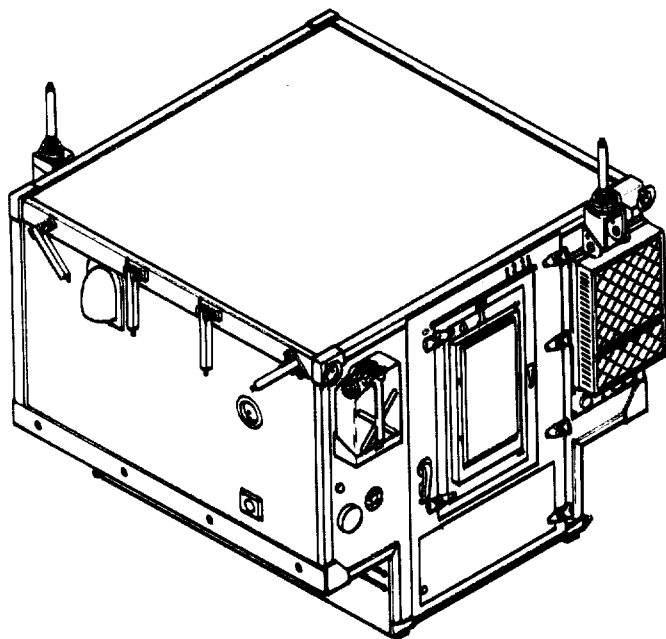


This copy is a reprint which includes current pages from Changes 1 and 2.

TECHNICAL MANUAL
OPERATOR'S MAINTENANCE MANUAL



EQUIPMENT DESCRIPTION
PAGE 1-5

**TECHNICAL PRINCIPLES
OF OPERATION**
PAGE 1-29

OPERATION INSTRUCTIONS
PAGE 1-29

OPERATOR PMCS
PAGE 2-28

**OPERATOR
TROUBLESHOOTING**
PAGE 3-1

OPERATOR MAINTENANCE
PAGE 3-20

RADIO TELETYPEWRITER SETS

- AN/GRC-122 (NSN 5515-00-401-9719)**
- 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)**

HEADQUARTERS, DEPARTMENT OF THE ARMY

5 MARCH 1985

Change

No. 4

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 1 October 1994

Operator's Maintenance Manual

RADIO TELETYPEWRITER SETS

AN/GRC-122	(NSN 5815-00-401-9719) (EIC: GFE)
AN/GRC-122A	(NSN 5815-00-167-7998) (EIC: GFA)
AN/GRC-122B	(NSN 5815-00-937-5295) (EIC: GFJ)
AN/GRC-122C	(NSN 5815-01-095-1211) (EIC: GFL)
AN/GRC-122D	(NSN 5815-01-096-0428) (EIC: GFP)
AN/GRC-122E	(NSN 5815-01-0951212) (EIC: GFM)
AN/GRC-142	(NSN 5815-00-401-9720) (EIC: GFF)
AN/GRC-142A	(NSN 5815-00-168-1556) (EIC: GFB)
AN/GRC-142B	(NSN 5815-00-443-5511) (EIC: GFG)
AN/GRC-142C	(NSN 5815-01-100-6815) (EIC: GFR)
AN/GRC-142D	(NSN 5815-01-104-7284) (EIC: GFT)
AN/GRC-142E	(NSN 5815-01-095-6258) (EIC: GFN)

**USED WITH OR WITHOUT INSTALLATION KIT,
ELECTRONIC EQUIPMENT MODIFICATION KIT MK-2488/G**

TM 11-5815-334-10, 5 March 1985, is changed as follows:

1. Remove old pages and Insert new pages as indicated below. New or changed material is indicated by a vertical bar in the margin of the page.

<i>Remove pages</i>	<i>Insert pages</i>
i through 1-2	i through 1-2
1-5 and 1-6	1-5 and 1-6
1-23 through 1-26	1-23 through 1-26
2-5 and 2-6	2-5 and 2-6
2-11 through 2-14	2-11 through 2-14
2-23 through 2-26	2-23 through 2-26
2-65 and 2-66	2-65 and 2-66
2-68.1 and 2-68.2	2-68.1 and 2-68.2
2-68.5 and 2-68.6	2-68.5 and 2-68.6
2-71 and 2-72	2-71 and 2-72
2-83 and 2-84	2-83 and 2-84
2-107 through 2-110	2-107 through 2-110
2-131 and 2-132	2-131 and 2-132
B-3 through B-30	B-3 (blank) through B-36 (blank)
C-1 and C-2	C-1 and C-2

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MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army

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block 2190 requirements for TM 11-5815-334-10.

Change

No. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
 Washington, DC, 15 July 1989

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	5818-00-095-1211)
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, 5 March 1985, is changed as follows:

1. Remove old pages and insert new pages as indicated below. New or changed material is indicated by a vertical bar in the margin of the page.

Remove pages

i and ii
 2-25 through 2-28
 None

Insert pages

i and ii
 2-25 through 2-28
 2-28.1 through 2-28.8

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General, United States Army
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Official:

WILLIAM J. MEEHAN II
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:

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CHANGE

No. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 15 December 1988

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 5815-401-9720)**
- AN/GRC-142A (NSN 5815-00-168-1556)**
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- AN/ GRC-142D (NSN 5815-01-104-7264)**
- AN/GRC-142E (NSN 5815-01-095-6258)**

**USED WITH OR WITHOUT INSTALLATION KIT,
ELECTRONIC EQUIPMENT MODIFICATION KIT MK-2488/G**

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1. Title of the manual is changed as shown above.
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Remove pages

Insert pages

E and F	E and F
i and ii	i and ii
1-1 and 1-2	1-1 and 1-2
1-5 and 1-6	1-5 and 1-6
1-9 and 1-10	1-9 and 1-10
1-13 and 1-14	1-13 and 1-14
1-17 through 1-20	1-17 through 1-20
1-23 through 1-30	1-23 through 1-30

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Remove pages

Insert pages

2-9 and 2-10	2-9 and 2-10
2-21 and 2-22	2-21 and 2-22
2-25 and 2-26	2-25 and 2-26
2-43 and 2-44	2-43 and 2-44
2-47 and 2-48	2-47 and 2-48
2-65 and 2-66	2-65 and 2-66
None	2-68.1 through 2-68.8
2-69 and 2-70	2-69 and 2-70
None	2-70.1 through 2-70.8
2-71 and 2-72	2-71 and 2-72
None	2-72.1 and 2-72.2
2-77 and 2-78	2-77 and 2-78
2-79 and 2-80	2-79 and 2-80
2-83 and 2-84	2-83 and 2-84
2-85 and 2-86	2-85 and 2-86
2-89 and 2-90	2-89 and 2-90
2-95 through 2-98	2-95 through 2-98
2-111 and 2-112	2-111 and 1-112
2-117 and 2-118	2-117 and 2-118
2-127 and 2-128	2-127 and 2-128
2-133 and 2-134	2-133 and 2-134
2-141 and 2-142	2-141 and 2-142
None	2-142.1 through 2-142.11/ (2-142.12 blank)
2-143 and 2-144	2-143 and 2-144
3-3 and 3-4	3-3 and 3-4
3-9 and 3-10	3-9 and 3-10
None	3-10.1 through 3-10.8
3-15 and 3-16	3-15 and 3-16
None	3-16.1 and 3-16.2
3-17 and 3-18	3-17 and 3-18
3-19 and 3-20	3-19 and 3-20
A-3 and A-4	A-3 and A-4
B-1 and B-2	B-1 and B-2
B-13 through B-16	B-13 through B-16
B-23 through B-28	B-23 through B-28
B-28.1 and B-28.2	B-28.1 and B-28.2
B-29 and B-30	B-29 and B-30
C-1 and C-2	C-1 and C-2
None	C-3/(C-4blank)
None	Figure FO-1.1
None	Figure FO-2.1
None	Figure FO-3.1
None	Figure FO-4.1
None	Figure FO-5.1
None	Figure FO-6.1

3. File this change sheet in the front of the publication for reference purposes.

By Order of the Secretary of the Army:

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General, United States Army
Chief of Staff

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CHANGE

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 1 October 1987

No. 1

**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)**

TM 11-5815-334-10, 5 March 1985, is changed as follows:

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Remove pages	Insert pages
E and F	E and F
1-1 and 1-2	1-1 and 1-2
1-5 and 1-6	1-5 and 1-6
1-15 through 1-18	1-15 through 1-18
2-9 and 2-10	2-9 and 2-10
2-15 and 2-16	2-15 and 2-16
2-21 and 2-22	2-21 and 2-22
2-27 and 2-28	2-27 and 2-28
2-63 through 2-66	2-63 through 2-66
2-69 and 2-70	2-69 and 2-70
2-147 and 2-148	2-147 and 2-148
A-1 and A-2	A-1 and A-2
B-5 through B-8	B-5 through B-8
B-11 and B-12	B-11 and B-12
B-17 and B-18	B-17 and B-18
B-23 and B-24	B-23 and B-24
B-29 and B-30	B-29 and B-30

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Chief of Staff

R.L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:

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5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

1 DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL

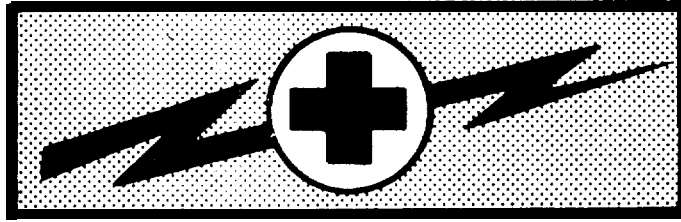
2 IF POSSIBLE, TURN OFF THE ELECTRICAL POWER

3 IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A WOODEN POLE OR A ROPE OR SOME OTHER INSULATING MATERIAL

4 SEND FOR HELP AS SOON AS POSSIBLE

5 AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION

WARNING



WARNING

HIGH VOLTAGE

IS USED IN THE OPERATION OF THIS EQUIPMENT

DEATH ON CONTACT

MAY RESULT IF PERSONNEL FAIL TO OBSERVE SAFETY PRECAUTIONS

Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid. When the technician is aided by operators, he must warn them about dangerous areas.

Whenever possible, the power supply to the equipment must be shut off before beginning work on the equipment. Take particular care to ground every capacitor likely to hold a dangerous potential. When working inside the equipment, after the power has been turned off, always ground every part before touching it.

Be careful not to contact high-voltage connections of 115 volt ac input connections when installing or operating this equipment.

When installing or operating this equipment, be careful not to touch high-voltage connections of 115 vac.

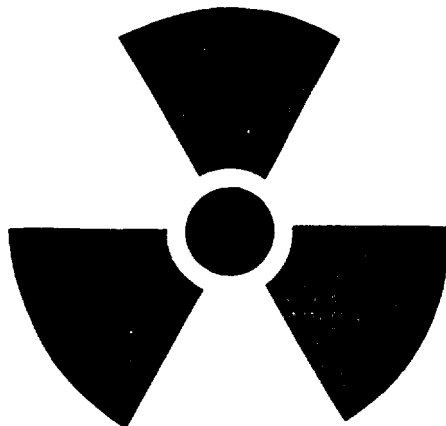
Whenever the nature of the operation permits, keep one hand away from the equipment to reduce the hazard of current flowing through vital organs of the body.

Remove all jewelry before working on electronic equipment.

WARNING Do not be misled by the term "low voltage". Potentials as low as 50 volts may cause death under adverse conditions.

For Artificial Respiration, refer to FM 21-11.

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.

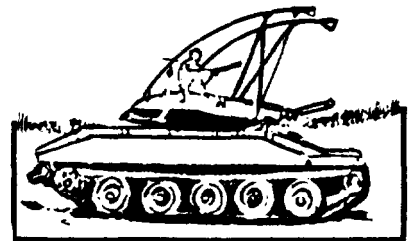
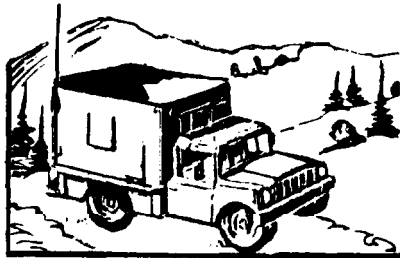
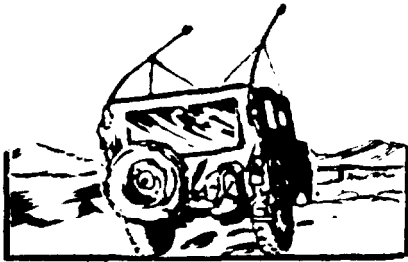
WARNING

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 ?

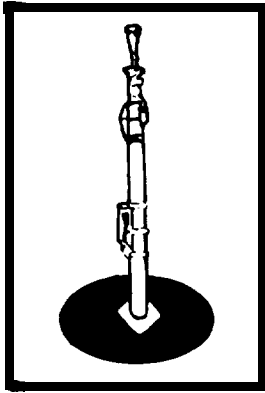
MOBILE OPERATION WITH WHIP ANTENNAS



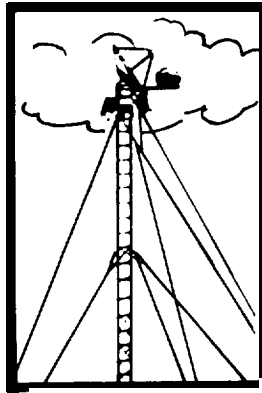
DO NOT STOP YOUR VEHICLE UNDER POWERLINES.

- 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.

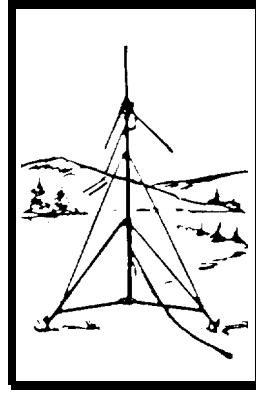
FIXED OPERATION WITH LONG RANGE ANTENNAS WARNING



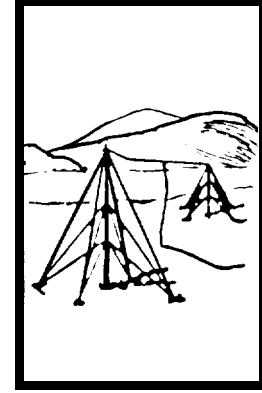
TELESCOPING ANTENNA
MAST



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.

CAUTION

Throughout the manual, the primary power rating is given as 115 v ac $\pm 10\%$. As the equipment power switches are turned on, the primary voltage may drop to some value in the $\pm 10\%$ range, but it should not remain at the changed level, but return to the original 115 v ac. If the level does drop and stay at a constant level, have the repair person check the condition of the last circuit turned on which created this condition.

OPERATOR'S MAINTENANCE MANUAL

RADIO TELETYPEWRITER SETS

AN/GRC-122 (NSN 5815-00-401-9719)	(EIC: GFE)
AN/GRC-122A (NSN 5815-00-167-7998)	(EIC: GFA)
AN/GRC-122B (NSN 5815-00-937-5295)	(EIC: GFJ)
AN/GRC-122C (NSN 5815-01-095-1211)	(EIC: GFL)
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AN/GRC-142A (NSN 5815-00-168-1556)	(EIC: GFB)
AN/GRC-142B (NSN 5815-00-443-5511)	(EIC: GFG)
AN/GRC-142C (NSN 5815-01-100-6815)	(EIC: GFR)
AN/GRC-142D (NSN 5815-01-104-7264)	(EIC: GFT)
AN/GRC-142E (NSN 5815-01-095-6258)	(EIC: GFN)

USED WITH OR WITHOUT INSTALLATION KIT, ELECTRONIC EQUIPMENT KIT MK-2488/G

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-LC-LM-LT, Fort Monmouth, NJ 07703-5007. A reply will be furnished direct to you.

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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 24 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.

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

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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
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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/GRG122E, and AN/GRC-142, which can be configured as AN/GRC-142A/AN/GRGC-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.

a. *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.

b. *Reporting of item and Packaging Discrepancies.* Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55 SECNAVINST 4355.18/AFR 400-54/MCO 4430.3H.

c. *Transportation Discrepancy Report (TDR) (SF 361).* Fill out and forward Transportation Discrepancy Report (TDR) (SF 361) 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 (i.e., 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 maybe 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.

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

Refer to the latest issue of DA Pam 25-30 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

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

If your equipment 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 or performance. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-LC-ED-CFO, Fort Monmouth, New Jersey 07703-5023. We'll send you a reply.

1-6. DESTRUCTION OF ARMY ELECTRONICS MATERIEL

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.

1-6.1. ADMINISTRATIVE STORAGE.

Administrative storage of equipment issued to and used by Army activities will have Preventive Maintenance Checks and Services (PMCS) performed before storing. When removing the equipment from administrative storage, the PMCS checks should be performed to assure operational readiness.

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 or AN/UGC-74 B(V)3	Amplifier RF AM-3349/GRC-106 Terminal, Communications AN/UGC- 74A(V)3 or Terminal, Communications AN/UGC-74B(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 local control loudspeaker microphone modem power meter power supply radio set remote box remote control RT-662/GRC shelter switch assembly switch box telephone o rTA-312/PT TT-76(*)/GGC TT-98/FG voltmeter whip antenna	Key Telegraph KY-116/U Local Control, C-434/GRC Dynamic Loudspeaker LS-166/U Microphone, M-29B/U Modem, MD-522(*)/GRC Standing Wave Ratio Power Meter ME-165/GRC Power Supply PP-4763(*)/GRC Radio Set, AN/GRC-106 Remote Control Box, C-7279/GRC-142 Remote Control, C-433/GRC Radio Transmitter RT-662/GRC Shelter Electrical Equipment S-250/G or S-318(*)/G Switch Assembly SA-1650/GRG Switch Box SA-1555/GRC-142 Telephone Set TA-312/PT Teletypewriter Reperforator/Transmitter TT-76(*)/GGC Teletypewriter, TT-98/FG or TT-722(*)/TG Voltmeter, ME-345/GRC Whip Antenna Consisting of: Mast Base AB-652/GR Mast Section MS-116A Mast Section MS-117A Mast Section MS-118A

1-8. LIST OF ABBREVIATIONS.

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

The AN/GRC-122(*) is capable of simultaneously transmit and receive (Duplex operation).

Remote duplex operation.

Teletypewriter one-way reversible transmit/receive 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 (with or without MK-2488/G) 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. (45.5, 50 and 75 with MK-2488/G.)

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 ovr operation,

Compatible am or ssb voice ovr local or remote operation.

Simultaneous local 85-Hertz nsk and voice ovr 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
- Inverter 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 operation
- 85-Hertz nsk plus voice remote operation.

Radio Teletypewriter Sets AN/GRC-122/142(*) (without MK-2488/G) can be used with each other and also with radio teletypewriter sets:

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

Radio Teletypewriter Sets AN/GRC-122/142(*) (with MK-2488/G) can be used with each other and with Radio Teletypewriter Sets AN/VSC-2 and AN/VSC-3 (with MK-2488/G).

1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.

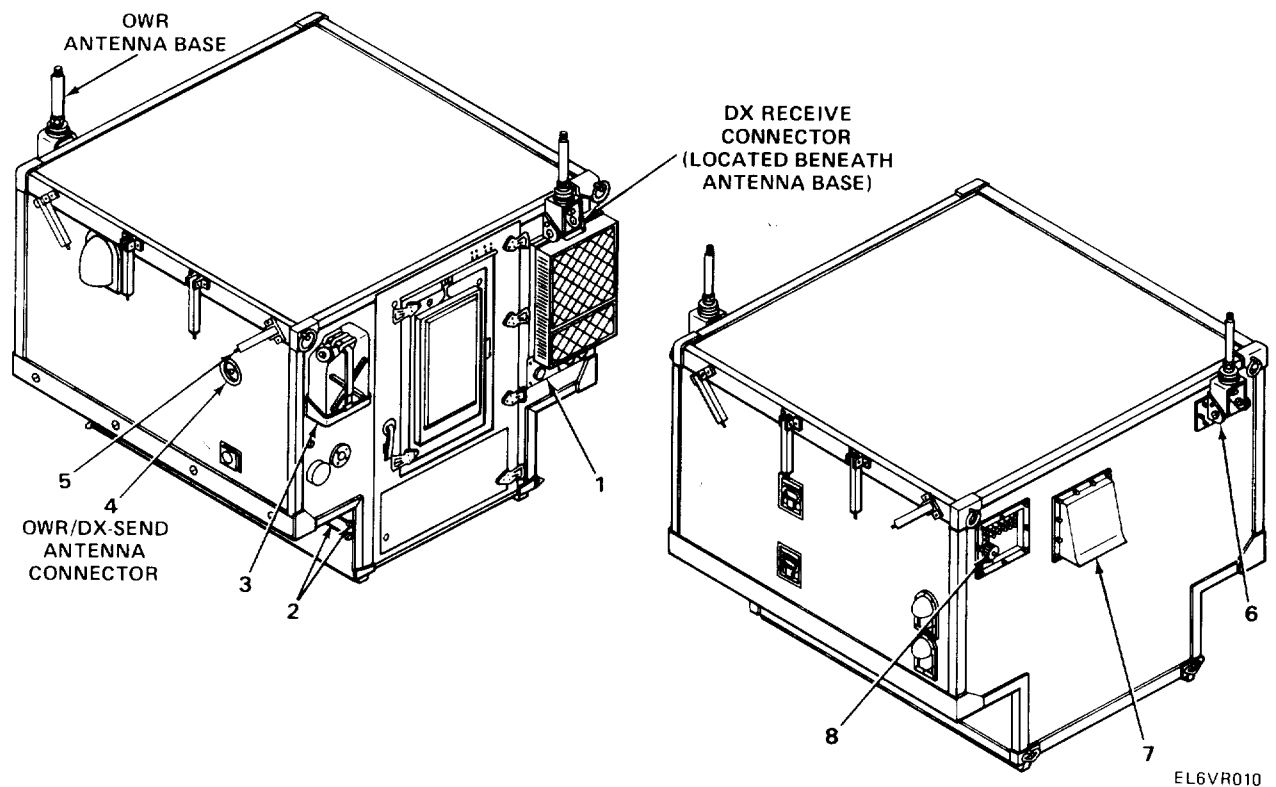
The two different shelters used (S-250 and S-318(*)/G) provide three basic configurations of equipment by the rack arrangement. The location and description of major components are described in three sections: AN/GRC-122/142 Plain and C; AN/GRC-122/142A and B; and AN/GRC-122/142D and E models.

NOTE

The following illustrations and descriptions are directly applicable to models which do not have the MK-2488/G. The MK-2488/G is installed by modification described in TM 11-5815-616-13 for shelter configuration. Application of the modification does not change the location of the major components in the shelter. The modification will adapt the COMSEC shelves which hold current security equipment to hold a mounting base MT-6442/G which will support a Digital Loop Encryption Device (DLED) TSEC/KG-84 or TSEC/KG-84A and on Interconnecting Box J-4024A/U for interfacing the DLED to the Teletypewriter inputs and to a VF (Voice Frequency) terminal or a Radio MODEM. The TSEC/KW-7 will be replaced by the TSEC/KG-84/J-4024 combination. Except for TSEC/KG-84(*)/G, the MK-2488/G provides all necessary material to make the change.

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

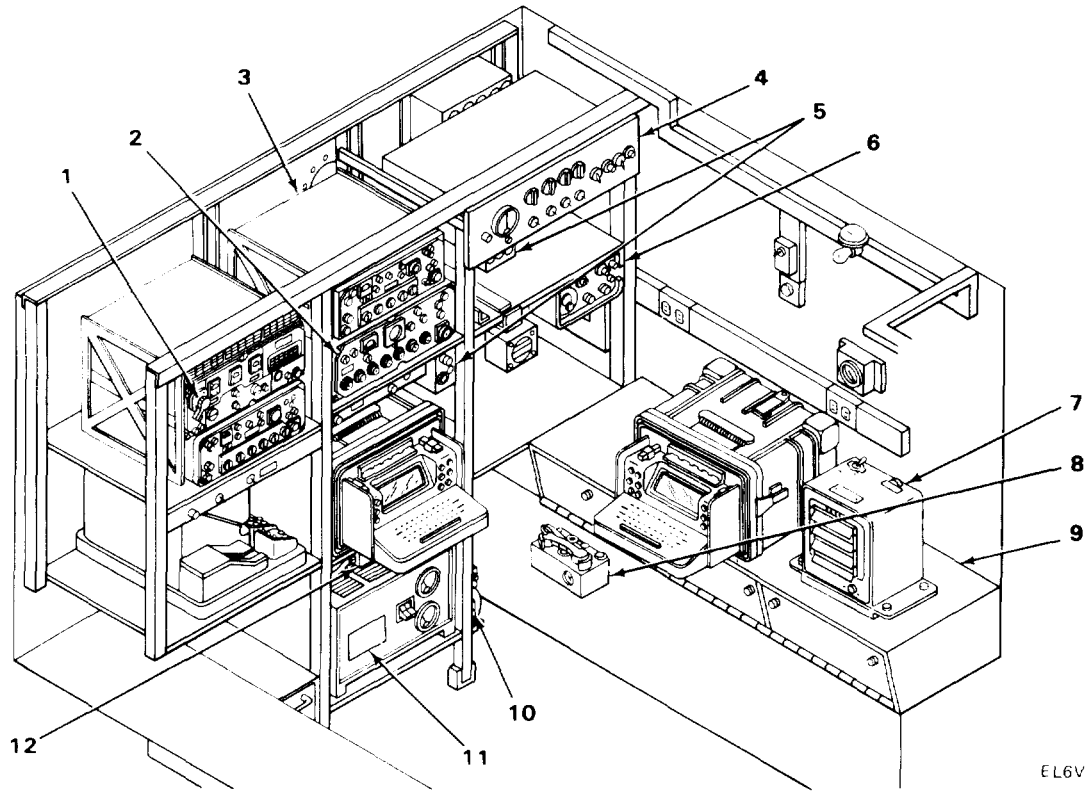
EXTERIOR ROADSIDE AND REAR WALL OF AN/GRC-122/142 PLAIN AND C MODELS
(S-318(*)/G Shelter Shown)



- 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



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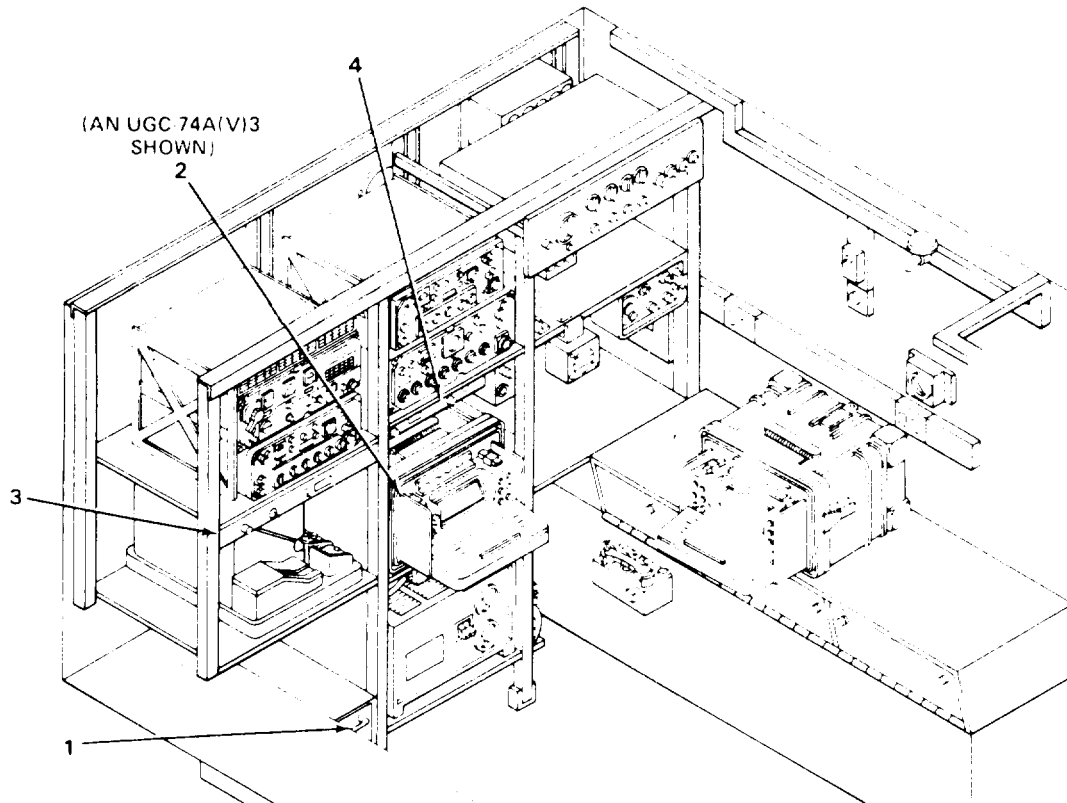
- 1 Radio Set AN/GRC-106(*). High-frequency, single sideband, radio receiver-transmitter set, consisting of Radio Transmitter RT-662/GRC or Radio Transmitter RT-834/GRC and Amplifier AM-3349/GRC-106. Installed with amplifier mounted on top of radio, and operates over a frequency range of 2.0 to 29.999 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/G RC-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/G RC-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)



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- 1 TT-76A/GGC Storage Drawers, Used for storage of TT-76A/GGC punched or unpunched tapes.
- 2 Terminal Communications AN/U GC-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/U GC-74A(V)3 is used in AN/GRC-122(*) models during duplex operation. For a detailed description, refer to TM 11-5815-602-12. When your equipment is modified with MK-2488/G, the baud rates are limited to 45.5, 50, and 75. The J-4024/U interface box circuits limit the baud rate (45.5, 50 and 75 with MK-2488/G).

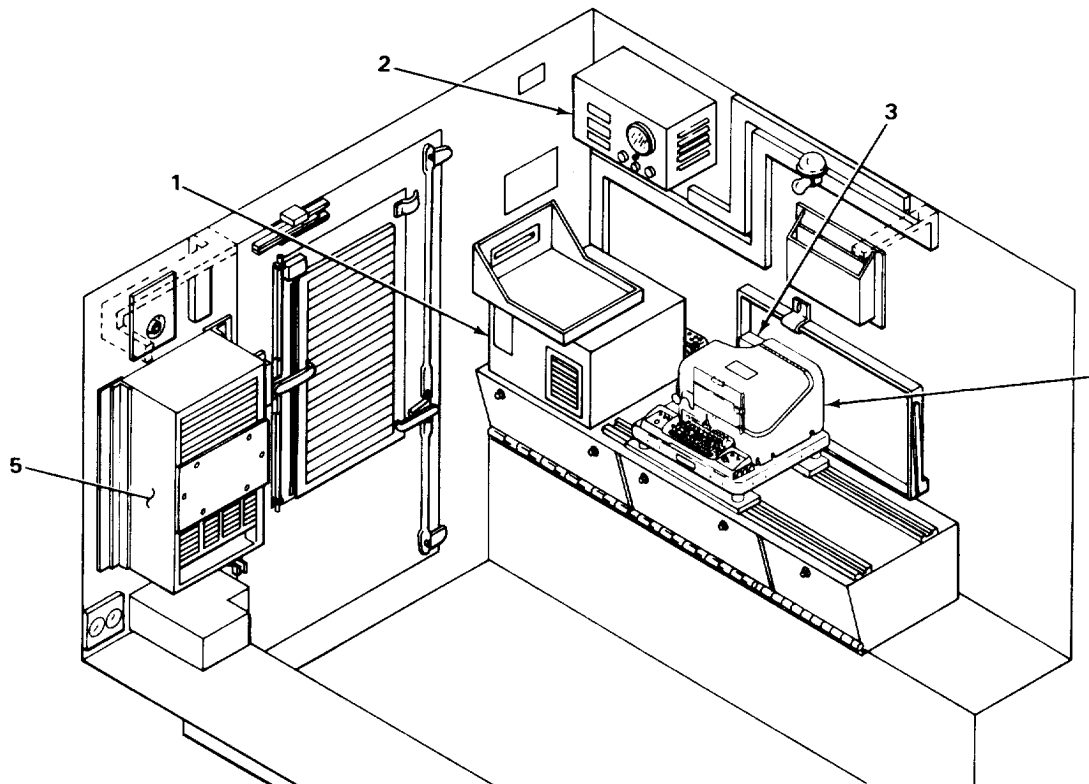
or

Teletypewriter TT-95/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 to 100 words per minute as page copy A second TT-988/FG, used for duplex operation in AN/G RC-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. (with TSEC/KW7 only). Permits switching TT-76A/GGC between ovr 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



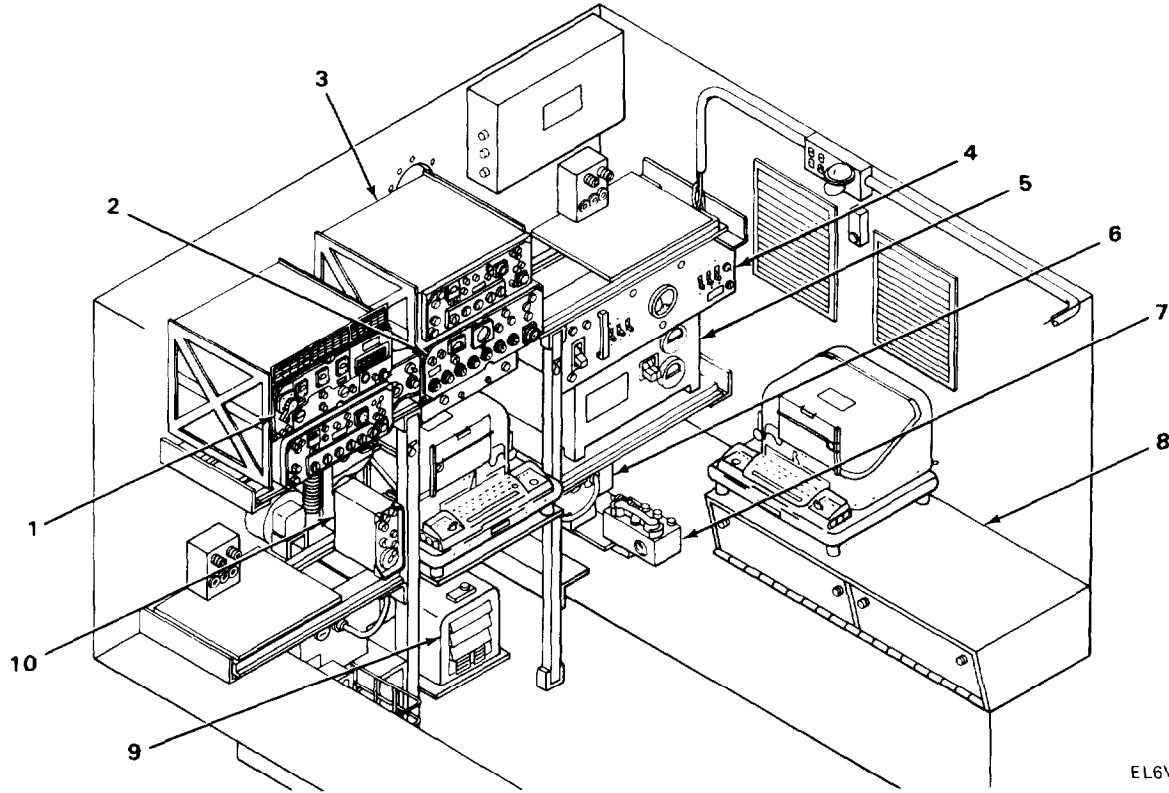
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- 1 Shelter Fuel Heater. Used to heat shelter in dc mode of operation. Operates on gasoline, kerosene, burner fuel, or jet fuel. For a detailed description, refer to TM 5-4520-211-14.
- 2 Standing Wave Radio Power Meter ME-165/G. Used for measuring 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



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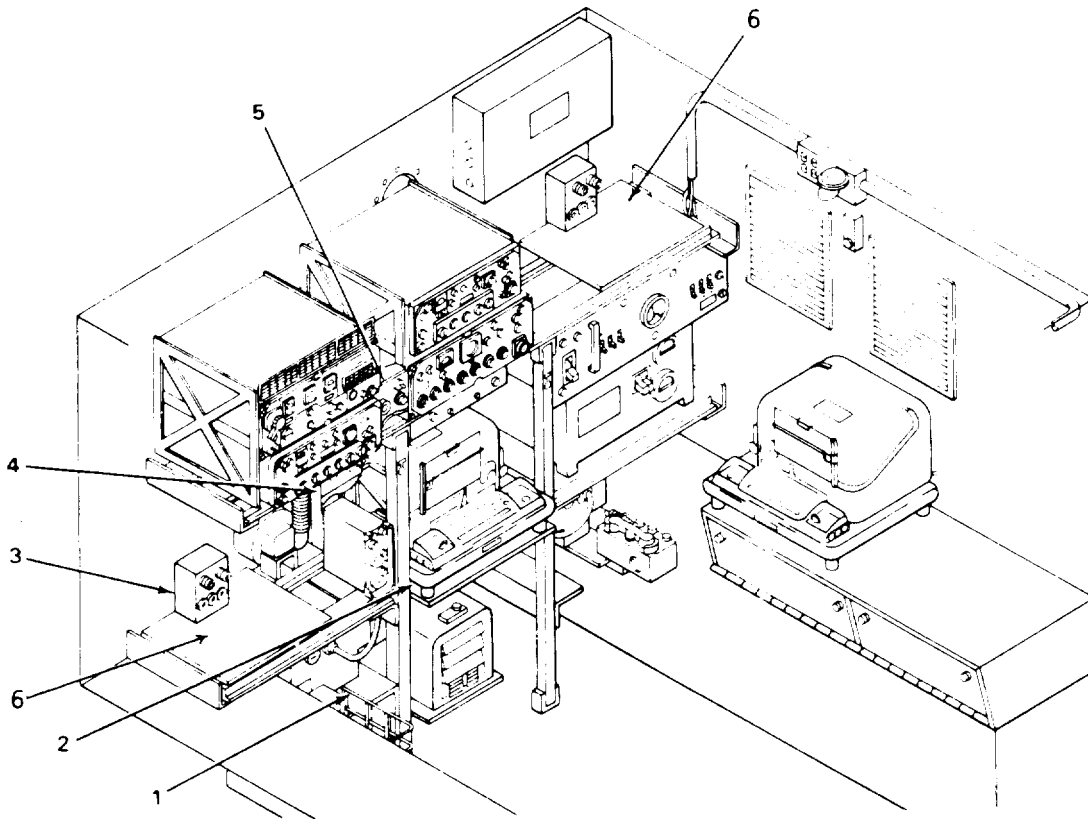
- 1 Radio Set AN/GRC-106(*). High-frequency, radio receiver-transmitter set consisting of Radio Transmitter RT-662/GRC or Radio Transmitter RT-834/GRC and Amplifier AM-3349/GRC-106. Installed with amplifier mounted on top of radio, and operates over a frequency range of 2.0 to 29.999 MHz. For a detailed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

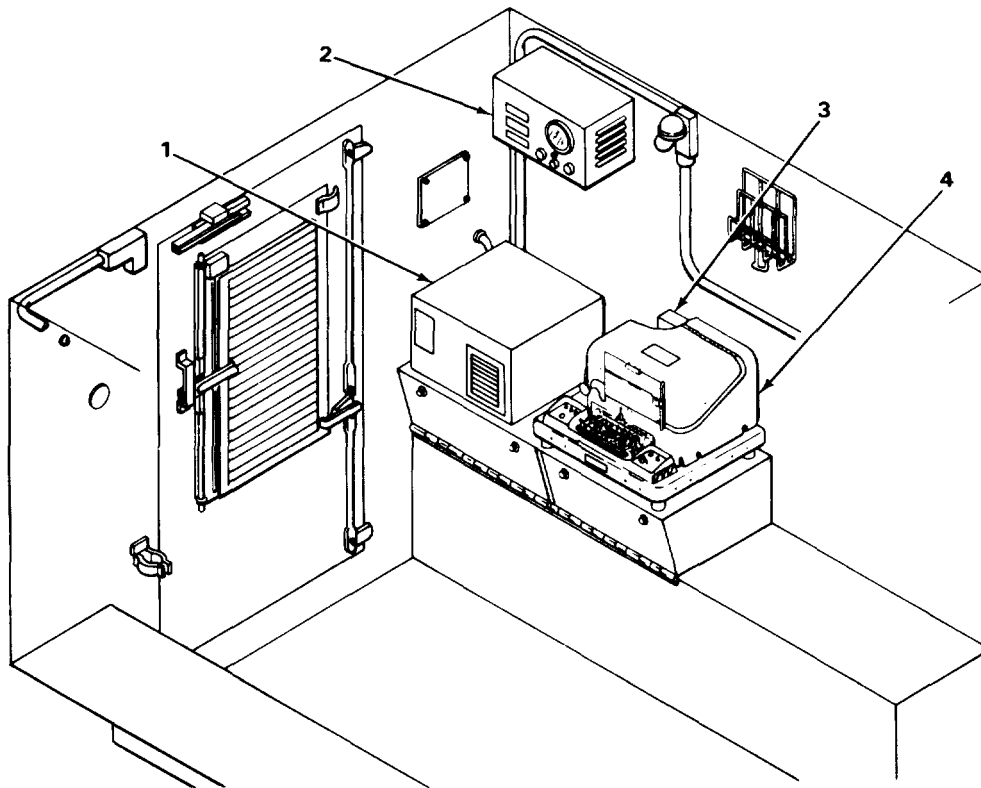


EL6VR012

- 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 to 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 ovr and duplex circuits. When operating in secure mode, with TSEC/KW7 only, a set low-level loop current is provided for tty equipment. Interconnects dummy boxes through front panel tty jacks.
- 6 Shelf for mounting security equipment.

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

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

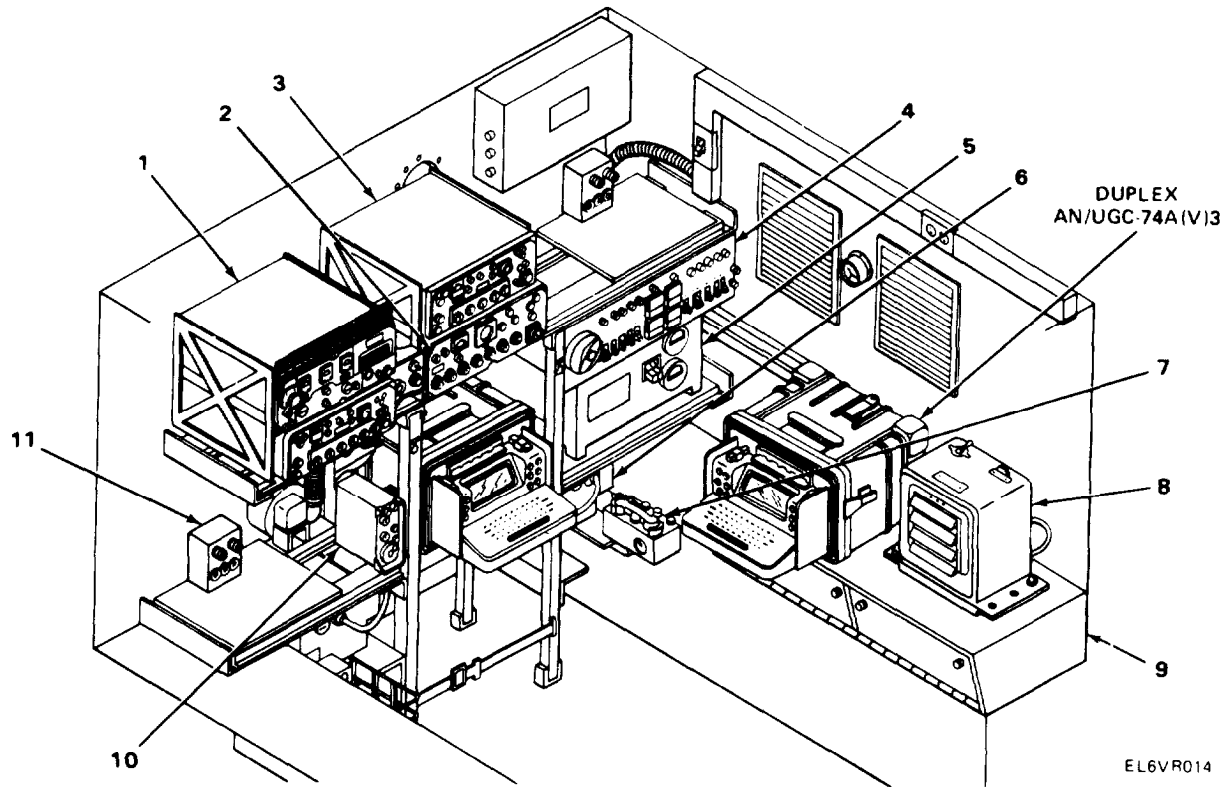


EL6VR013

- 1 Shelter Fuel Heater. Used to heat shelter in dc mode of operation. Operates on gasoline, kerosene, burner fuel, or jet fuel.
- 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.

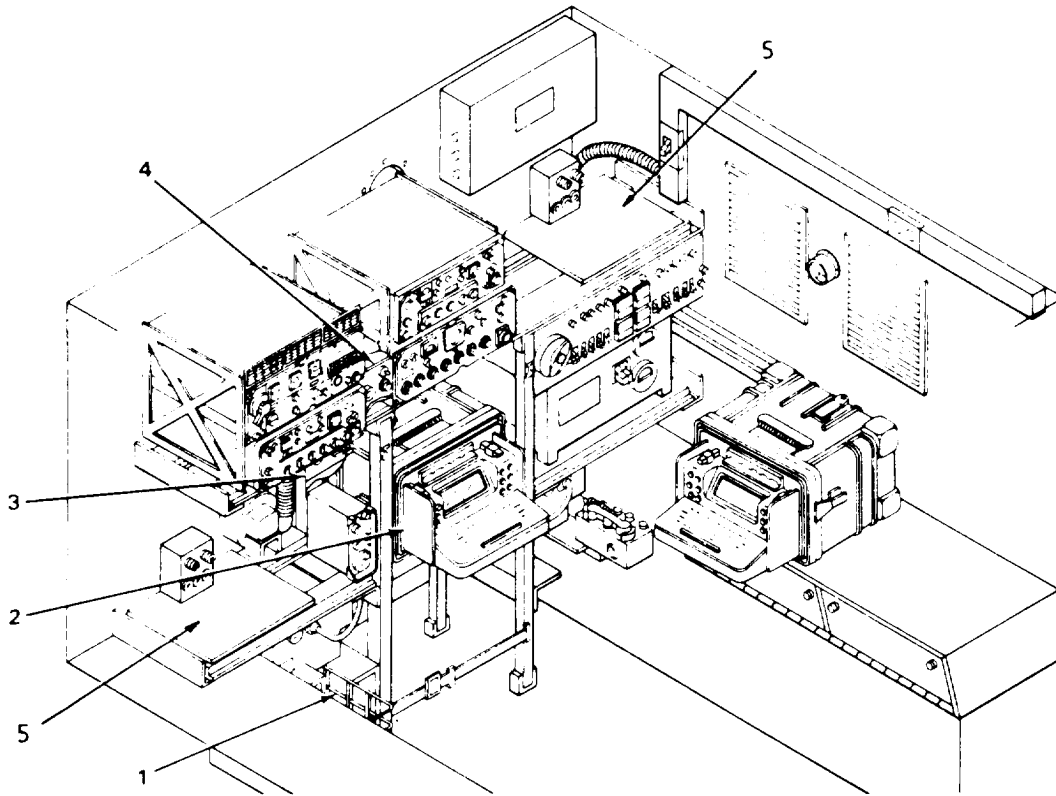
- 7 Telephone Set TA-312/PT. Two-wire, battery-operated, field telephone containing handcrank for generating ring-down signal. Used for telephone communication from shelter. A second telephone is stored in compartment underneath TT-76A/GGC and is used for communication between local and remote operators.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

NOTE

Only one MK-2488/G is needed to replace the two TSEC/KW7 equipments. The TSEC/KG-84 is capable of both Duplex and OWR radio operation. A second MK-2488/G is required for remote operation.

