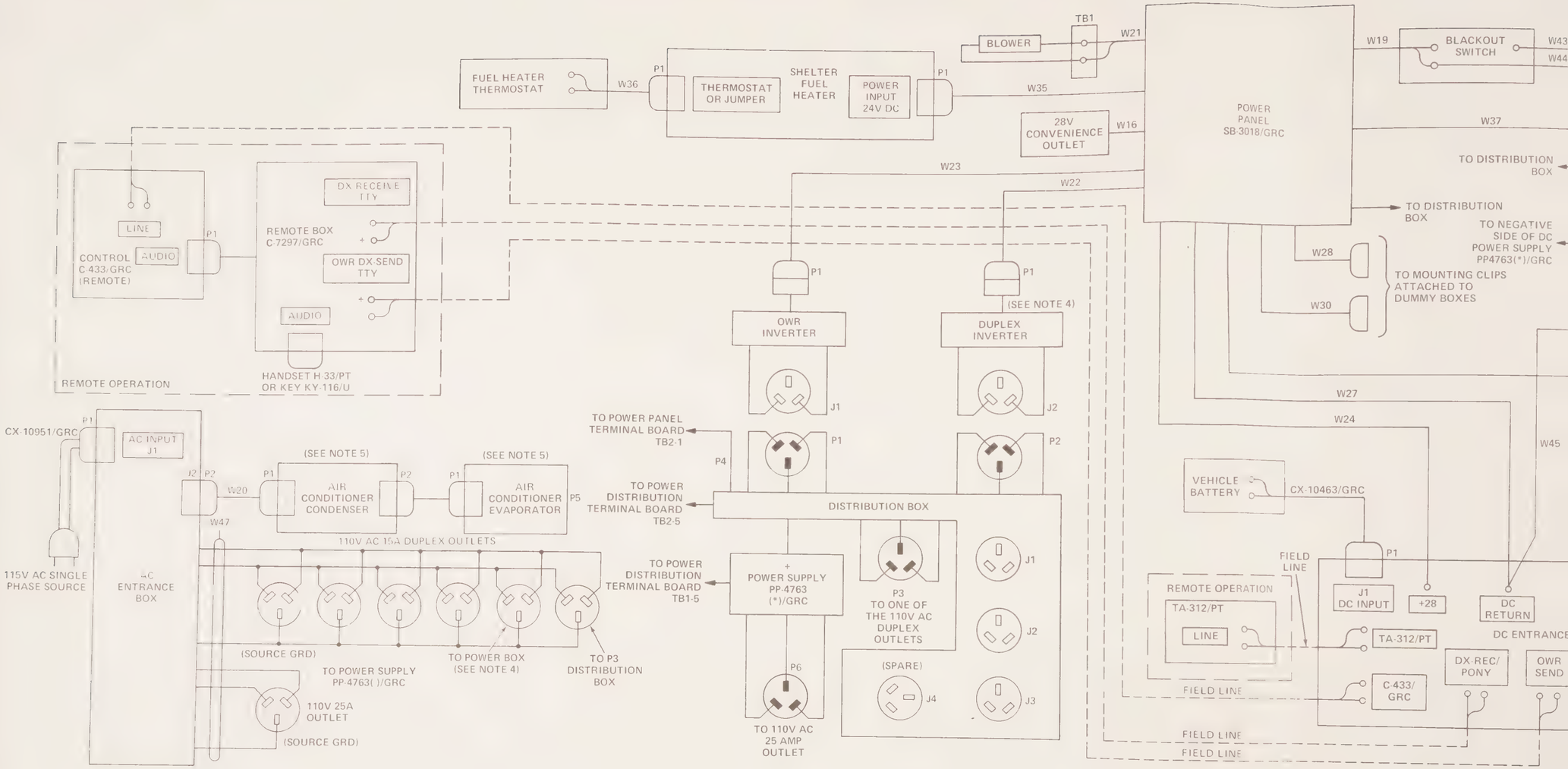
JOHN A. WICKHAM JR.
*General, United States Army*
*Chief of Staff*