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

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

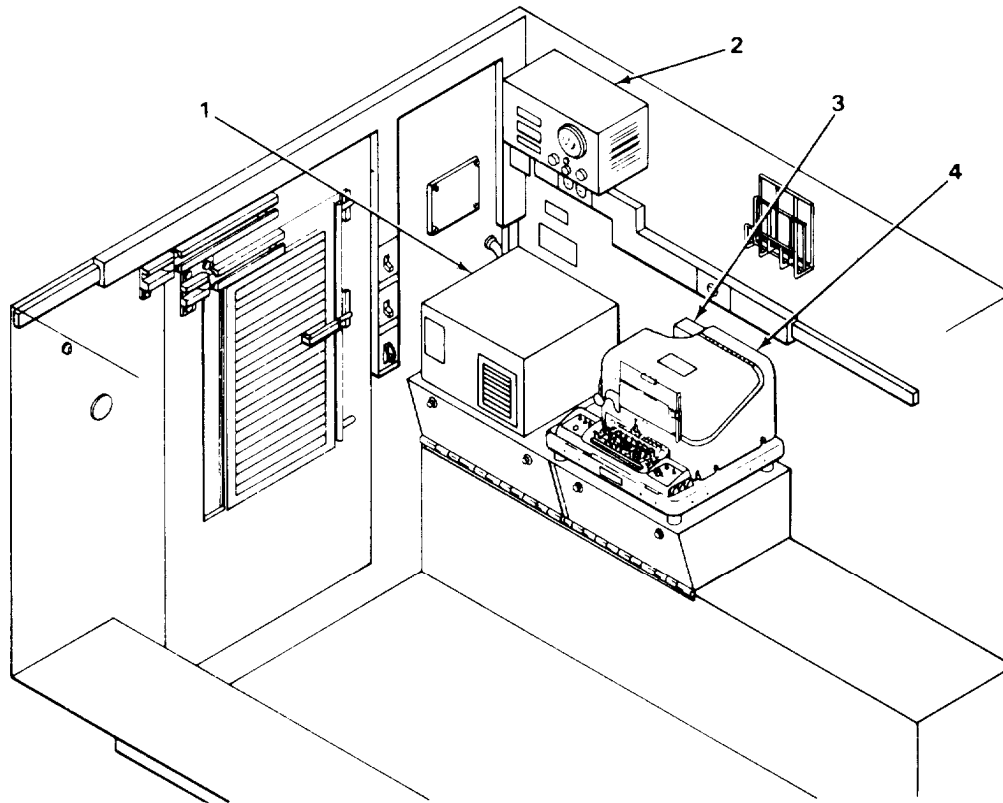


EL6VR015

- 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 (with MK-2488/G baud rates limited to 45.5, 50 and 75.) 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 11-5815-602-10.
- 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 ovr 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.
- 5 Shelf or mounting security equipment.

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

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



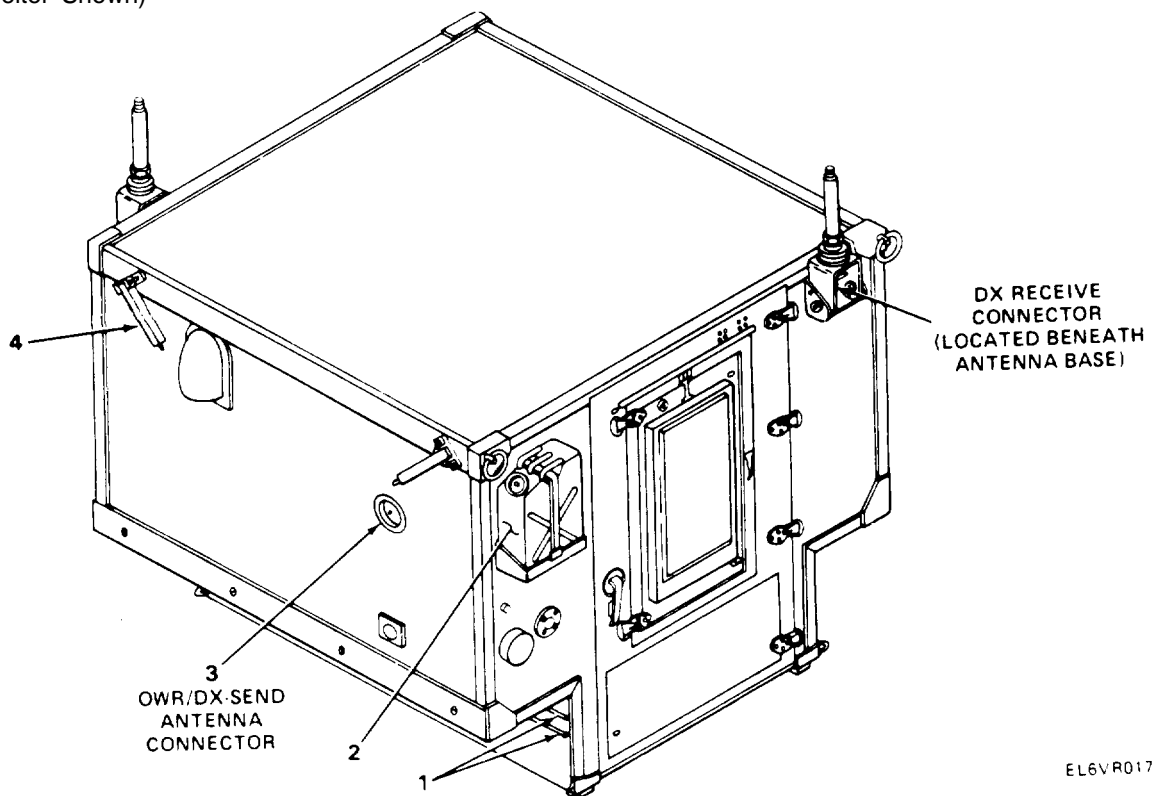
EL6VR016

- 1 Shelter Fuel Heater. Used to heat shelter in dc mode of operation. Operates on gasoline, kerosene, burner fuel, or jet fuel
- 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 to 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)

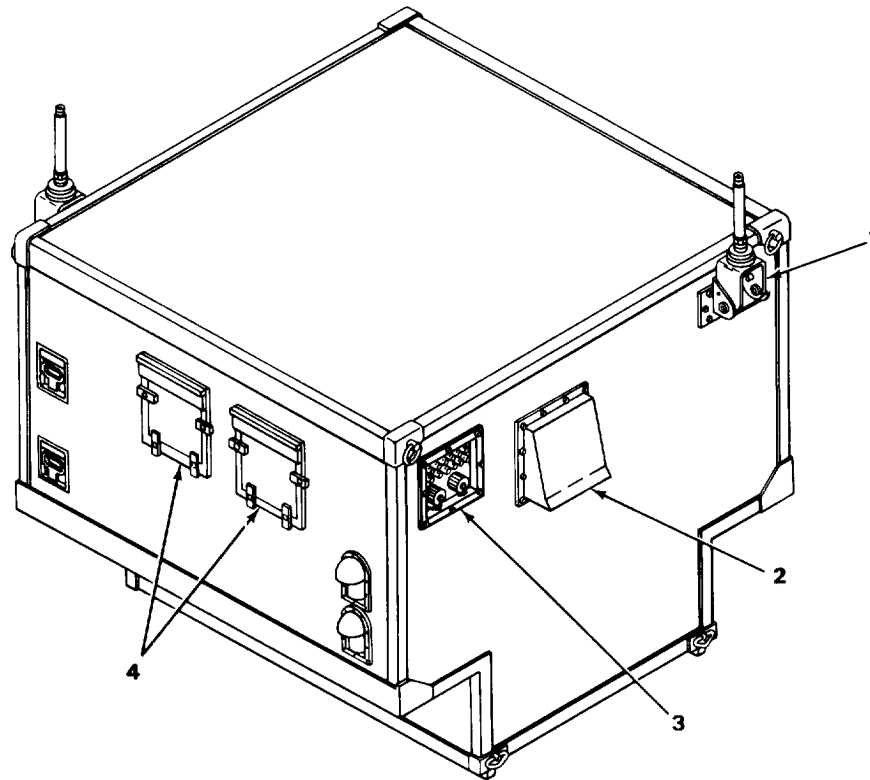


- 1 Ground Rods. Used for externally grounding shelter to earth.
- 2 Fuel Can. Used for storage of fuel supply for fuel heater.
- 3 Owr-Dx-Send Doublet Antenna Connector. Used for connection of doublet antenna to shelter during fixed or mobile-at-halt operation. Owr lead-in cable connector is located 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.

EL6VR017

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

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

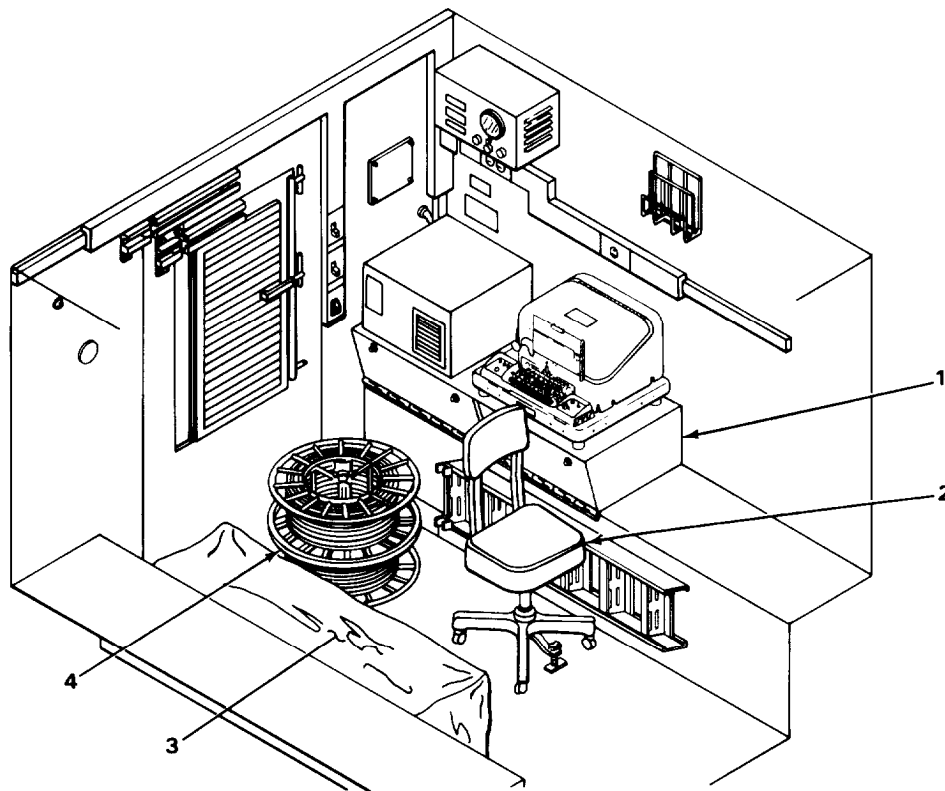


EL6VR018

- 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



EL6VR019

- 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/GC-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						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

NOTE

When modification for secure operation using MK-2488/G is authorized for any of the above shelter configurations, Mounting Base MT-6442/G, DLED TSEC/KG-84(*)/G and Interconnecting Box J-4024/U are the equipment used to provide the secure communication capability. The modification instructions are contained in TM 11-5815-616-13, Appendix E.

1-14. EQUIPMENT DATA.

POWER REQUIREMENTS

Input Voltage:	100 amp at 28.5 vdc 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
Interconnecting Box J-4024/U (all models with MK-2488/G)	70 w, ac or dc
DLED, TSEC/KG-84(*) (all models with MK-2488/G)	30 w, ac or 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 12.5 amp at 28.5 vdc with 1 tty 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)	2,048 lb (928.96 kg)
Shelter Electrical Equipment S-318(*)/G (AN/GRC-122C)	1,962 lb (889.95 kg)
Shelter Electrical Equipment S318(*)/G (AN/GRC-122D)	2,100 LB (952.54 kg)
Shelter Electrical Equipment S-250/G (AN/GRC-122E)	2,448 lb (1,110.39 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)	1,774 lb (804.67 kg)
Shelter Electrical Equipment S-318(*)/G (AN/GRC-142D)	1,952 LB (885.41 kg)
Shelter Electrical Equipment S-250/G (AN/GRC-142E)	2,300 LB (1 ,043.26 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. (162.88 cm)

1-14. EQUIPMENT DATA. (CONT)

Types of Signals Transmitted/Received:	85 Hz narrow nsk or 850 Hz fsk compatibility am, ssb voice and cw Voice and teletypewriter simultaneously (voice plus risk) Nsk diversity
Transmitted Power Output (Maximum):	400 w, peak envelope power
Transmit Range:	20 mi (32.18 km) planning range 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 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 AN/GRC-122D AN/GRC-122E AN/GRC-142C AN/GRC-142D AN/GRC-142E OR All of the above with MK-2488/G

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 (models without MK-2488/G)

Operates with MIL-STD-188-114 equipment (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-FGG-84)

System interface (models with MK-2488)

Operate with MIL-STD-188-114 equipment (eg KG-84 and KG-84A)

Keyboard:

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

Printer:

Type
Print rate
Printed characters

Drum
60 characters per second, minimum
Gothic 63 character of ASCII subset and a diamond
Operator selectable from 40 to 80 characters

Printed character per line

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 Paper low lamp (for roll paper only) Automatic shutdown of printing on physical paper outage (for roll paper only) Automatic shutdown of print drum motor if there is no printing for between 2 and 4 min.
Power Requirement:	100 w, maximum
Operating Voltages:	20 ± 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. 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 PRINCIPALS OF OPERATION

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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 duplex 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 diagram of AN/GRC-122/142 models without MK-2488/G are given in FO-5 and FO-6 Models with MK-2488/G are given in FO-5.1 and FO-5.2.

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,

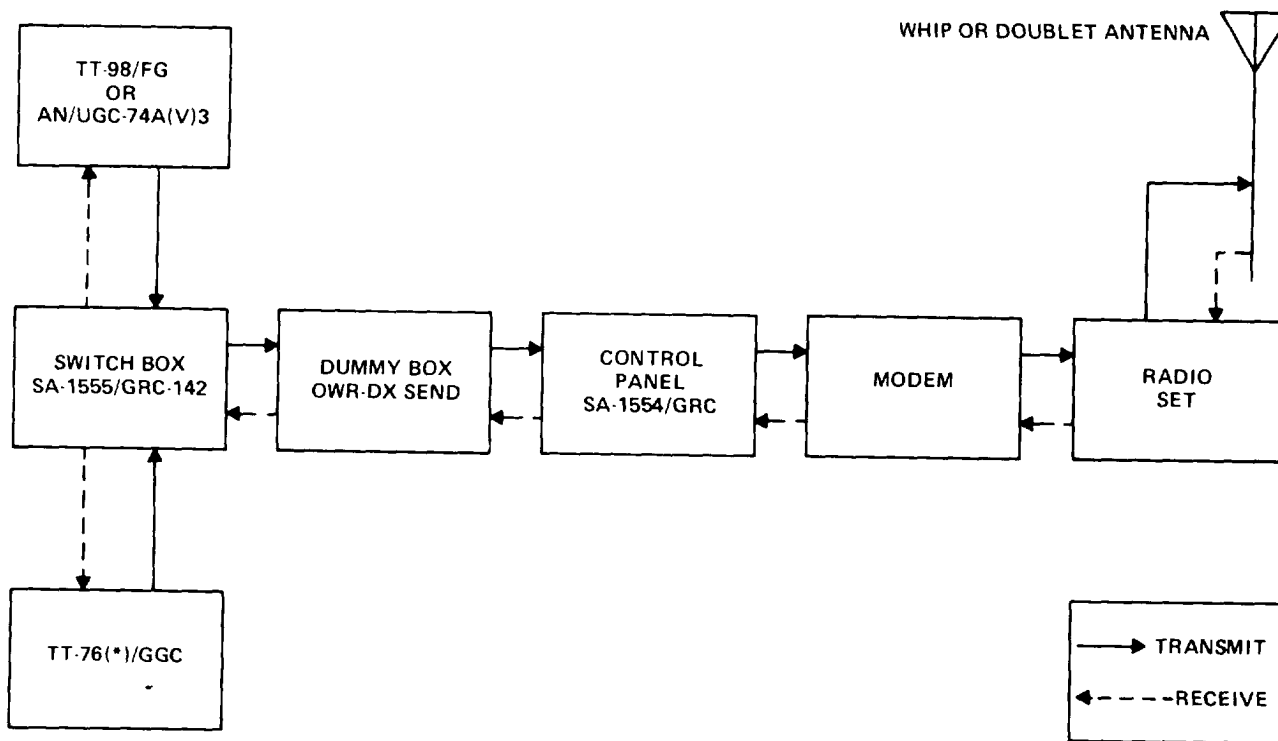
1-16. LOCAL OWR RADIO TELETYPEWRITER OPERATION AN/GRC.-122/142 PLAIN AND C MODELS.

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.



EL6VR022

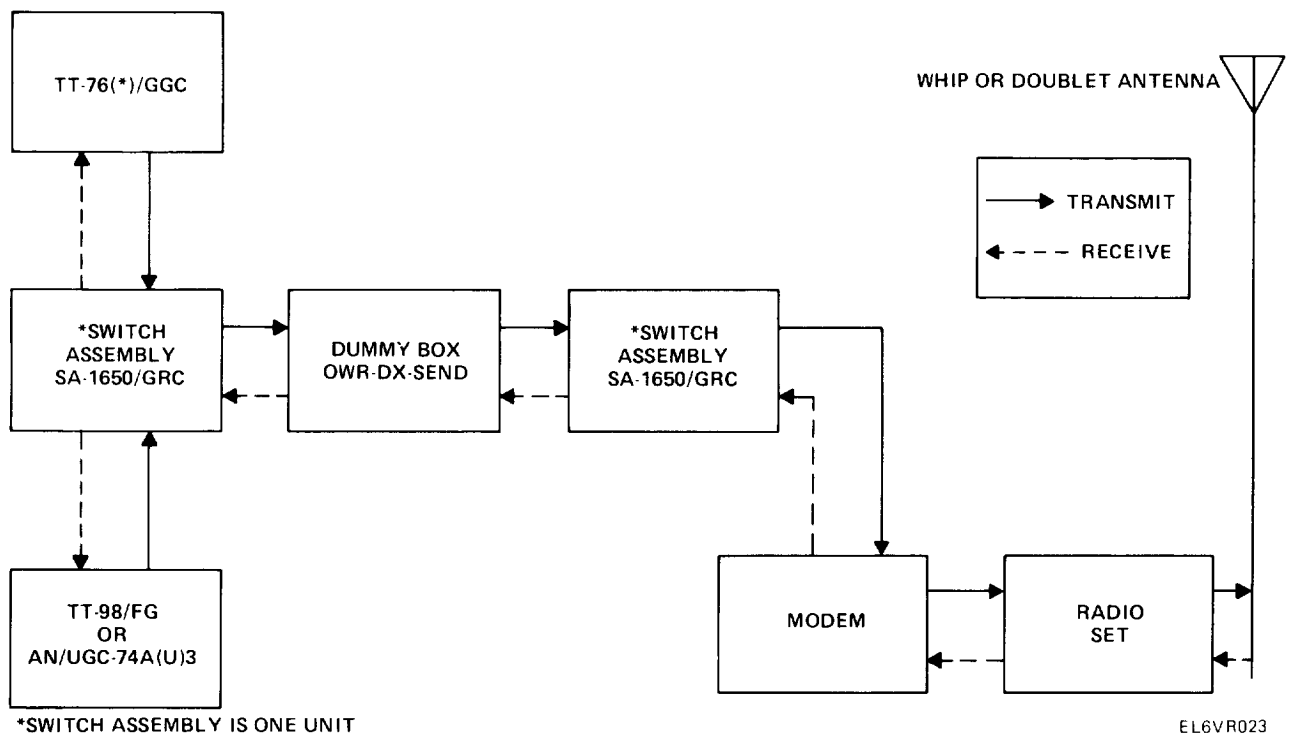
1-17. LOCAL OWR RADIO TELETYPEWRITER OPERATION AN/GRC-122/142A, B, D, AND E MODELS.

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.



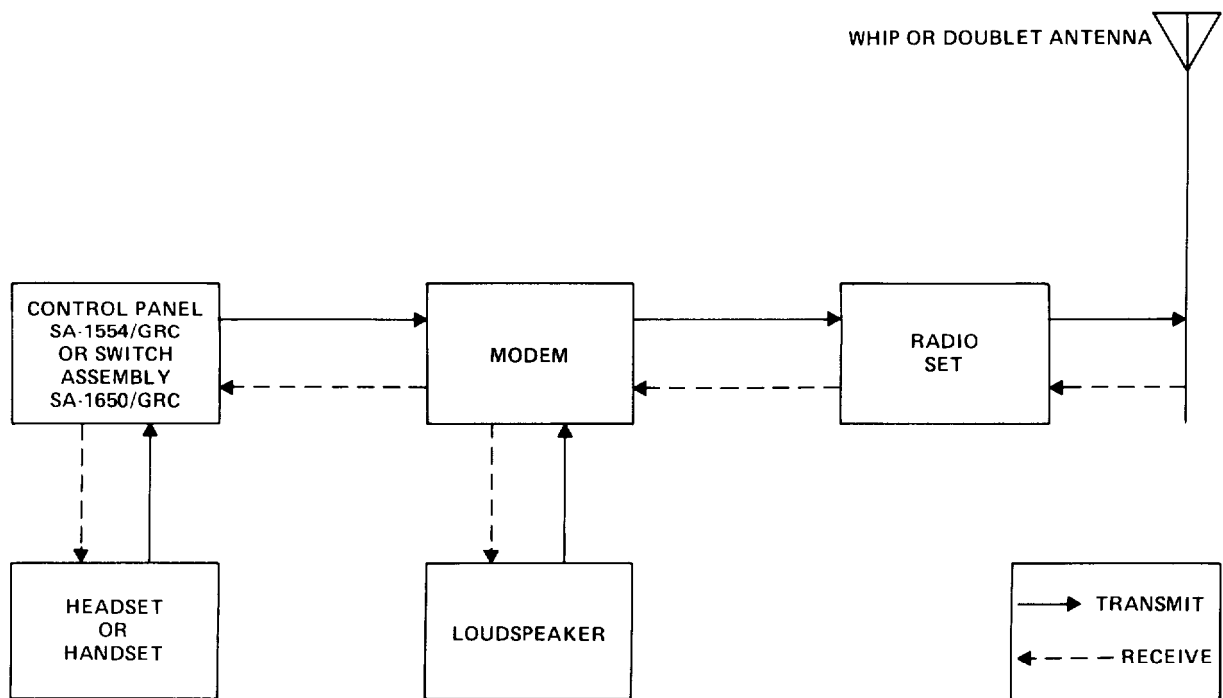
1-18. LOCAL OWR VOICE OPERATION AN/GRC-122/142(*) MODELS.

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.



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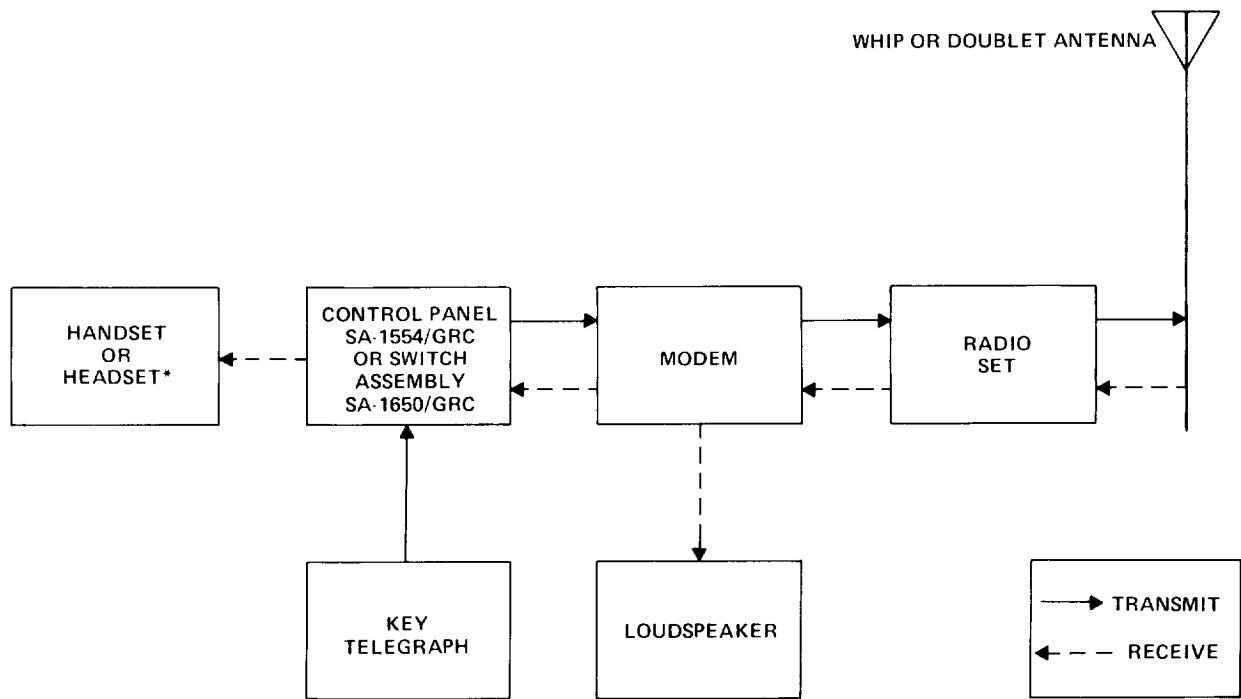
1-19. LOCAL OWR CW OPERATION AN/GRC-122/142(*) MODELS.

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.



*RECEIVE ONLY

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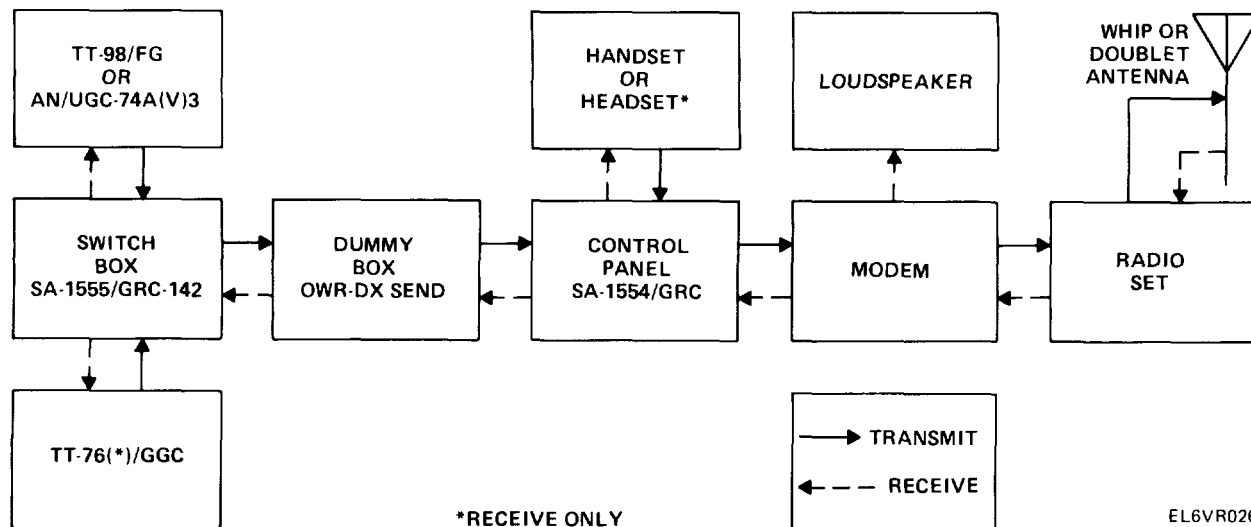
1-20. LOCAL OWR VOICE PLUS TELETYPEWRITER (NSK) OPERATION AN/GRC-122/142 PLAIN AND C MODELS.

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.



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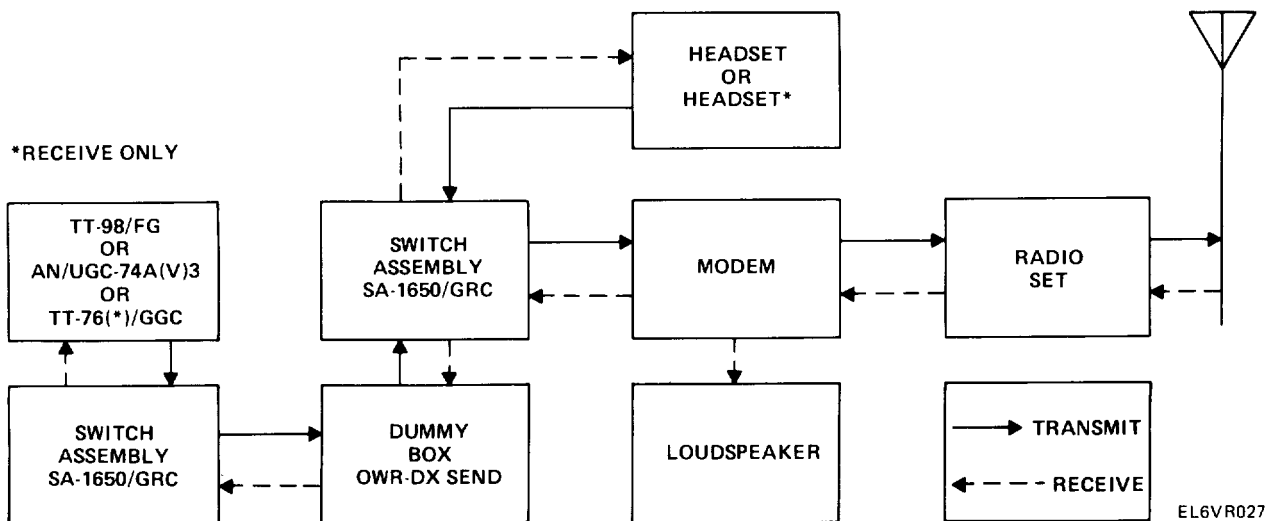
1-21. LOCAL OWR VOICE PLUS TELETYPEWRITER (NSK) OPERATION AN/GRC-122/142A, B, D, AND E MODELS.

TRANSMIT

Voice frequency signals generated by speaking into handset are applied to switch assembly. Simultaneously, tty mark and space pulses (risk) 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/GRG122(*) 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.

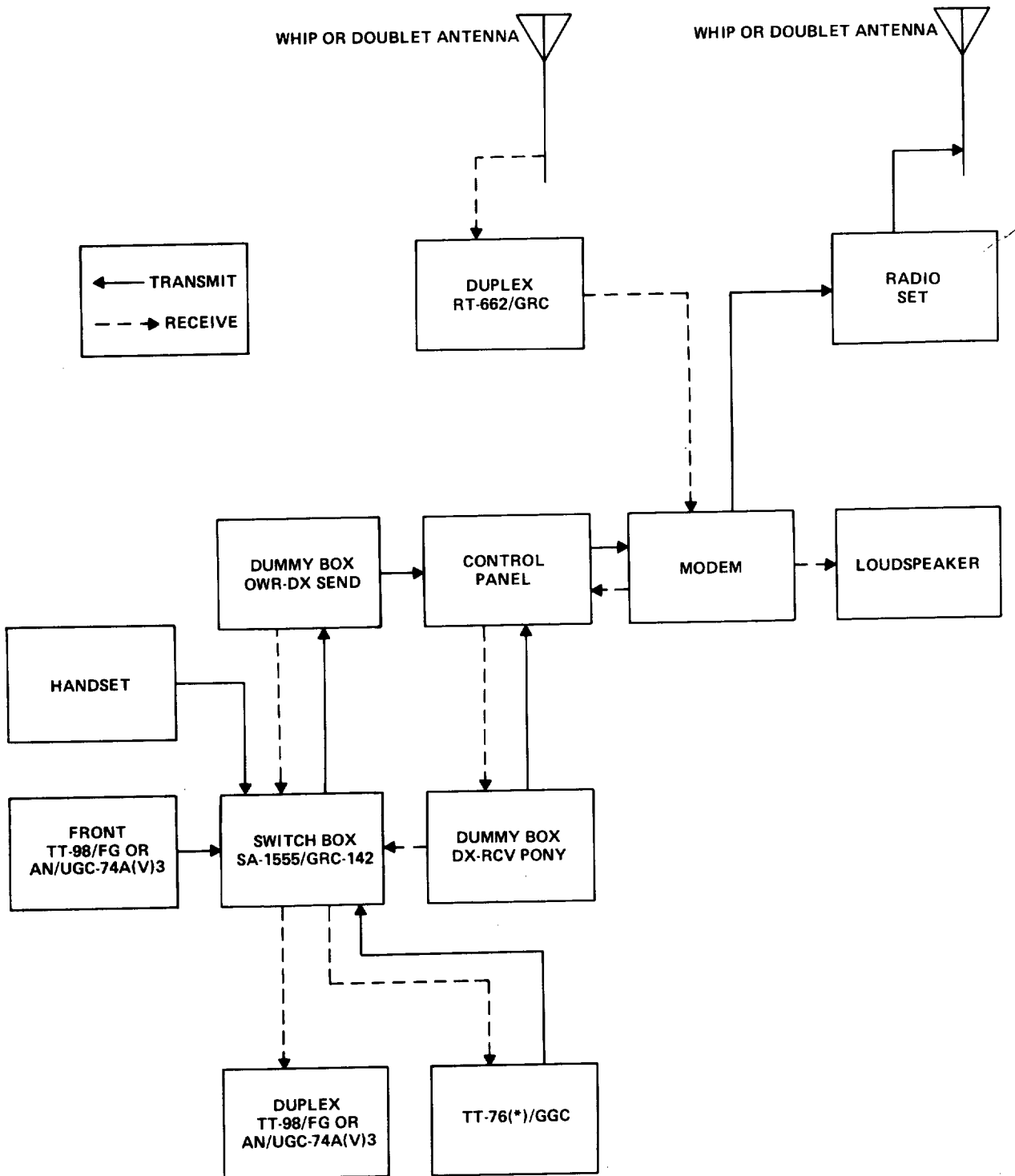
TRANSMIT

Tty mark and space pulses generated by TT-98/FG or AN/UGC-74A(V)3 are routed through switch box, ovr-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.



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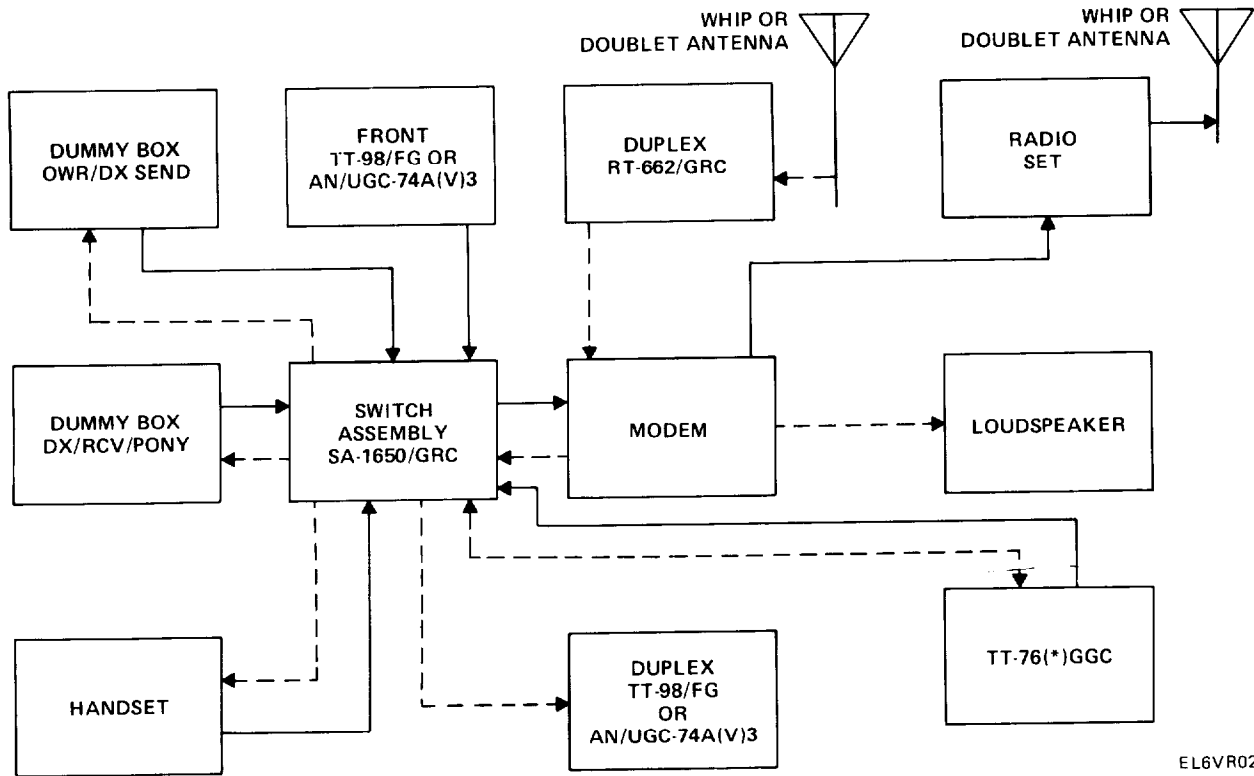
1-24. DUPLEX OPERATION AN/GRC-122A, B, D, AND E MODELS.

TRANSMIT

Tty mark and space pulses generated by TT-98/FG or AN/UGC-74A(V)3 are routed through switch assembly, ovr-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.



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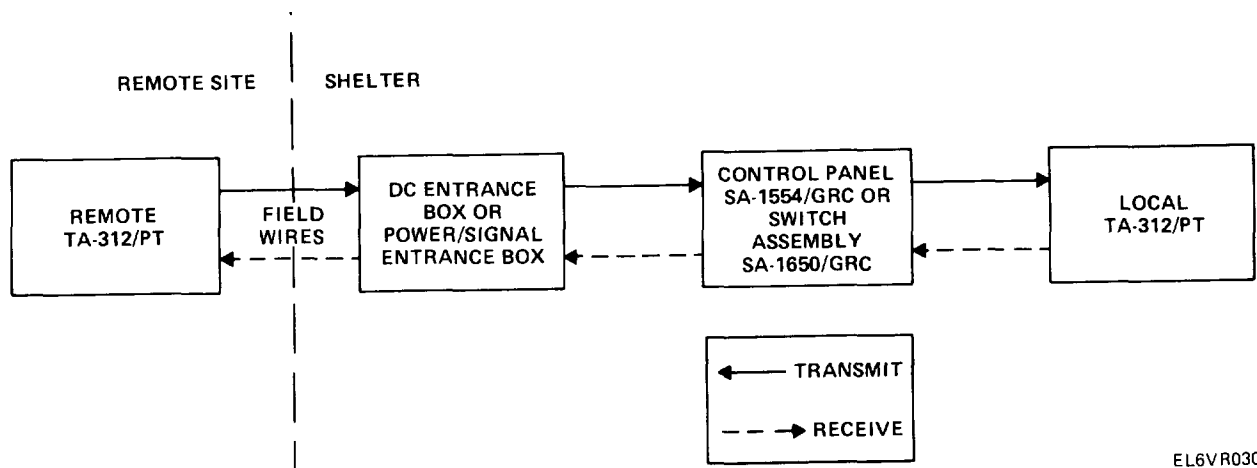
1-25. REMOTE FIELD TELEPHONE OPERATION AN/GRC-122/142(*) MODELS.

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.



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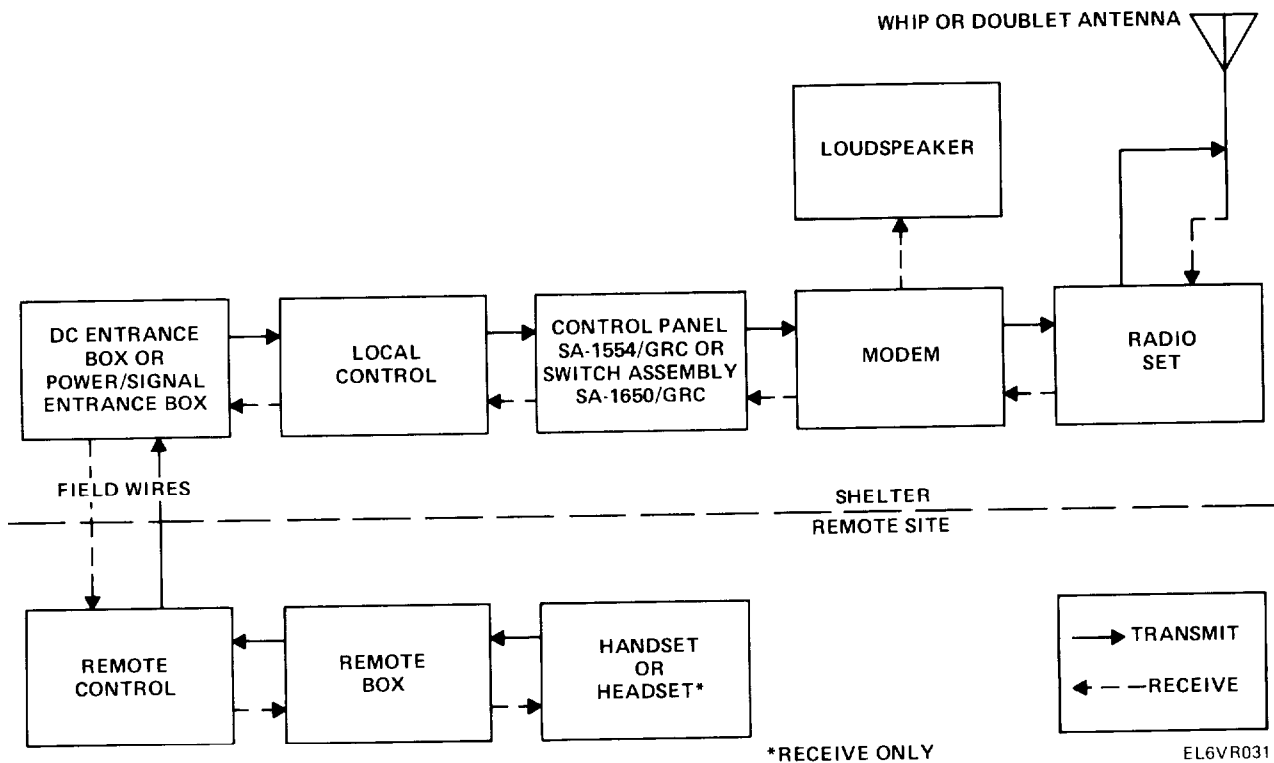
1-26. REMOTE OWR VOICE OPERATION AN/GRC-122/142(*) MODELS.

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.



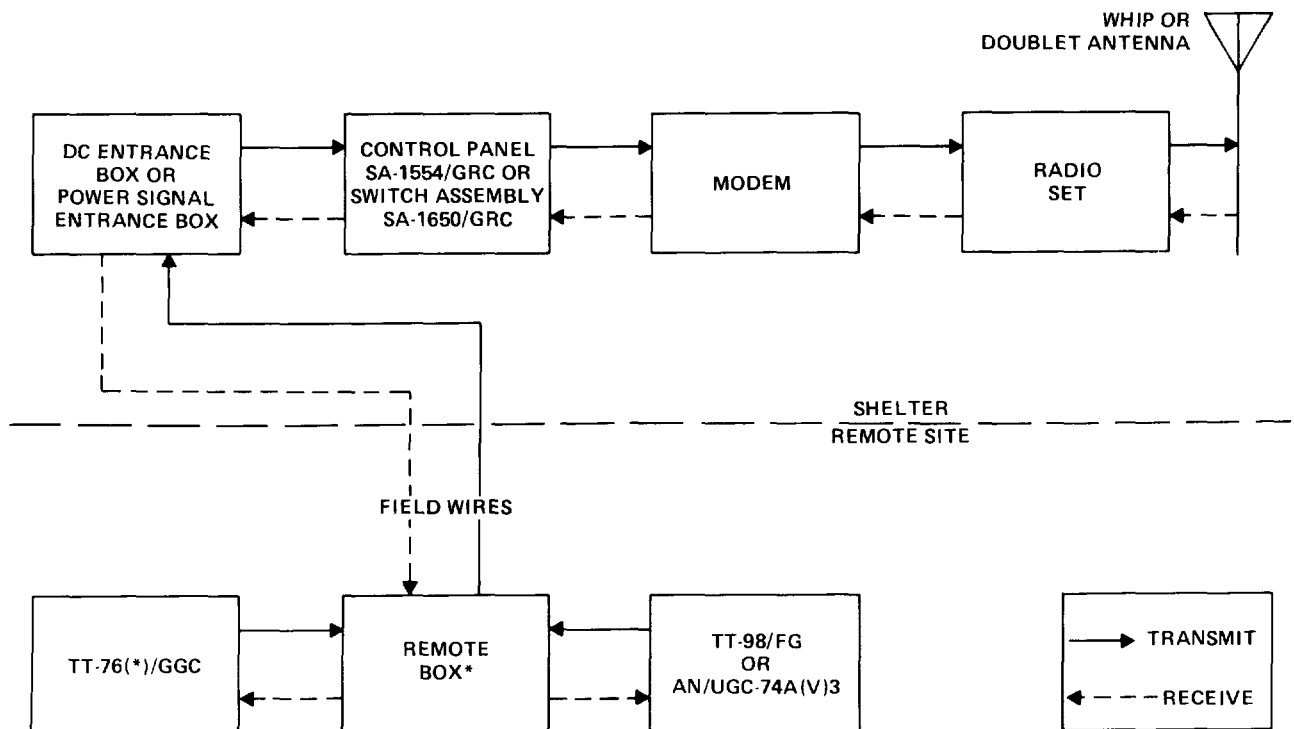
1-27. REMOTE OWR TELETYPEWRITER OPERATION AN/GRC-122/142(*) MODELS.