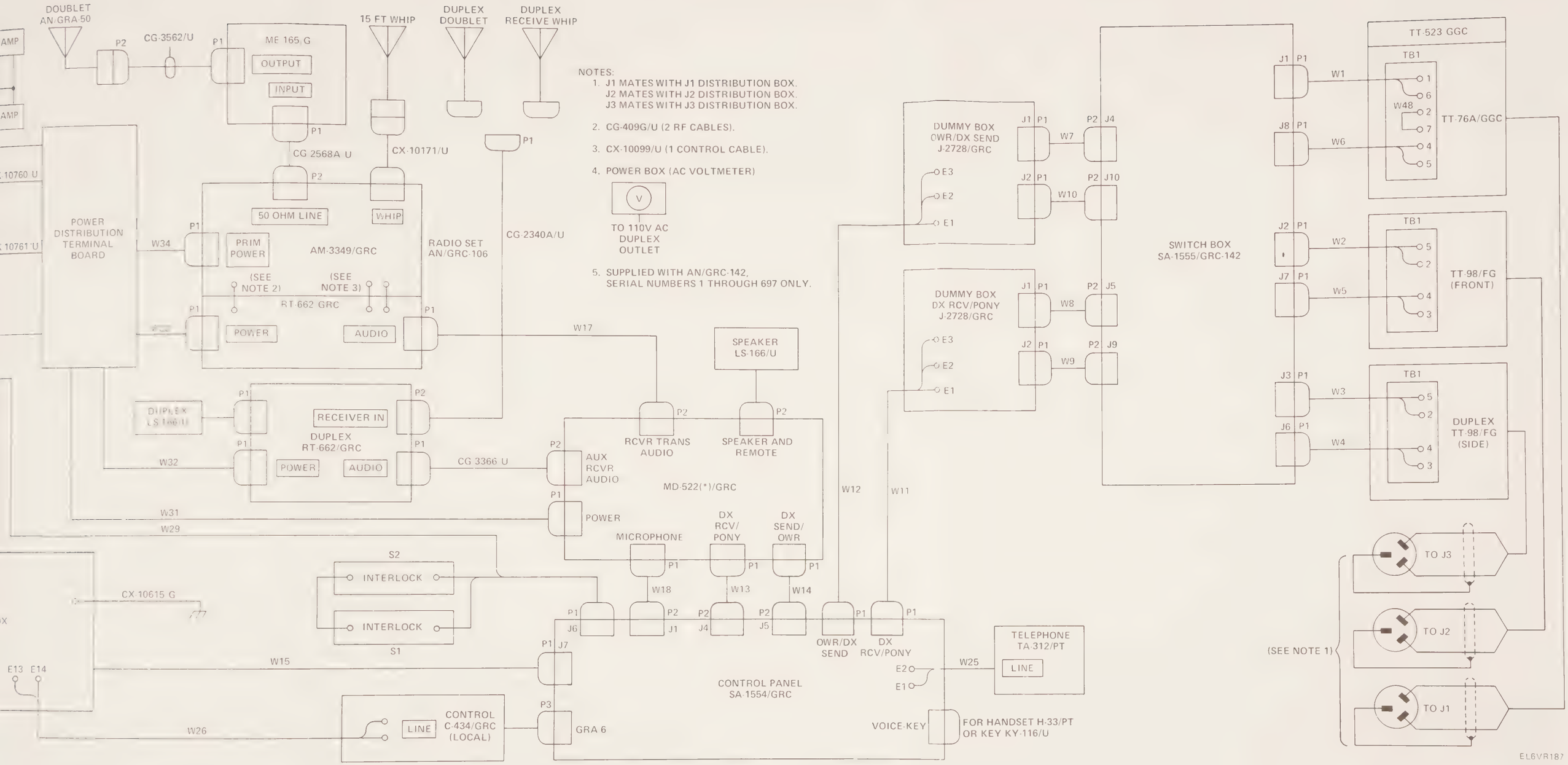
Official:

DONALD J. DELANDRO
*Brigadier General, United States Army*
*The Adjutant General*