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

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

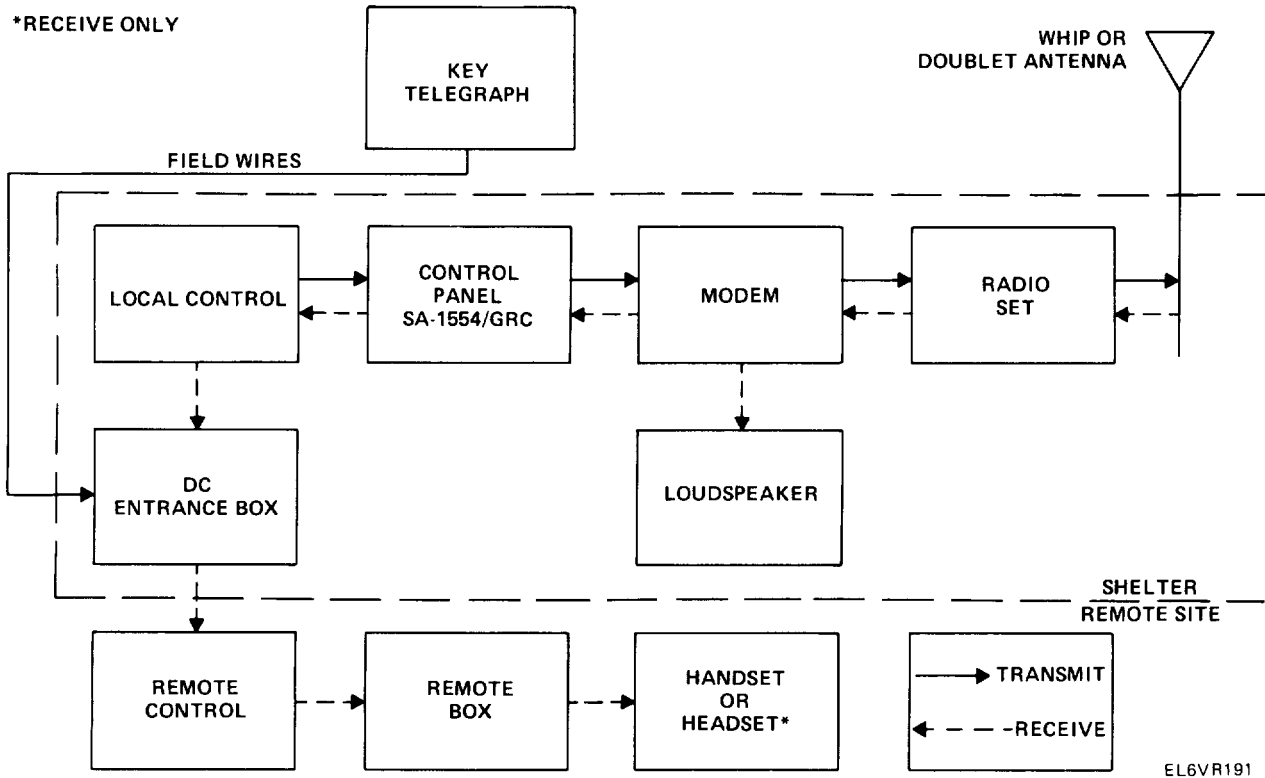
For cw operation, control panel TEL/REMOTE CW switch must be set to REMOTE CW. This causes radio set to be keyed when key telegraph is being operated. Remote key telegraph uses the same field wires as remote TA-312/PT.

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.

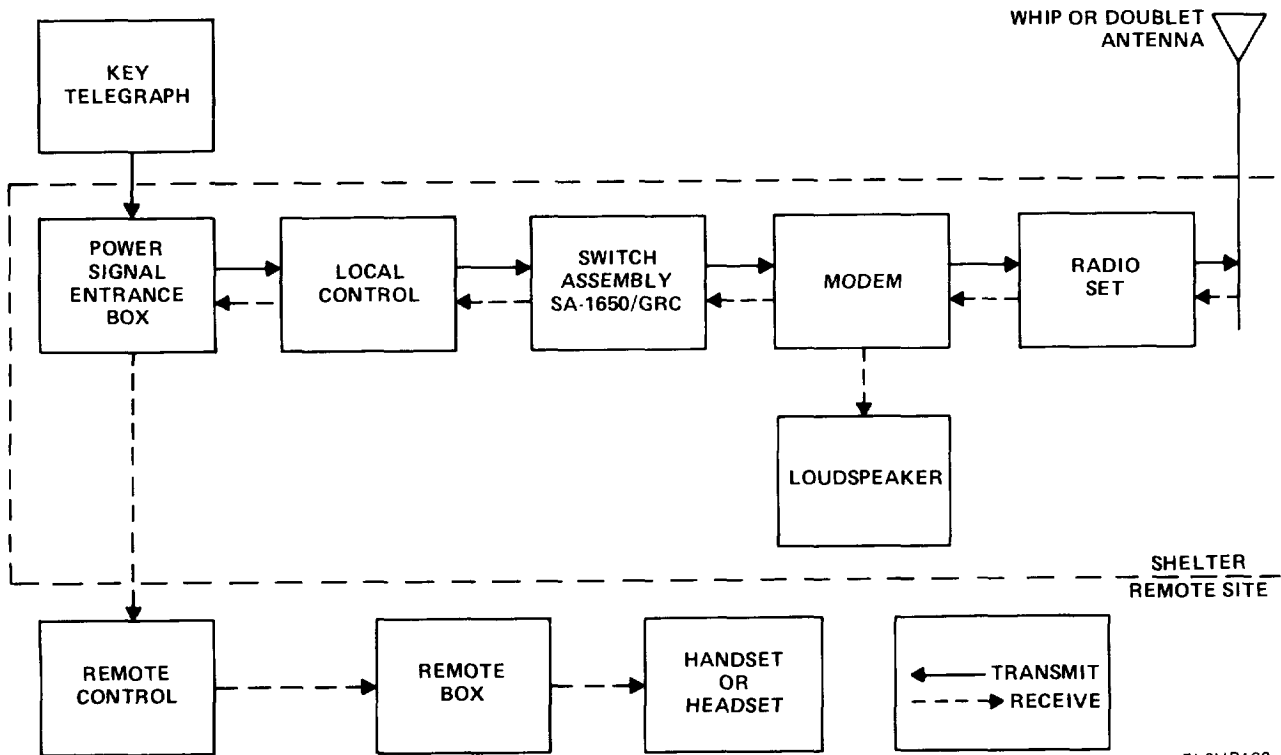
For cw operation, cable SM-C-613236 must be plugged into switch assembly. This causes radio set to be keyed when key telegraph is being operated.

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 wires to 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.

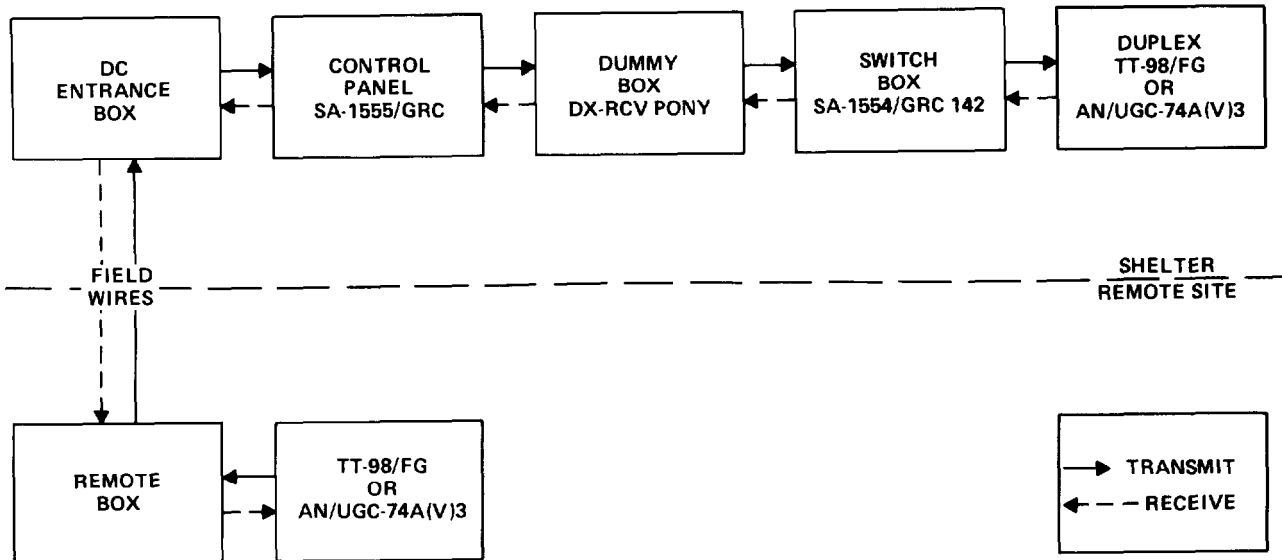
Tty order wire capability is present only in AN/GRC-122(*) models. This loop allows tty operations between local and remote operators. It uses duplex TT-98/FG or AN/UGC-74A(V)3 and a remote additional authorized TT-98/FG or AN/UGC-74A(V)3.

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.



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

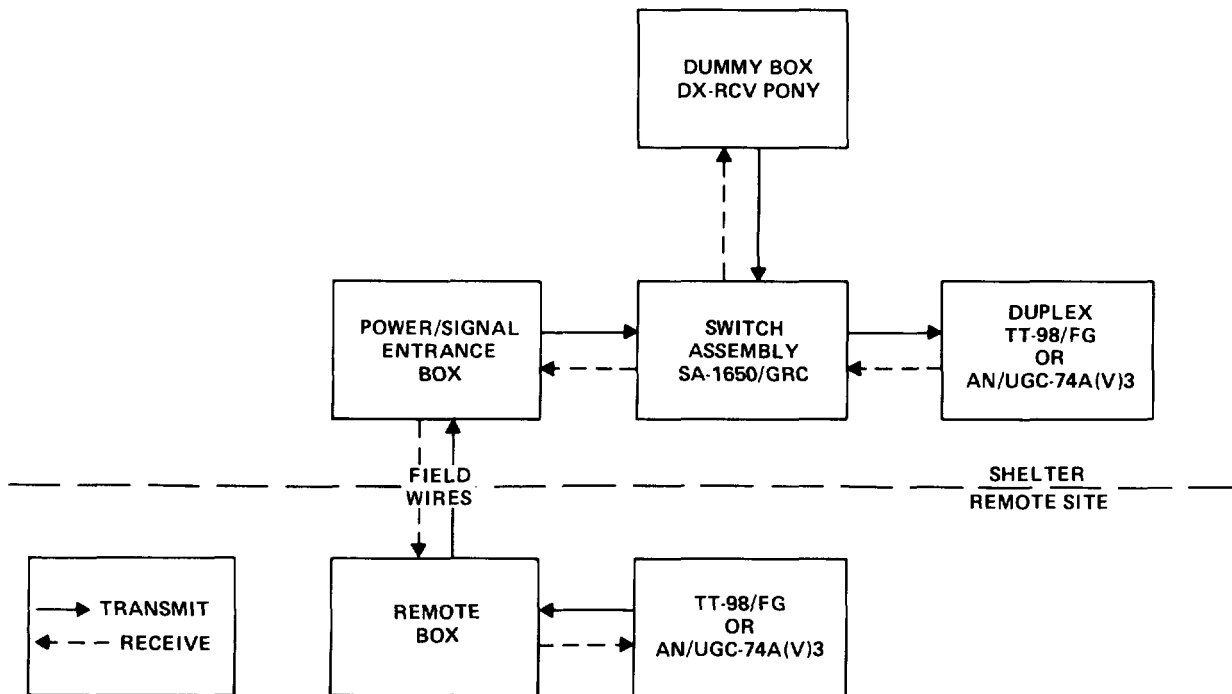
Tty order wire capability is present only in AN/GRC-122(*) models. This loop allows tty operations between local and remote operators. It uses duplex TT-98/FG or AN/UGC-74A(V)3 and a remote additional authorized TT-98/FG or AN/UGC-74A(V)3.

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

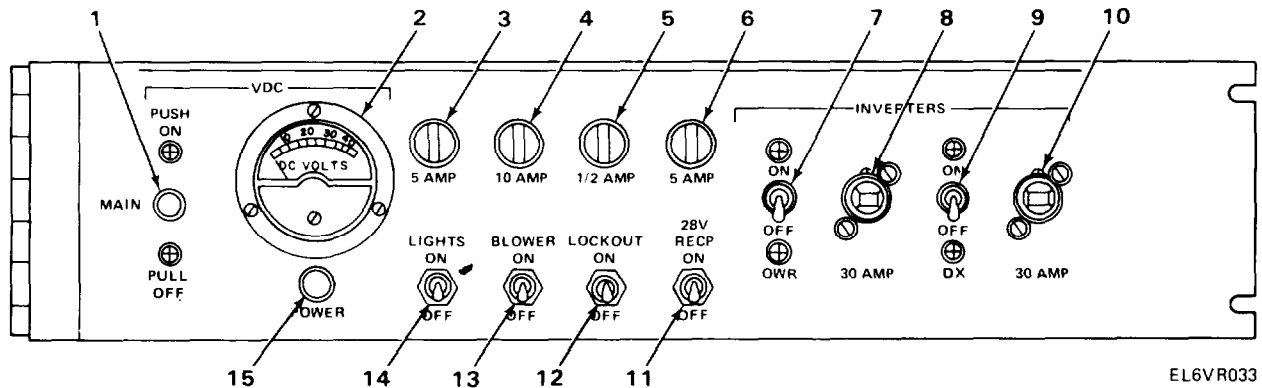
2-1. GENERAL.

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.

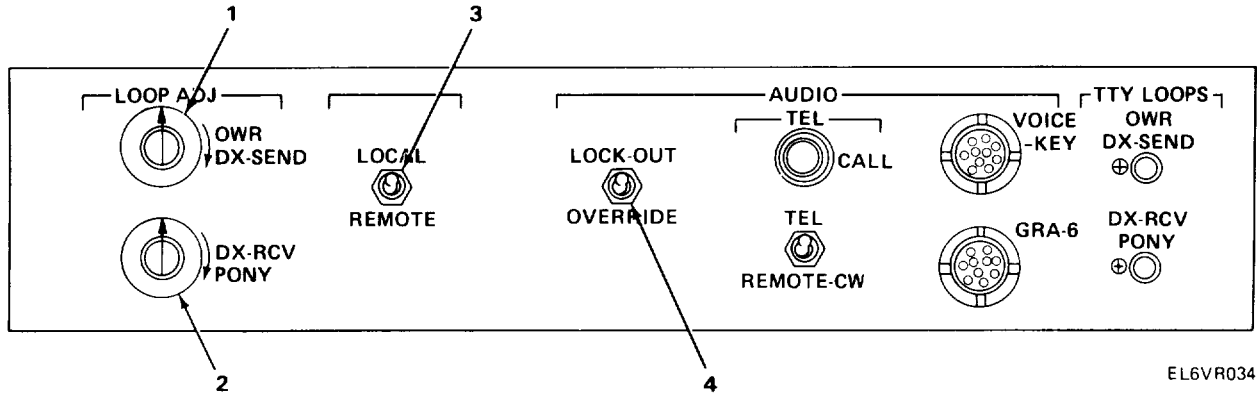
POWER DISTRIBUTION PANEL SB-3018/GRC-142



- 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 (INSERTERS). 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

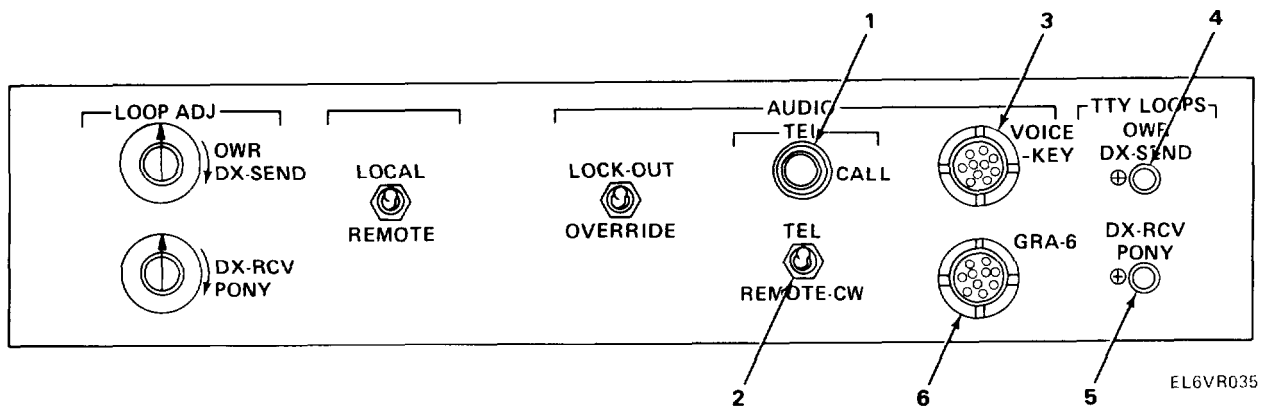


- 1 LOOP ADJ OWR-DX-SEND Control. Used to adjust OWR-DX-SEND TTY loop current to desired level indicated on modem test meter. (lest METER FUNCTION switch set to DC LOOP NO. 1.) Clockwise rotation increases loop current.
- 2 LOOP ADJ DX-RCV-PONY Control (used on AN/GRC-122 models only). Used to adjust 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)



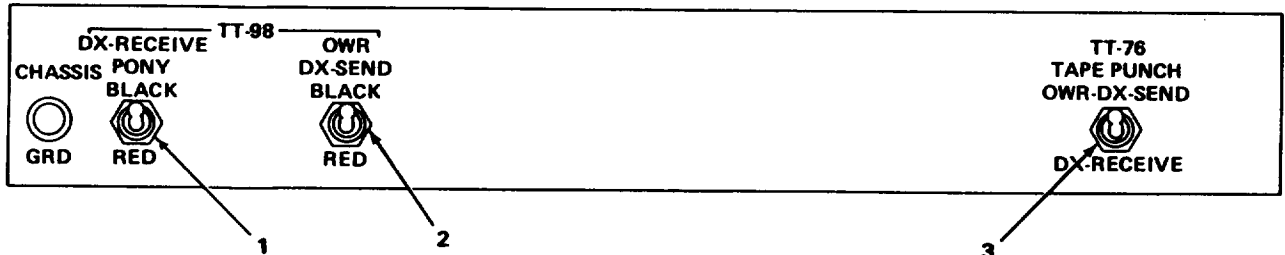
- 1 AUDIO TEL CALL Lamp. In secure mode, lamp will flicker to indicate remote operator is ringing local operator and desires TA-312/PT circuit be returned to normal operation.
- 2 AUDIO TEL REMOTE-CW Switch. Enables TA-312/PT lines to be used for telephone or remote cw operation.

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/G RC-122/142 PLAIN AND C MODELS. (CONT)

SWITCH BOX SA-1555/GRC-142



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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.

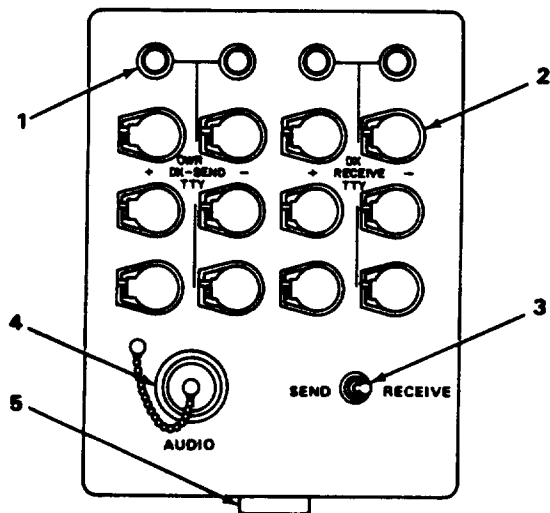
SWITCH POSITION	EFFECT
BLACK	This is normal position and results in normal loop current (20 or 60 ma).
RED	Reduces OWR-DX-SEND TTY loop current for use with security equipment.

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)

1 REMOTE BOX C-7279/GRC-142



EL6VR037

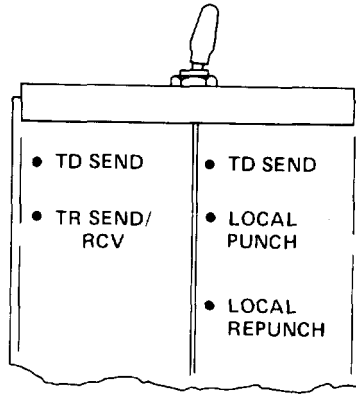
1. Teletypewriter Loop Binding Posts. Provide for termination of dc tty loop field wires originating at shelter dc entrance box binding posts. One pair is for OWR-DX-SEND TTY loop, the other pair is for DX-RECEIVE tty loop (used in AN/GRC-122 models only).
2. Teletypewriter Jacks. Provide connection of remote 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 35 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



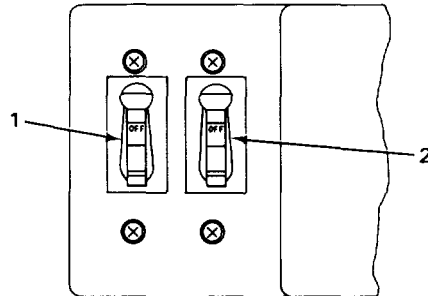
EL6VR038

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

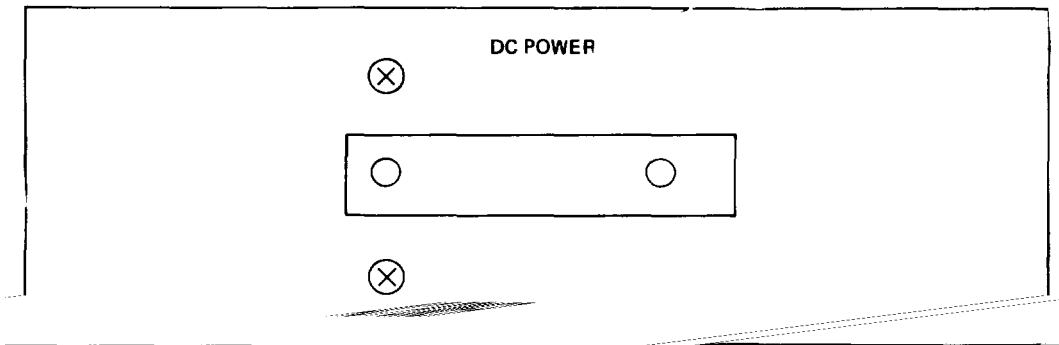


EL6VR039

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

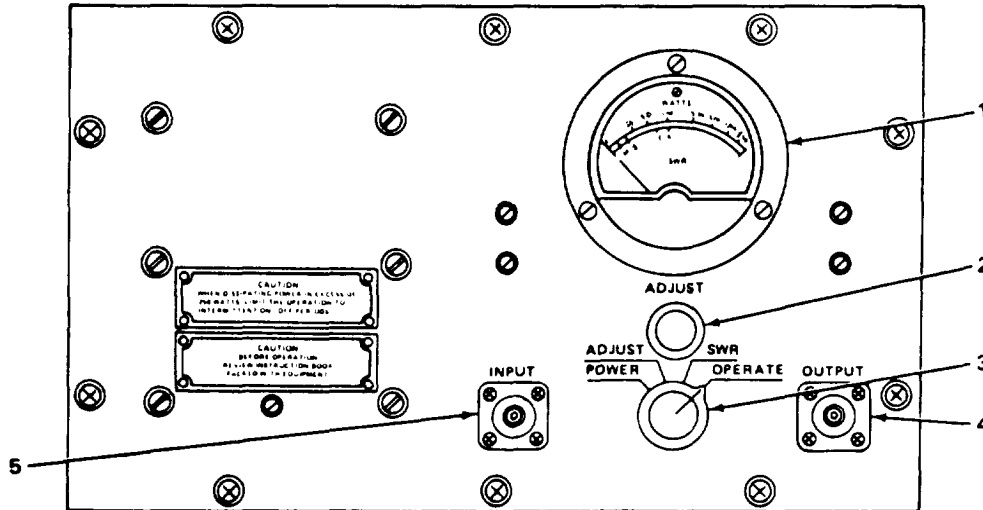


EL6VR040

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



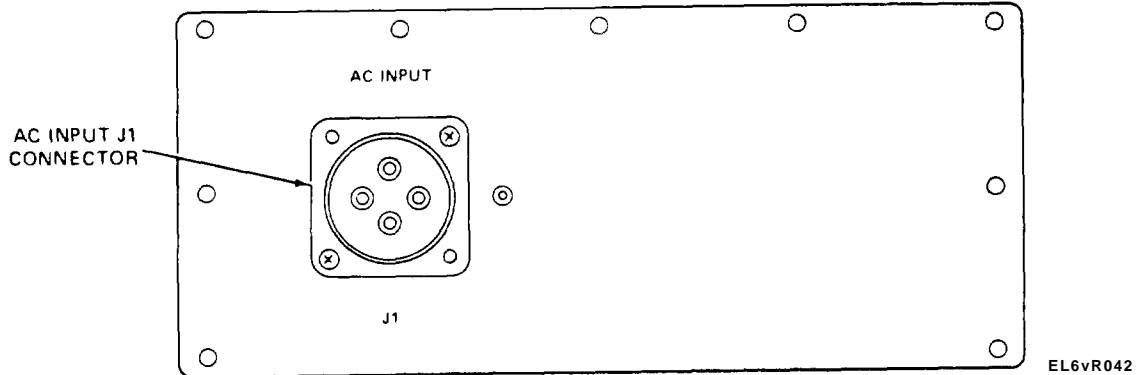
- 1 Meter. Indicates AM-3349/GRC-106 average output in watts or vswr, depending on setting of function switch.
- 2 ADJUST Control. Used with function switch (ADJUST position) to calibrate meter for vswr measurement.
- 3 Function Switch. Selects mode of operation for ME-165/G.
- 4 OUTPUT Connector. Radio 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/GRA-50, if used).

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

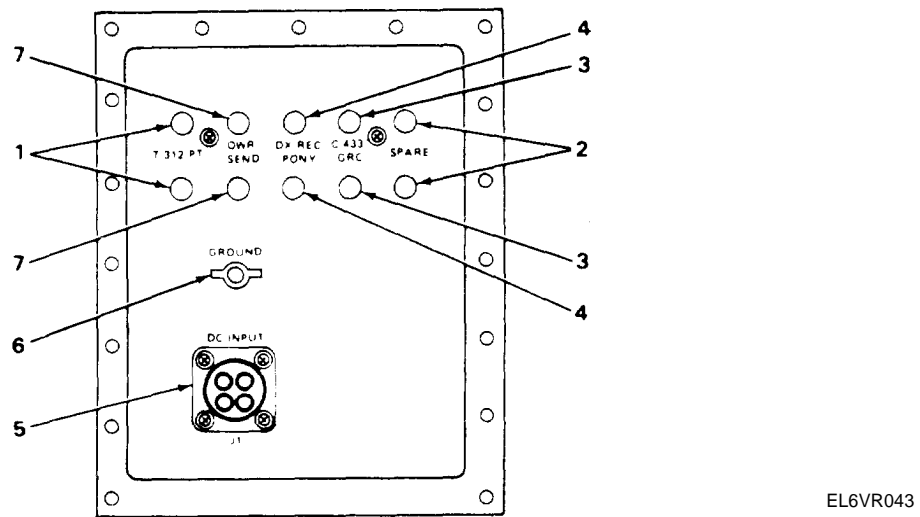
2-2. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142 PLAIN AND C MODELS. (CONT)

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 labeled 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.

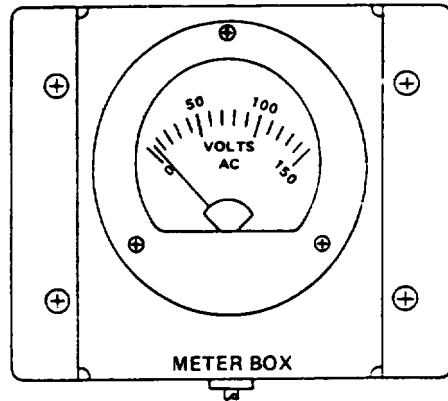
2-2. DESCRIPTION OF CONTROLS AND INDICATORS FOR AN/GRC-122/142 PLAIN AND C MODELS. (CONT)

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

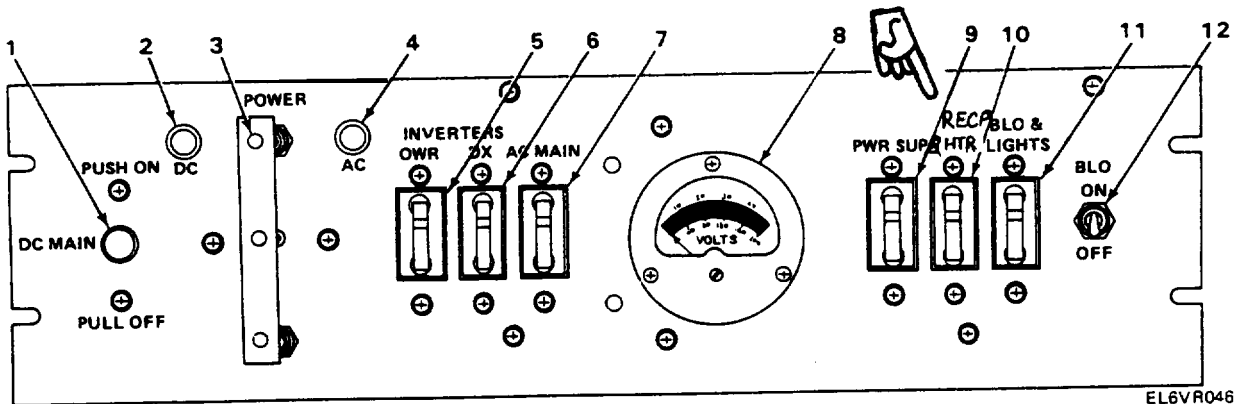


EL6VR045

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

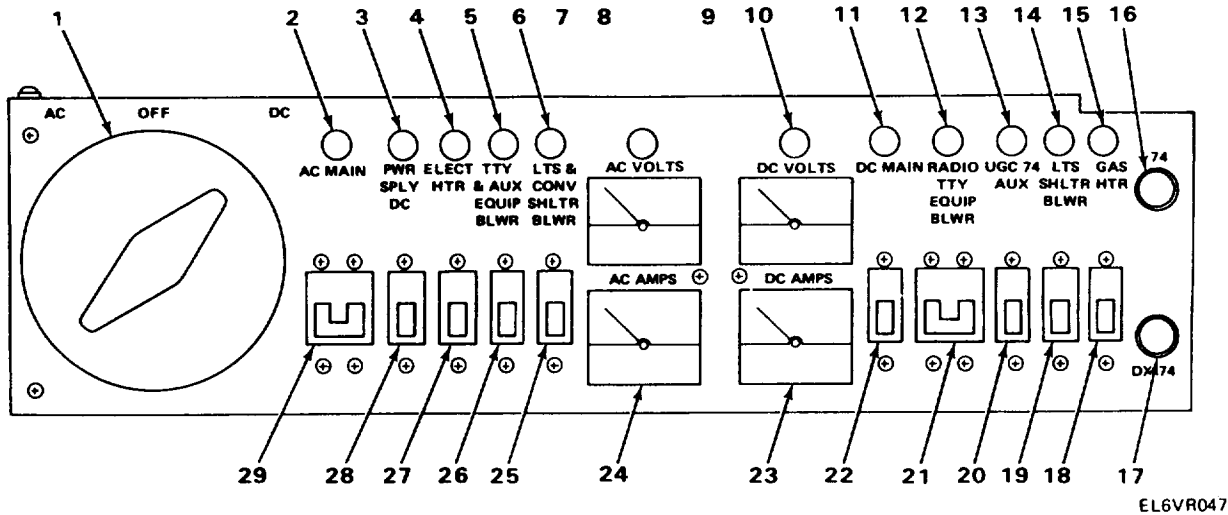
1. DC MAIN Circuit Breaker. In PUSH ON position, provides dc circuit protection to all dc powered shelter components.
2. DC Indicator Lamp. Lights when DC MAIN circuit breaker is in PUSH ON position to indicate presence of dc power.

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 & HTR Circuit Breaker. Energizes shelter 28-volt and heater 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)



EL6VR047

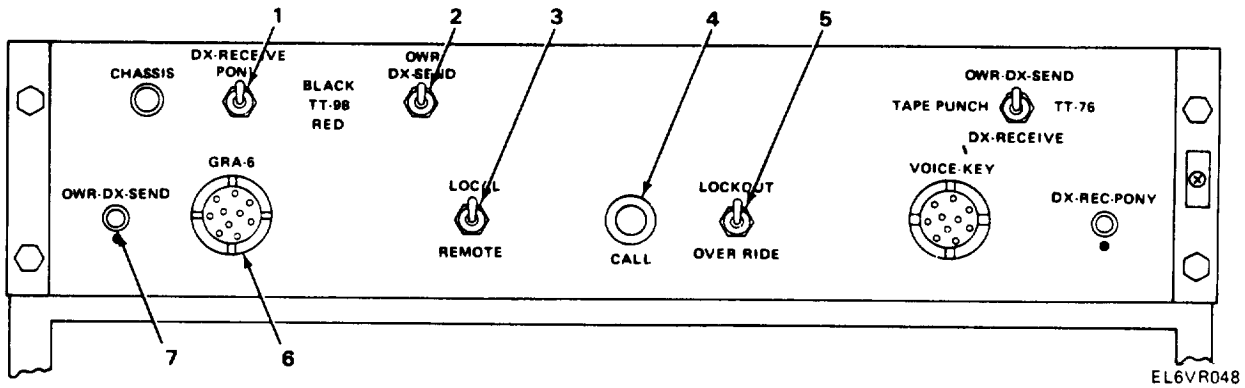
- 1 AC-OFF-DC Power Selector Switch. In AC position external ac(115 v, 60 Hz) is transferred through switching circuits to supply AC MAIN circuit breaker with operating voltage. In DC position, external 28 vdc from vehicle battery is transferred through switching circuits to supply DC MAIN circuit breaker 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 Fuseholder. Lights when fuse fails on AN/UGC-74(V)3.
- 17 DX 74 Fuseholder. Lights when fuse fails on duplex AN/UGC-74A(V)3.
- 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, ovr 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, C, 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.)

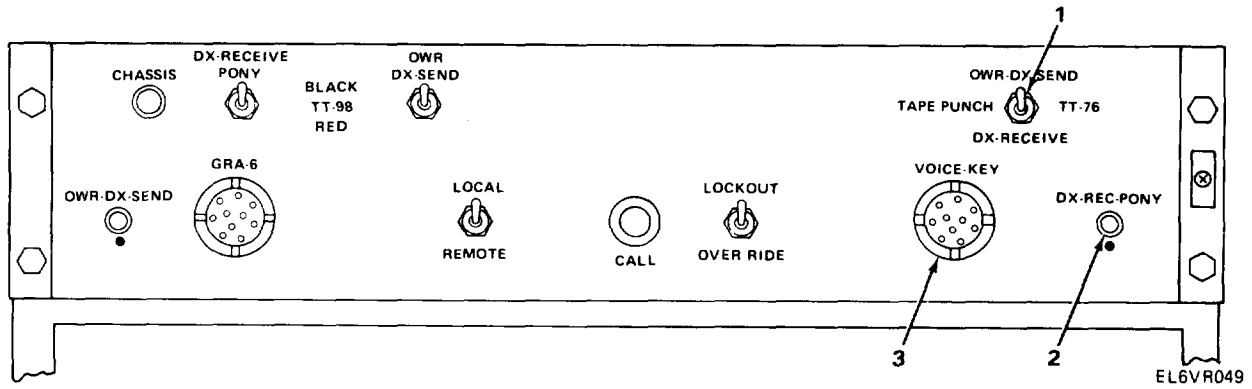
SWITCH POSITION	EFFECT
LOCKOUT	Lockout circuit operates.
OVER RIDE	Lockout circuit is disabled.

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



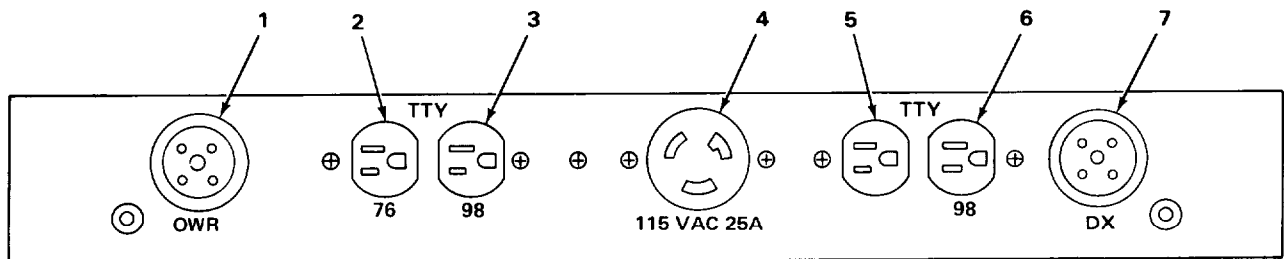
1 OWR-DX-SEND/TAPE PUNCH/TT-76/DX-RECEIVE Switch. Allows operator to switch TT-76(*)/GDC tape punch function between OWR-DX-SEND loop and DX-RECEIVE or pony (tty order wire) loop.

SWITCH POSITION	EFFECT
OWR-DX-SEND 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 OWR-DX-SEND tty loop. 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)

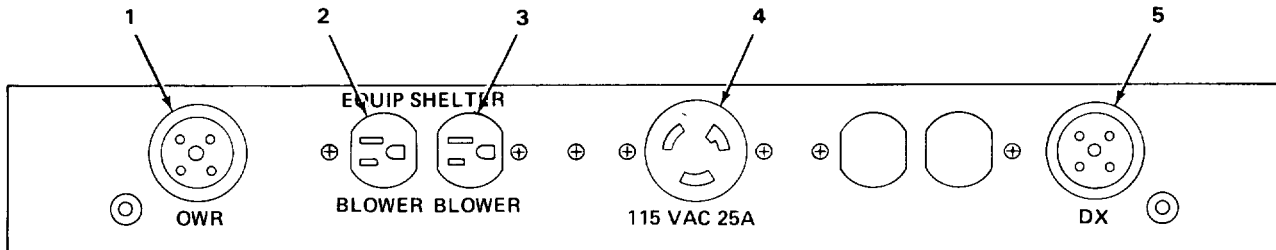


EL6VR050

- 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)

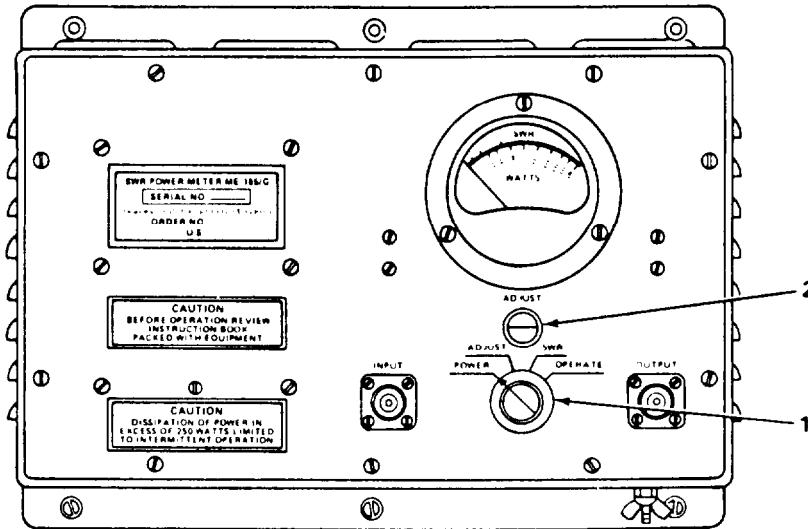


EL6VR051

- 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



EL6VR116

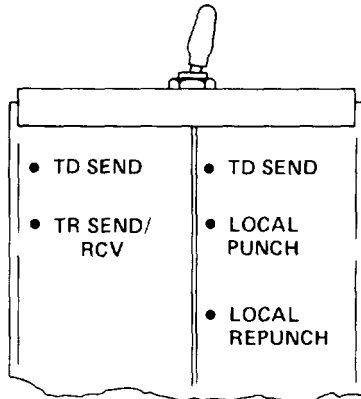
- 1 Meter. Indicates AM/3349/GRC-106 average output in watts or vswr, depending on setting of function switch.
- 2 ADJUST Control. Used with function switch (ADJUST position) to calibrate meter for vswr measurement.
- 3 Function Switch. Selects mode of operation for ME-165/G.
- 4 OUTPUT Connector. Radio 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	<p>Used in conjunction with ADJUST control to calibrate meter for vswr measurement.</p> <p>Meter indicates vswr of antenna.</p> <p>Output of AM-3349/GRC-106 is routed directly to doublet antenna (AN/GRA-50, if used).</p>

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



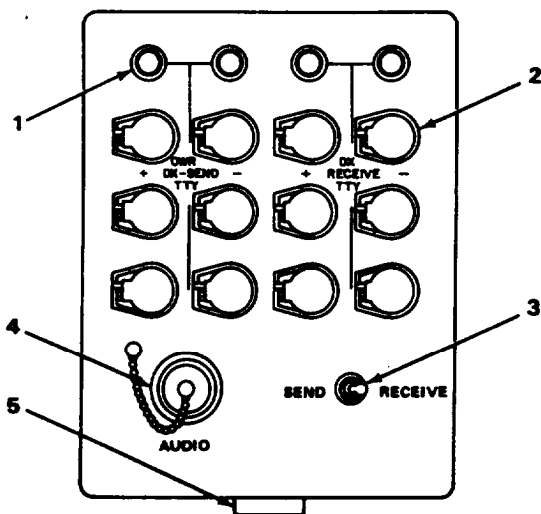
EL6VR038

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 C-7279/GRC-142



EL6VR037

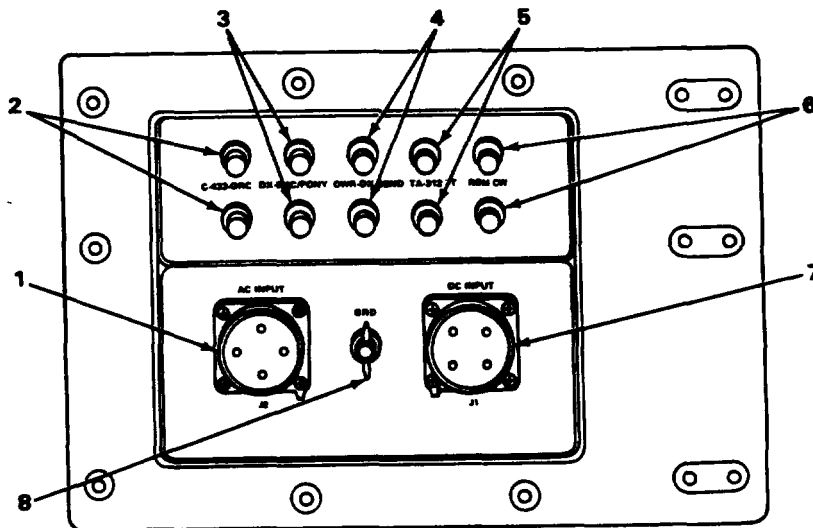
1. Teletypewriter Loop Binding Posts. Provide for termination of dc tty loop field wires originating at shelter dc entrance box binding posts. One pair is for OWR-DX-SEND TTY loop, the other pair is for DX-RECEIVE TW loop (used in AN/GRC-122 models only).
2. Teletypewriter Jacks. Provide for connection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

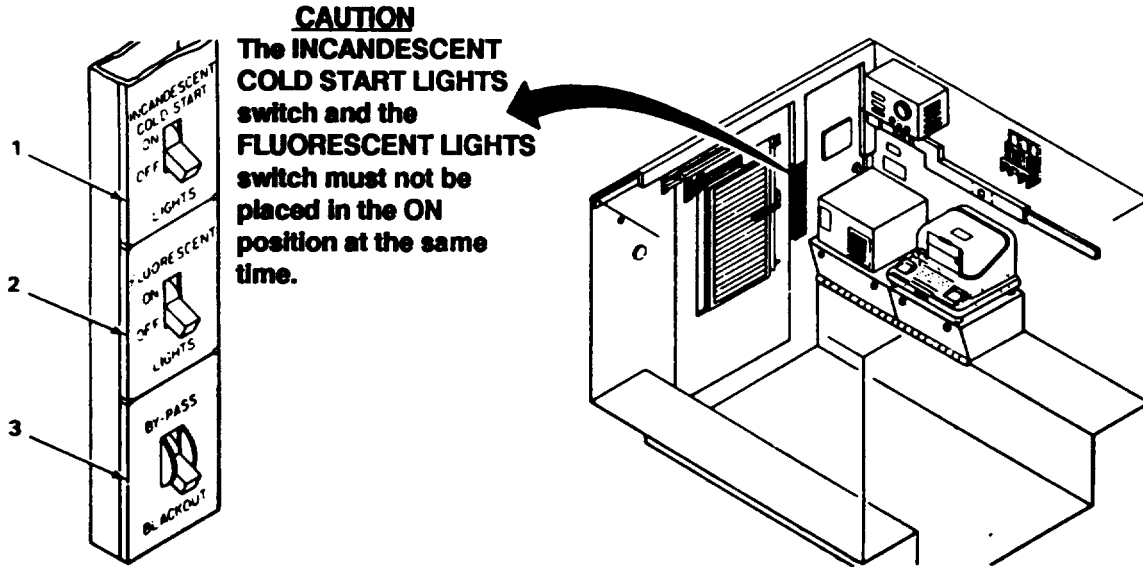


EL6VR052

- 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/GRG-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)

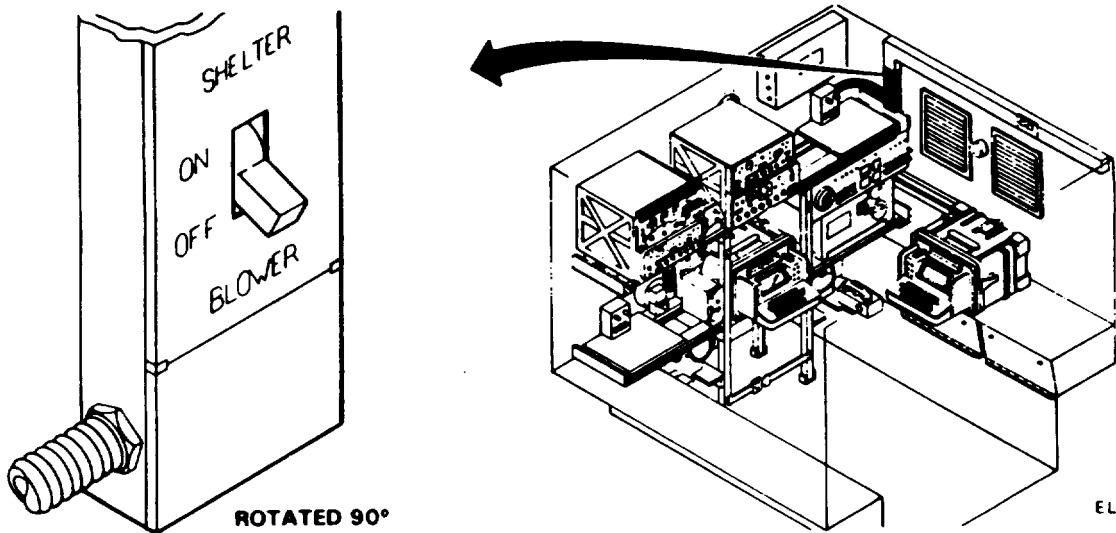
LIGHTING CONTROLS (USED ON AN/GRC-122/142 D AND E MODELS ONLY)



EL6VR053

1. INCANDESCENT COLD START LIGHTS Switch. Controls power to incandescent lights.
2. FLUORESCENT LIGHTS Switch. Controls power to fluorescent lights.
3. BY-PASS/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)



EL6VR054

SHELTER BLOWER Switch. Controls shelter exhaust blower.

SECTION II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES
(PMCS) AND SYSTEM READINESS CRITERIA

2-4. GENERAL.

a. Maintenance Forms and Records. The forms and records you fill out have several uses, including: (1) a permanent record of the services, repairs, and modifications made on your equipment; (2) reports to the next level of maintenance and to your commander; and (3) a checklist for you when you want to know the status of the equipment after its last use, and whether faults, if any, have been fixed. For information on forms and records, see DA PAM 738-750 (if USMC, see TM-4700-15/1d).

b. Routine Checks. Routine checks, such as cleaning, dusting, washing, stowing items not in use, covering unused receptacles, and checking for damage, are not listed as PMCS checks. They are things you should do any time you see they must be done. Ensure that all discrepancies are noted and corrected.

c. PMCS Operators. PMCS are the required periodic inspections and actions necessary to keep your equipment in good operating condition.

d. System Readiness Criteria. System Readiness Criteria are those standard, specific requirements your system must meet for it to be mission-capable.

2-5. PMCS table (paragraph 2-5.1). The PMCS table lists all the scheduled maintenance tasks required for your system.

a. Explanation of Columns.

(1) Item No. This column contains a number for each procedure to be performed. When reporting malfunctions or failures on DA Form 2404, Equipment Inspection and Maintenance Worksheet, place this number in the "TM Item No." column.

(2) Interval. These columns tell you when to do a procedure. Each column that applies will contain an asterisk (*). Some procedures will have asterisks in more than one column.

(3) Item to be inspected/procedure. This column contains the name of the item to be inspected and tells how to perform the required checks and services on it. Carefully follow these instructions and perform them in the order listed.

(4) Equipment is not ready/available if:. This column tells you the conditions which will cause the equipment to be classified as not ready (red) for readiness reporting.

NOTE

If the equipment must be kept in continuous operation, check and service only those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

b. Instructions.

(1) Do your before (B) preventive maintenance just before you operate your equipment. Pay attention to CAUTIONS and WARNINGS.

(2) Do your during (D) preventive maintenance while the equipment and/or its components systems are in operation.

(3) Do your after (A) preventive maintenance right after operating the equipment. Pay attention to the CAUTIONS and WARNINGS.

(4) Do your weekly (W) preventive maintenance once a week.

(5) Do your monthly (M) preventive maintenance once a month.

(6) If something doesn't work, troubleshoot it with the instructions in this manual and notify your supervisor.

(7) Always do your preventive maintenance in the same order.

(8) If anything goes wrong and you can't fix it, write it on your DA Form 2404, or applicable form. If you find something seriously wrong, report it to the next level of maintenance IMMEDIATELY.

WARNINGS

Never operate the generator or shelter until it has been properly grounded. Electrical defects in the load lines or equipment can cause DEATH by electrocution when contact is made with an ungrounded system.

Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame, the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician.

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

2-5.1. Operator Preventive Maintenance Checks and Services

Item No.	Interval					[tern to be inspected Procedure	Equipment is not ready/available if:
	B	D	A	W	M		
1						Truck (1) 1 1/4 Ton (M-880) Follow PMCS procedures in TM 9-2320-266-10.	Truck is inoperative and no substitute is available.
2						Generator Set PU-620/M (2 generators in set) Follow PMCS procedures in TM 5-6115-365-15.	Both generators are inoperative and no substitutes are available.
3	*			*		Grounding Rod MX-148/G Check grounding system to see that it is properly installed. Tighten loose ground connections.	Unable to ground properly.
4	*					Shelter Door Air Filters Clean or replace as necessary.	
5	*	*				Shelter Blowers Check blowers for proper air flow. Clean as necessary.	Blowers fail to operate.
6						Heater, Multi-Fuel Follow PMCS procedures in TM 5-4520-211-14.	
7						Electric Heater Follow PMCS procedures in TM 5-4520-236-14.	

2-5.1 Operator Preventive Maintenance Checks and Services (cont'd)

Item No.	Interval					Item to be inspected Procedure	Equipment is not ready/available if:
	B	D	A	W	M		
8						Inverter Motor Generator PU-724(*)/G Follow PMCS procedures in TM 5-6125-252-15.	PU-724(*)/G is inoperative.
9					*	Telephone Set TA-312/PT Batteries-Inspect for for- eign matter and corrosion. Clean as necessary.	

2-5.2. System Readiness Criteria table (paragraph 2-5.3). The System Readiness Criteria table is your "checklist" for determining the mission readiness of your system.

a. Explanation of Columns.

(1) Item No. This column contains a number for each readiness-reportable item. When reporting, on DA Form 2404, Equipment Inspection and Maintenance Worksheet, malfunctions or failures that cannot be repaired "on-the-spot," place this number in the "TM Item No." column.

(2) Subsystems and Components. This column lists all system equipments which are required for readiness reporting.

(3) Equip Model ID #. This column contains the equipment model identification number (type-classification) of each equipment.

(4) Qty. This column tells you the quantity of equipment/items furnished as part of, or with, your system.

(5) Remarks. This column contains other information/special instructions and will alert you to any exceptions to the requirements, designed to give you maximum mission flexibility.

b. Instructions. Perform the following steps to determine system readiness:

(1) BEFORE starting your mission, ensure that listed equipments/items are on hand and operational. If necessary, perform operational checks in applicable TM's to determine the condition of your equipment.

(2) Take note of REMARKS column. This column contains exceptions and special instructions to help you tailor your requirements to your mission.

(3) If any required equipment/item is not on hand and operational, your entire system is deadlined (unless otherwise noted in the REMARKS column) .

(4) Correct any discrepancies, then re-check all equipments/items on list. When all required equipment/items are on hand and operational, your system is mission-ready.

(5) AFTER completing your mission, and before moving to a new location, ensure that all listed equipments/items are on hand.

2-5.3. SYSTEM READINESS CRITERIA

System ratings: Fully Mission Capable (FMC)
 Not Mission Capable (NMC)

Item No.	AN/GRC-122, AN/GRC-142 Subsystems and Components	Equip Model ID #	Quantity	REMARKS
1R	Shelter, Electrical Equipment (wired with the following components):	S-250/G or S-318/G	1	System may be rated FMC with component(s) rated NMC if that/those component(s) are not required to support the mission.
2R	AC-DC Distribution Box (used in AN/GRC-122/142, AN/GRC-122C/142C only)	J-2276	1	
3R	Adapter Kit, Fuel Can		1	
4R	Antenna Mounting Support Assembly		1	
5R	Blower Assembly		2	
6R	Communications Security Equipment	TSEC/KW -7	1	
7R	Communications Security Equipment	TSEC/KG -7	1	
8R	Dummy Box	J-2728	2	
9R	Heater, Electric		1	
10R	Heater, Multi-Fuel		1	
11R	Inverter, Motor Generator	PU-724 (*)/G	2	One-half the quantity is used in AN/GRC-142 models.
12R	Low-Level Signaling Device	TT-523	1	

2-5.3. SYSTEM READINESS CRITERIA (cont'd)

System ratings: Fully Mission Capable (FMC)
 Not Mission Capable (NMC)

Item No.	AN/GRC-122, AN/GRC-142 Subsystems and Components	Equip Model ID #	2 t Y	REMARKS
13R	Modem, Radio Teletypewriter	MD-522 (*) /GRC	1	
14R	Panel (used in AN/GRC-122/142 and AN/GRC-122C/142C only)	SB-3018	1	
15R	Power Distribution Panel (used in AN/GRC-122A, B, D, E/ 142A, B, D, E only)	SB-3358	1	
16R	Power Supply	PP-4763	1	
17R	Power Terminal Assembly (used in AN/GRC-122A, B, D, E/ 142A, B, D, E only)		1	
18R	Radio Set	AN/GRC -106*	1	
19R	Receiver-Transmitter	RT-662 or RT-834	2	One-half the quantity is used in AN/GRC-142 models.
20R	Remote Control Box	C-7279	1	
21R	Remote Control Group	AN/GRA-6	1	
22R	Standing Wave Ratio-Power Meter	ME-165/G	1	
23R	Switch Assembly	SA-1554 and SA-1555 OR SA-1650	1	
24R	Telephone Box		1	

2-5.3. SYSTEM READINESS CRITERIA (cont'd)

System ratings: Fully Mission Capable (FMC)
 Not Mission Capable (NMC)

Item No.	AN/GRC-122, AN/GRC-142 Subsystems and Components	Equip Model ID #	Quantity	REMARKS
25R	Telephone Set	TA-312	2	
26R	Teletypewriter (use in AN/GRC-122/142 and AN/GRC-122A,B/142A,B only)	TT-98 or TT-722	2	One-half the quantity is used in AN/GRC-142 models.
27R	Terminal, Communications (used in AN GRC-122C,D,E/142C,D, E only)	AN/UGC-74A(V) 3	2	One-half the quantity is used in AN/GRC-142 models.
28R	Antenna Group (consisting of):	AN/GRA-50	1	
29R	Bag	BG-175	1	
30R	Cable Assembly, RF	CG-687/U	1	
31R	Halyard	MX-2706 /G	2	
32R	Insulator	IL-4/GRA-4	1	
33R	Reeling Machine	RC-432/G	2	
34R	Tape, Measuring		1	
35R	Wire Assembly	CX-7303	2	
36R	Generator Set (2 generators in set)	PU-620/M	1	System may be rated FMC if one generator is rated NMC.
37R	Ground Rod	MX-148/G	2	

Table 2-5.3. SYSTEM READINESS CRITERIA (cont'd)

System ratings: Fully Mission Capable (FMC)
 Not Mission Capable (NMC)

Item No.	AN/GRC-122, AN/GRC-142 Subsystems and Components	Equip Model ID #	Quantity	REMARKS
38R	Mast Assembly NOTE The following components are required for EACH Mast Assy.	AB-155/U	6	One-half the quantity is used in AN/GRC-142 models.
39R	Adapter, RF	UG-29B/U	1	
40R	Cable Assembly, RF OR	CG-55C/U	1	
41R	Cable Assembly, RF	CG-692A	1	
42R	Insulator		12	
43R	Masts, Mast Section	MS-44	8	
44R	Reel, Cable	RC-435	1	
45R	Splice, Split Bolt Burgundy	KS-90	18	
46R	Carrying Device	MX-387/ GRA-4	6	
47R	Wire, Copper Stranded #14 AWG (500 FT)		1	
48R	Whip Antenna (consisting of):		1	
49R	Adapter Connector	UG-204/U	1	
50R	Adapter Connector	UG-306B	1	
51R	Antenna Tip Assembly		3	
52R	Bag	CW-206	1	
53R	Clamp		2	One half the quantity is used in AN/GRC-142 models.

Table 2-5.3. SYSTEM READINESS CRITERIA (cont'd)

System ratings: Fully Mission Capable (FMC)
 Not Mission Capable (NMC)

Item No.	AN\GRC-122, AN\GRC-142 Subsystems and Components	Equip Model ID #	Quantity	REMARKS
54R	Cover, Antenna		2	One half the quantity is used in AN\GRC-142 models.
55R	Mast Base	AB-652	2	One half the quantity is used in AN\GRC-142 models.
56R	Mast Section	MS-116A	6	One half the quantity is used in AN\GRC-142 models.
57R	Mast Section	MS-117A	2	One half the quantity is used in AN\GRC-142 models.
58R	Mast Section	MS-118A	2	One half the quantity is used in AN\GRC-142 models.
59R	Rope (40 FT)		1	
60R	Antenna Tiedown Kit		4	
61R	AC Cable Assembly, Power Electrical (50 FT)	CX-10951 /G	1	
62R	DC Power Cable (15 FT)	CX-10463 /GRC-142	1	
63R	Truck, 1 1/4 Ton	M-880	1	System may be rated FMC if appropriate substitute is available.

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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/G RC-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.

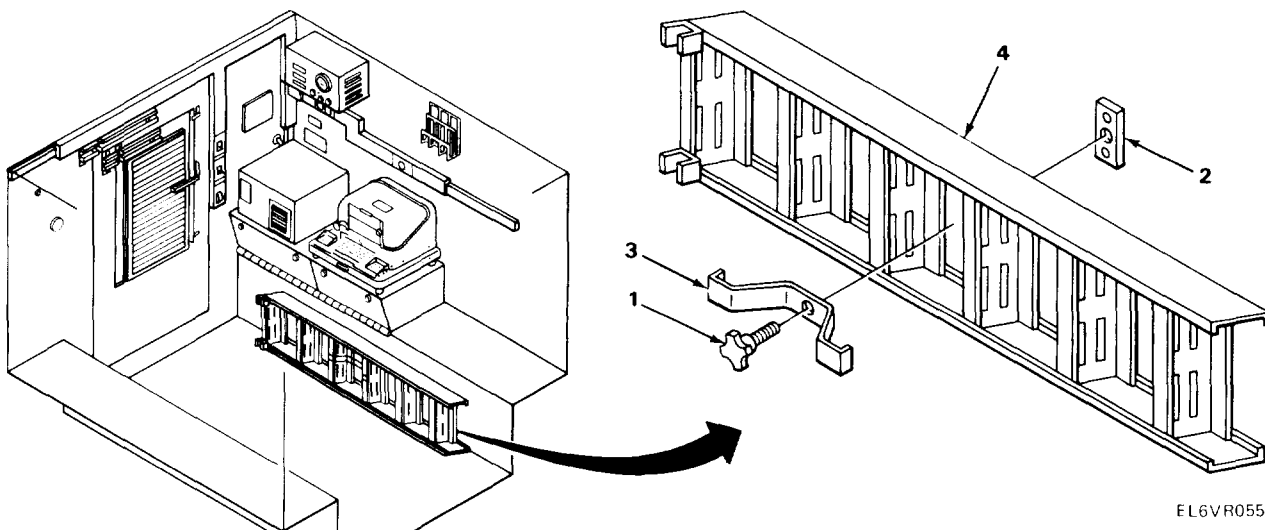
Location of antennas for long distances of communication is important. Radio signals are absorbed and sometimes reflected by nearby obstructions such as hills, buildings, bridges, or telephone lines that extend above height of antennas. Transmitted signals have their greatest range as high above ground 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 maybe 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 chosen, 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.



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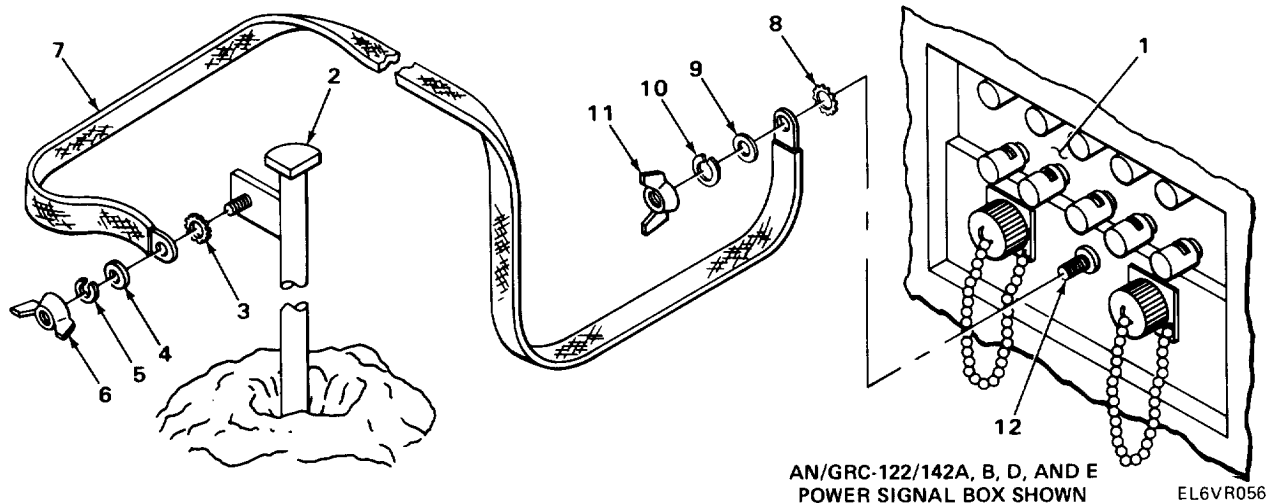
1. Unscrew tiedown assemblies (1) from side-mounted retaining plates (2).
2. Place brackets (3) in mountings for future use and remove ladder (4) from shelter.
3. Place boarding ladder bracket against tailgate of truck.
4. Fasten hook on each of two securing ropes to lower towing rings of truck.
5. Pull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



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

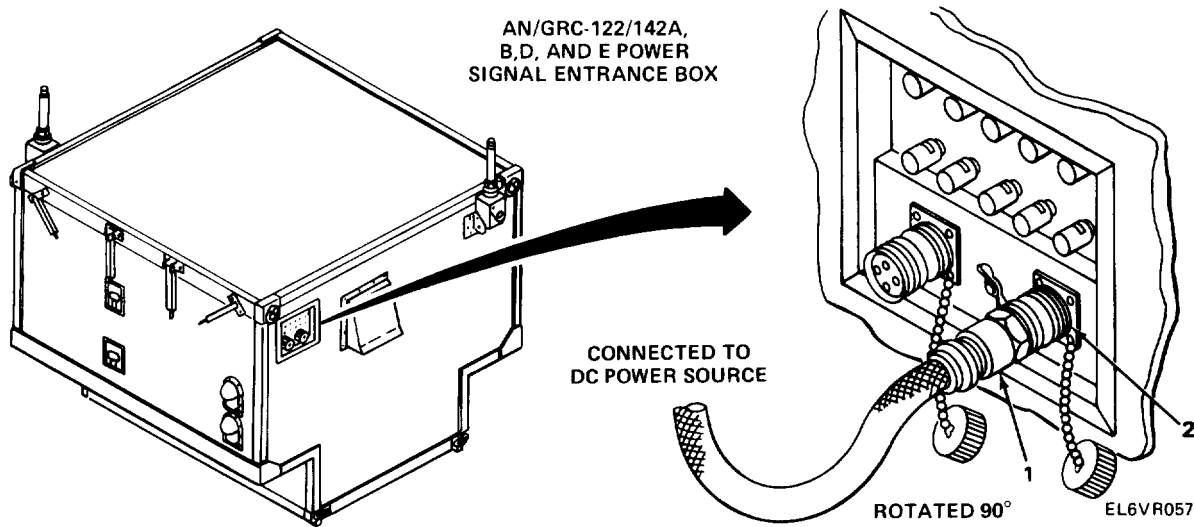
Place all circuit breakers and equipment power switches in OFF position. Make sure shelter is grounded to prevent electrical shock. Connect only one ac or dc power source to shelter at any given time.

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.

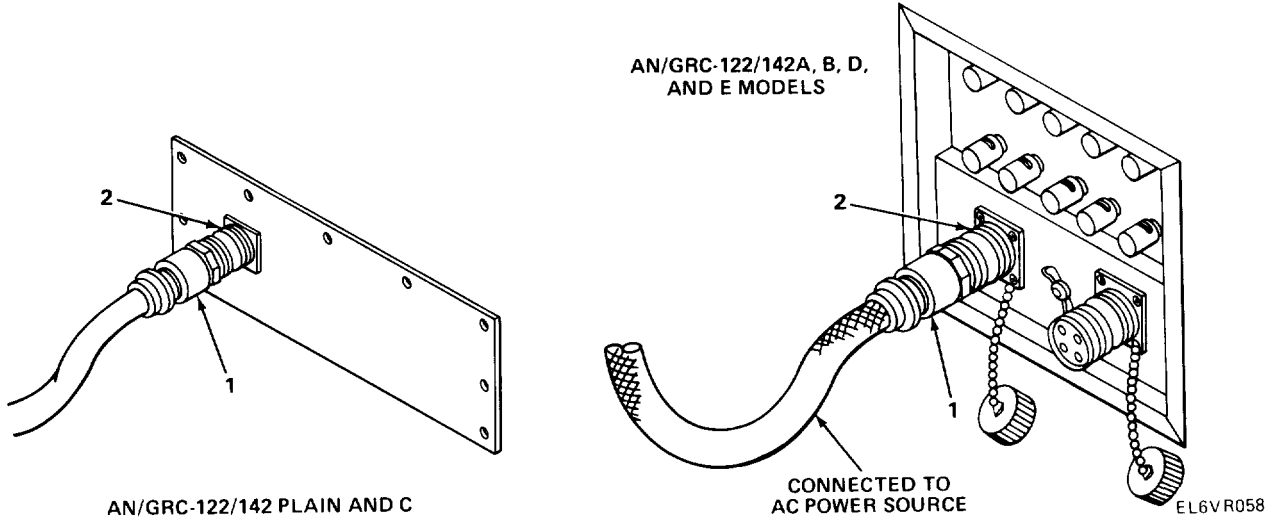


Connect dc power cable (1) from dc power source to DC INPUT receptacle (2).

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.



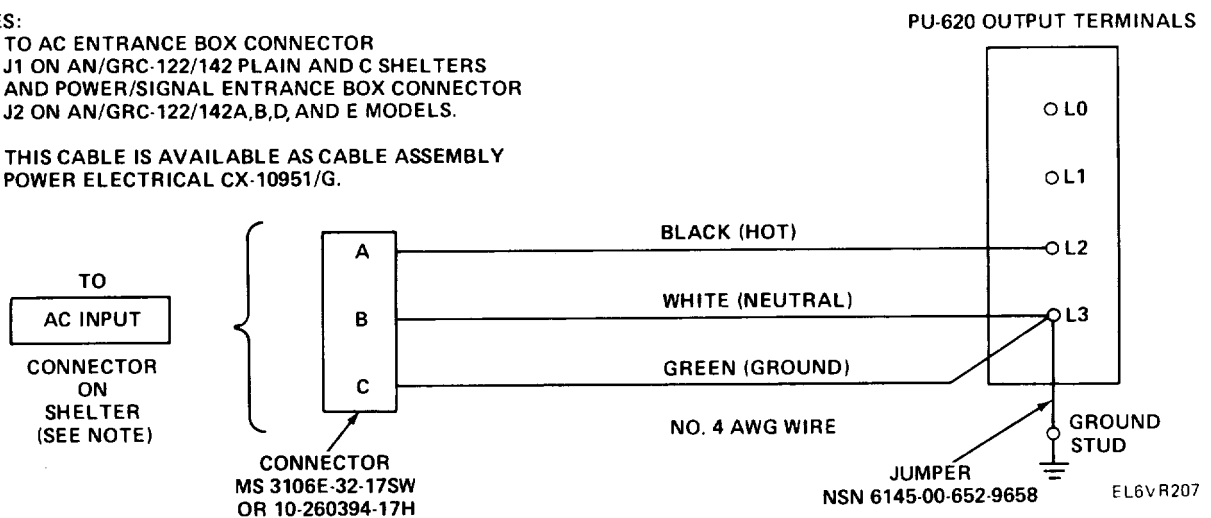
Connect ac power cable (1) from ac power source to AC INPUT receptacle (2).

AC POWER CABLE CONNECTION TO GENERATOR

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

NOTES:

1. TO AC ENTRANCE BOX CONNECTOR
J1 ON AN/GRC-122/142 PLAIN AND C SHELTERS
AND POWER/SIGNAL ENTRANCE BOX CONNECTOR
J2 ON AN/GRC-122/142A,B,D, AND E MODELS.
2. THIS CABLE IS AVAILABLE AS CABLE ASSEMBLY
POWER ELECTRICAL CX-10951/G.



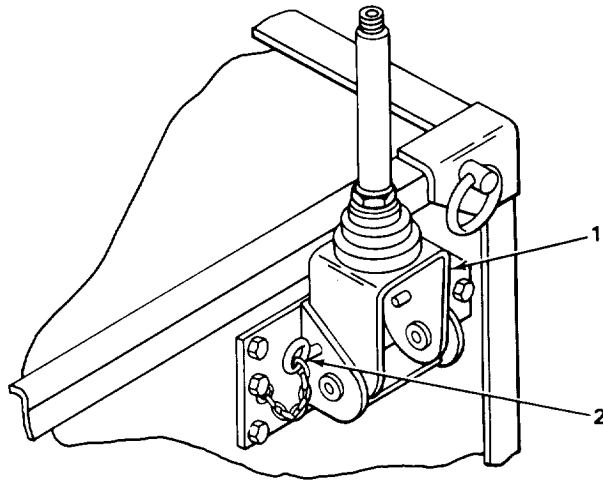
2-11. WHIP ANTENNA INSTALLATION.

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 ovr 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:



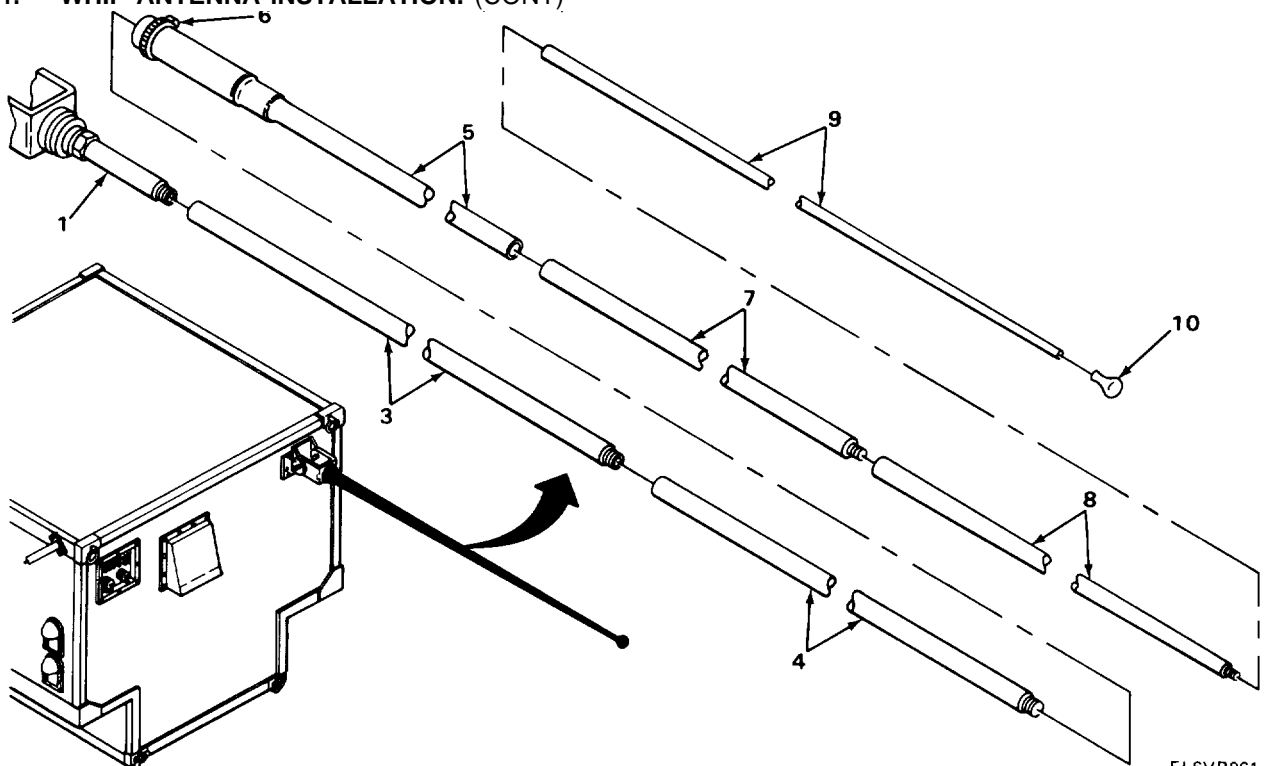
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NOTE

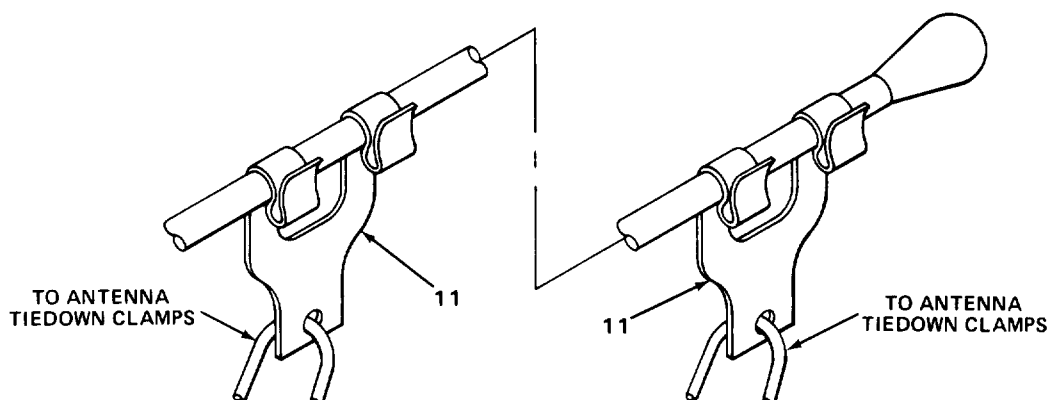
For AN/GRC-122(*) models, repeat procedure for dx-receive antenna.

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)



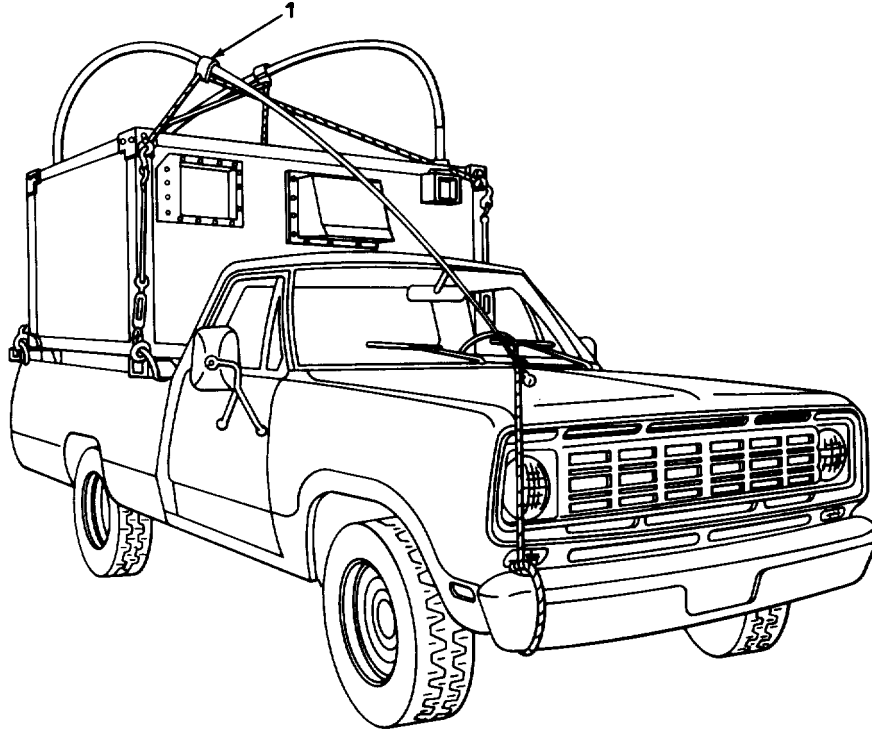
3. Screw one antenna section MS-116-A (3) into mast base (1).
4. Screw second antenna section MS-116-A (4) into first antenna mast section (3).
5. Slip antenna cover (5) and antenna cover clamp (6) onto MS-116-A installed in step 4. Slide antenna cover (5) down onto antenna mast base as far as it will 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)



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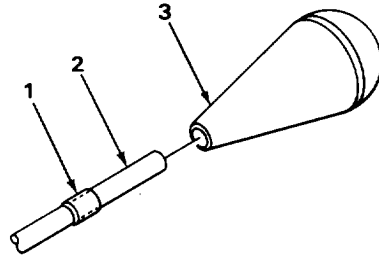
CAUTION

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.

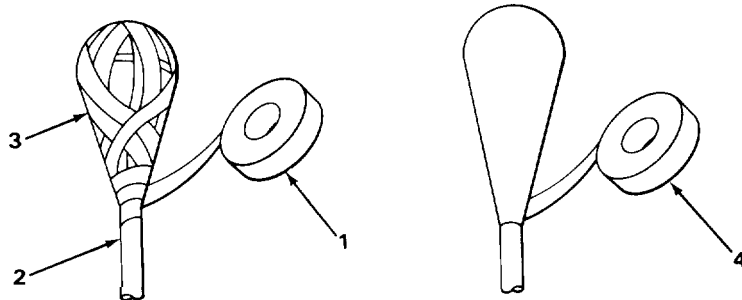
2-12. ANTENNA TIP CAP INSTALLATION.

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



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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.



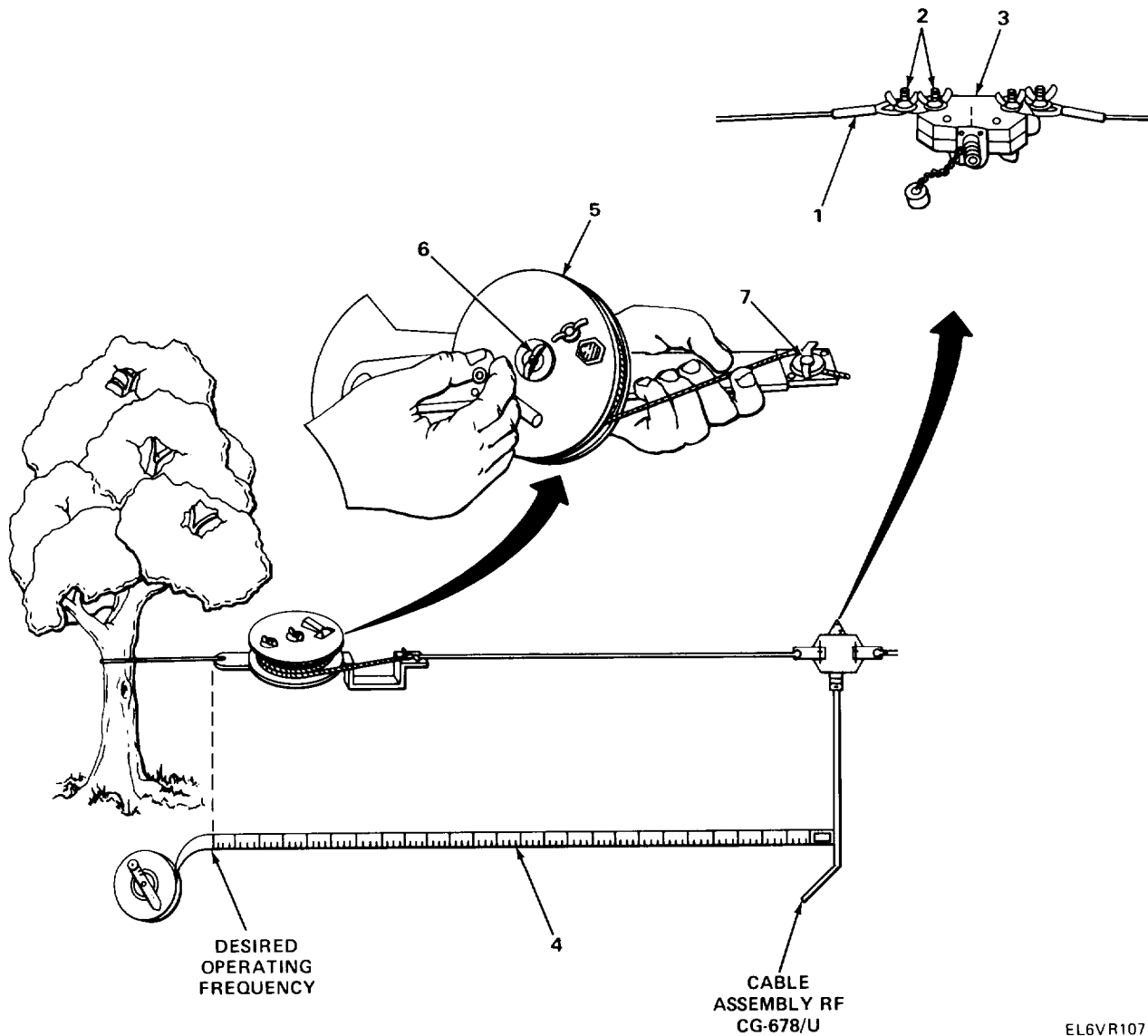
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3. Wrap reinforced tape (1) around base of tip cap (3) where it meets top element (2).
4. Secure tip cap (3) to top element (2).
5. Wrap tip cap (3) completely with electrical tape (4).

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.



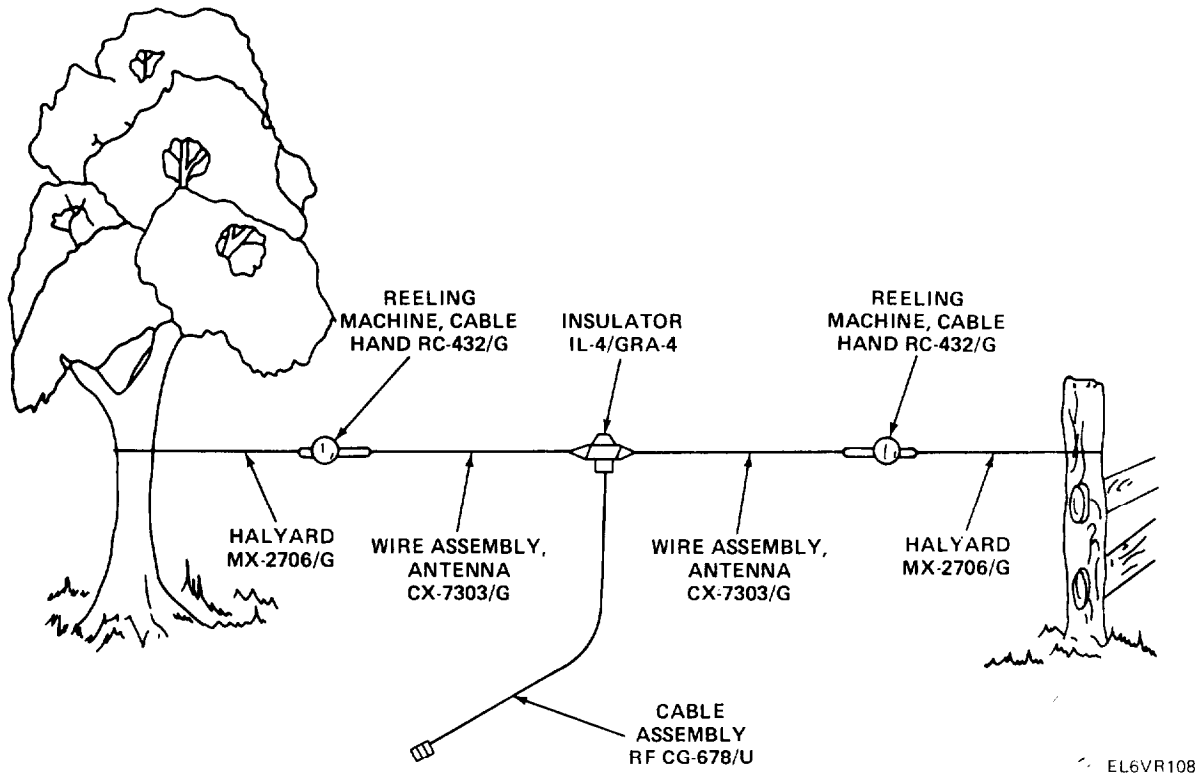
2-13. ANTENNA GROUP AN/GRA-50 INSTALLATION. (CONT)

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

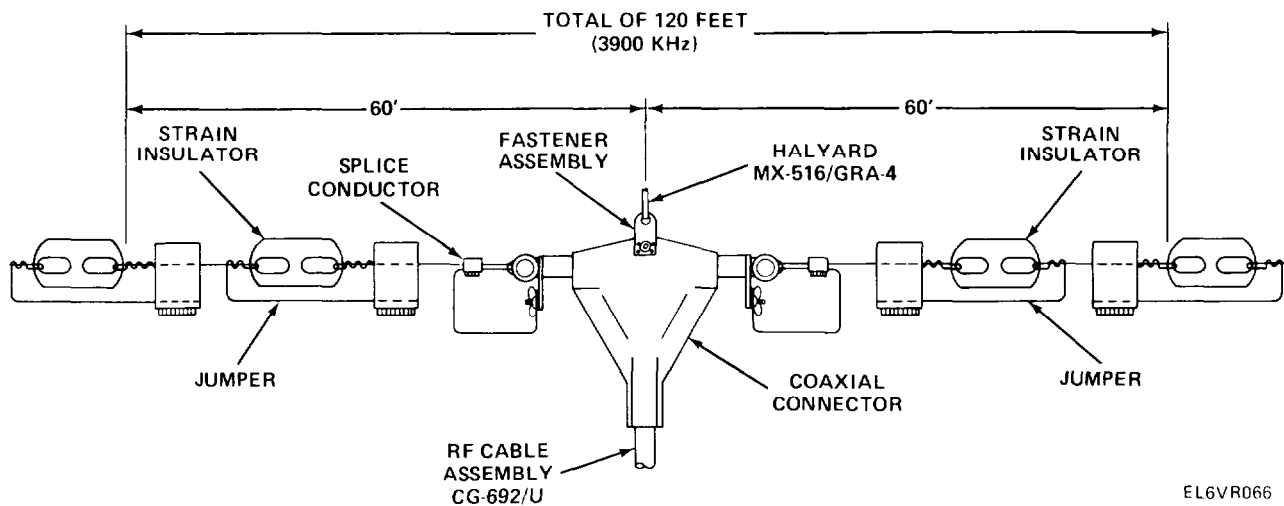
0. Shorten or lengthen antenna assembly a few inches at a time if voltage swr is within red scale of power meter.

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.



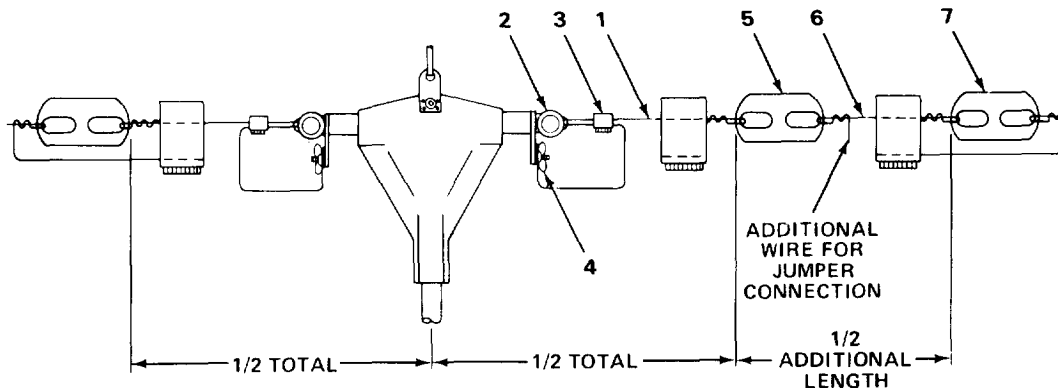
EL6VR066

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.

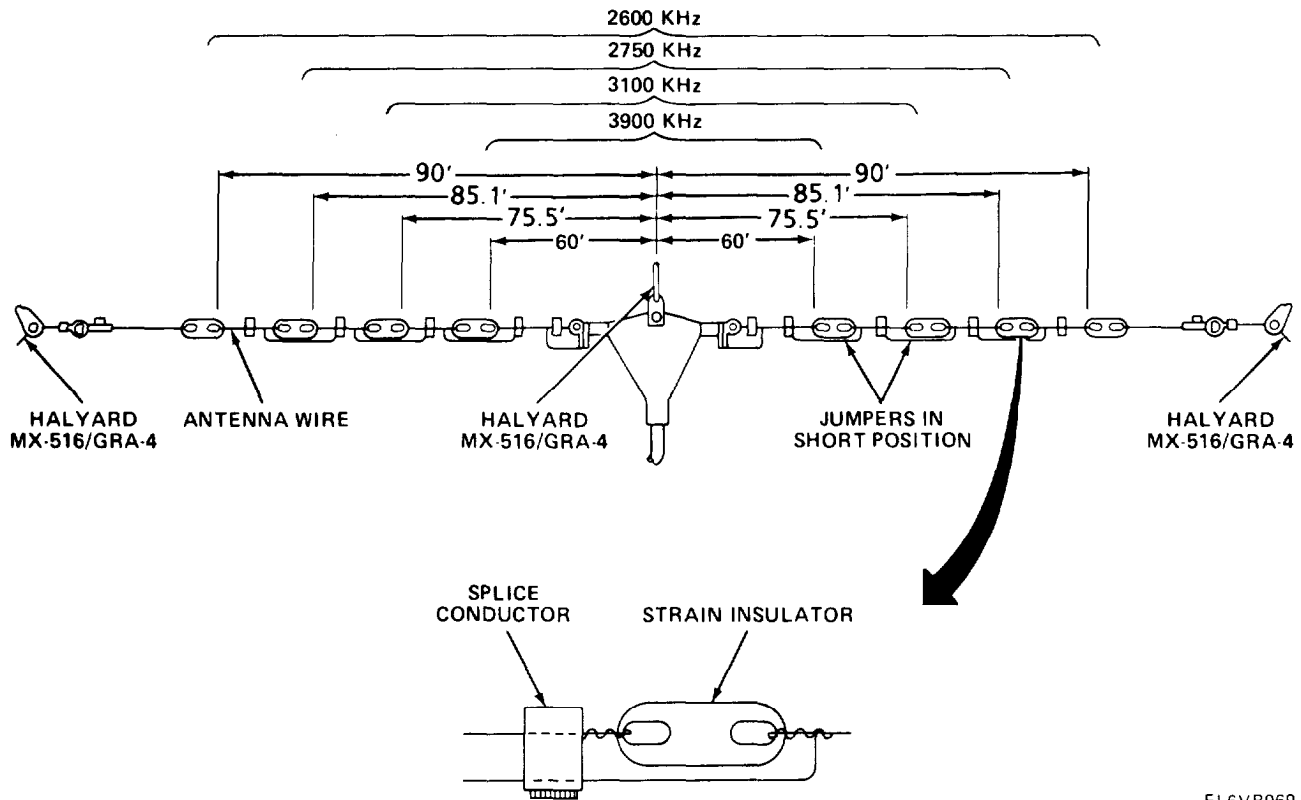
NOTE

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.



EL6VR069

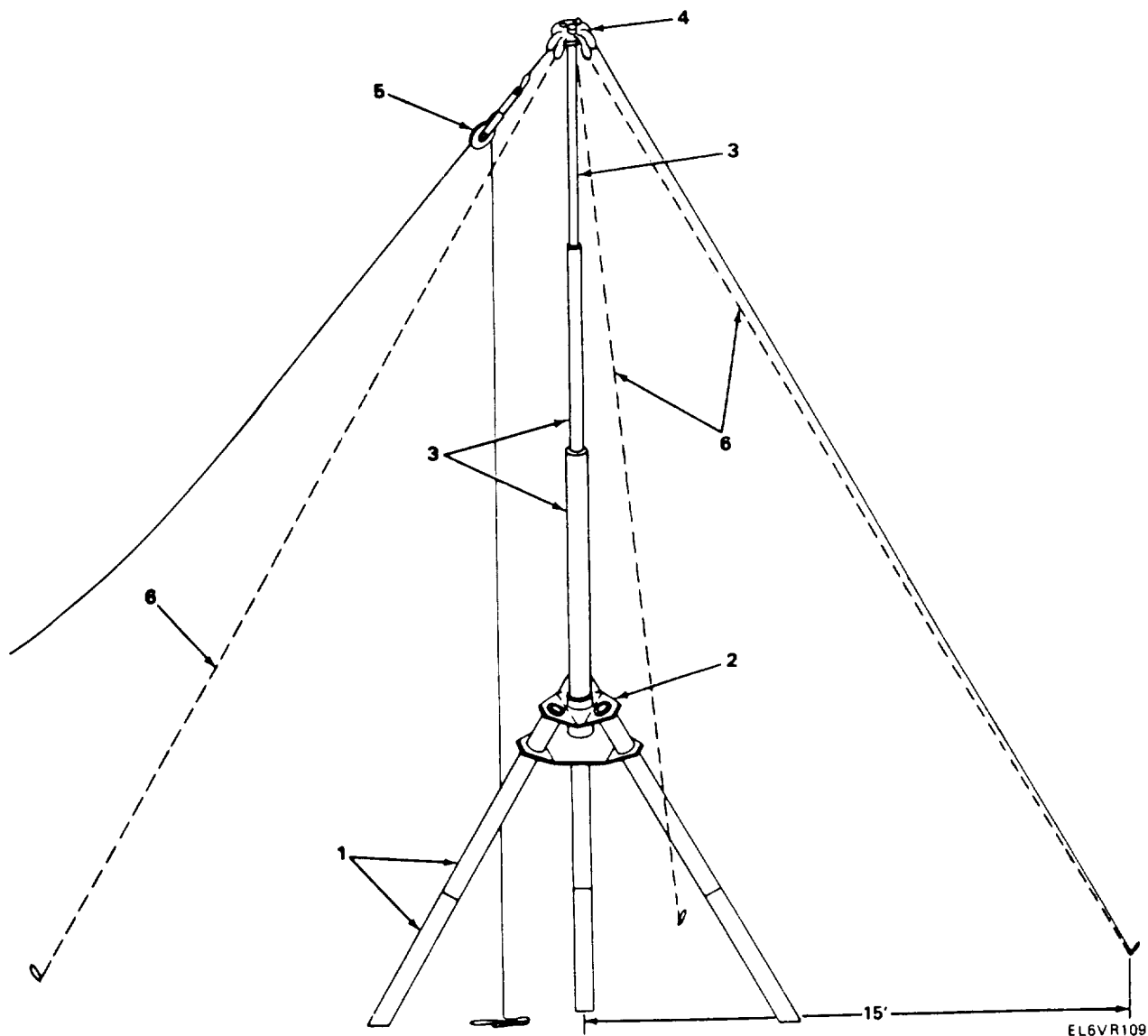
NOTE

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

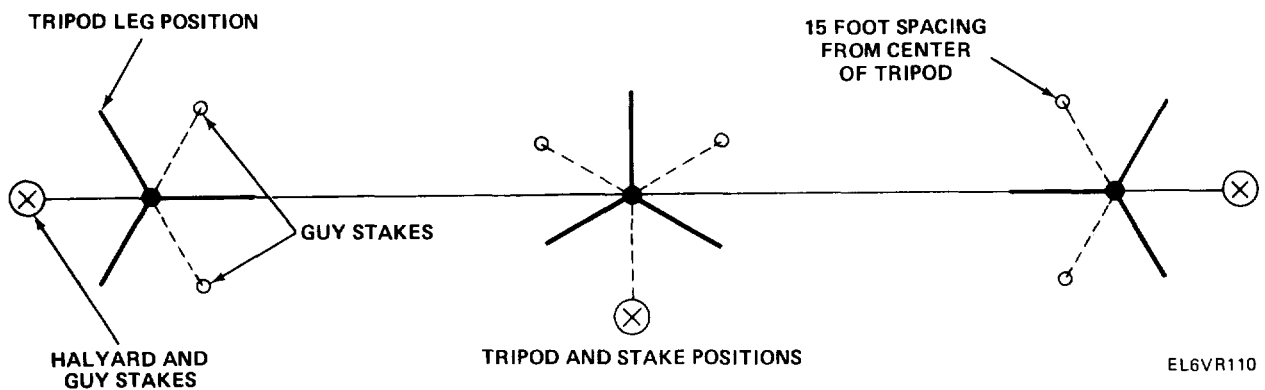
Assemble antenna on ground and then raise.