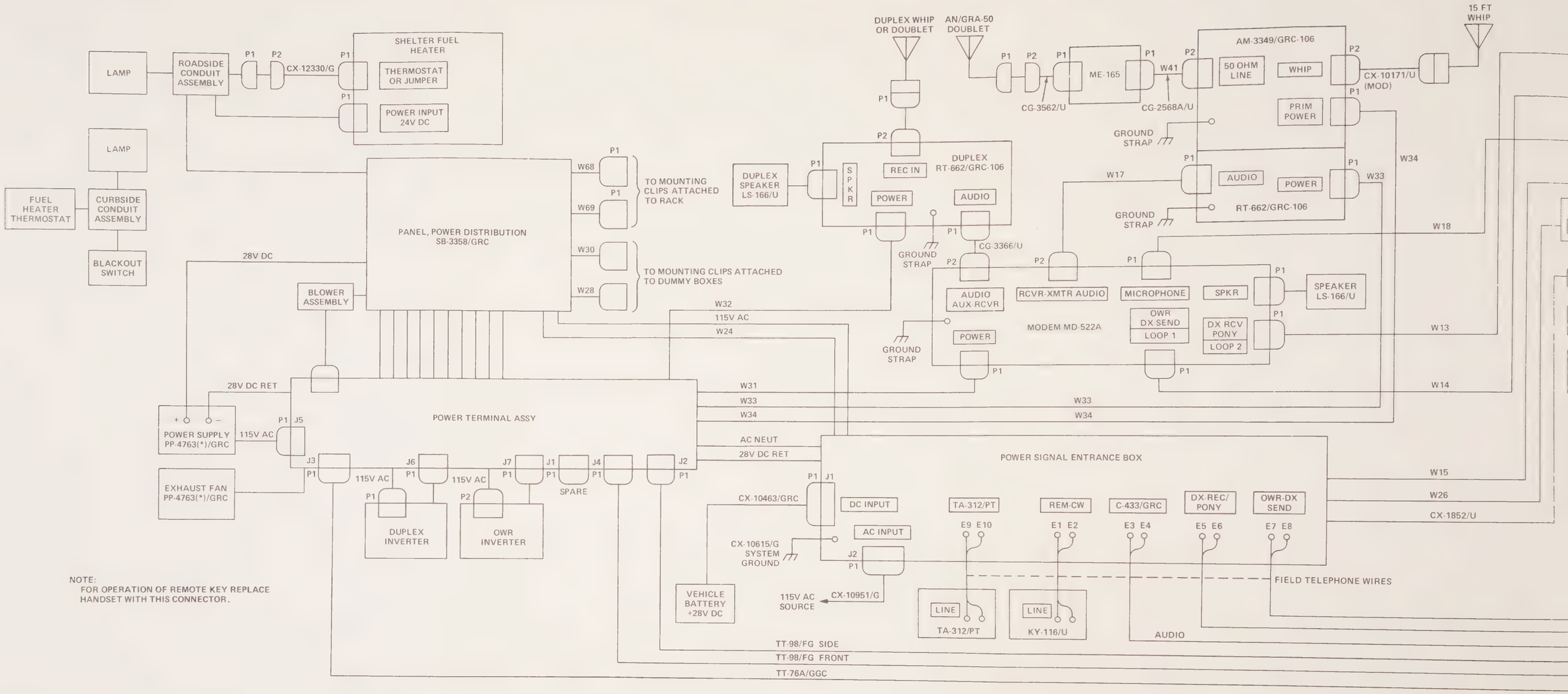
DISTRIBUTION:

To be distributed in accordance with DA Form 12-51, Operator's Maintenance requirements for AN/GRC-142 and AN/GRC-122.