1. Join two mast assembly sections (1) together.
2. Install joined mast sections (1) into tripod adaptor (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

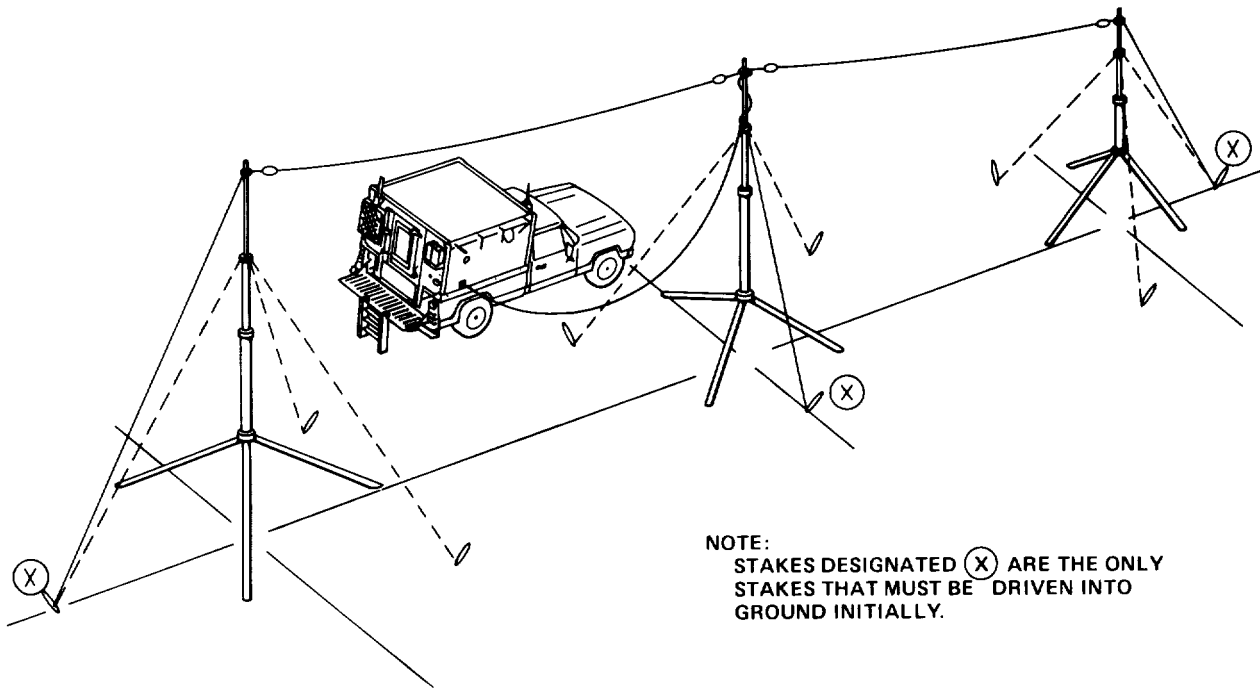
Three required stake installations are marked with an X (as shown below and on page 2-46), and are used to support halyards which support antenna wire. Six remaining stakes can be driven in ground if time permits. Use three assembled mast sections, which measure 15 feet, for proper spacing of guy stakes.

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*		FREQUENCY (MHz)	LENGTH OF EACH ANTENNA WIRE*	
	(FT)	(M)		(FT)	(M)
2.0	117.0	(35.68)	4.0	58.5	(17.83)
2.05	114.14	(34.81)	4.4	53.18	(16.21)
2.1	111.42	(33.98)	4.6	50.86	(15.51)
2.15	108.83	(33.19)	4.8	48.75	(14.86)
2.2	106.36	(32.43)	5.0	46.80	(14.27)
2.25	104.0	(31.72)	5.2	45.0	(13.72)
2.3	101.73	(31.02)	5.4	43.33	(13.21)
3.0	78	(23.77)	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.

NOTE

The above values represent 1/4 wavelength at the given operating frequency in MHz. The velocity figure for 1/4 wavelength is 234, therefore the formula is:

$$1/4 \text{ wavelength (ft)} = \frac{234}{\text{Freq (MHz)}}$$

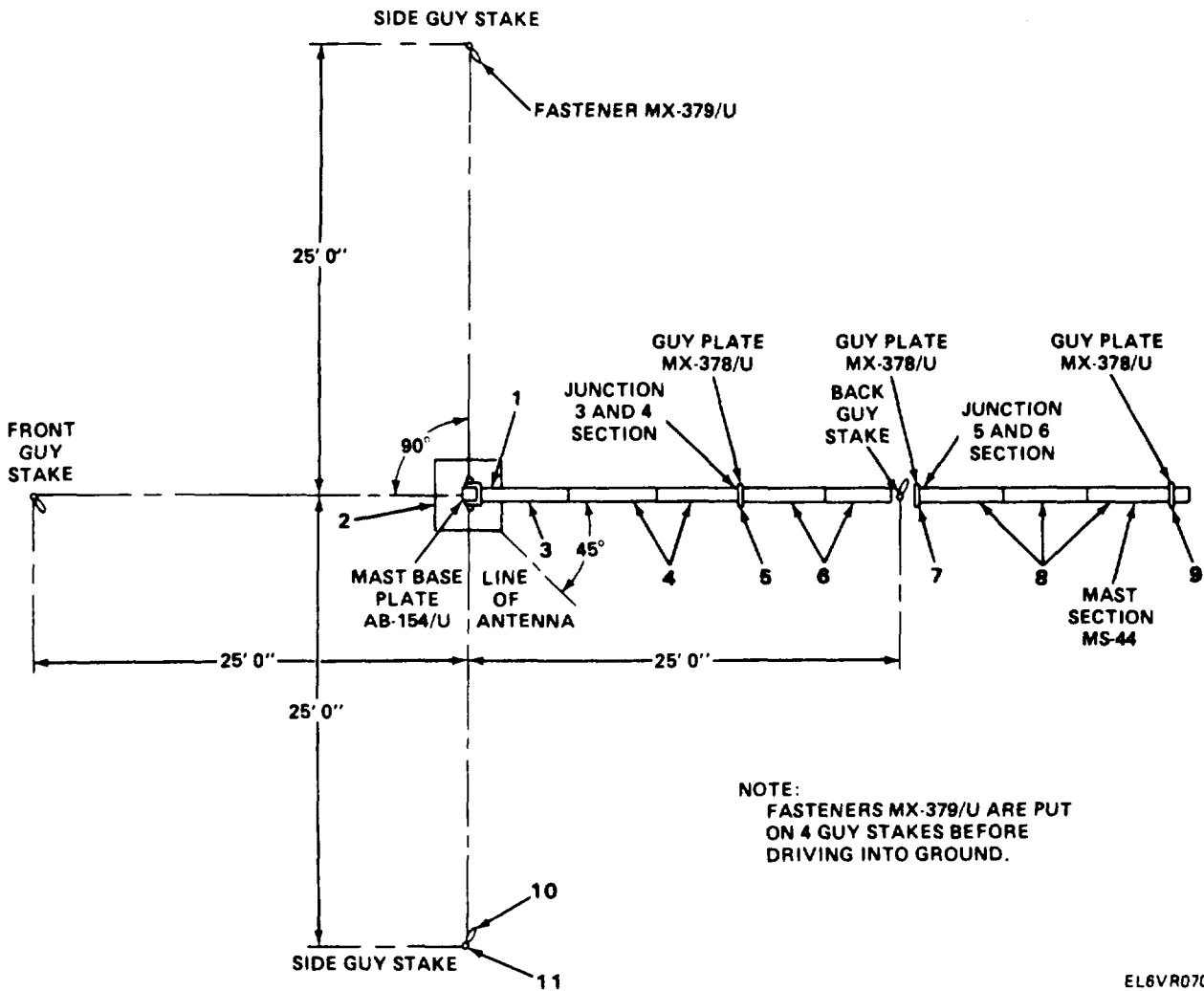
To convert the wavelength from feet to meters, multiply the answer to the above by .3048.

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).

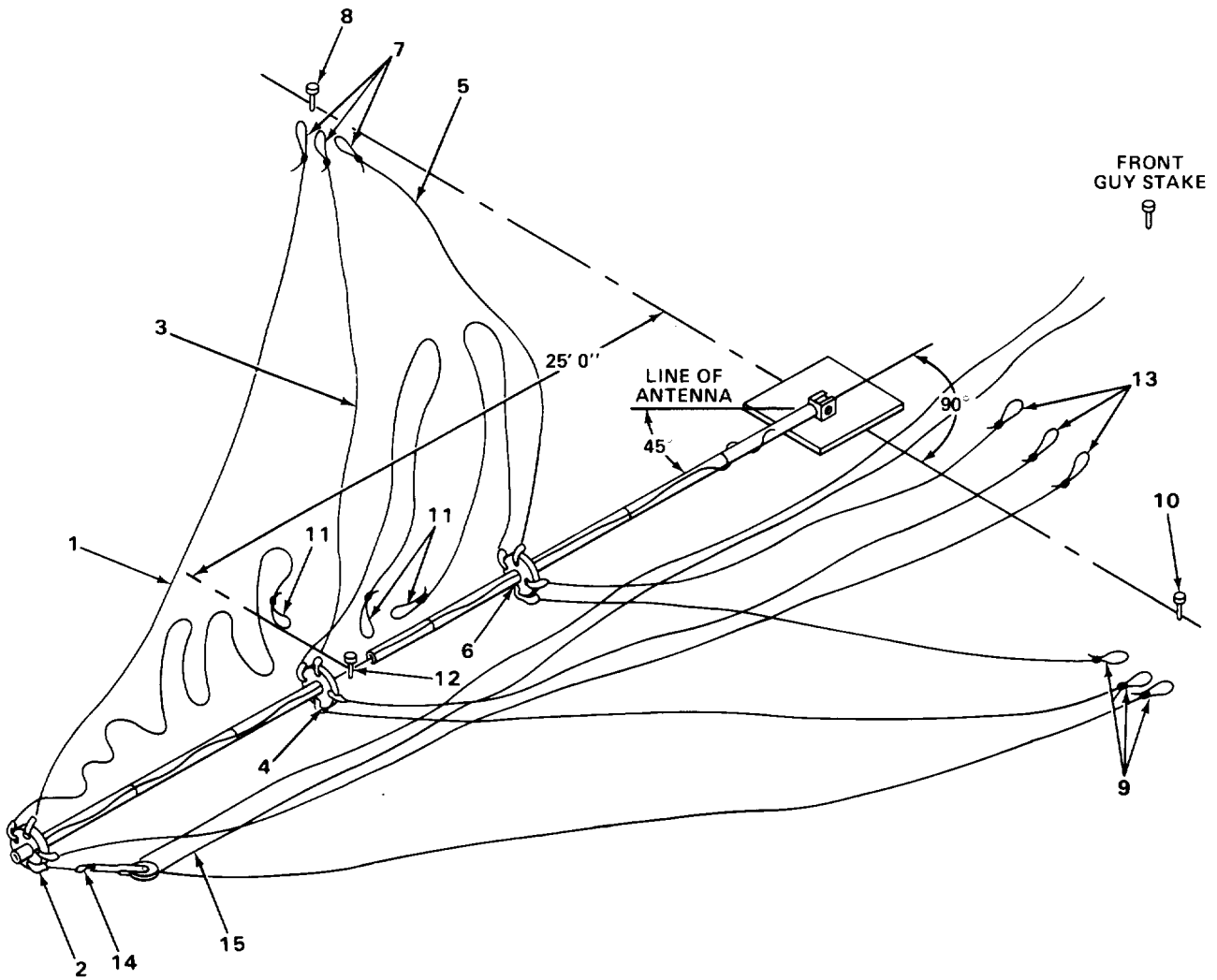
NOTE

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**

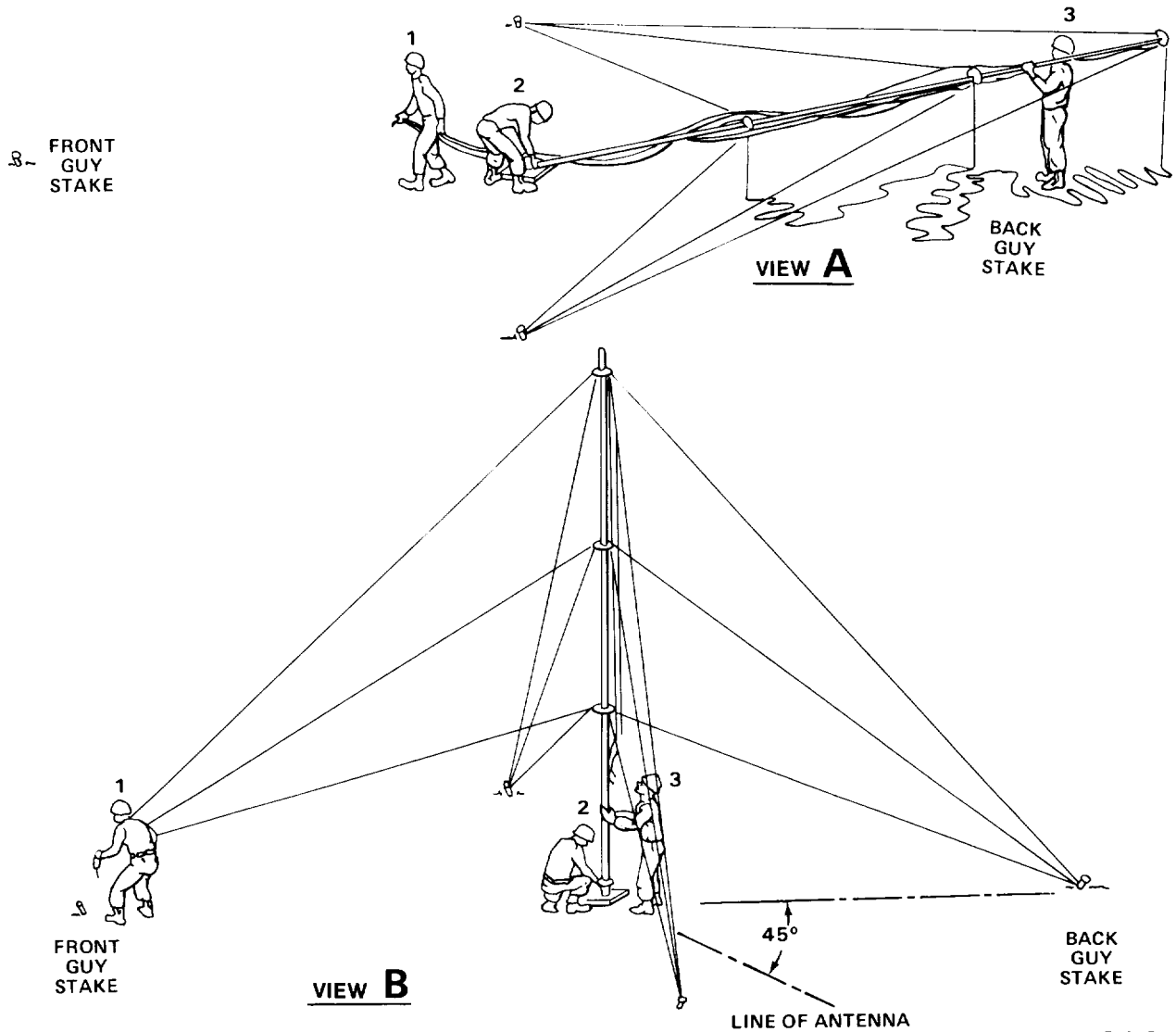
Fasten guy lines by snapping fastener at end of each guy line into one of four holes located 90 degrees apart on MX-378/U.

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 stake.
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



EL6VR072

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)

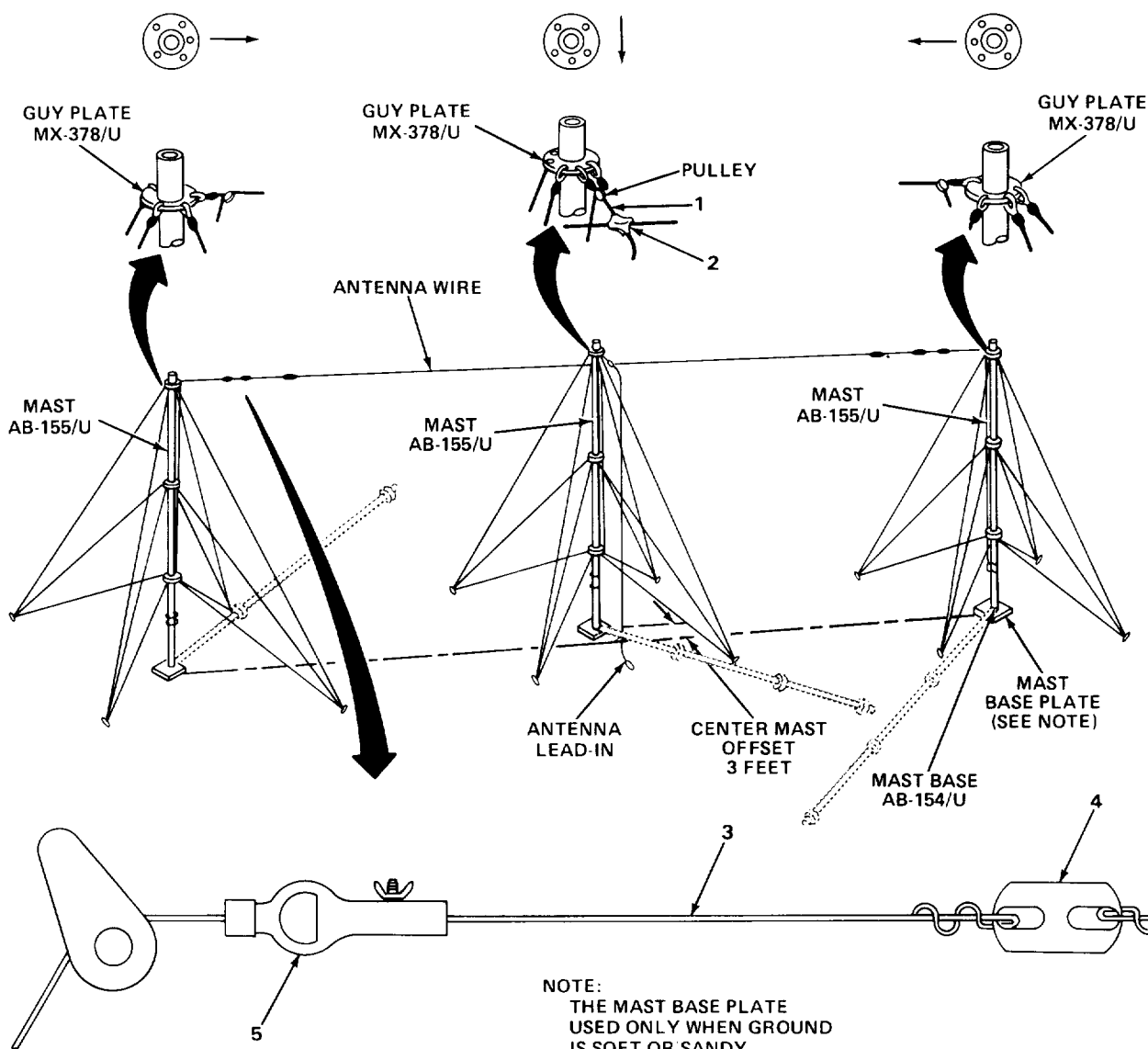
NOTE

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.



EL6VR073

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:

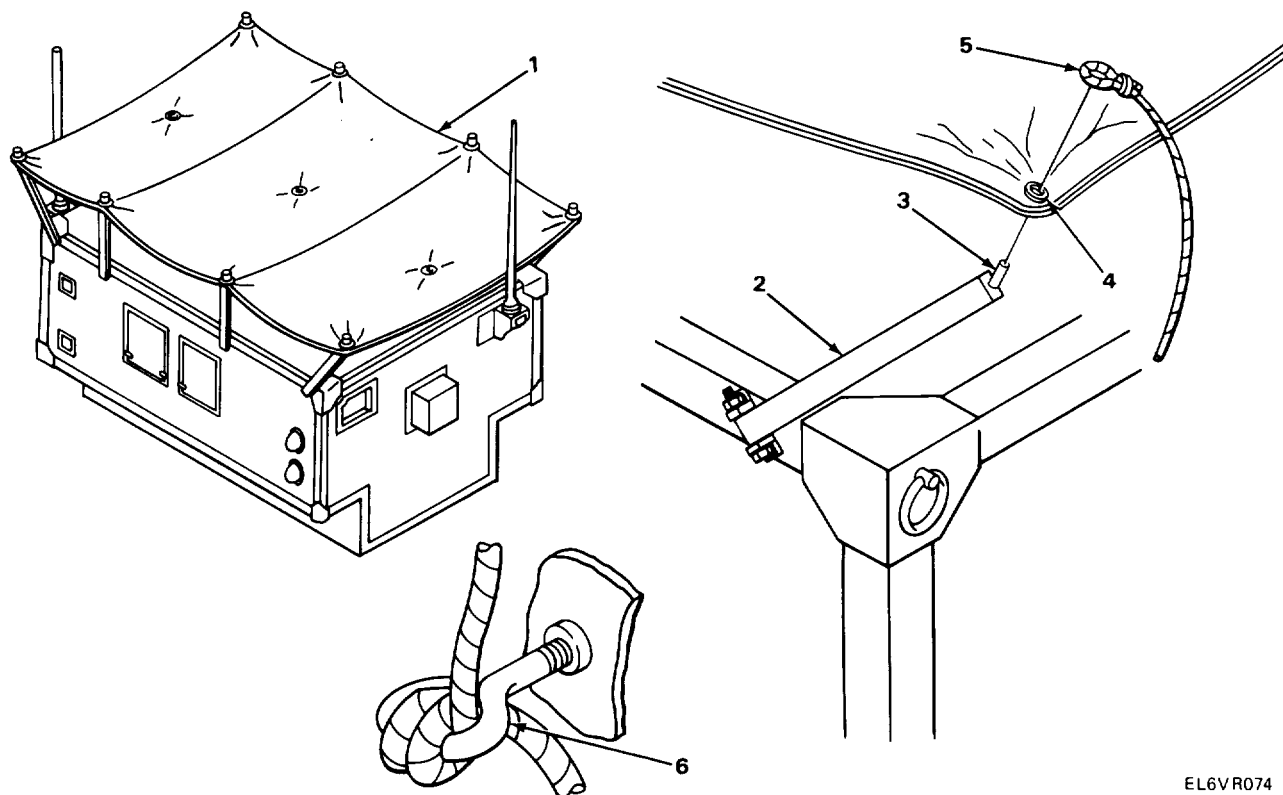
CAUTION

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.



EL6VR074

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

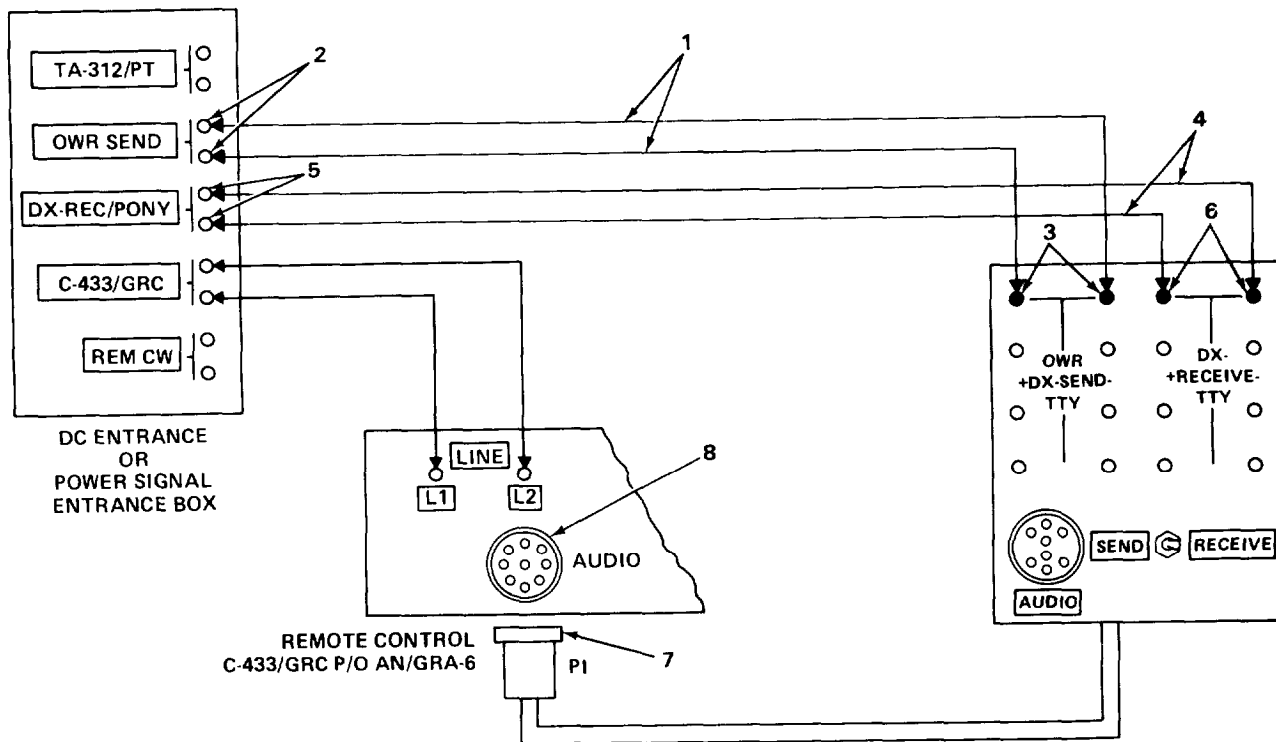
NOTE

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:



EL6VR076

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.

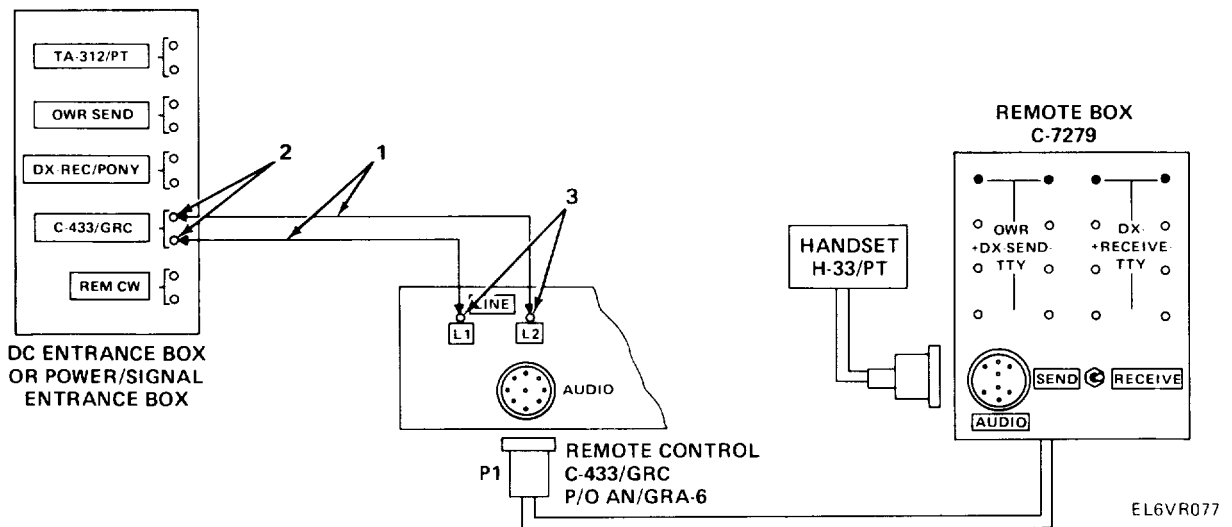
2. Connect field wire (4) from DC ENTRANCE BOX or POWER/SIGNAL ENTRANCE BOX DX-REC/PONY terminals (5) to remote box DX-RECEIVE TTY terminals (6).
3. Connect pendant plug P1 (7) to remote control C-433/GRC AUDIO connector (8).

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:



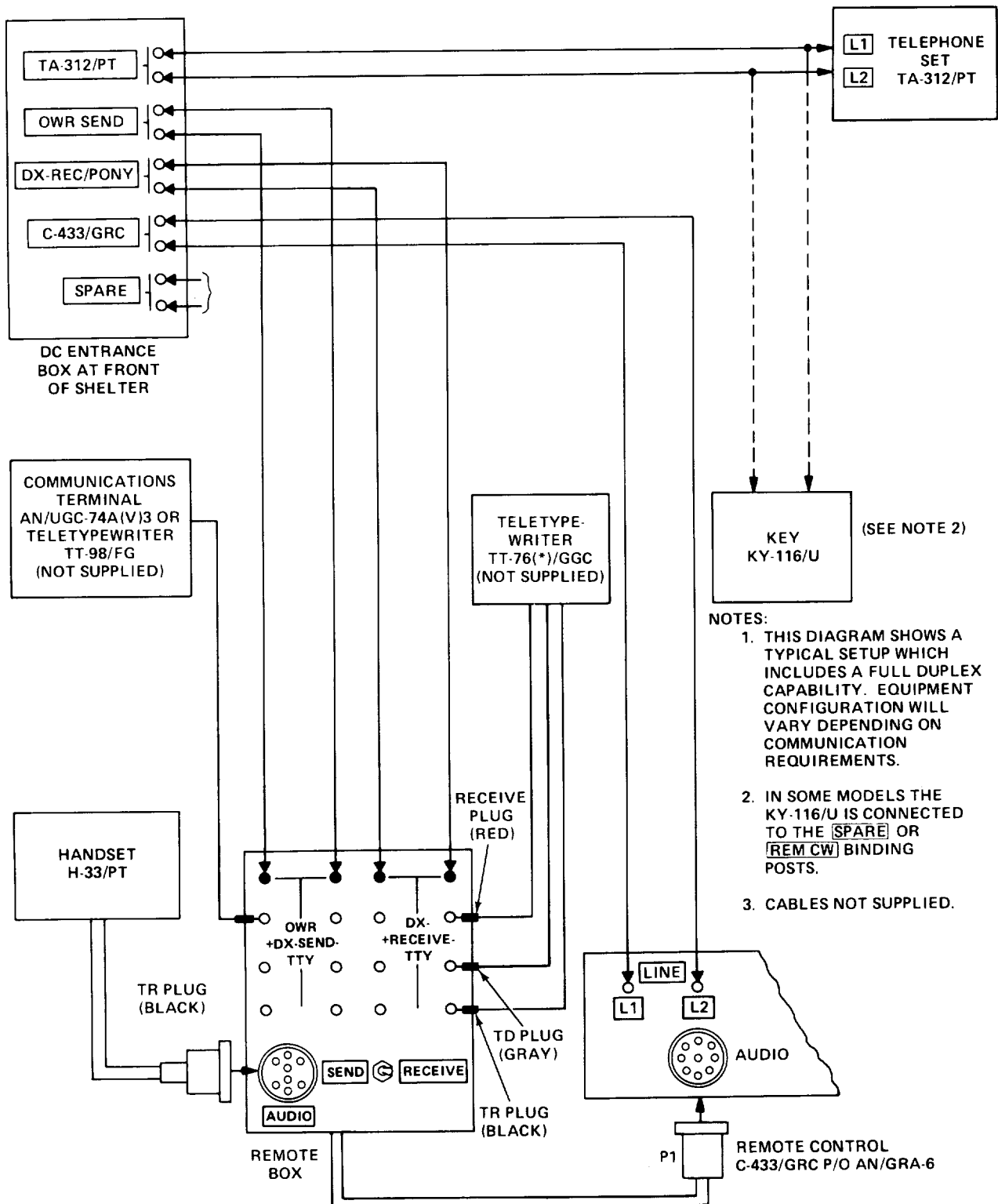
1. Connect field wires (1) from DC ENTRANCE BOX or POWER/SIGNAL ENTRANCE BOX C-433/GRC terminals (2) to remote control jacks L1 and L2 (3).
2. Mark remote control SELECTOR switch as follows: Left switch position 1 and middle switch position 2.

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

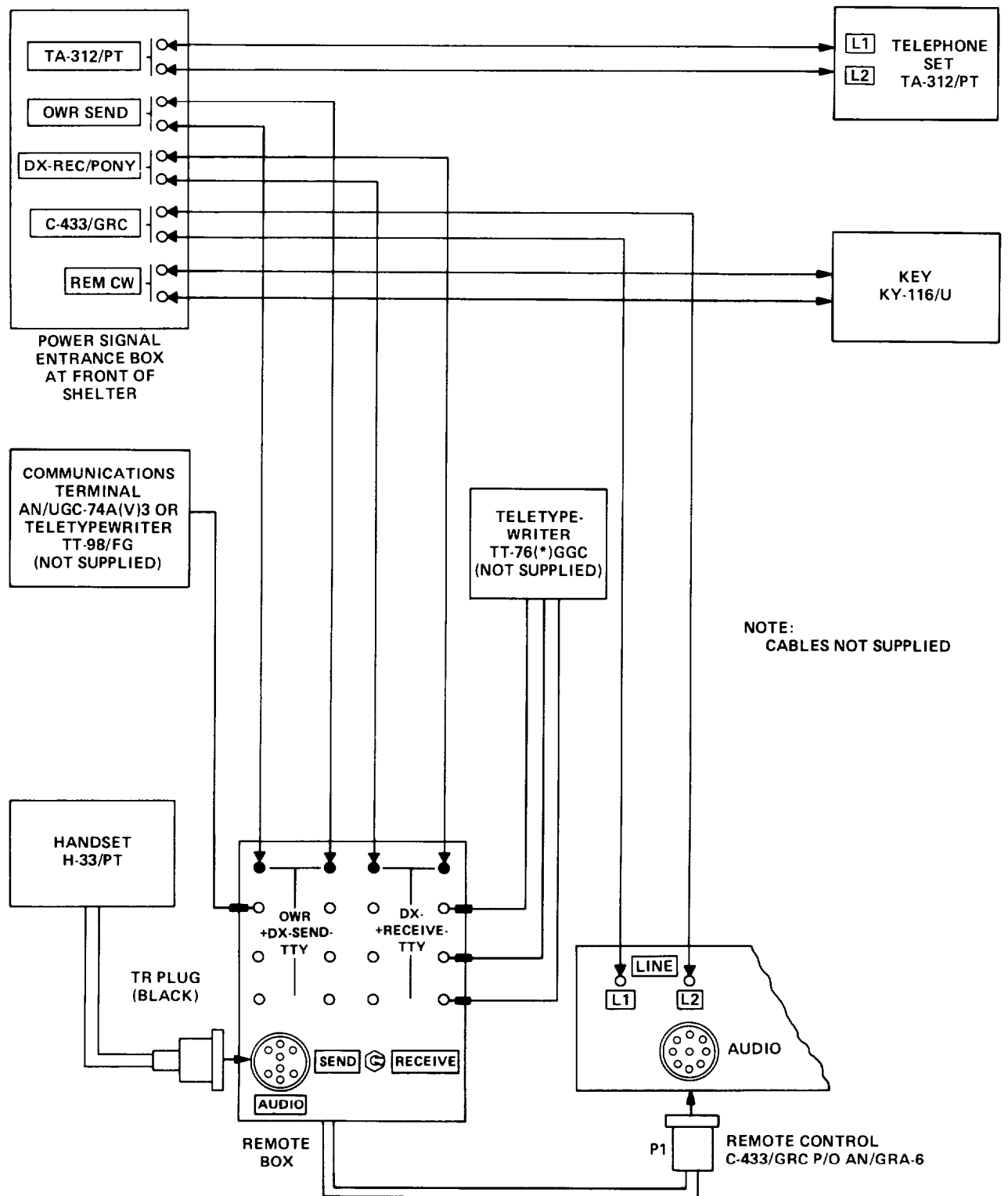


NONSECURE RADIO TTY SETUP FOR AN/GRC-122/142 PLAIN AND C MODELS

EL6VR078

2-20. REMOTE EQUIPMENT INSTALLATION. (CONT)

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

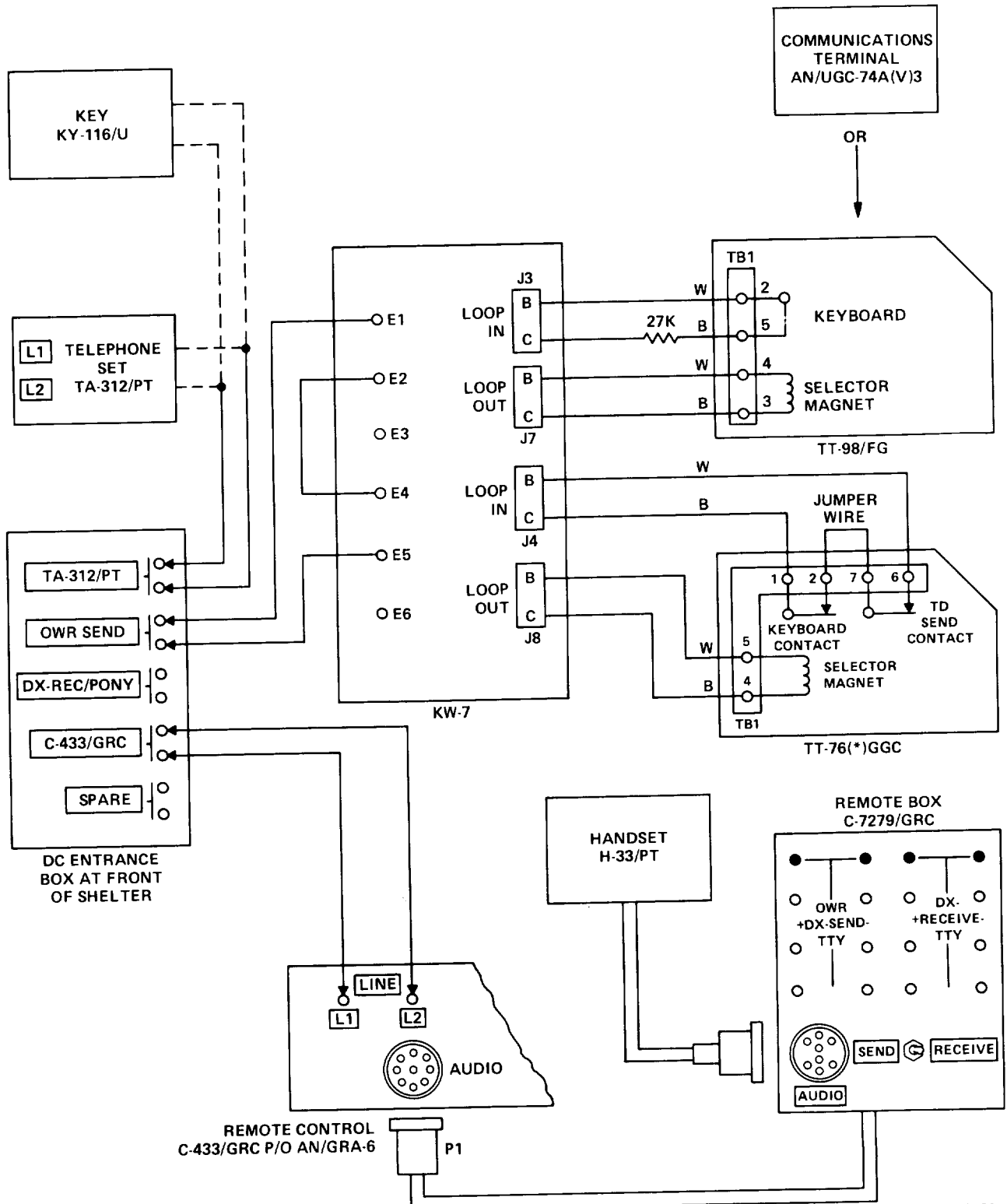


NONSECURE REMOTE SETUP FOR AN/GRC-122/142A, B, D, AND E MODELS

EL6VR079

2-20. REMOTE EQUIPMENT INSTALLATION. (CONT)

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

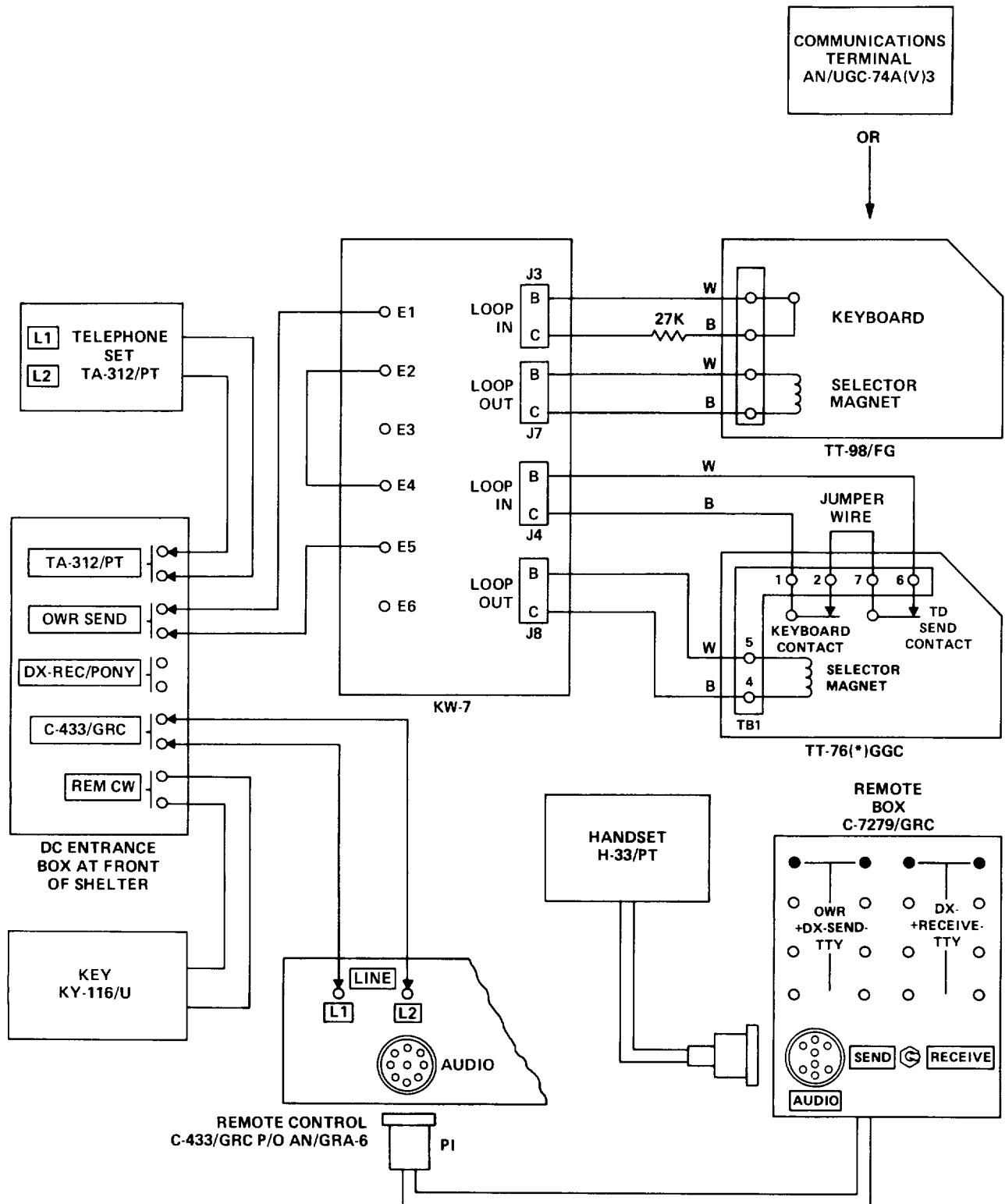


SECURE REMOTE SETUP FOR AN/GRC-122/142 PLAIN AND C MODELS

EL6V R080

2-20. REMOTE EQUIPMENT INSTALLATION. (CONT)

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



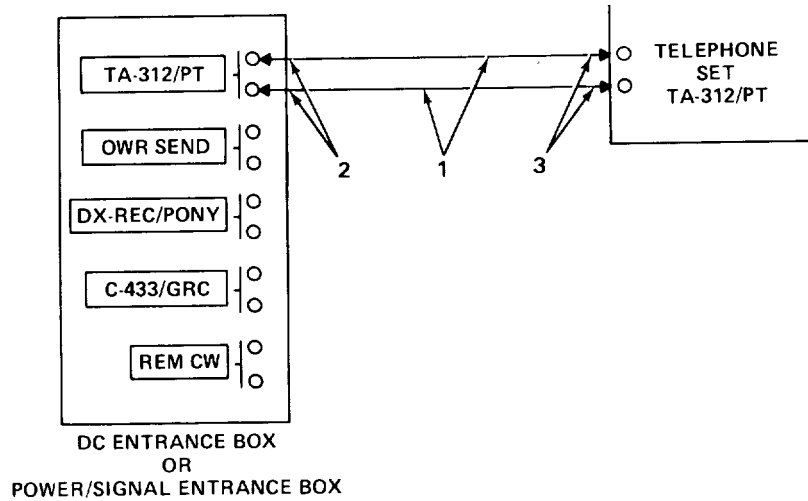
SECURE REMOTE SETUP FOR AN/GRC-122/142A, B, D AND E MODELS

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:



EK6VR082

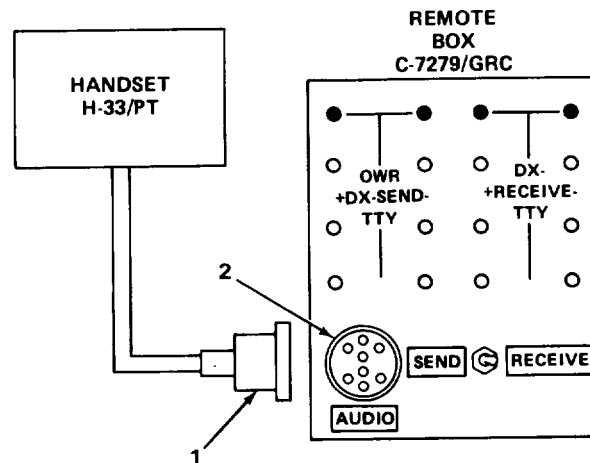
Connect field wires (1) from DC ENTRANCE BOX or POWER SIGNAL ENTRANCE BOX TA-312/PT terminals (2) to TA-312/PT terminals (3).