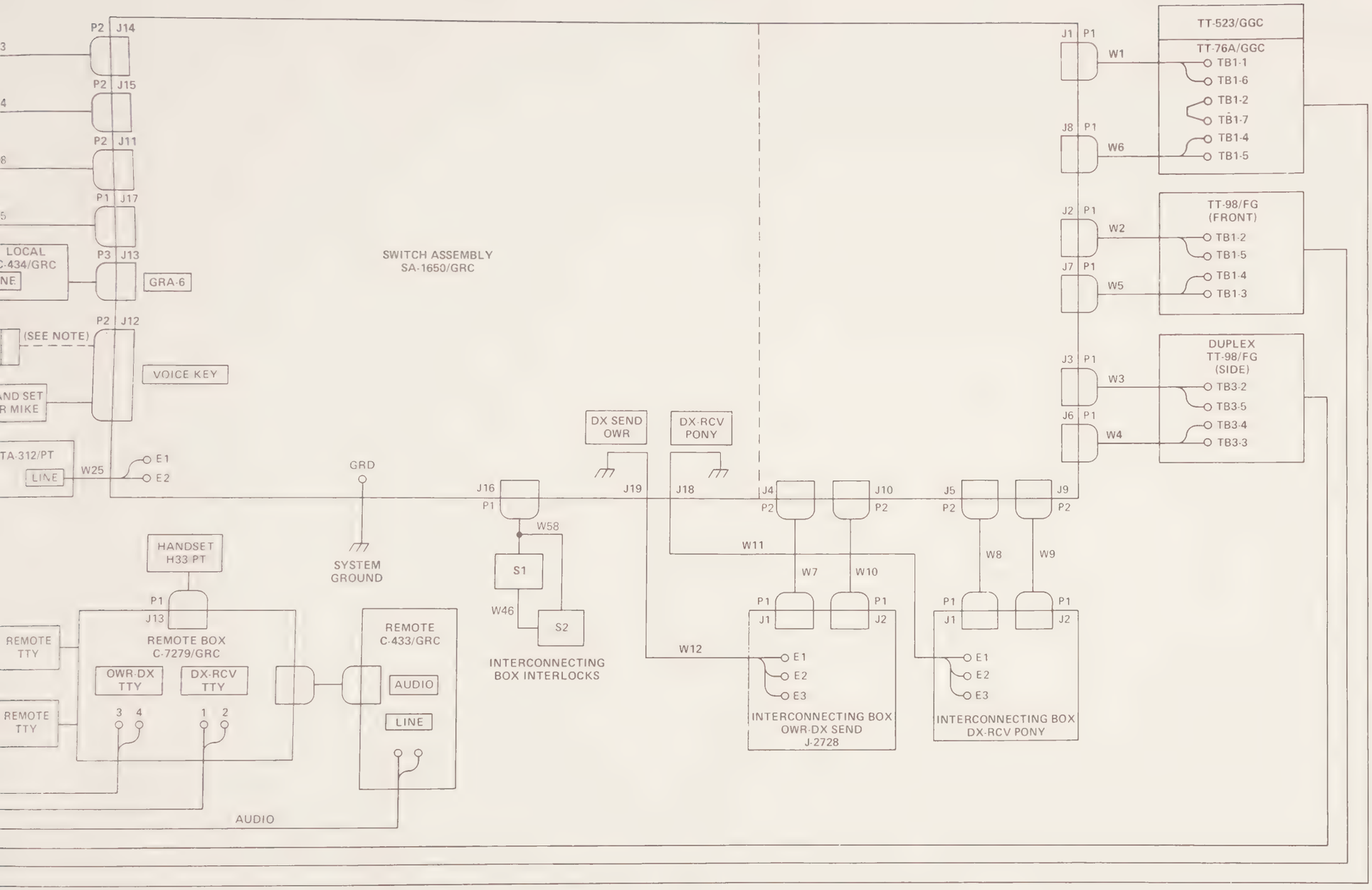

FUEL HEATER THERMOSTAT
W36
P1
THERMOSTAT OR JUMPER
SHELTER FUEL HEATER
POWER INPUT 24V DC
P1
W35
TB1
BLOWER
W21
28V CONVENIENCE OUTLET
W16
POWER PANEL SB-3018/GRC
W19
BLACKOUT SWITCH
W43
W44
W37
TO DISTRIBUTION BOX
TO DISTRIBUTION BOX
TO NEGATIVE SIDE OF DC POWER SUPPLY PP4763(*)/GRC
W28
W30
TO MOUNTING CLIPS ATTACHED TO DUMMY BOXES
W23
W22
LINE
AUDIO
CONTROL C-433/GRC (REMOTE)
P1
REMOTE BOX C-7297/GRC
DX RECEIVE TTY
OWR DX-SEND TTY
AUDIO
HANDSET H-33/PT OR KEY KY-116/U
REMOTE OPERATION
P1
OWR INVERTER
P1
DUPLEX INVERTER
(SEE NOTE 4)
J1
J2
W27
W24
W45
TO POWER PANEL TERMINAL BOARD TB2-1
P4
P1
P2
VEHICLE BATTERY
CX-10463/GRC
TO POWER DISTRIBUTION TERMINAL BOARD TB2-5
DISTRIBUTION BOX
FIELD LINE
P1
REMOTE OPERATION
TA-312/PT
LINE
J1 DC INPUT
+28
DC RETURN
DC ENTRANCE
TA-312/PT
DX-REC/ PONY
OWR SEND
C-433/ GRC
FIELD LINE
FIELD LINE
FIELD LINE
CX-10951/GRC
P1
AC INPUT J1
J2
P2
W20
(SEE NOTE 5)
P1
AIR CONDITIONER CONDENSER
P2
(SEE NOTE 5)
P1
AIR CONDITIONER EVAPORATOR
P5
W47
110V AC 15A DUPLEX OUTLETS
115V AC SINGLE PHASE SOURCE
AC ENTRANCE BOX
TO POWER DISTRIBUTION TERMINAL BOARD TB1-5
+ POWER SUPPLY PP-4763 (*)/GRC
P3 TO ONE OF THE 110V AC DUPLEX OUTLETS
J1
J2
J3
J4
(SPARE)
P6
TO 110V AC 25 AMP OUTLET
(SOURCE GRD)
TO POWER SUPPLY PP-4763( )/GRC
TO POWER BOX (SEE NOTE 4)
TO P3 DISTRIBUTION BOX
110V 25A OUTLET
(SOURCE GRD)




*FO-1. Radio Teletypewriter Sets AN/GRC-122/142(*) Cording Diagram.*

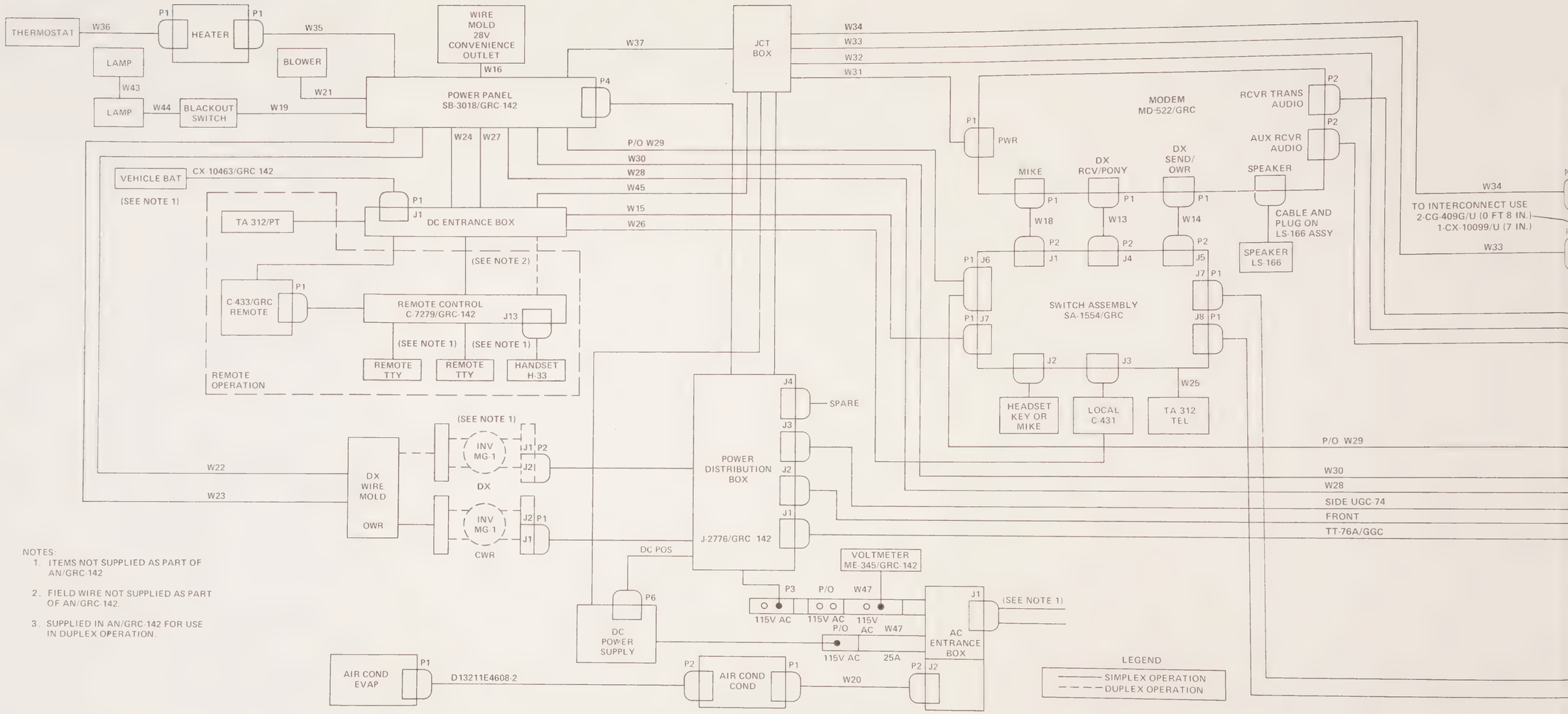



NOTE:
FOR OPERATION OF REMOTE KEY REPLACE HANDSET WITH THIS CONNECTOR.