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.

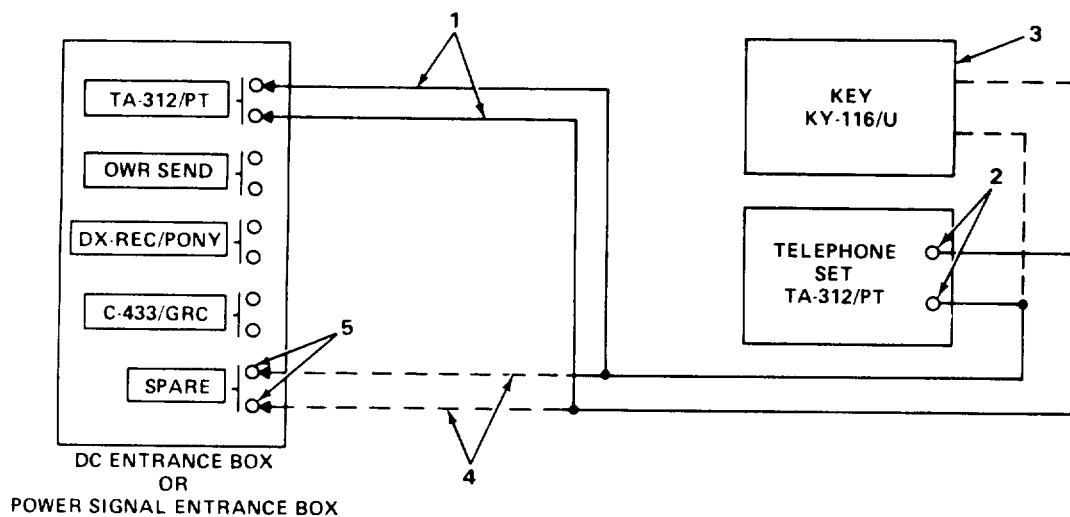
2-20. REMOTE EQUIPMENT INSTALLATION. (CONT)

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:



EL6VR084

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-122/142 A, 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.

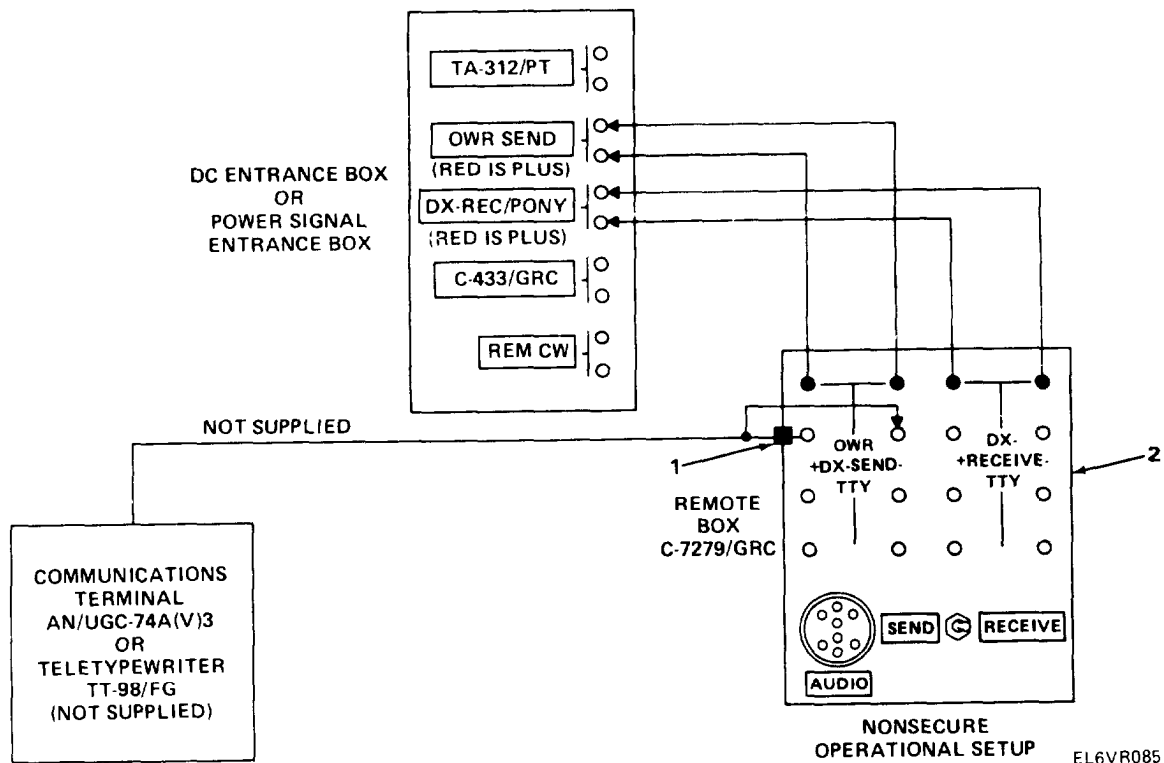
TT-98/FG selector magnet wiring must be checked prior to installation and set to same loop current as shelter (20 or 60 ma). Refer to paragraph 2-22 for loop current adjustments. Refer to TM 11-5815-200-12 for all initial unpacking, switch positions, and adjustments of TT-98/FG.

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.

NOTE

Part number SM-D-015889 is used with AN/UGC-74(V)3.

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



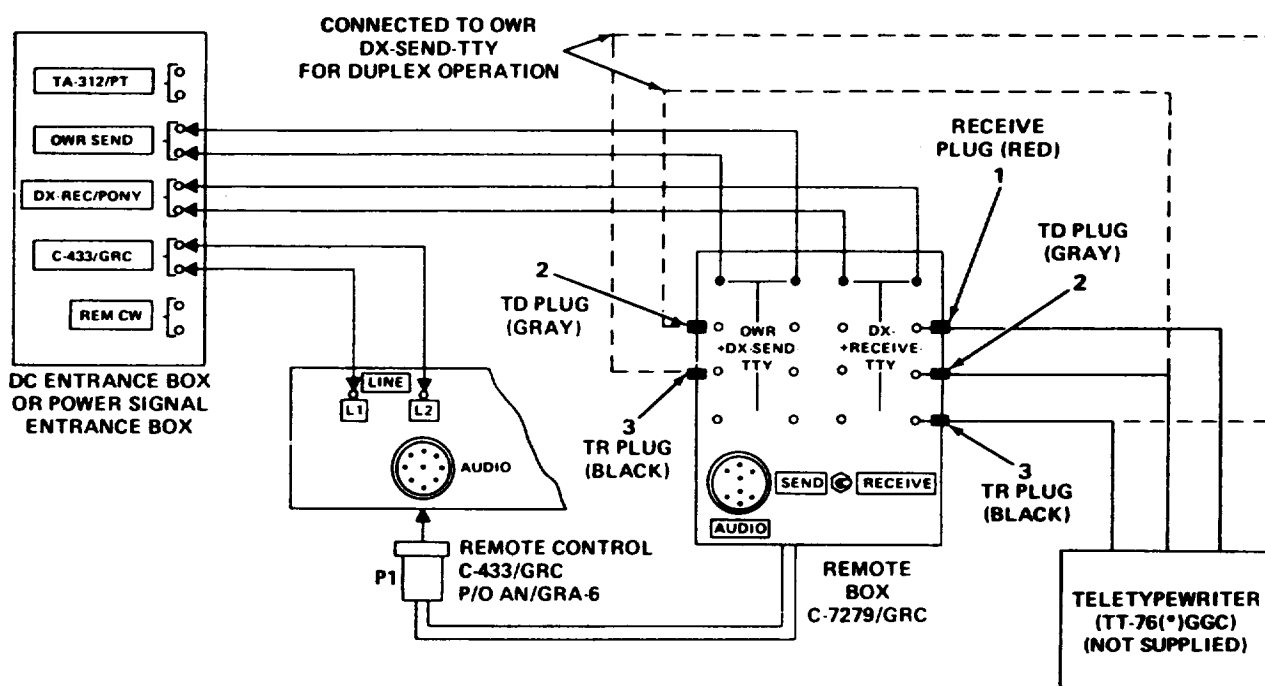
For nonsecure operation, plug TT-98/FG or AN/UGC-74A(V)3 cord (1) into OWR-DX-SEND TTY jack of remote box (2).

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.

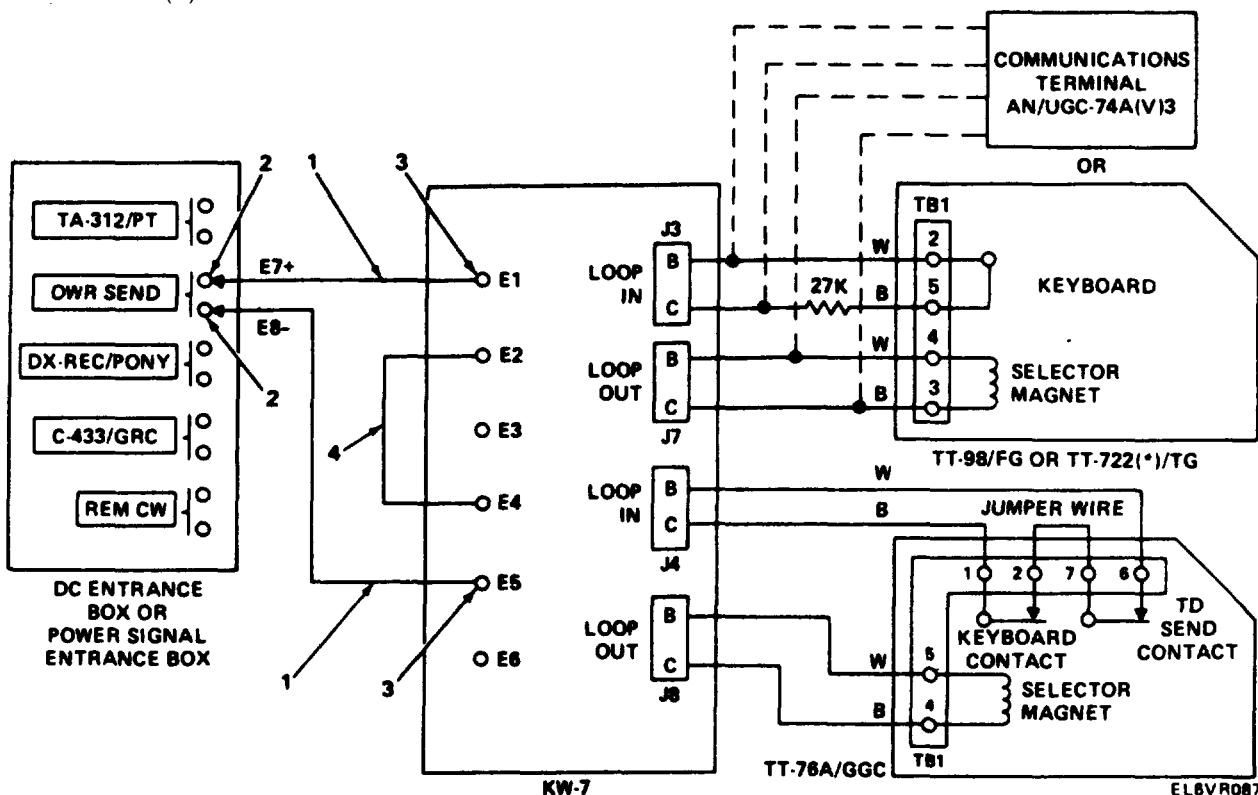
2-20. REMOTE EQUIPMENT INSTALIATION. (CONT)

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 fallows:

- Cable W6 Loop In (NSN 5995-00-955-1770)
- Cable W7 Loop Out (NSN 5995-00-955-1767)
- Resistor 27 Kiloohm (NSN 5905-00-299-2020)
- AC Power Cable (Ctypto) (NSN 5995-00-955-1766)
- AC Power Cable [AN/UGC-74A(V) (NSN 5995-00-271-9444)]

Obtain a special cable assembly 5995-01-131-9661, part number SM-D-964513, to connect AN/UGC-74A(V) to KW-7.



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

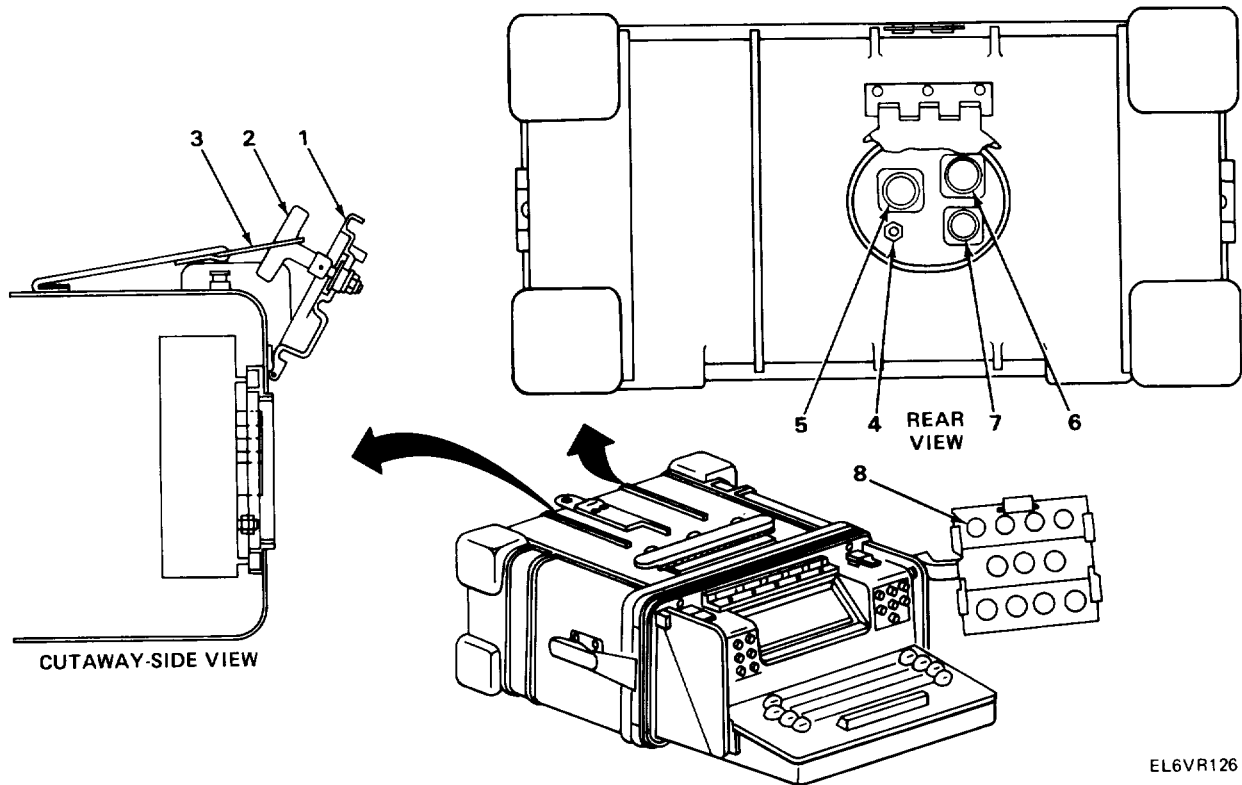
Preliminary starting procedures for AN/UGC-74A(V)3 will be done by operator at a remote site.

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)



EL6VR126

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.

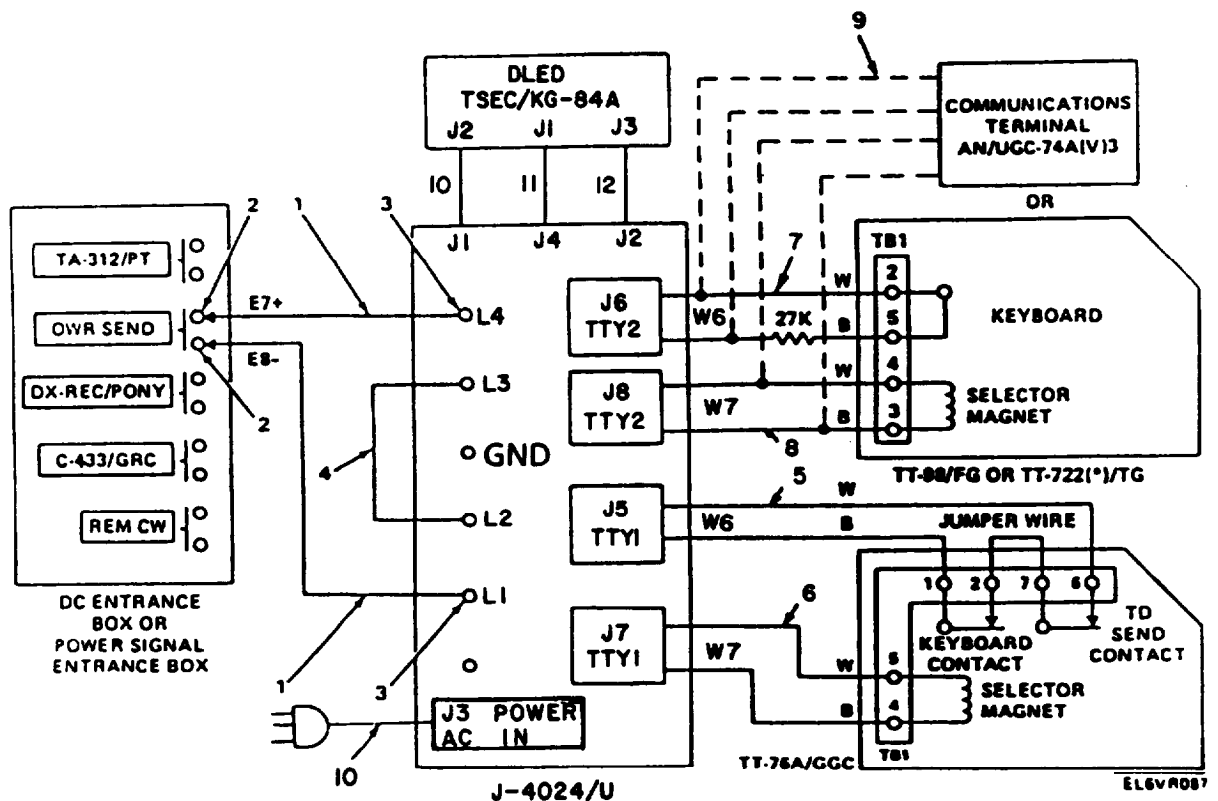
5. Connect appropriate signal line to J1 clock and data connector (5).
6. Connect primary power cable to power source and J2 power connector (6).
7. Connect an appropriate 12 vdc power source or backup battery to J3 backup connector (7).
8. Install cardholder (8) (TM 11-581 5-602-12).

2-20. REMOTE EQUIPMENT INSTALLATION. (CONT)

REMOTE SECURE TT76(*)/GGC, TT-98/FG OR AN/UGC-74A(V)3 OWR OPERATION IN MODELS WITH MK-2488/G (CONT)

For remote secure obtain, obtain the following components for TT-76(*)/GGC and TT-96/FG connection to remote box. For use with the TSEC/KG-84A, the TT-76(*)/GGC and TT098/FG must be modified to operate at 50 or 75 baud (67 or 100 wpm). Connect secure remote tty's as follows:

- Cable W6 LoopIn (NSN 5995-00-955-1770)
- Cable W7 Loop Out (NSN 5995-00-955-1767)
- Resistor 27 Kiloohm (NSN 5905-00-299-2020)
- AC Power Cable (Crypto) (NSN 5995-00-955-1766)
- AC Power Cable [AN/UGC-74A(V) (NSN 5995-00-271-9444)]
- Cable Assembly, Power, Electrical, CX-13315/G (NSN 5995-01-216-1989)
- Cable Assembly, Special Purpose, Electrical, CX-13316/G (NSN 5995-01-216-1999)
- Cable Assembly, Special Purpose, Electrical, CX-13317/G (NSN 5995-01-216-2000)



1. Connect field wires (1) from POWER SIGNAL ENTRANCE BOX E7 + and E8 - terminals (2) to Interconnecting Box, J4024/U L4 and L1 jacks (3).
2. Connect a jumper (4) from J4024/U terminals L3 to L2.

NOTE

Banana plugs must be attached to the field wires for connection to L1 through L4. In addition a length of wire to a banana plug will be attached to GND. GND panel marking corresponds to schematic designation L5.

2-20. REMOTE EQUIPMENT INSTALLATION (CONT)

REMOTE SECURE TT-76(*)/GGC, TT-98/FG OR AN/UGC-74A(V)3 OWR OPERATION IN MODELS WITH MK-2488/G (CONT)

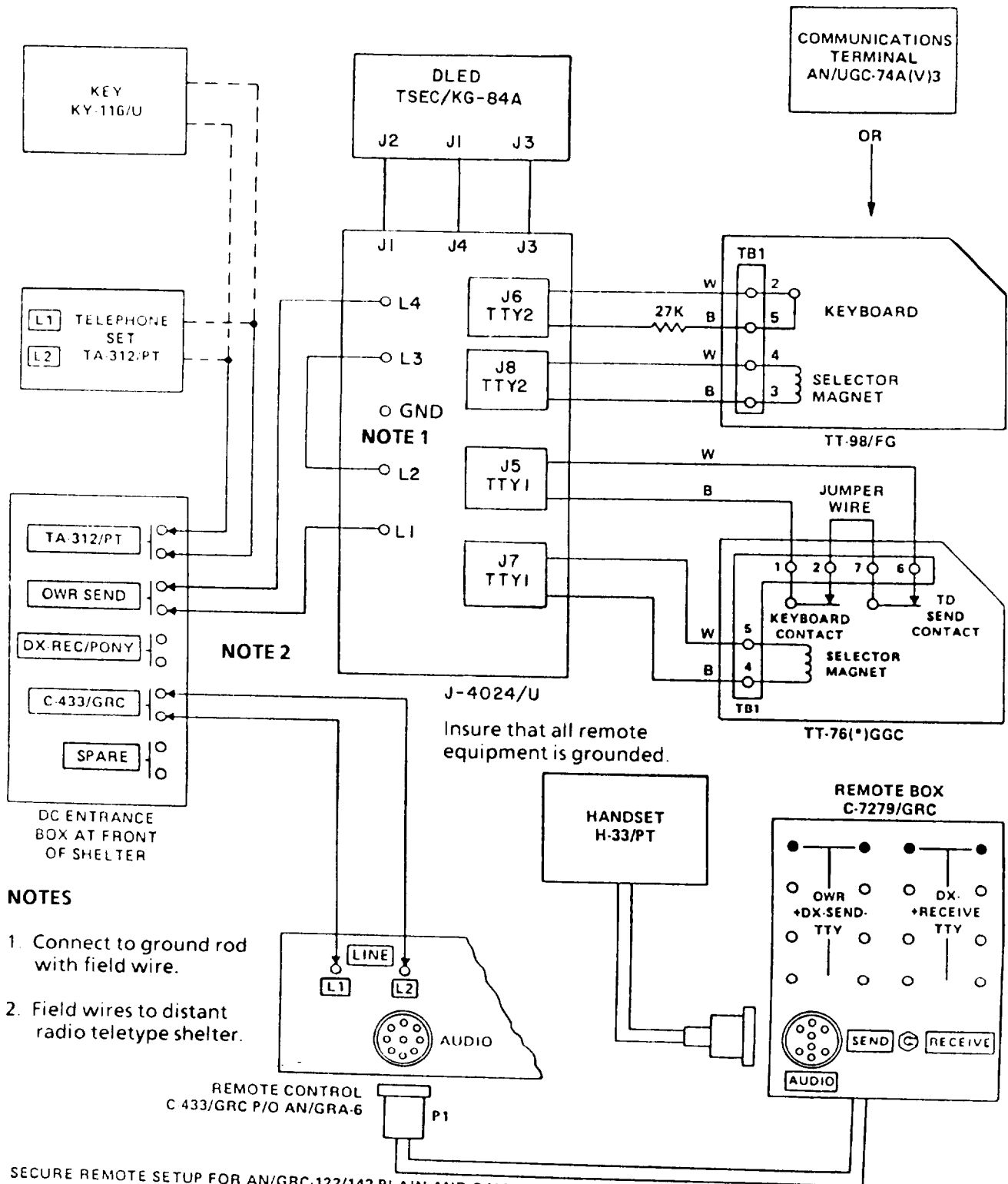
3. Connect Cable W6 (5) from TT-76A/GGC to J5, TTY 1, Red Transmitter, on the J-4024/U.
4. Connect Cable W7 (6) from TT-76A/GGC to J7, TTY 1, Red Receiver on the J-4024/U. If your are using a TT-98/FG, do steps 5 and 6. If you are using an AN/UGC-74A(V)3, do steps 7 through 9.
5. Connect Cable W6 (7) from the TT-98/FG to J6, TTY 2, Red Transmitter on the J-4024/U.
6. Connect Cable W7 (8) form the TT-98/FG to J8, TTY 2, Red Receiver, on the J-4024/U.
7. Connect the large, single-connector end of Cable Assembly CX-13253 to the AN/UGC-74A(V)3.
8. Connect the send side of AN/UGC-74A(V)3 cable assembly to J6, TTY 2, Red Transmitter, on the J-4024/U .
9. Connect the receive side of AN/UGC-74A(V)3 cable assembly to J8, TTY 2, Red Receiver on the J-4024/U.
10. Select Cable Assembly, Special Purpose, Electrical, CX-13317/G (10) and connect the J-4024/U end to J 1 on the J-4024/U rear panel.
11. Select Cable Assembly, Power, Electrical, CX-13315/G(11) and connect the J-4024/U end to J4 on the J-4024/U rear panel.
12. Select Cable Assembly, Special Purpose, Electrical, CX-13316/G (12) and connect the J-4024/U end to J2 on the J-4024/U rear panel.
13. Connect the KG-84 end of the Cable Assembly, Special Purpose, Electrical, CX-13317/G (10) to J2, BLACK I/O on the DLED.
14. Connect the KG-84 end of the Cable Assembly, Power, Electrical, CX-13315/G (11) to J 1, POWER on the DLED.
15. Connect the KG-84 end of the Cable Assembly, Special Purpose, Electrical, CX-13315/G (12) to J3, RED I/O, on the DLED.
16. Connect the crypto end of the ac power cable to J3, AC POWER IN (1 O) ON THE J-4024/U rear panel.
17. Connect the other end of the ac power cable to the ac power source.

For remote locations, follow steps 1 through 17 above, and install wiring as shown in the following illustrations.

When in remote operation, the remote J4024/U interface is used in place of the shelter-mounted J-4024/U. The remote J-4024/U applies its encrypted signals via field wire to the radio modem MD-522. In remote half duplex, 2-wire loop is used. For Duplex, 4 wire loop is used.

2-20. REMOTE EQUIPMENT INSTALLATION (CONT)

SECURE REMOTE SETUP FOR AN/GRC-122/142 PLAIN AND C MODELS WITH MK-2488/G OWR OPERATION

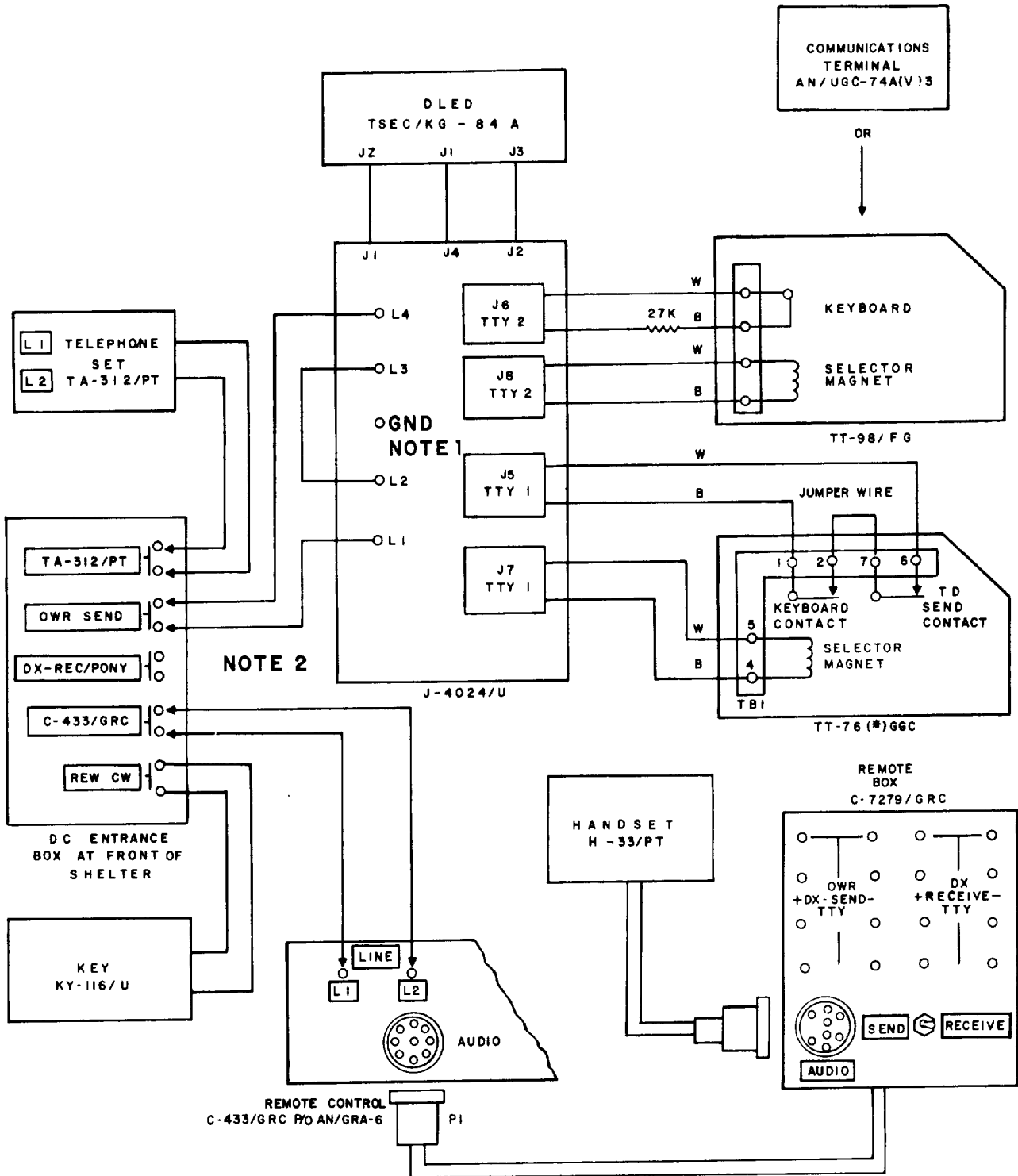


SECURE REMOTE SETUP FOR AN/GRC-122/142 PLAIN AND C MODELS WITH MK-2488/G

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2-20. REMOTE EQUIPMENT INSTALLATION (CONT)

SECURE REMOTE RADIO TTY SETUP FOR AN/GRC-122/142A, B, D, AND E MODELS WITH MK-2488/G OWR OPERATION..



SECURE REMOTE SETUP FOR AN/GRC-122/142A, B, D AND E MODELS WITH MK-2488/G

NOTES

1. CONNECT TO GROUND ROD WITH FIELD WIRE.
2. FIELD WIRES TO DISTANT RADIO TELETYPE SHELTER.

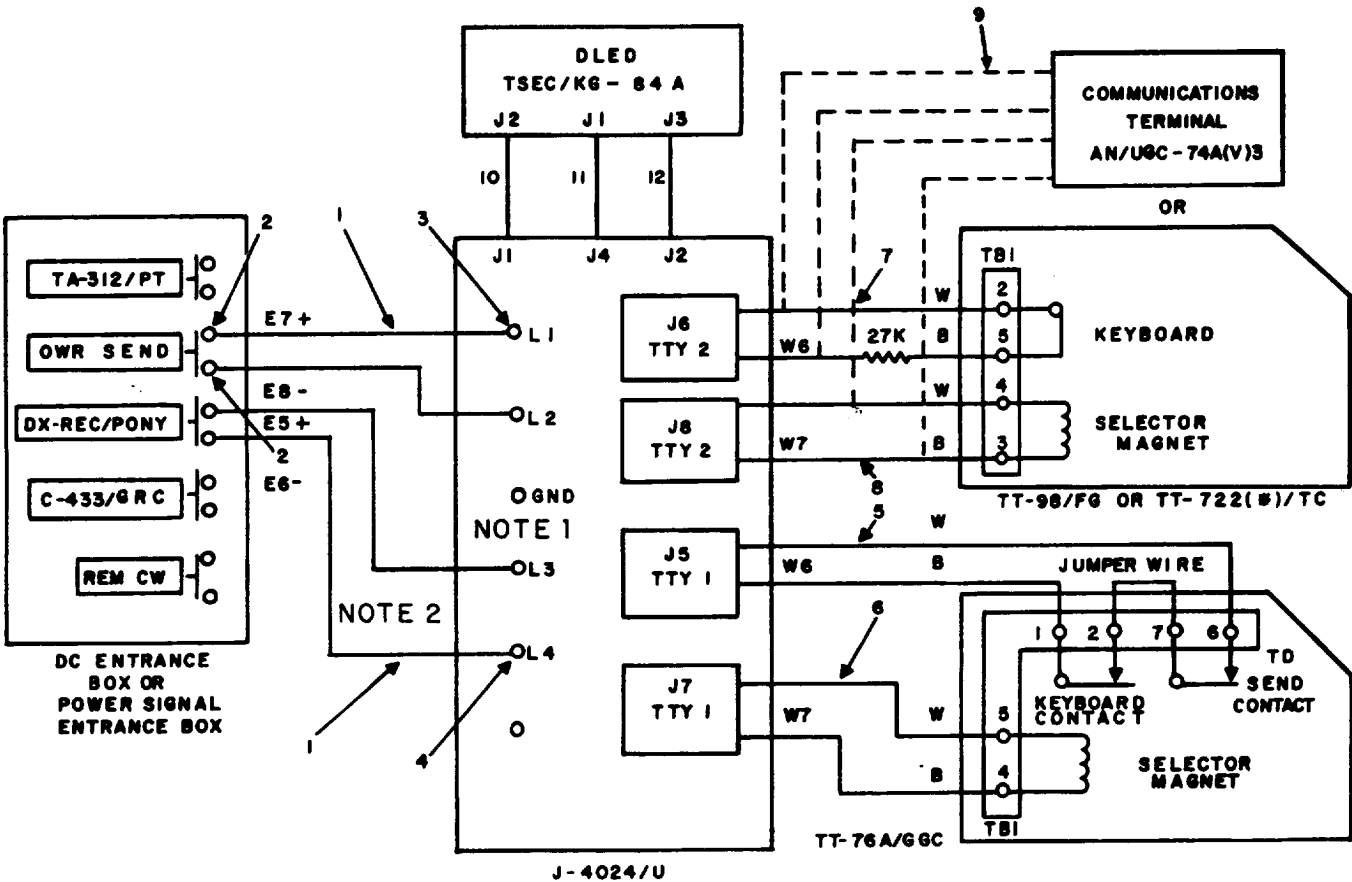
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2-20. REMOTE EQUIPMENT INSTALLATION. (CONT)

REMOTE SECURE TT-76(*)/GGC, TT-98/FG OR AN/UGC-74A(V)3 DUPLEX OPERATION IN MODELS WITH MK-2488/G

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

- Cable W6 Loop In (NSN 5995-00-955-1770)
- Cable W7 Loop Out (NSN-5995-00-955-1767)
- Resistor 27 Kiloohm (NSN 5905-00-299-2020)
- AC Power Cable (Crypto) (NSN 5995-00-955-1766)
- Cable Assembly, Power, Electrical, CX-13315/G (NSN 5995-01-216-1989)
- Cable Assembly, Special Purpose, Electrical, CX-13316/G (NSN 5995-01-216-1999)
- Cable Assembly, Special Purpose, Electrical, CX-13317/G (NSN 5995-01-216-2000)
- AC Power Cable [AN/UGC-74A(V)] (NSN 5995-00-271-9444)



- NOTES
1. Connect to ground rod with field wire.
 2. Field wires to distant radio teletype shelter.

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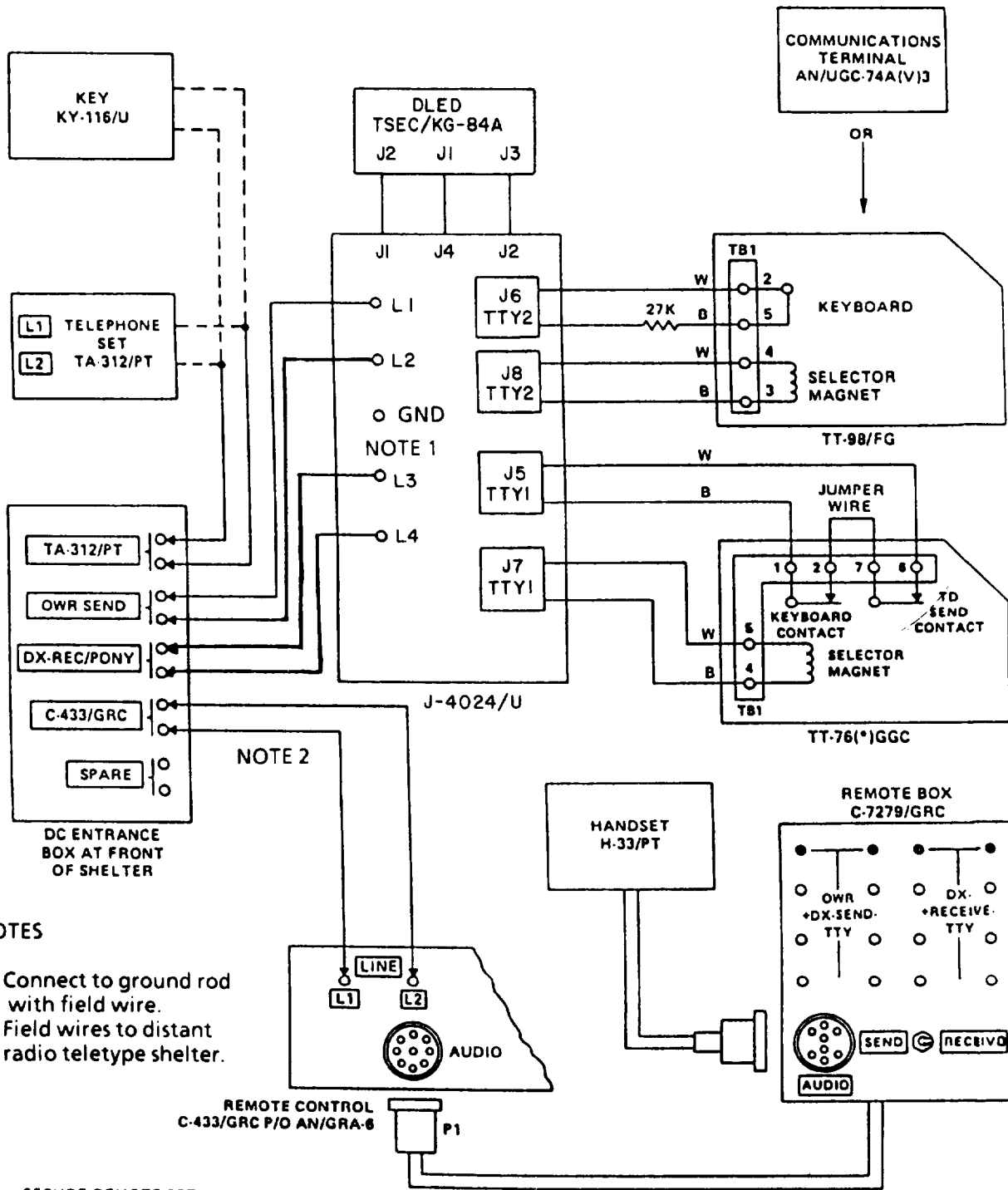
2-20.1. REMOTE EQUIPMENT OPERATION (CONT)**REMOTE SECURE TT-76 (*)/GGC, TT-98/FG OR AN/UGC-74(V)3 DUPLEX OPERATION IN MODELS WITH MK-2488/G**

Follow the Steps 3 through 15 at the remote sites as illustrated by the following two pages. Field wires from distant shelters will connect to J4024/U box as shown.

1. Connect field wires (1) from POWER SIGNAL ENTRANCE BOX E7 + and E8 - terminals (2) to Interconnecting Box, J-4024/U L1 and L2 jacks (3). (Note: Banana plugs must be connected to the field wires for connection to the J-4024/U).
2. Connect field wires (1) from POWER SIGNAL ENTRANCE BOX E5 + and E6 - terminals (2) to Interconnecting Box L3 and L4 jacks. (Note: Banana plugs must be connected to the field wires for connection to the J-4024/U).
3. Connect Cable W6 (5) from TT-76A/GGC to J5, TTY 1, Red Transmitter, on the J-4024/U.
4. Connect Cable W7 (6) from TT-76A/GGC to J7, TTY 1, Red Receiver, on the J-4024/U. If you are using a TT-98/FG, do steps 5 and 6. If you are using an AN/UGC-74A(V)3, steps 7 through 9.
5. Connect Cable W6 (7) from the TT-98/FG to J6, TTY 2, Red Transmitter, on the J-4024/U.
6. Connect Cable W7 (8) from the TT-98/FG to J8, TTY 2, Red Receiver, on the J-4024/U.
7. Connect the large, single-connector end of Cable Assembly, CX-13253 to the AN/UGC-74A(V)3.
8. Connect the send side of Cable Assembly CX-13253 to J6, TTY 2, Red Transmitter, on the J-4024/U.
9. Connect the receiver side of Cable Assembly CX- 13253 to J8, TTY 2, Red Receiver on the J-4024/U.
10. Select Cable Assembly, Special Purpose, Electrical, CX-13317/G (10) and connect the J-4024/U end to J1 on the J-4024/U rear panel.
11. Select Cable Assembly, Power, Electrical, CX-13315/G (11) and connect the J-4024 end to J4 on the J-4024/U rear panel.
12. Select Cable Assembly, Special Purpose, Electrical, CX-13316/G (12) and connect the J-4024/U end to J2 on the J-4024/U rear panel.
13. Connect the KG-84 end of the Cable Assembly, Special Purpose, Electrical, CX-13317/G (10) to J2, BLACK I/O, on the DLED.
14. Connect the KG-84 end of the Cable Assembly, Power, Electrical, CX-13315/G (11) to J1, POWER, on the DLED.
15. Connect the KG-84 end of the Cable Assembly, Special Purpose, Electrical, CX-13316/G (12) to J3, RED I/O, on the DLED.

2-20.1. REMOTE EQUIPMENT OPERATION (CONT)

SECURE REMOTE SETUP FOR AN/GRC-122 PLAIN AND C MODELS WITH MK-2488/G DUPLEX OPERATION



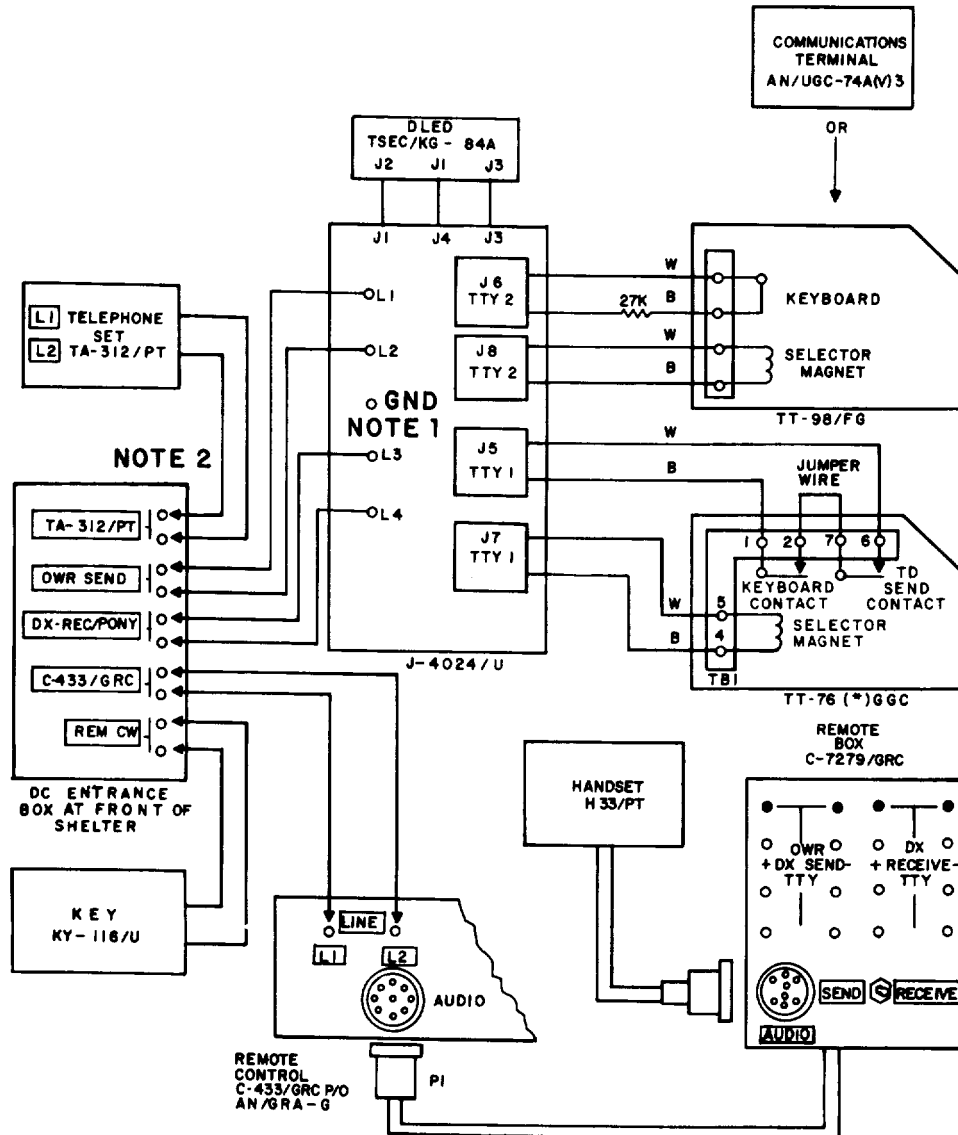
- NOTES
1. Connect to ground rod with field wire.
 2. Field wires to distant radio teletype shelter.

SECURE REMOTE SETUP FOR AN/GRC-122 PLAIN AND C MODELS WITH MK-2488/G EL6VF080

2-20.1. REMOTE EQUIPMENT INSTALLATION (CONT)

SECURE REMOTE TTY SETUP FOR AN/GRC-122A, B, D AND E MODELS WITH MK-2488/G DUPLEX OPERATION

TM 11-5815-334-10



SECURE REMOTE SETUP FOR AN/GRC -122/142 PLAIN AND C MODELS WITH MK - 2488/G

- NOTES
1. CONNECT TO GROUND ROD WITH FIELD WIRE.
 2. FIELD WIRE TO DISTANT RADIO TELETYPE SHELTER.

ELGVR080

2-21. SECURITY EQUIPMENT TSEC/KW-7 INSTALLATION IN MODELS WITHOUT MK-2488/G.

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, TSEC/KW-7.

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. Upper and lower security shelves used when T/SEC-KW7 security equipment is installed. Two T/SEC- KW7's are needed for Duplex operation.

2-21. SECURITY EQUIPMENT TSEC/KG-84 INSTALLATION (CONT)

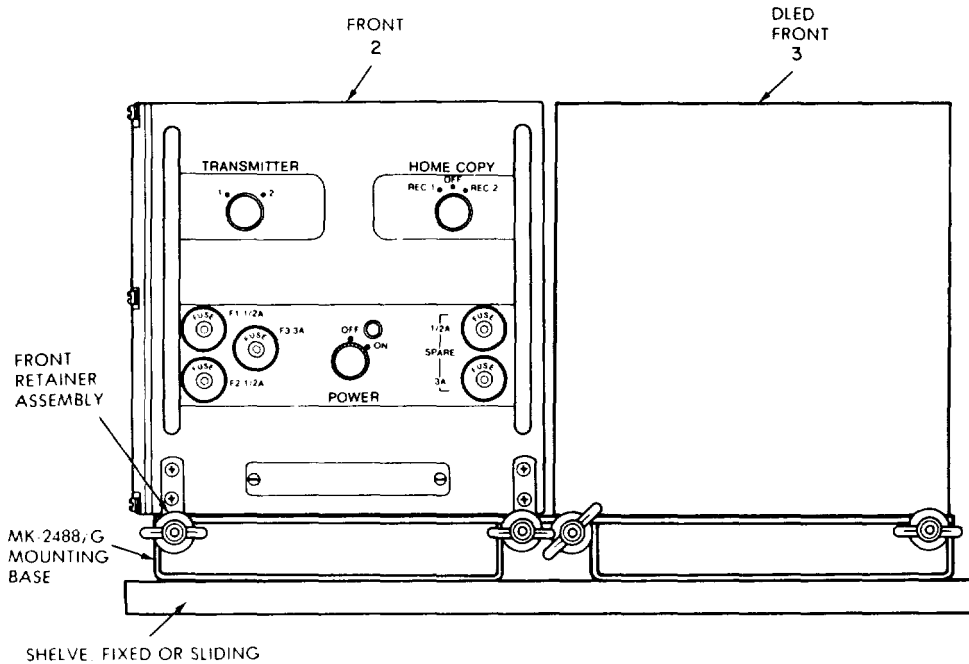
MOUNTING BASE MT-6442/G

The mounting base for security equipment, MK-2488. Mounting Base MT-6442/G(1) will hold one Interconnecting Box J-4024/U (2) and one DLED, TSEC/KG-84A (3). Connections for various modes of operation are described in the following pages.

Application of modification of Appendix E in TM 11-5815-616-13 installs the mounting base in selected models to provide updated secure communication with DLED, TSEC/KG-84A and J-4024/U hookup. Do not attempt to use a DLED, TSEC/KG-84A unless the modification has been implemented.

CAUTION

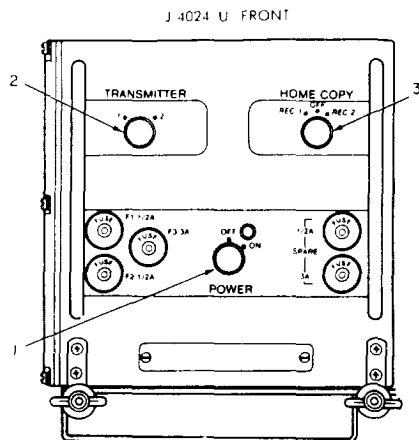
MAKE SURE THAT THE MD-522(*)/GRC is turned off before disconnecting wires or cables from a dummy box or associated equipment.



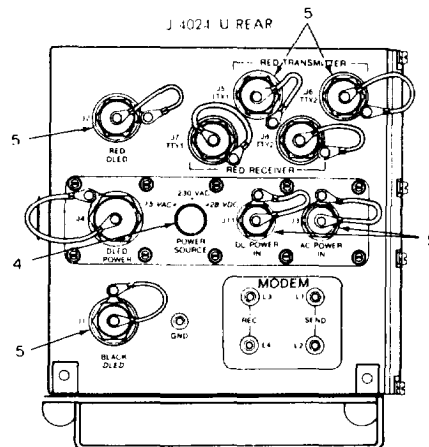
2-21. SECURITY EQUIPMENT INSTALLATION (CONT)

INITIAL SET UP J-4024/U

1. Operate the POWER SOURCE switch (4) on the rear panel to match the primary shelter power to which the J-4024/U is connected (In AN/GRC-122/142 plain and C (with MK-2488/G) set to 28 VDC. In AN/GRC-122/142 A, B, D, & E (with MK-2488/G) set to either 28 VDC or 115 VAC).
2. Operate the POWER switch (1) on the front panel to OFF.
3. Operate the HOME COPY switch (3) on the front panel to position 1.
4. Operate the TRANSMITTER switch (2) on the front panel to position 1.
5. Remove the protective covers from all the connectors (5) on the rear of the J-4024/U, except from the connectors which will not be used.



1

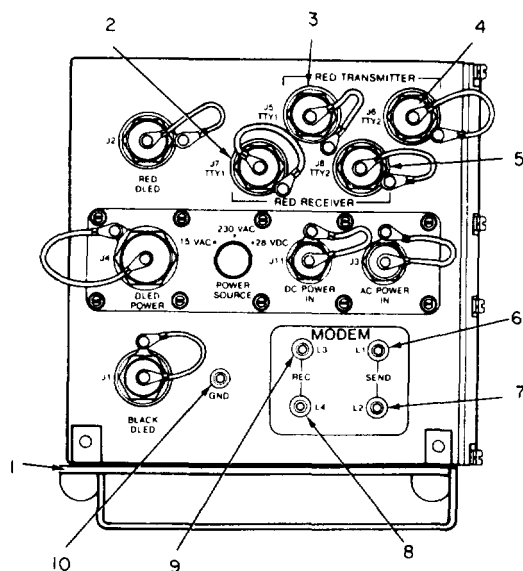


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21. SECURITY EQUIPMENT INSTALLATION (CONT)

INSTALLATION OF J-4024AJ IN OWR POSITION

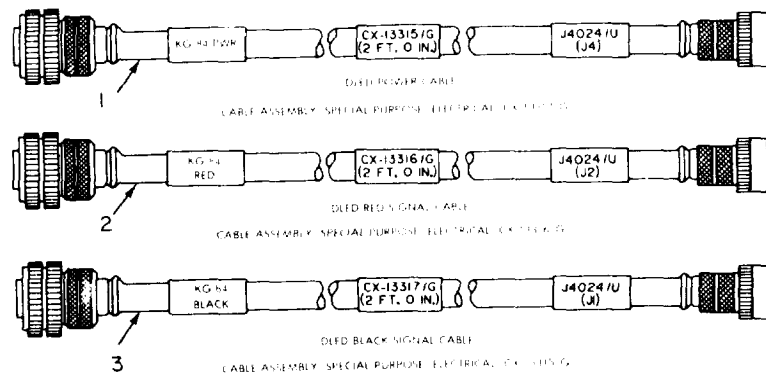
1. Rest the J-4024/U atop the mounting base (1) so as to provide access to the rear panel.
2. Disconnect Cable W1 from the switch box, (SA-1555/GRC in Plain and C models; SA-1650/GRC in A, B, D & E models) and connect it to J5 (3) on the rear of the J-4024/U.
3. Disconnect Cable W6 from the switch box and connect it to J7 (2) on the J-4024/U.
4. Disconnect Cable W2 from the switch box and connect it to J6 (4) on the J-4024/U.
5. Disconnect Cable W5 from the switch box and connect it to J8 (5) on the J-4024/U.



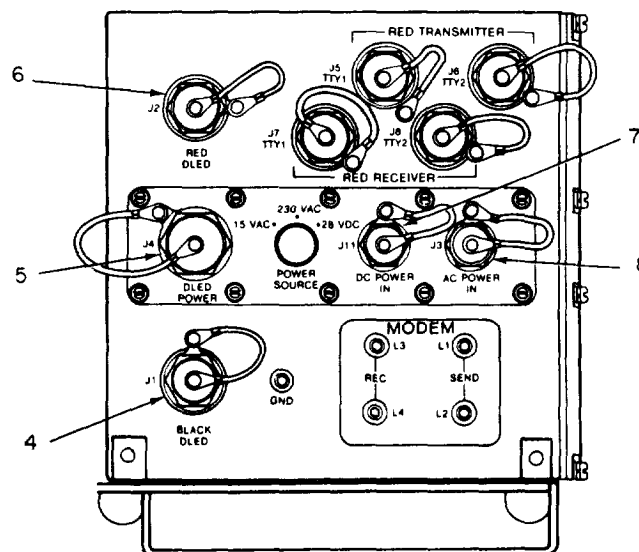
6. In AN/GRC-142(*)122 (with MK-2488/G) for OWR operation, connect a jumper cable between banana connectors L2 (7) and L3 (9) on the J-4024/U.
7. Disconnect the three color-coded banana plugs (W12) from the dummy box J-2728/GRC/142 and connect them as follows on the J-4024/U:
 - a. Black banana plug to GND(10).
 - b. Blue banana plug to L4 (8).
 - c. White banana plug to L1 (6).

SECURITY EQUIPMENT INSTALLATION (CONT)

INSTALLATION OF J-4024/U IN OWR POSITION

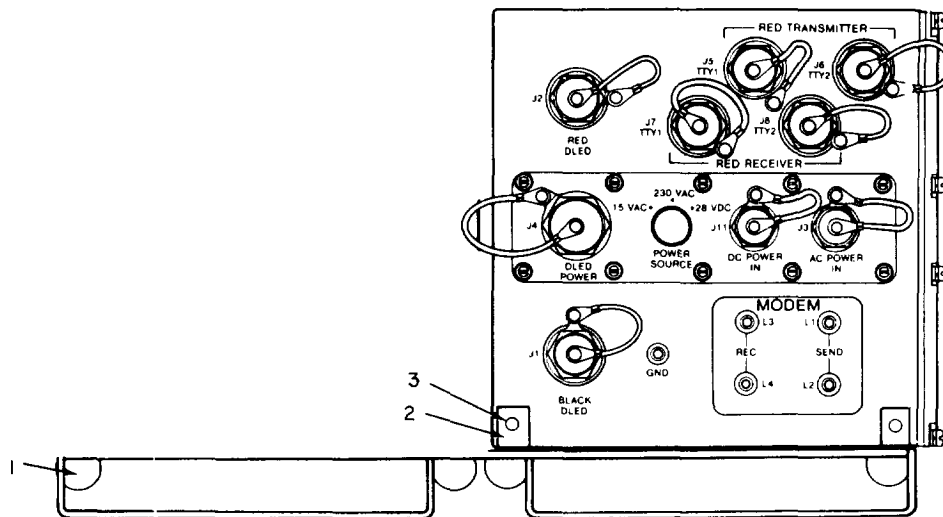


8. Select Cable Assembly, Special Purpose, Electrical, CX-13317/G (3) and connect J-4024/U end to J1 (4) on the J-4024/U rear panel.
9. Select Cable Assembly, Power, Electrical, CX-13315/G (1) and connect the J-4024/U end to J-4 (5) on the J-4024/U rear panel.
10. Select Cable Assembly, Special Purpose, Electrical, CX-13316/G (2) and connect the J-4024/U end to J2 (6) on the J-4024/U rear panel.
11. Disconnect the W28 power (DC) cable from clip on the J-2728/GRC-142 Dummy Box and connect it to J11, DC POWER IN (7) on the J-4024/U rear panel. In the AN/GRC-122/142 A, B, D and E models with MK-2488/G only, disconnect the W68 power (AC) cable from its clip on the rack and connect it to J3, AC POWER IN (8) on the J-4024/U rear panel in addition to the J11 connections.



2-21. SECURITY EQUIPMENT INSTALLATION (CONT)

INSTALLATION OF J-4024/U IN OWR POSITION



12. Carefully and slowly slide the J-4024/U onto the mounting base (1) to engage the left rear retaining pins (2) into the rear panel retainer guide holes (3) on the J-4024/U.

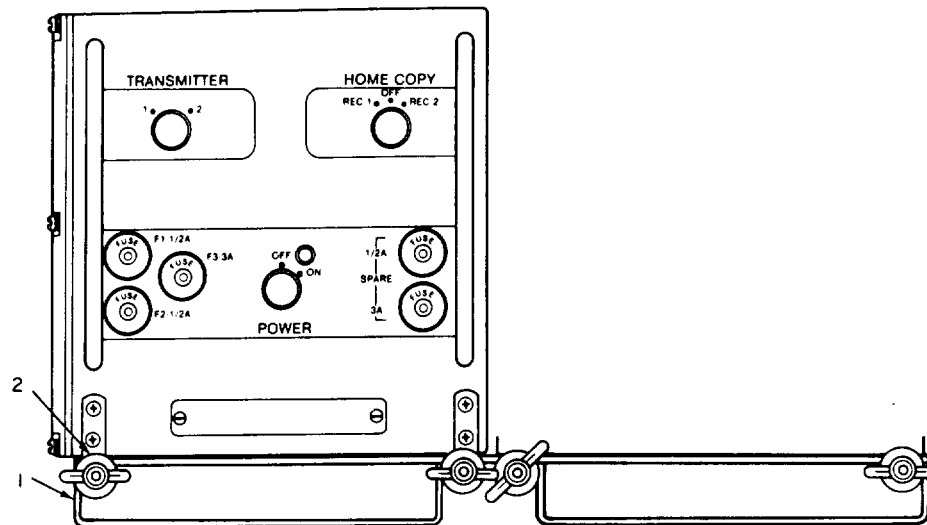
CAUTION

While sliding the J-4024/U onto the mounting base, make sure that the cables do not get caught on parts of the shelves. Make sure the free ends of the cable assemblies from the J-4024/U rear panel are visible and accessible to the right side of the J-4024/U.

13. Gently push the J-4024/U back against the retainer pins.

2-21. SECURITY EQUIPMENT INSTALLATION (CONT)

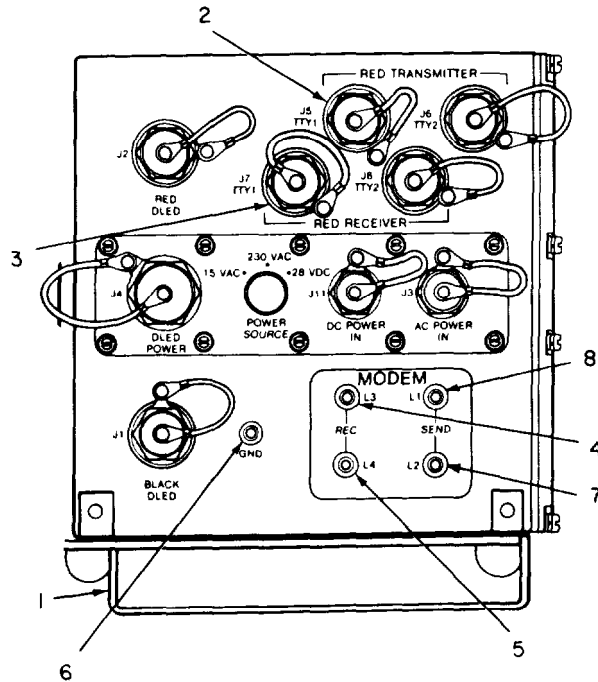
INSTALLATION OF J-4024/U IN OWR POSITION



14. While holding the J-4024/U back against the retainer pins, place each front retainer assembly lock nuts (1) over its front hook (2) on the J-4024/U.
15. Tighten the wing nuts on the front retainers until the J-4024/U is secured tightly on the mounting base. Release the hand pressure on the J-4024/U.

2-21. SECURITY EQUIPMENT INSTALLATION (CONT)

INSTALLATION OF J-4024/U IN DUPLEX POSITION



1. Rest the J-4024/U atop the mounting base (1) so as to provide access to the rear panel.
2. Disconnect Cable W3 from the switch box (SA-1555/GRC in Plain and C modes; SA-1650/GRC in A, B, D, and E models) and connect it to J5 (2) on the J-4024/U.
3. Disconnect Cable W4 from the switch box and connect it to J7 (3) on the J-4024/U.
4. Disconnect the three color-coded banana plugs (W11) from one dummy box and three plugs from other dummy box (W12) and connect as follows:
 - a. Black banana plug to GND (6).
 - b. Blue banana plug to L4 (5) (From W11)
 - c. White banana plug to L3 (4). (From W11)
 - d. Blue banana plug to L2(7) from W12
 - e. White banana plug to L1(8) From W12)
5. Continue installation of J-4024/U following procedure given in OWR installation, steps 8 through 15.

2-21. SECURE EQUIPMENT INSTALLATION (CONT)

INSTALLATION OF DLED, TSEC/KG-84 IN OWR AND DUPLEX POSITIONS

1. Remove the protective covers from the connectors on the rear panel.
2. Place the POWER switch on the front panel to OFF.

NOTE

The TSEC/KG-84A model must be strapped Internally and have its controls set to emulate the KG-84 (plain model). The information is illustrated on page 2-6.10. Additional Information on this is found in TM 11-5810-309-23 and TM 11-5815-616-13 These steps must be done by qualified authorized personnel.

3. After proper preparation of the DLED, slide the DLED onto the mounting base next to the J-4024/U until the free ends of the cables from the J-4024/U reach the connectors on the rear of the DLED.
4. Connect the KG-84 end of the Cable Assembly, Special Purpose, Electrical, CX-13317/G to J2, BLACK I/O, on the DLED.
5. Connect the KG-84 end of the Cable Assembly, Power, Electrical, CX-13315/G to J1, POWER, on the DLED.
6. Connect the KG-84 end of the Cable Assembly, Special Purpose, Electrical, CX-13316/G to J3, RED I/O, on the DLED.
7. Select an 18-inch length of stranded wire to use as a ground wire. Connect one end of the ground wire to the ground screw terminal on the rear of the DLED Connect the other end to a convenient chassis grounding screw.
8. Carefully and slowly slide the DLED onto the mounting base to engage the right rear retainer pins into their rear panel guide holes on the DLED

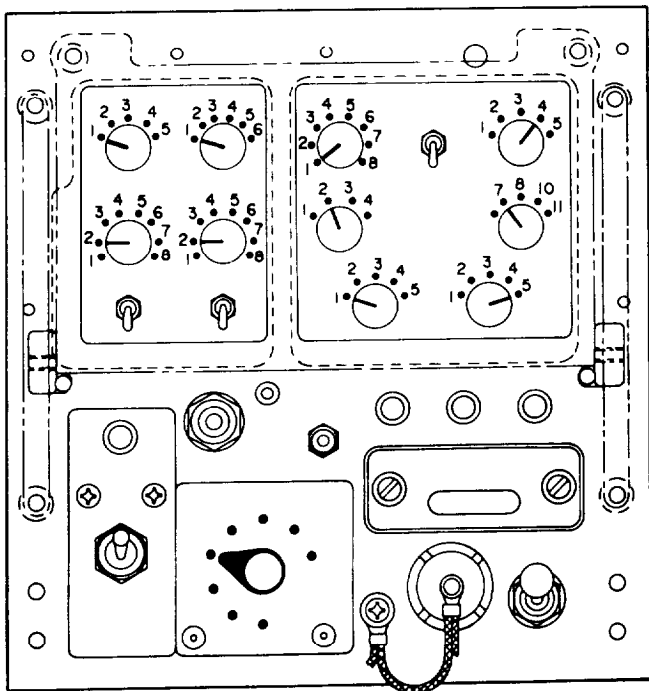
CAUTION

While sliding the DLED onto the mounting base, make sure that the cables do not get caught on parts of the shelves or racks.

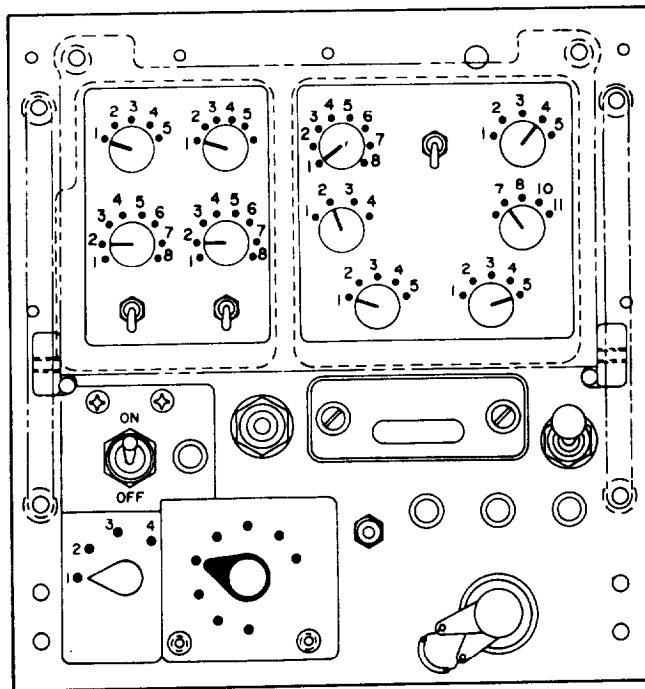
9. Gently push and hold the DLED back against the retainer pins.
10. While holding the DLED back against the rear retainer pins, place each front retainer nut lock over its front hooks on the DLED.
11. Tighten the wing nuts on the front retainers until the DLED is secured tightly on the mounting base. Release the hand pressure from the DLED.

BD	FCTN	STRAPPING			
		BAL	<input type="checkbox"/>	UNBAL	<input checked="" type="checkbox"/>
A1		BAL	<input type="checkbox"/>	UNBAL	<input checked="" type="checkbox"/>
A2		BAL	<input type="checkbox"/>	UNBAL	<input checked="" type="checkbox"/>
A5		ENBL	<input checked="" type="checkbox"/>	DSBL	<input type="checkbox"/>
A5		ENBL	<input checked="" type="checkbox"/>	DSBL	<input type="checkbox"/>
A9		BAL	<input type="checkbox"/>	UNBAL	<input checked="" type="checkbox"/>
A9		SGL	<input checked="" type="checkbox"/>	DBL	<input type="checkbox"/>
A9		GATED	<input type="checkbox"/>	CONT	<input checked="" type="checkbox"/>

BD-PLUG	STRAPPING			
		<input type="checkbox"/>		<input checked="" type="checkbox"/>
A1	P2	<input type="checkbox"/>	J6-J7 J8-J9	<input checked="" type="checkbox"/>
	P3	<input type="checkbox"/>	J5-J6 J9-J10	<input checked="" type="checkbox"/>
	P4	<input type="checkbox"/>	J12-J13 J15-J16	<input checked="" type="checkbox"/>
A2	P5	<input type="checkbox"/>	J11-J12 J14-J15	<input checked="" type="checkbox"/>
	P6	<input type="checkbox"/>	J17A	<input checked="" type="checkbox"/>
	P7	<input checked="" type="checkbox"/>	J20-J22	<input type="checkbox"/>
	P8	<input type="checkbox"/>	J21-J22	<input type="checkbox"/>
A5	P9	<input type="checkbox"/>	J15-J16 J12-J13	<input checked="" type="checkbox"/>
	P10	<input type="checkbox"/>	J18-J19	<input checked="" type="checkbox"/>
	P11	<input type="checkbox"/>	J17-J18	<input checked="" type="checkbox"/>
A6	P12	<input type="checkbox"/>	J8-J9	<input checked="" type="checkbox"/>
	P13	<input type="checkbox"/>	J5-J7	<input checked="" type="checkbox"/>
	P14	<input type="checkbox"/>	J9-J10	<input checked="" type="checkbox"/>
A9	P15	<input type="checkbox"/>	J14-J15 J11-J12	<input checked="" type="checkbox"/>
	P16	<input checked="" type="checkbox"/>	J7-J8	<input type="checkbox"/>
	P17	<input type="checkbox"/>	J6-J9	<input type="checkbox"/>
A9	P18	<input type="checkbox"/>	J7	<input checked="" type="checkbox"/>
	P19	<input checked="" type="checkbox"/>	J11-J12	<input type="checkbox"/>
	P20	<input checked="" type="checkbox"/>	J12-J13	<input type="checkbox"/>
A9	P21	<input checked="" type="checkbox"/>	J8-J9	<input type="checkbox"/>
	P22	<input type="checkbox"/>	J9-J10	<input type="checkbox"/>



KG-84/G



KG-84A/G

NOTE: REMOVE TYPE 1 MODEM CARD FROM UNIT PRIOR TO USE WITH THE MK-2488/G.

2-22. LOOP CURRENT TEST**MODELS WITHOUT MK-2488/G**

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 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 11-5815-263-10 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 RCV MODE and XMIT MODE switches are set.
3. Perform interface assembly switch settings as given in TM 11-5815-602-10 or -20.
4. Ensure that J1 DATA and J2 PWR cables are properly installed on rear of AN/UGC-74A(V)3.
5. Replace dust covers.

MODEM MD-522(*)/GRC

1. As applicable, set METER FUNCTION switch to DC LOOP NO. 1 (when using OWR-DIX-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.

2-22. LOOP CURRENT TEST (CONT)

MODELS WITH MK-2488/G

Loop current must be checked after installation of all local and remote equipment to ensure proper TTY operation. The procedure given is for OWR-DX-SEND TTY loop or DX-RECEIVE pony loop. DX-RECEIVE pony loop is used only during duplex or pony circuit operation. In the AN/GRC-122/142(*) (with MK-2488/G) the loop current must be 20 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).

AH 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 and SELECTOR MAGNET cable is plugged into 20 ma connector.
4. Lower dust cover.

NOTE

In the AN/GRC-122/142(*) (with MK-2488/G) the TT-76(*)/GGC must conform to the following setup:

- (a) Gearing set for 50 or 75 baud (67 or 100 wpm)
- (b) With TT-523 installed set SIGNAL BIAS switch to 60 ma
- (c) SELECTOR MAGNETIC cable plugged into 20 ma connector.

TT-98/FG

1. Remove TT-98/FG and duplex TT-98/FG dust covers.
2. Set LINE SELECTOR switches to 20 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 ma.

2-22. LOOP CURRENT TEST (CONT)**MODELS WITH MK-2488/G**

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 with MK-2488/G).

NOTE

Step 2 applies to AN/GRC-122/142 Plain and C models only with MK-2488/G.

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 ma. If 20 ma does not register, a loop current adjustment is necessary. Refer to a higher level of maintenance.

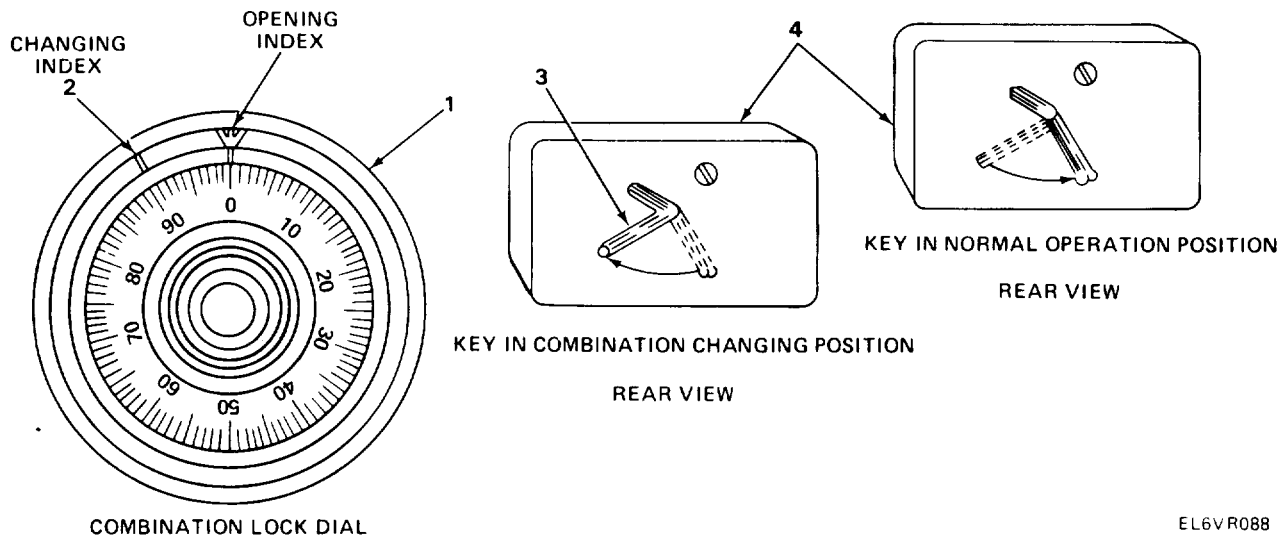
2-23. SHELTER DOOR COMBINATION LOCK.**CHANGING SHELTER DOOR COMBINATION LOCK**

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 stops when 50 is alined with changing index mark.

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



EL6VR088

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 aligned with changing index mark (2).
5. Turn dial (1) counterclockwise three full turns and stop when second number of new combination is aligned with changing index mark (2).
6. Turn dial (1) clockwise two full turns and stop when third number of new combination is aligned 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.

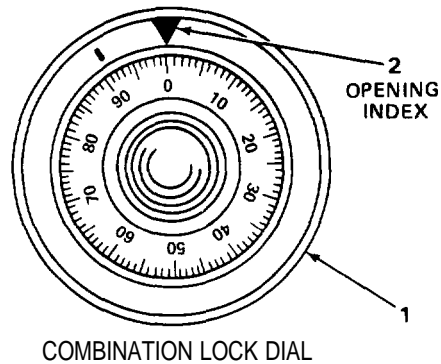
2-23. SHELTER DOOR COMBINATION LOCK. (CONT)

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.



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.

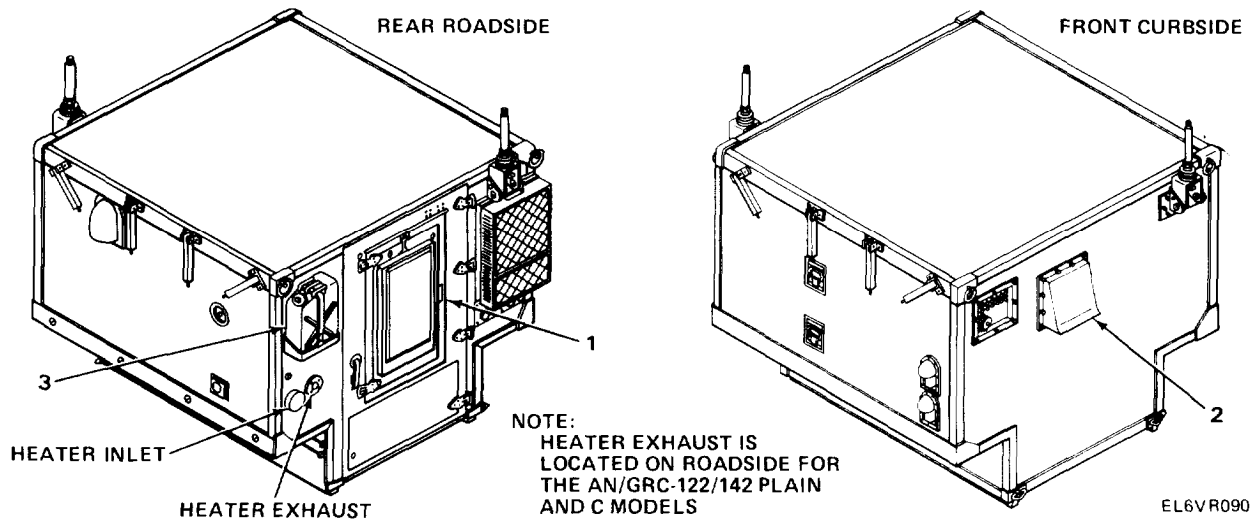
To Unlock

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**

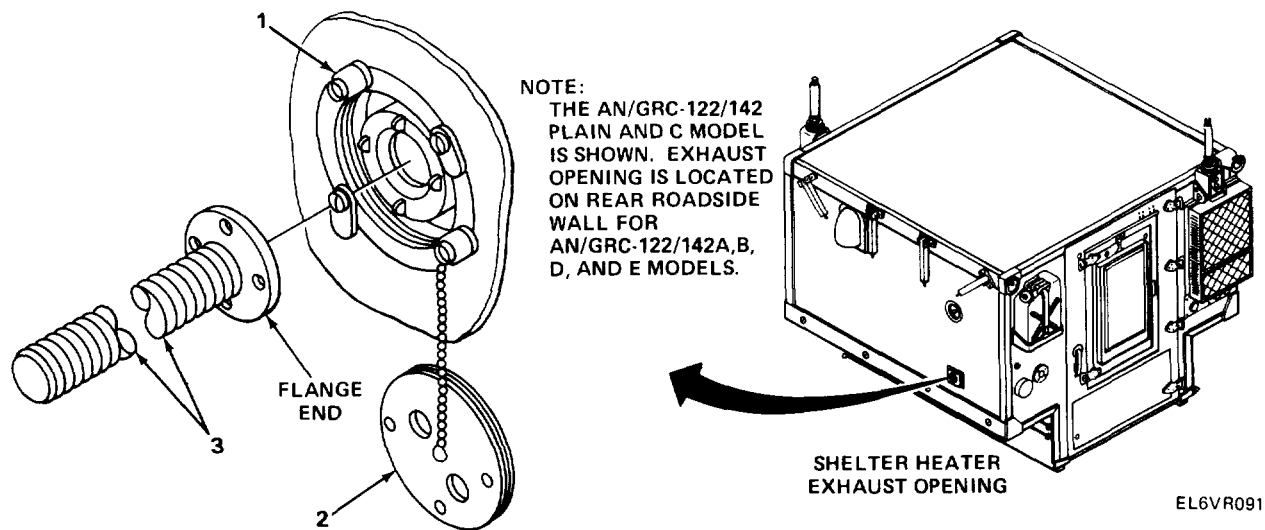
Truck exhaust pipe hose is a flexible steel hose. It is used when shelter is truck mounted to redirect exhaust gases away from shelter. Slide exhaust pipe hose onto truck exhaust pipe about 12 inches and direct truck exhaust gases away from shelter.

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.

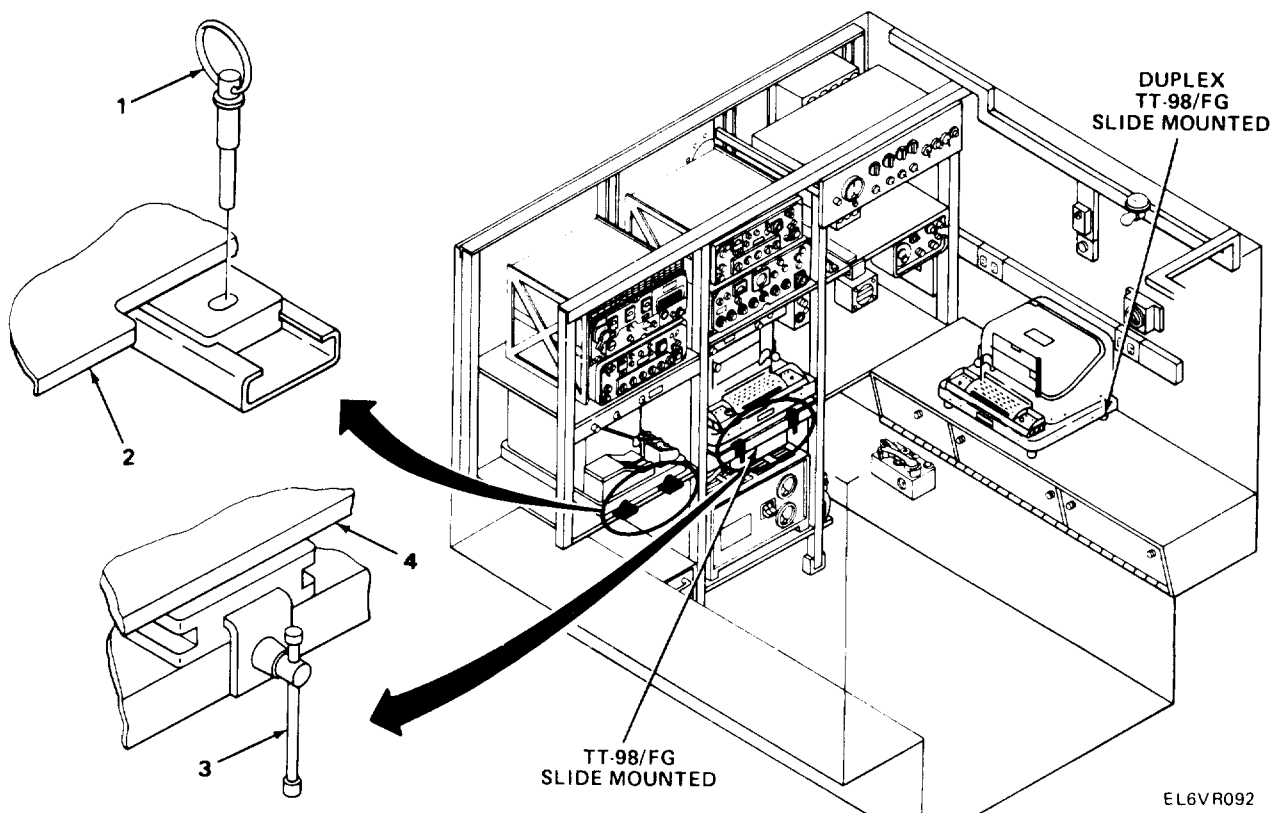
In shelters where AM-3349/GRC-106 vents air to outside of shelter, open rear door vent covers enough to prevent deadly fumes from being drawn into shelter.

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.



EL6VR092

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 5815-602-10 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 \pm 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 **24** 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 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-098/FG POWER switch set to OFF.
17. Duplex RT-662/GRC SERVICE SELECTOR switch set to OFF.

In AN/GRC-122/142(*) models with MK-2488/G, perform the additional procedures listed below prior to preoperational equipment settings given in paragraph 2-26.

1. J-4024/U Interconnecting Box.

- (a) J-4024/U POWER switch to OFF.
- (b) J-4024/U POWER SELECTOR switch to 28 VDC in AN/GRC-122/142 plain and C models with Mk-2488/G. POWER SELECTOR switch to match shelter primary in AN/GRC-122/142A, B, D and E models with MK-2488/G.
- (c) J-4024/U TRANSMIT switch to " 1".
- (d) J-4024/U HOME COPY switch to OFF.

2. DLED, TSEC/KG-84A.

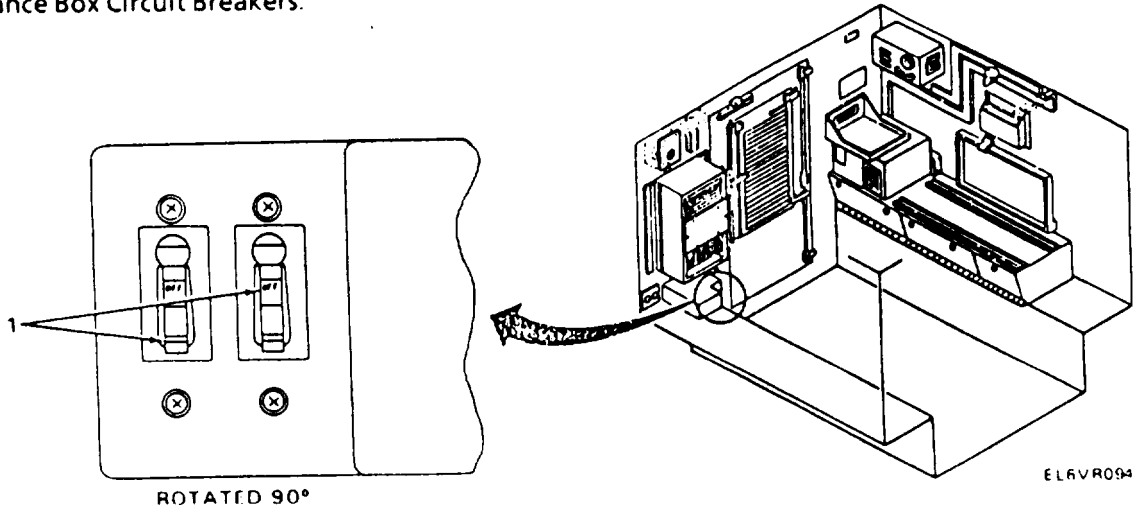
- (a) POWER switch to OFF
- (b) Baud rate to match TTY.
- (c) AN/GRC-142(*) with MK-2488/G will have KG-84A strapped and setup for Half Duplex operation. AN/GRC-122(*) with MK-2488/G can use either OWR or DUPLEX, KG-84A will be setup accordingly.

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. Modifications and additional procedures needed prior to operating models with MK-2488/G are noted in the appropriate group. 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.

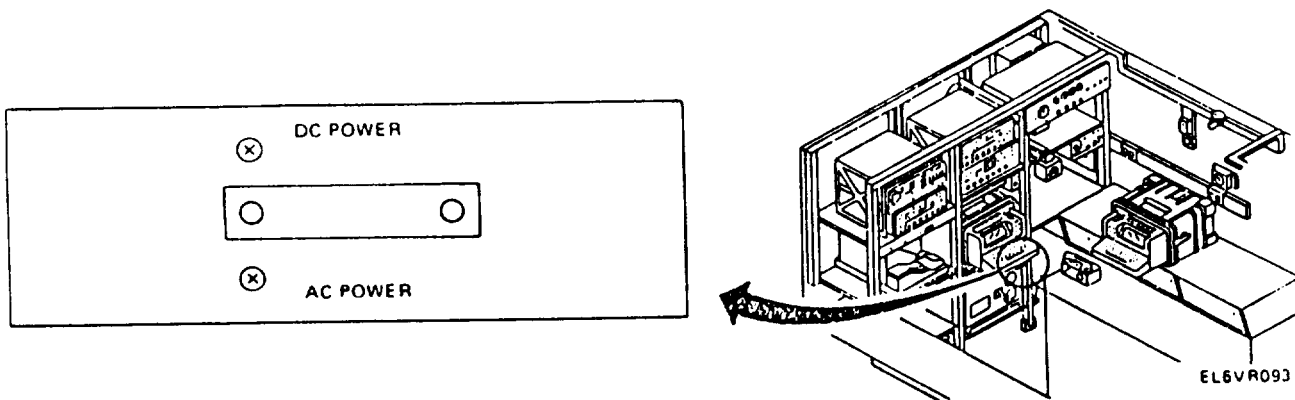
AN/GRC-122/142 PLAIN AND C MODELS

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 \pm 10 percent.

Distribution Box AC Power-DC Power.

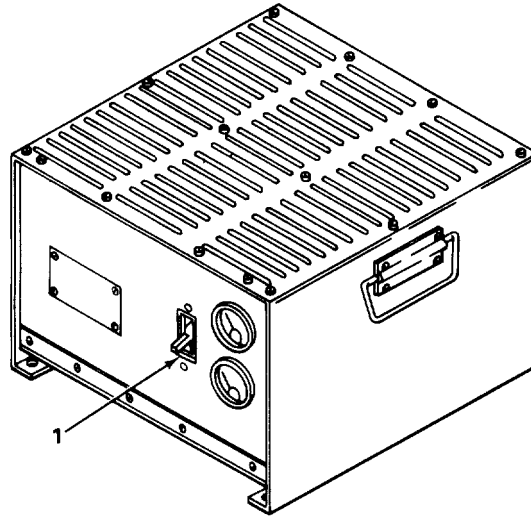


1. Set distribution box to DC POWER for dc operation and AC POWER for ac operation.
2. Set dc power supply to ON as shown on page 2-86.

2-26. PREOPERATIONAL EQUIPMENT SETTINGS. (CONT)

Power Supply PP-4763(*)/GRC

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



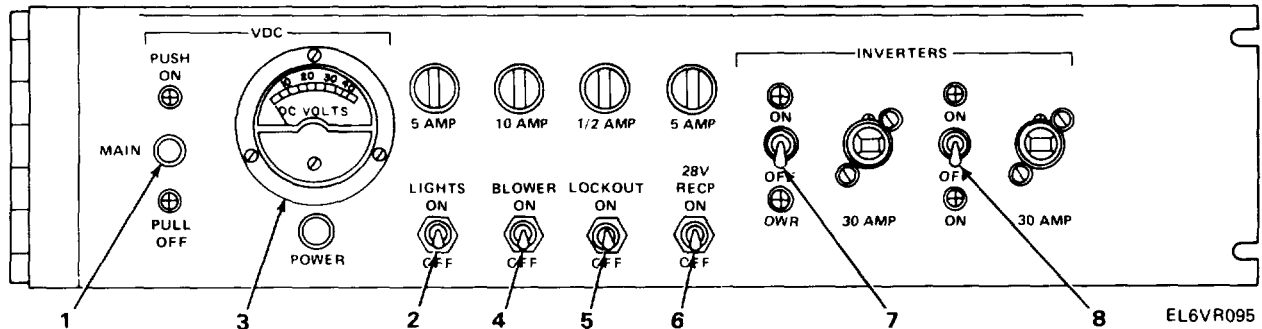
EL6VR100

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.

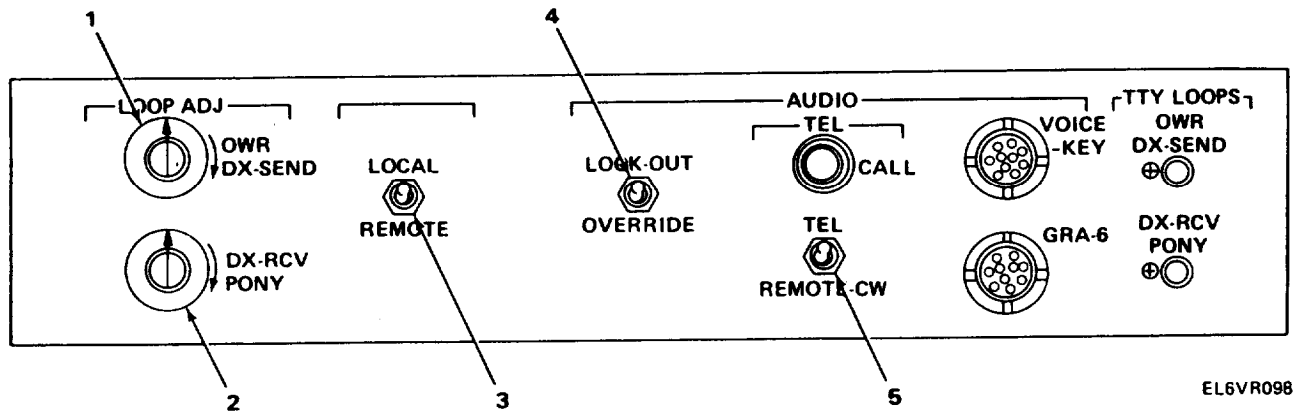
NOTE

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)

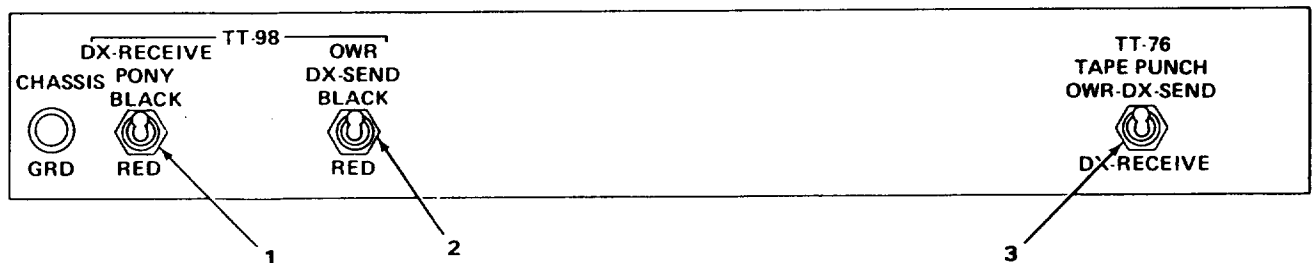
Control Panel SA-1554/GRC-142



EL6VR098

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 (not operational in models used with the MK-2488/G).