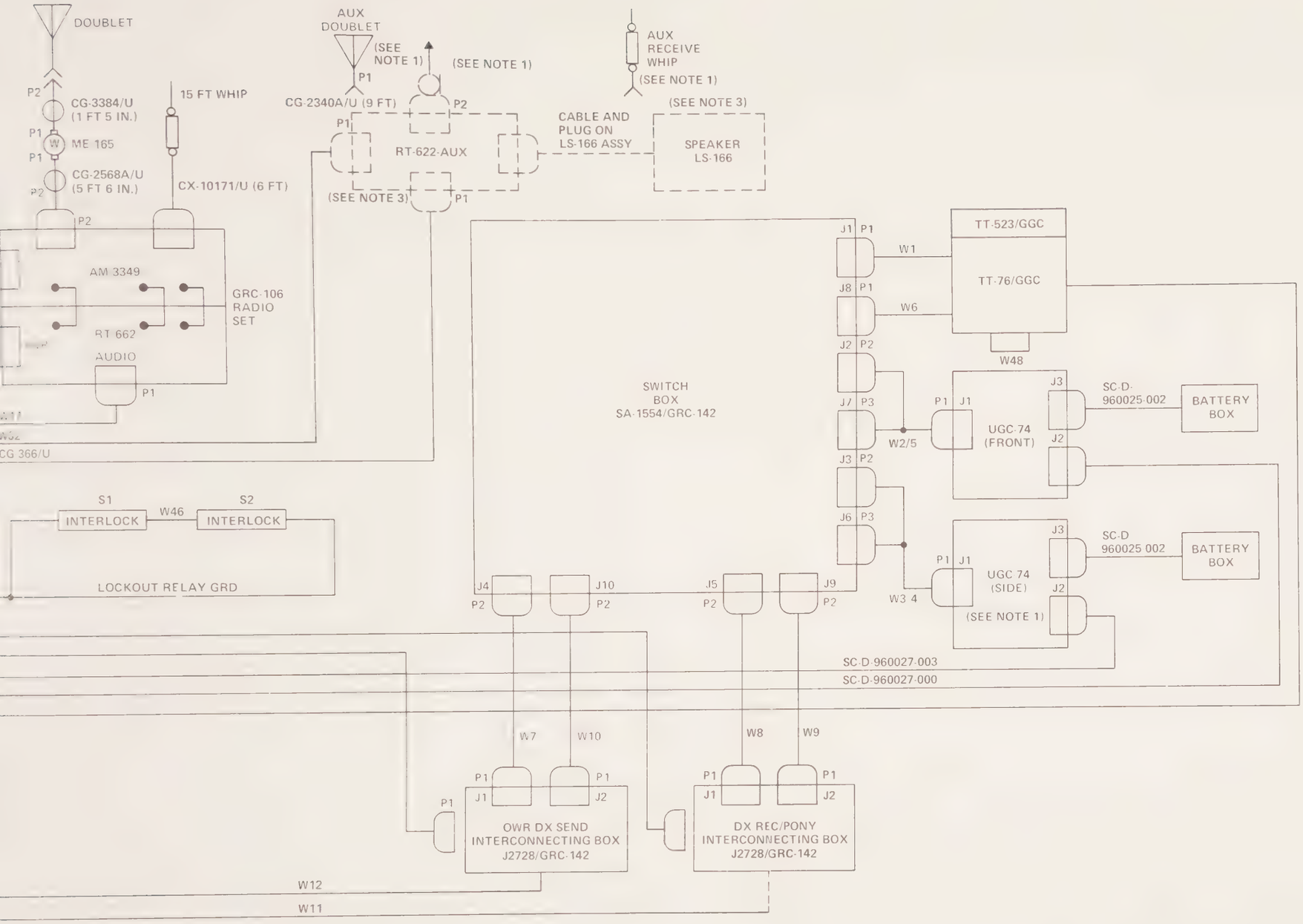

EL6VR188

*FO-2. Radio Teletypewriter Sets AN/GRC-122/142A and B Cording Diagram.*



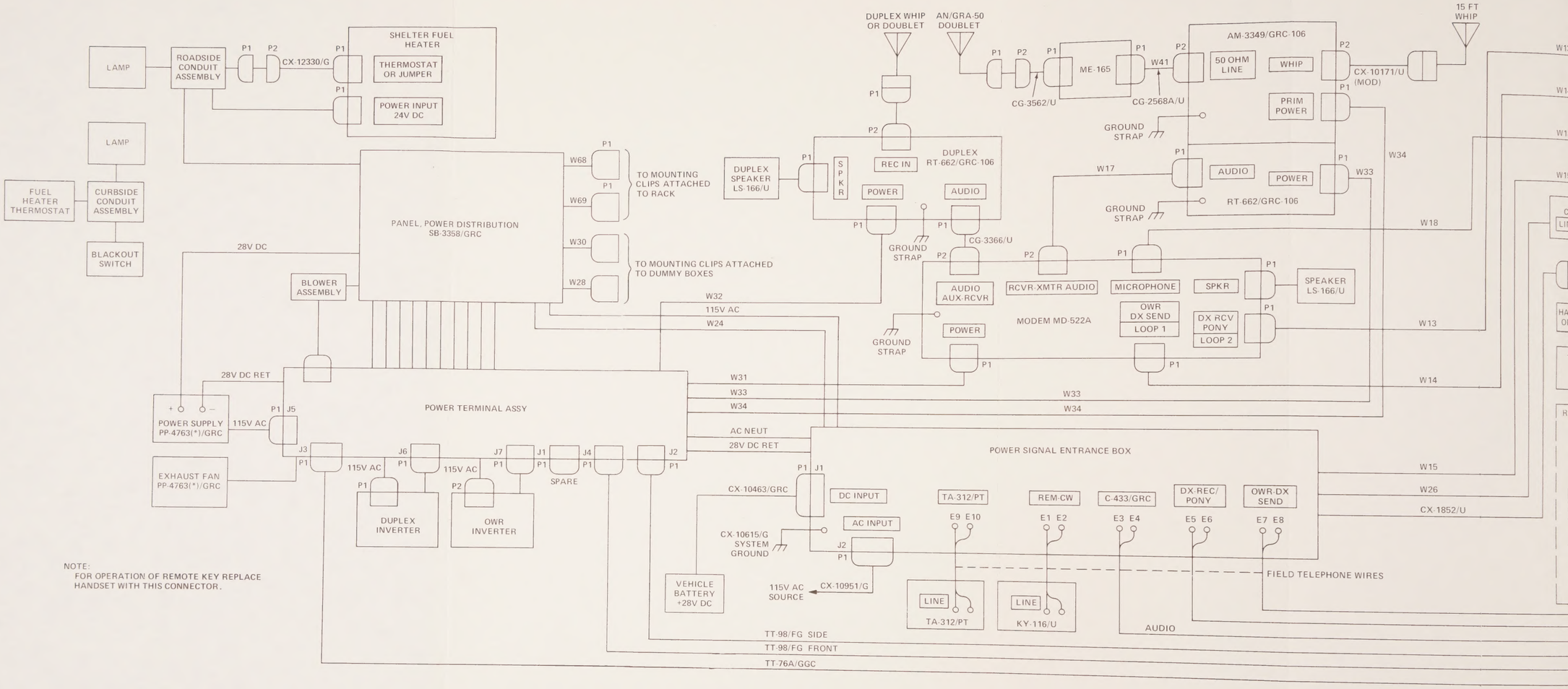

NOTES:

1. ITEMS NOT SUPPLIED AS PART OF AN/GRC-142
2. FIELD WIRE NOT SUPPLIED AS PART OF AN/GRC-142.
3. SUPPLIED IN AN/GRC-142 FOR USE IN DUPLEX OPERATION.

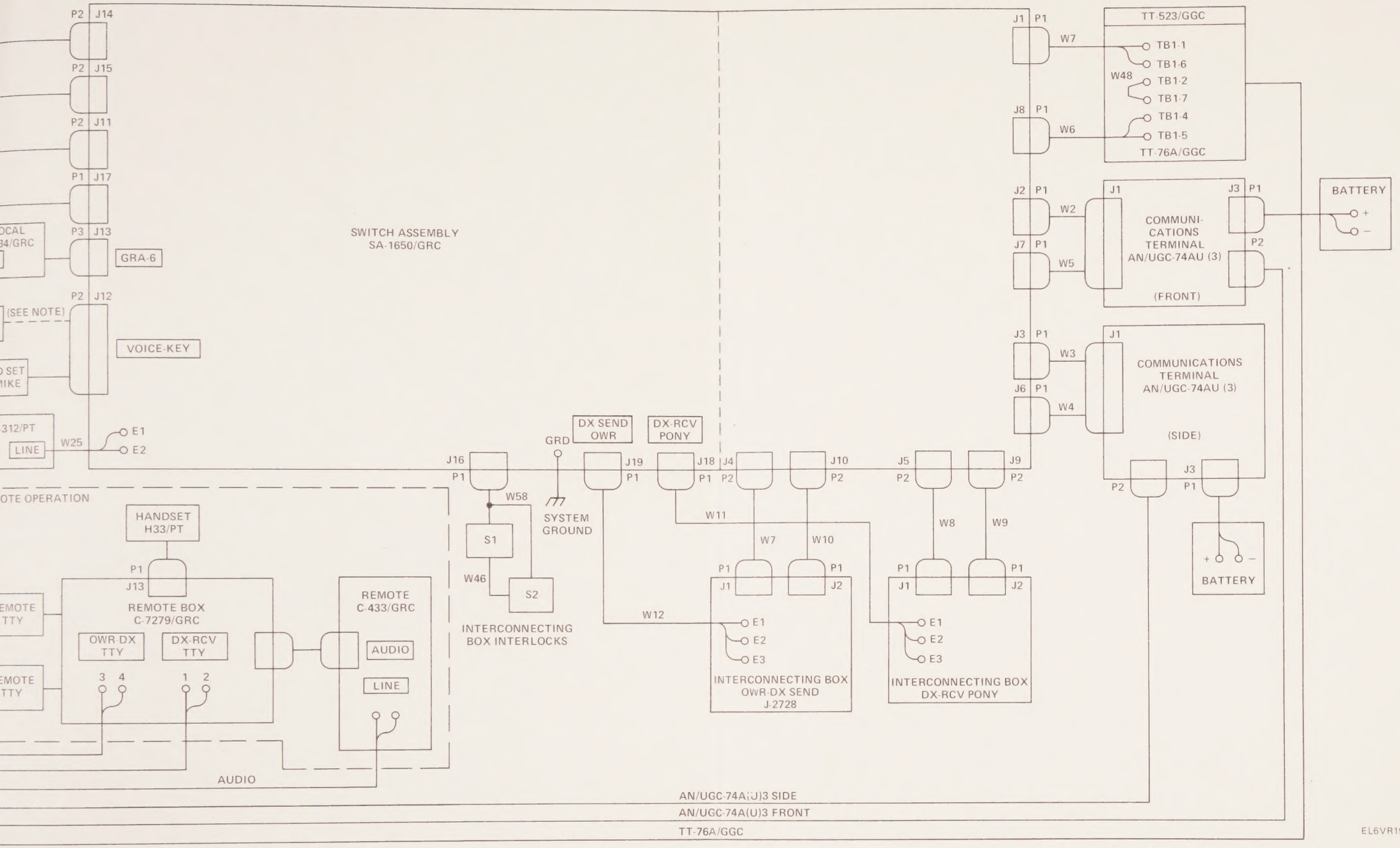



EL6VR189

*FO-3. Radio Teletypewriter Sets AN/GRC-122/142C Cording Diagram.*

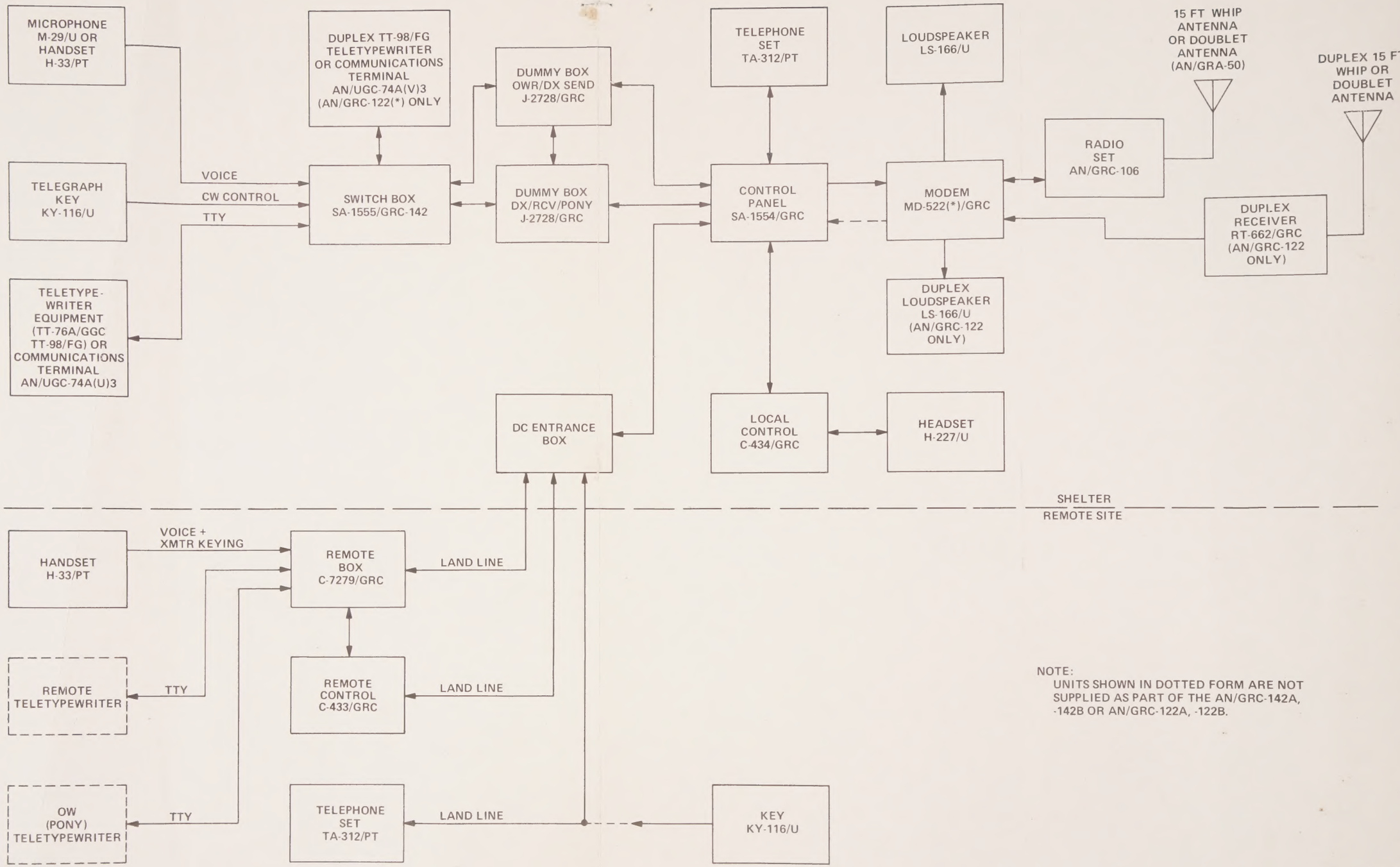



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EL6VR190

*FO-4. Radio Teletypewriter Sets AN/GRC-122/142D and E Cording Diagrams.*




NOTE:
UNITS SHOWN IN DOTTED FORM ARE NOT SUPPLIED AS PART OF THE AN/GRC-142A, -142B OR AN/GRC-122A, -122B.

EL6VR020

*FO-5. Radio Set AN/GRC-122/142 Plain and C Block Diagram.*