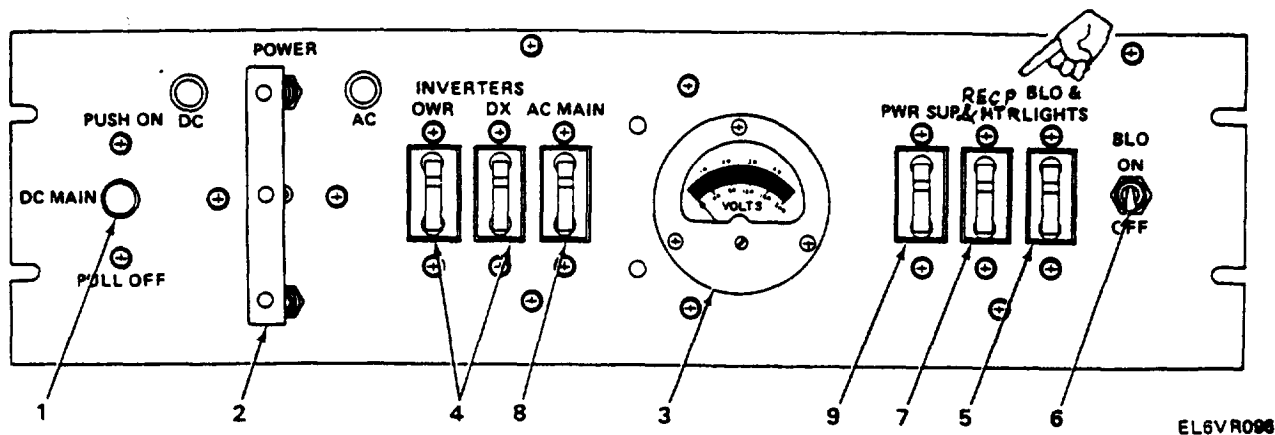
EL6VR036

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 & HTR circuit breaker (7) to ON (energizes 26-volt and heater 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 \pm percent.
5. Set PWR SUP circuit breaker (9) to ON.

NOTE

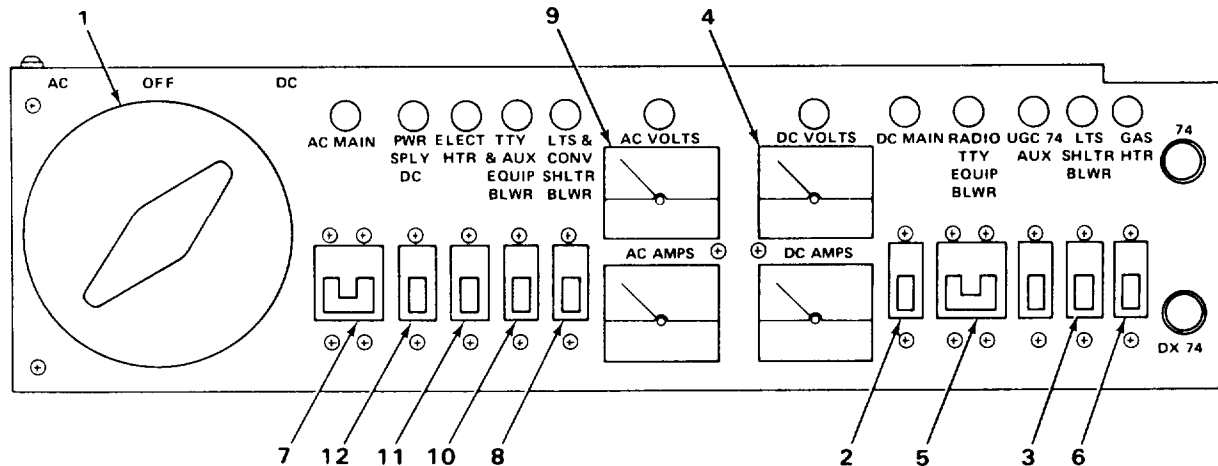
For lights to work with shelter door open, blackout switch must be pulled out.

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 \pm 10 percent indication.
3. Set LTS & CONV SHLTR BLWR circuit breaker (8) to ON.
4. Observe AC VOLTS meter (9) for 115 volt \pm 10 percent indication.
5. Set TTY & CONV SHLTR BLWR circuit breaker to ON.
6. Set ELECT HTR circuit breaker (11) to ON if required.
7. Set PWR SPLY DC circuit breaker to ON.

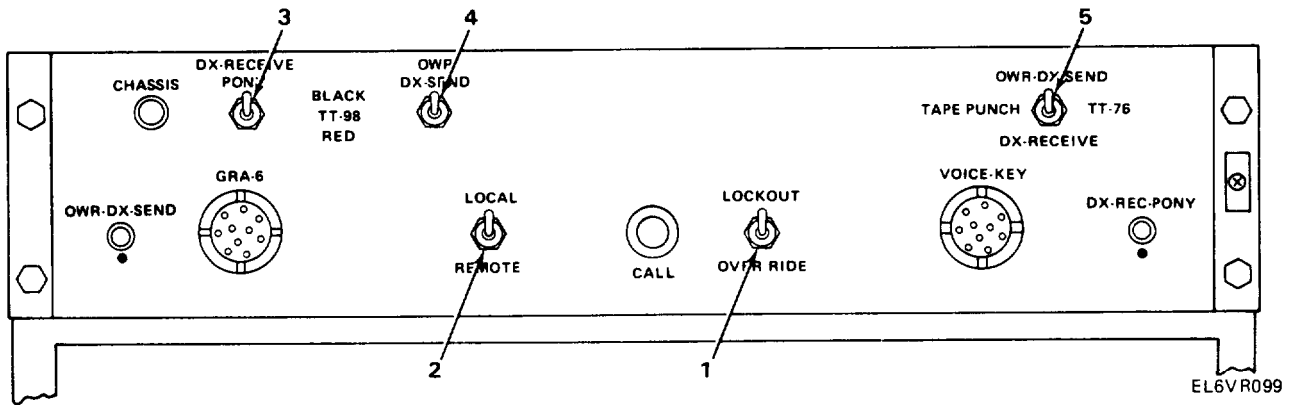
NOTE

If the voltage specified in step 4 above drops below normal operating voltage, (115 volts ac) and fails to return to the original voltage level, have your maintenance person check the condition of the last item which was turned on at the power distribution panel.

2-26. PREOPERATIONAL EQUIPMENT SETTINGS. (CONT)

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

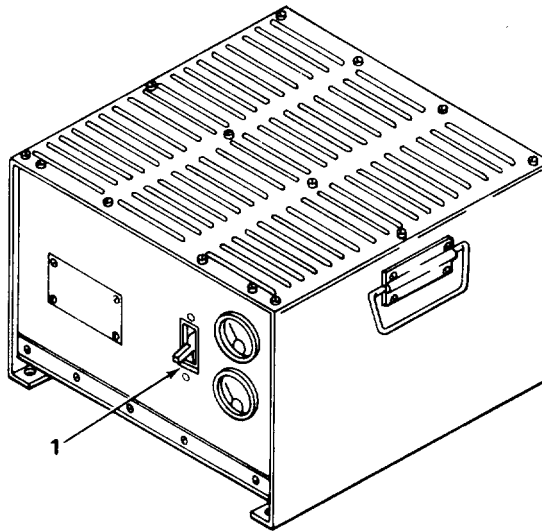
Switch Assembly SA-1650/GRC



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. (not used in models with MK-2488/G).
4. Set TT-98 OWR-DX-SEND BLACK-RED switch (4) to BLACK. (not used in models with MK-2488/G).
5. Set TT-76/TAPE PUNCH/OWR-DX-SEND/DX-RECEIVE switch (5) to OWR-DX-SEND. (not used in models with MK-2488/G).

Power Supply PP-4763(*)/GRC

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



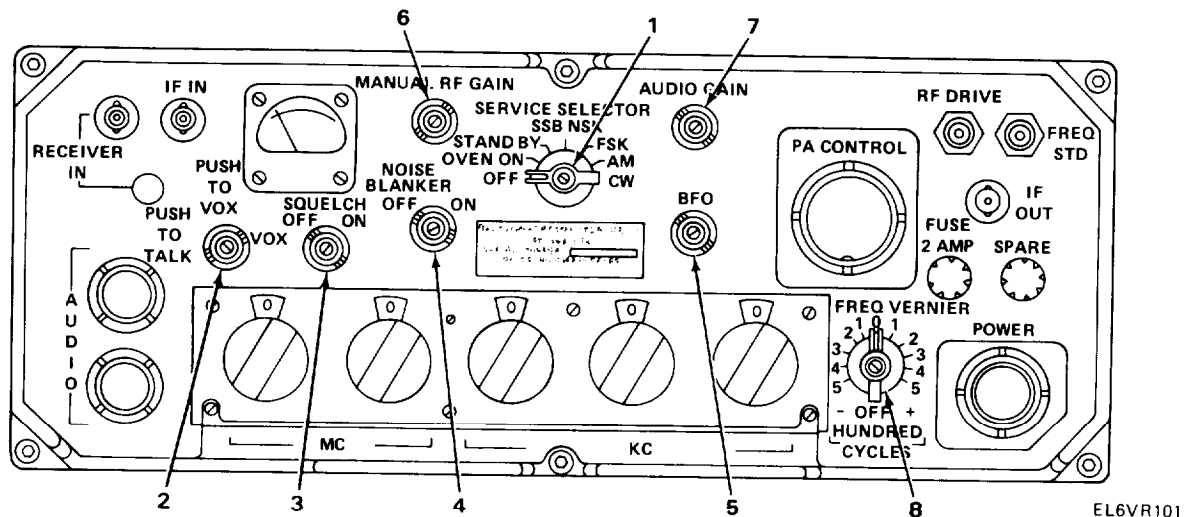
Set power supply ON-OFF switch (1) to ON and observe voltmeter for 28 vdc.

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.



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.

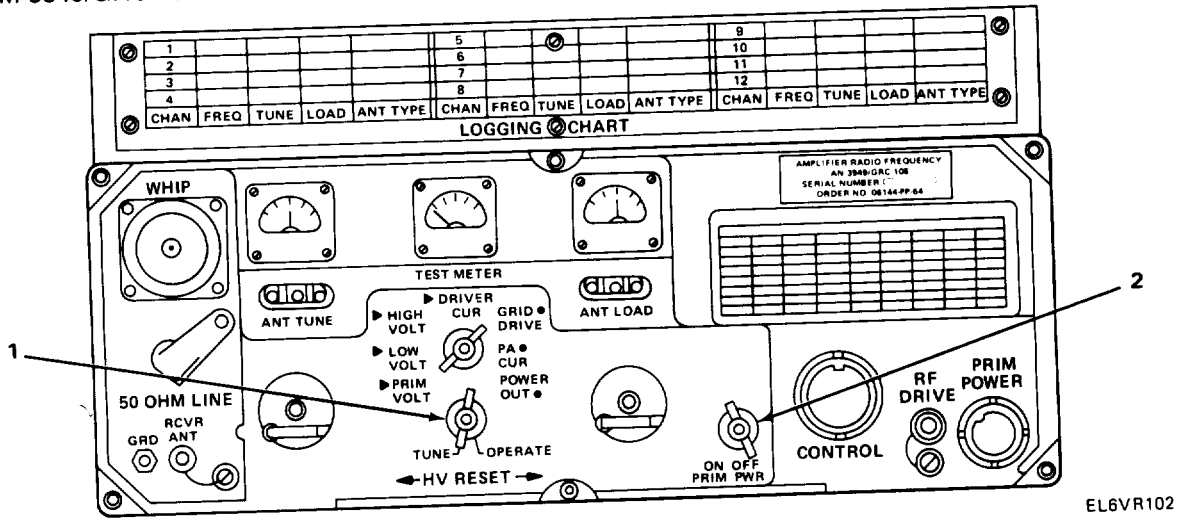
CAUTION

In duplex or ovr 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



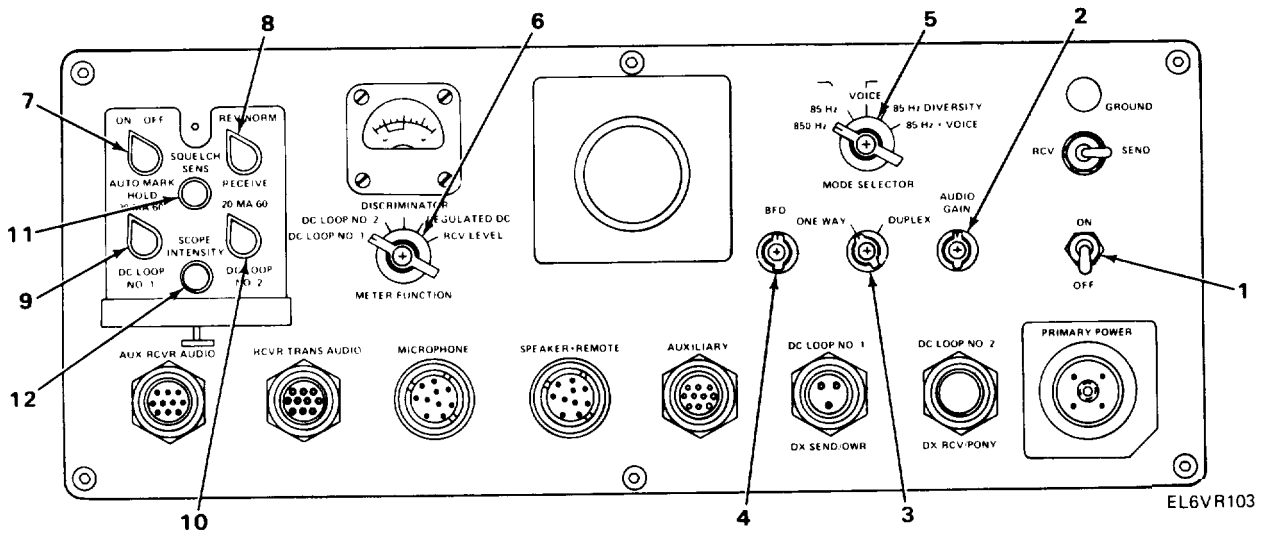
1. Set HV RESET switch (1) to OPERATE.

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



2-26. PREOPERATIONAL EQUIPMENT SETTINGS. (CONT)

CAUTION

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

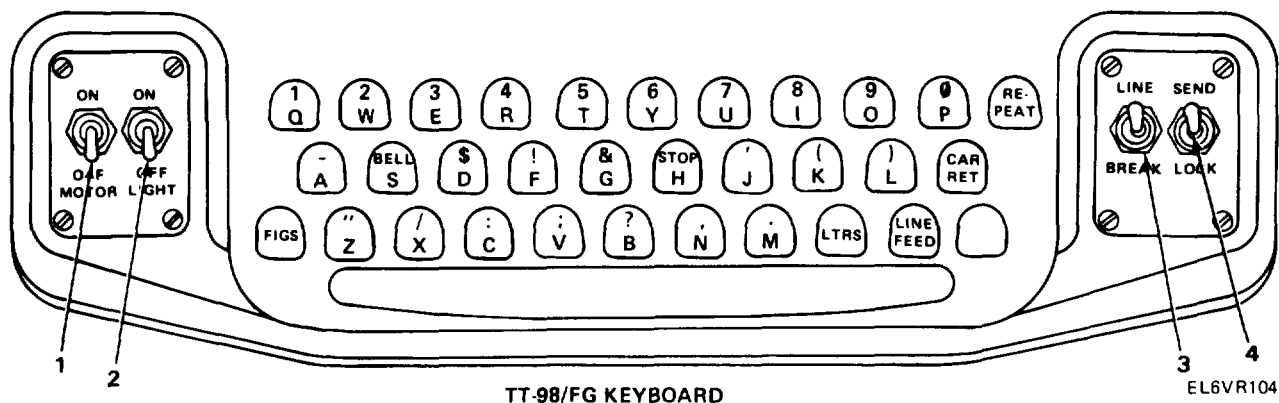
1. Set ON-OFF switch (1) to ON.
2. Turn AUDIO GAIN control (2) to midrange.
3. Set ONE WAY-DUPLEX switch (3) to ONE WAY.
4. Turn BFO control (4) to midrange.
5. Set MODE SELECTOR switch (5) to VOICE.
6. Set METER FUNCTION switch (6) to REGULATED DC and check for 20 vdc on meter.
7. Set AUTO MARK/HOLD 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 (20 ma in models with MK-2488/G).
10. Set DC LOOP NO. 2 switch (10) to 20 or 60 ma (20 main models with MK-2488/G).
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.



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.

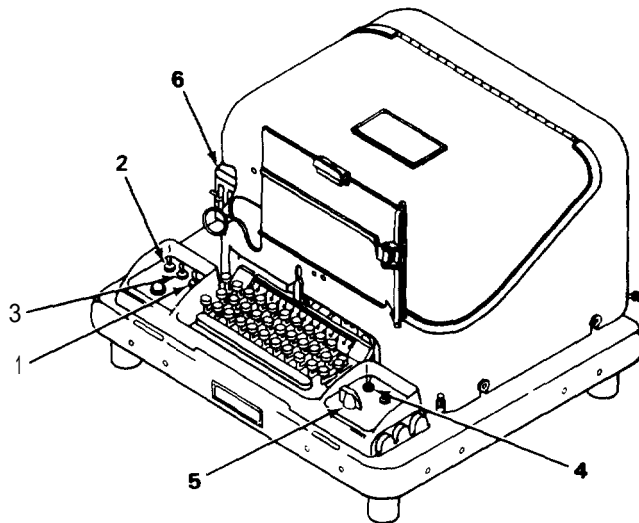
NOTE

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

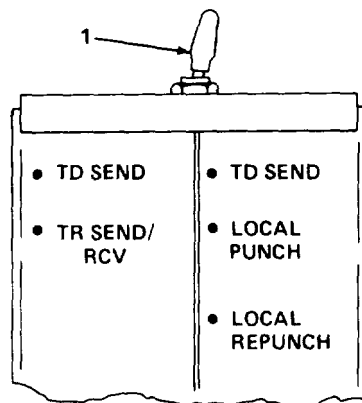


EL6VR105

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.



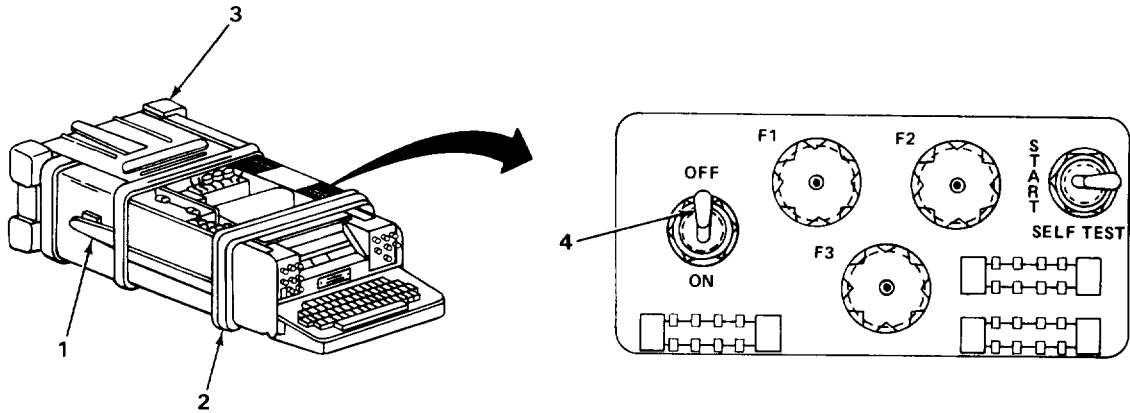
EL6VR106

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

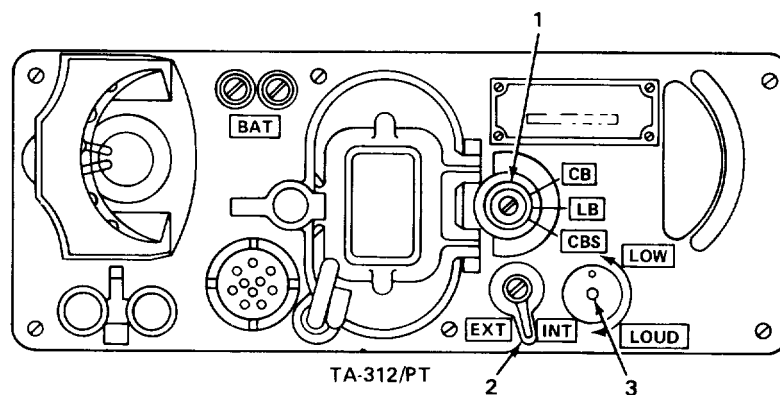
CAUTION

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.



EL6VR113

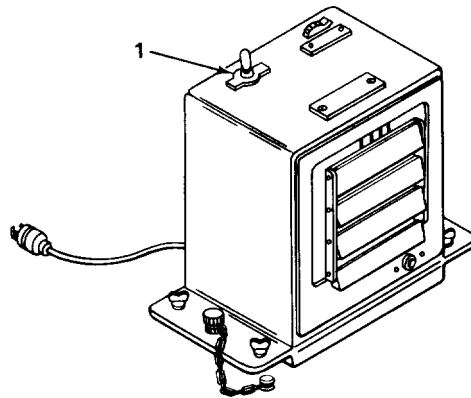
1. Set selector switch (1) to LB.
2. Set INT-EXT switch (2) to INT.
3. Turn LOUD control (3) fully clockwise.

2-26. PREOPERATIONAL EQUIPMENT SETTINGS. (CONT)

EQUIPMENT SETTINGS COMMON TO ALL MODELS (CONT)

Electric Heater

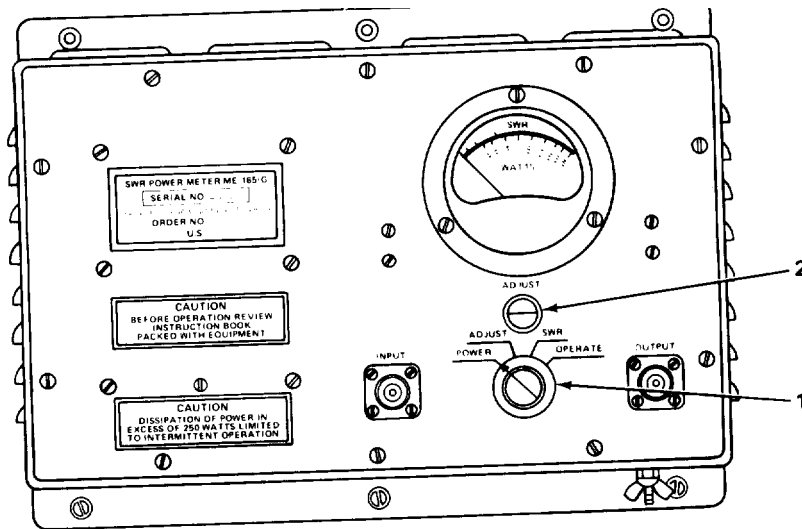
Electric heater is used in ac only mode of operation.



EL6VR114

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

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



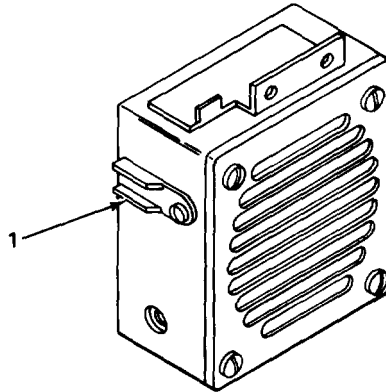
EL6VR116

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.

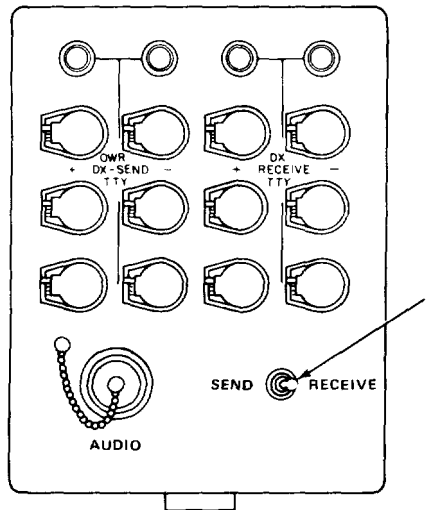


EL6VR115

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

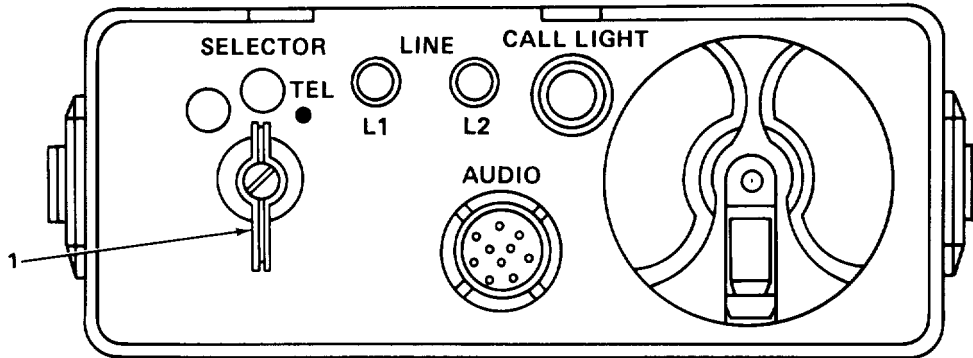
Set SEND-RECEIVE switch (1) to RECEIVE.

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.

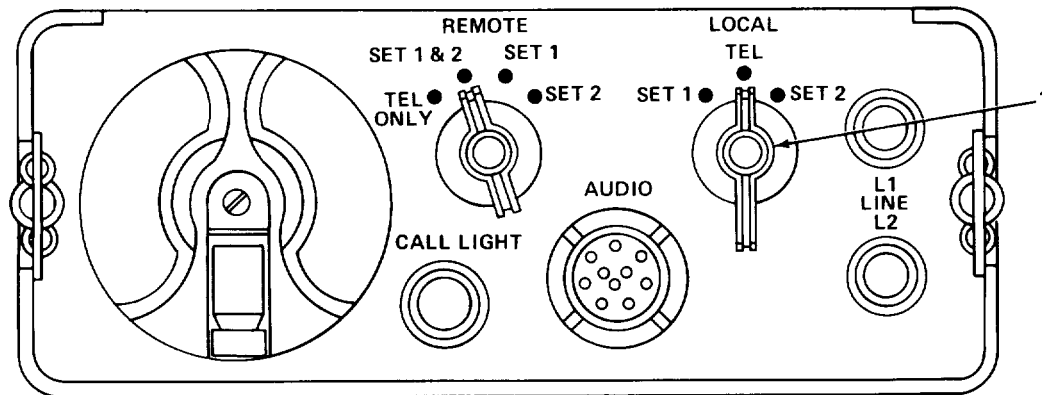


EL6VR118

Set SELECTOR switch (1) to TEL.

Local Control C-434/GRC

Perform initial settings on local control for remote operation.



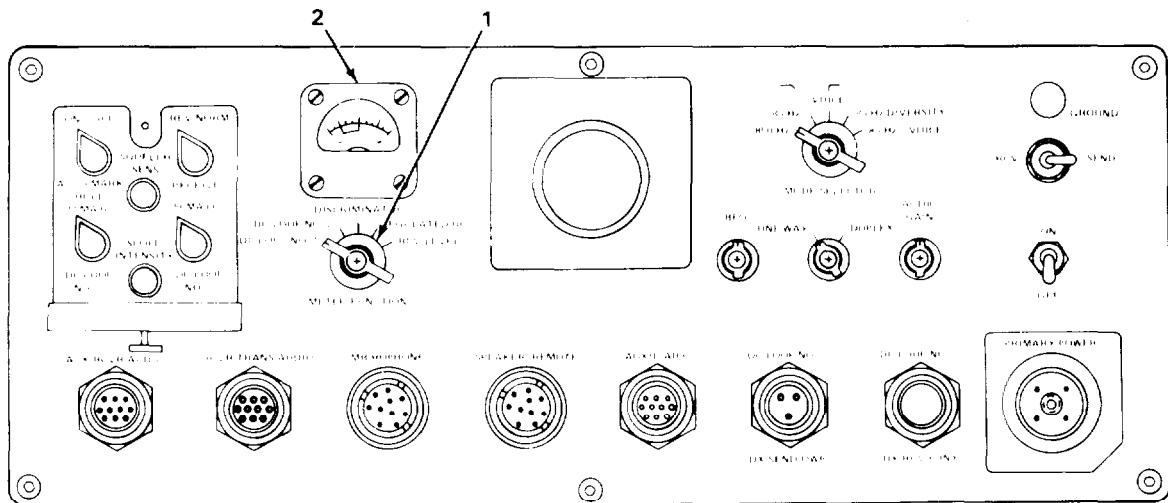
EL6VR119

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. (20 ma only in models with MK-2488/G).

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). (20 ma only in models with MK-2488/G).

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, (20 ma only in models with MK-2488/G). If control has no effect, go to troubleshooting.

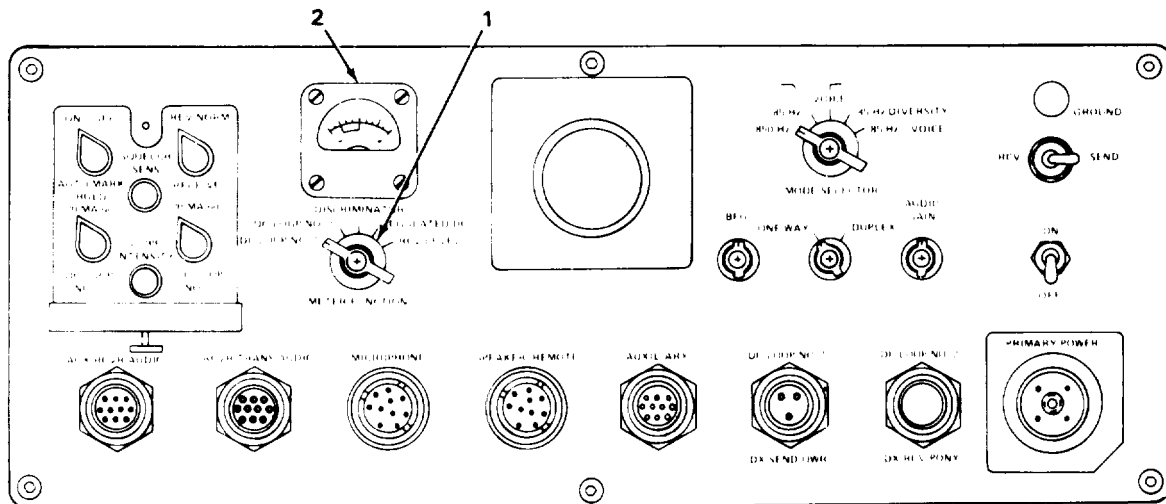
2-27. PREOPERATIONAL EQUIPMENT CHECKS. (CONT)

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. (20 ma only in models with MK-2488/G).

NOTE

If remote tty's are being used, set control panel LOCAL-REMOTE switch to REMOTE before performing adjustment.



1. Set modem METER FUNCTION switch (1) to DC LOOP NO. 2.
2. Check that 20 or 60 ma is indicated on meter (2). (20 ma only in models with MK-2488/G).

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. (20 ma only in models with MK-2488/G). 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 11-5815-602-10.

The following procedure is an example of AN/UGC-74A(V)3 installed in a link, with the link having specific requirements. Refer to TM 11-5815-602-10 and set controls and switches of AN/UGC-74A(V)3 to link requirements below.

LINK REQUIREMENTS AN/GRC-122/142 Models C, D, and E.

Internal Control Settings

<u>Without MK-2488/G</u>		<u>With MK-2488</u>
Parity: Odd	PARITY:	INHIB
State: ICT	STATE :	KSR
Communications Interface: LO DATA	REC MODE:	48V
Data Format: NRC	XMIT MODE:	70 Microamps
Transmission Speed: 45.5	BAUD RATE:	50 or75
Communication Clock Source: Internal	CLOCK INT/EXT:	INT
Clock Edge: Positive (+)	CLOCK:	
Figure S/J: Not applicable in ASCII	FIGURE S/J:	J
Data Input: Noninverted data	SIGNAL HRZ/DIO:	NRZ
No. of Stop Bits in Data Format: One	STOP BITS:	1
Data Character Set: BAUDOT	MODE:	BAUDOT (50 OR 75) OR ASCII II (75 only).

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 Models without MK-2488	SYSTEM INITIALIZED Models with MK-2488	
SWITCH STATE = ICT	SWITCH STATE:	KSR
OPERATIONAL STATE = ICT	OPERATIONAL STATE:	KSR
OPERATING CAPACITY = FULL	OPERATION CAPACITY:	FULL
MODE = BAUDOT	MODE:	BAUDOT OR ASCII
BAUD RATE = 45.5	STOP BITS :	1
STOP BITS = 1	BAUD RATE:	50 or 75
END OF LINE OPTION = OD OD OA	END OF LINE OPTION:	OD OD OA
SPACE OPTION = ON	SPACE OPTION:	ON
LINE LENGTH = 80	LINE LENGTH:	80
LINE FEEDS = 1	LINE FEEDS:	1
RECEIVE ENVELOPE OPTION = :	RECEIVE ENVELOPE:	:
TRANSMIT ENVELOPE OPTION = :	TRANSMIT ENVELOPE:	:
BELL OPTION = FIGURES S	BELL OPTION:	FIGURES J

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 11-5815-602-10.

Perform lamp test and keyboard test as given in TM 11-5815-602-10.

To set parameters, refer to TM 11-5815-602-10.

2-29. TUNING PROCEDURE.

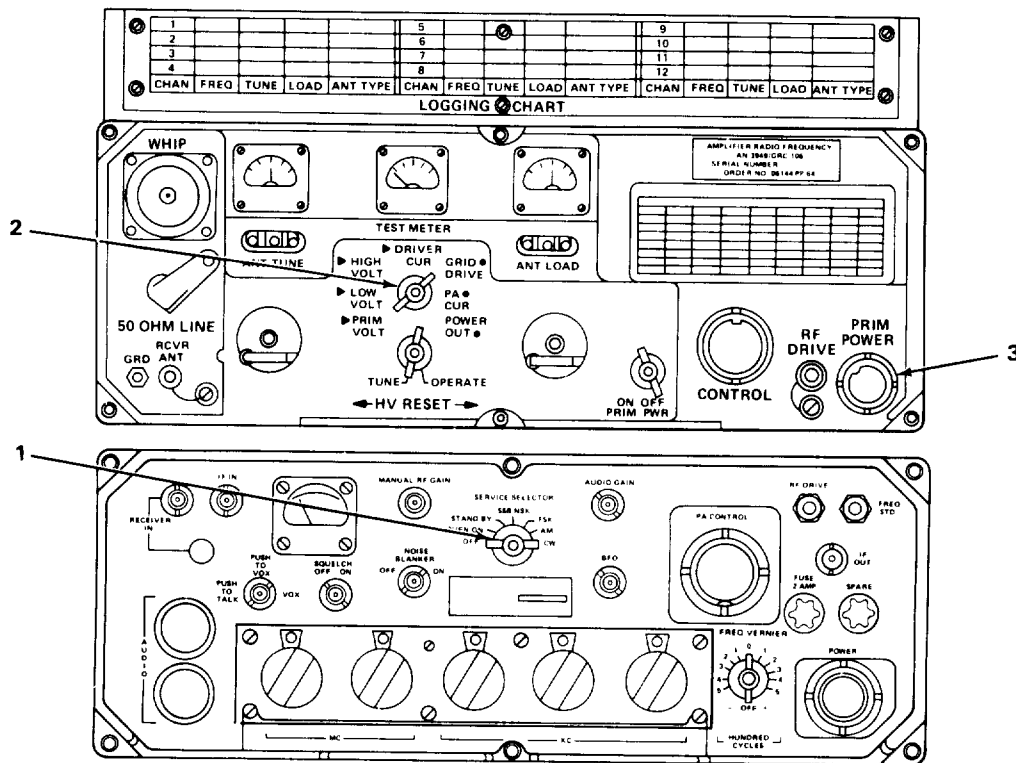
Tuning procedure given applies to any mode of operation (ssb nsk, fsk, am, or cw) for which radio operates. Transmitter tuning procedures given vary slightly when using whip or doublet antenna. Perform all preoperational equipment settings (para 2-26) and preoperational equipment checks (para 2-27) prior 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).



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.

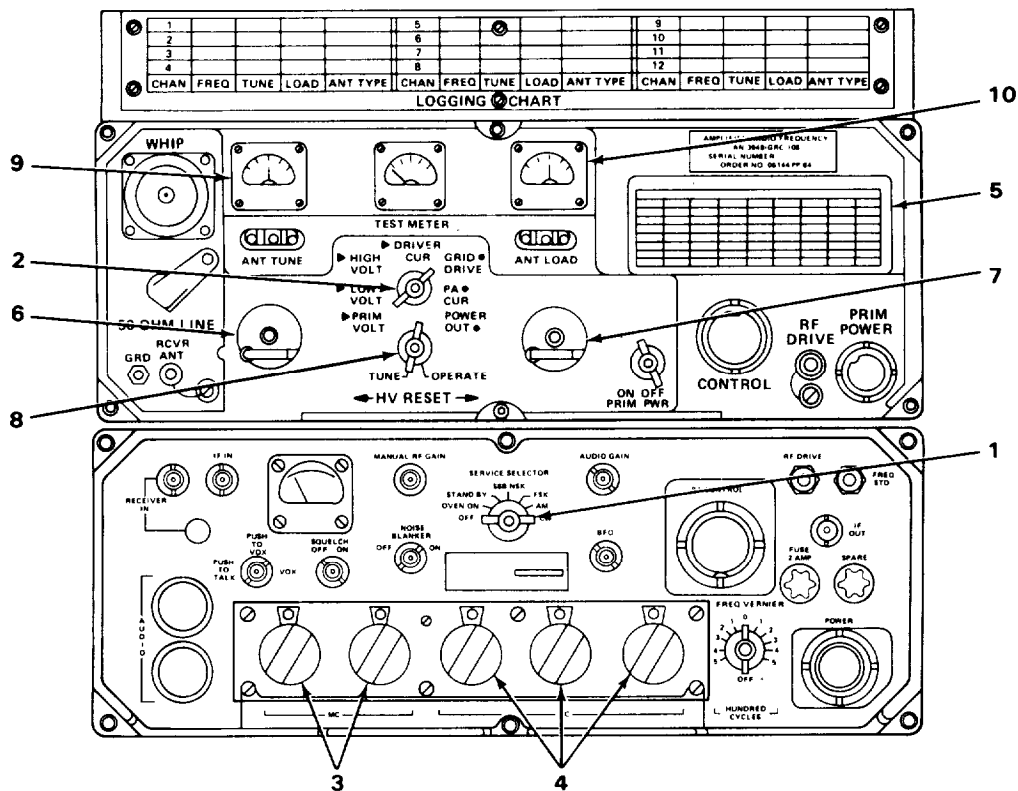
EL6VR121

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.

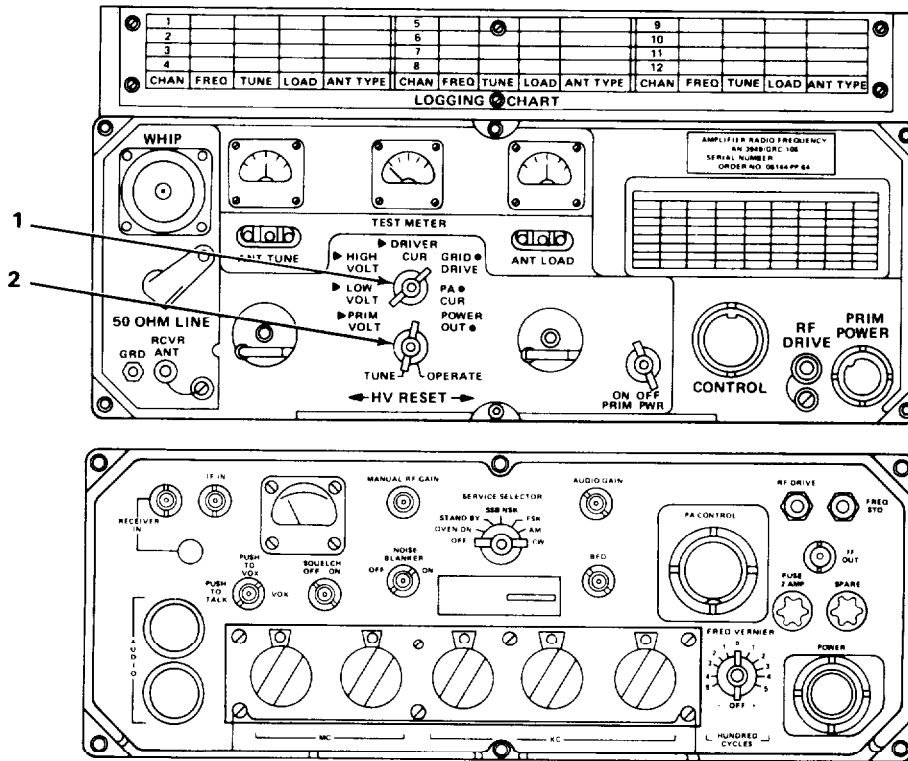
NOTE

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.

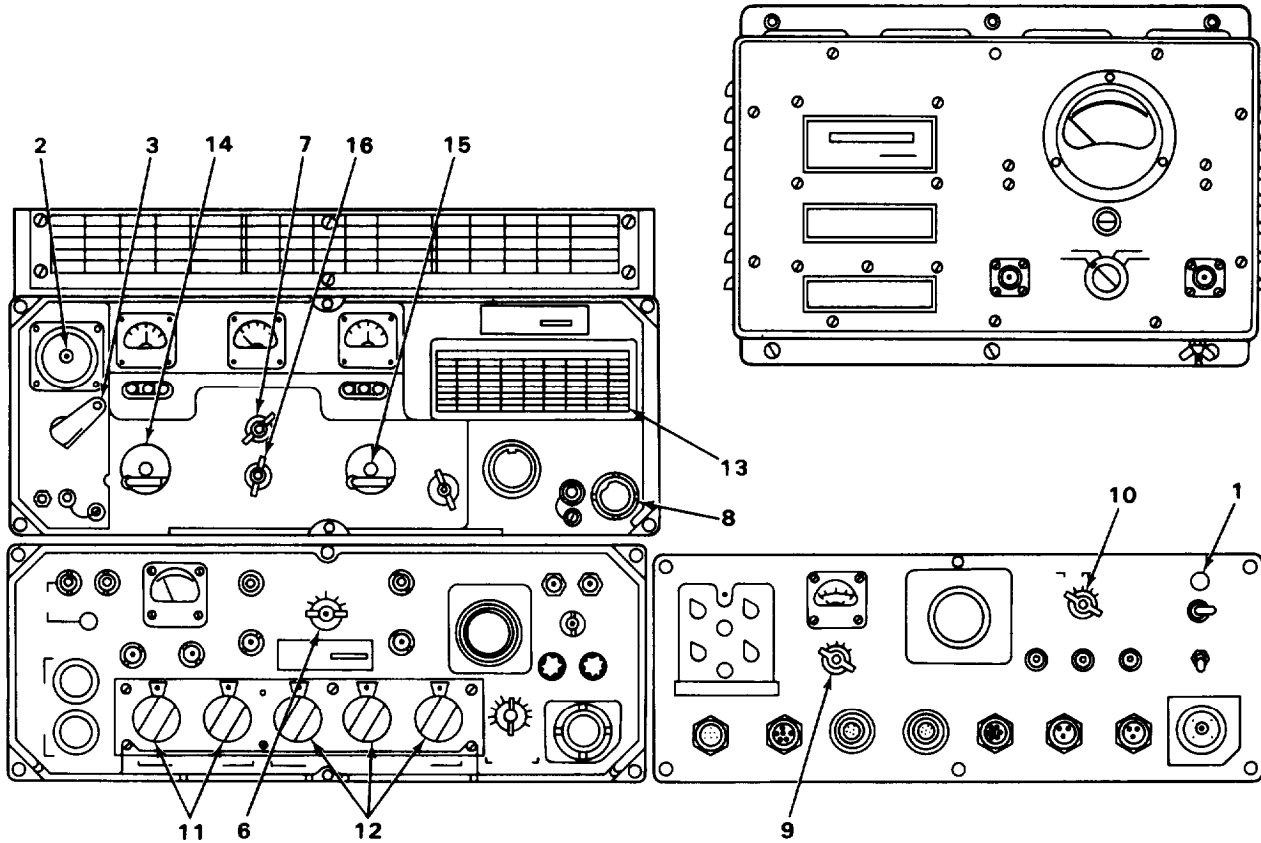
NOTE

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 \pm 10 percent.
31. Set modem RCV/SEND switch to RCV.
32. Set power meter FUNCTION switch to ADJUST.
33. Set modem RCV/SEND switch to SEND.
34. Adjust power meter ADJUST control for full scale deflection. Do not exceed 600 mark.
35. Set modem RCV/SEND switch to RCV.
36. Set power meter FUNCTION switch to SWR.
37. Set modem RCV/SEND switch to SEND.
38. Check that indication on lower scale of power meter is in green or white area. (Green or white area indicates an acceptable VSWR.) This rating should not exceed 2:1.
39. Readjust ANT TUNE and ANT LOAD controls so that ANT TUNE and ANT LOAD meter needles indicate in green (center) position of scales.

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.

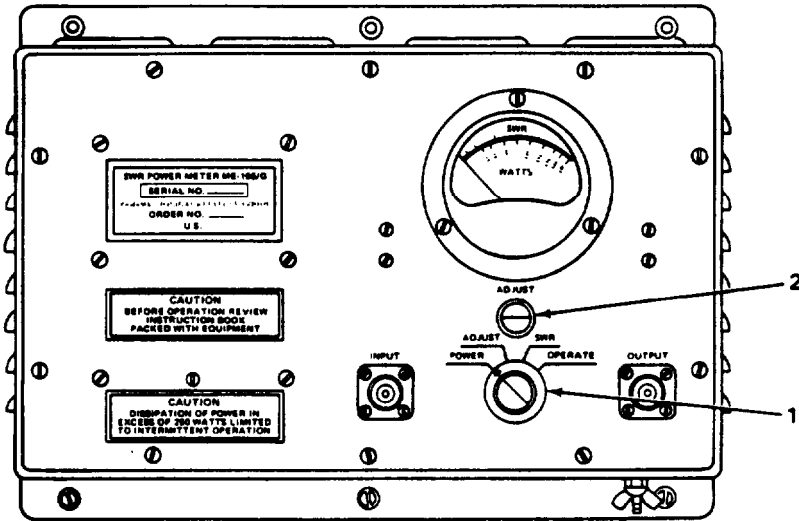
40. Set modem RCV/SEND switch to RCV.
41. Set power meter FUNCTION switch to OPERATE.
42. Set modem MODE SELECTOR switch to mode of operation desired.
43. Log ANT TUNE and ANT LOAD counter settings on logging chart for future tuning reference.

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).



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2. Set ME-165/G function switch (1) to POWER.
3. Perform tuning procedures (para 2-29).

NOTES

1. 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.
2. The ME-165/G is only calibrated up to 19 MHz. (Readings above 19 MHz are usually higher than actual value).
4. Perform desired mode of operation (Local OWR Operation, para 2-32 or Remote Operation, para 2-34).
5. 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

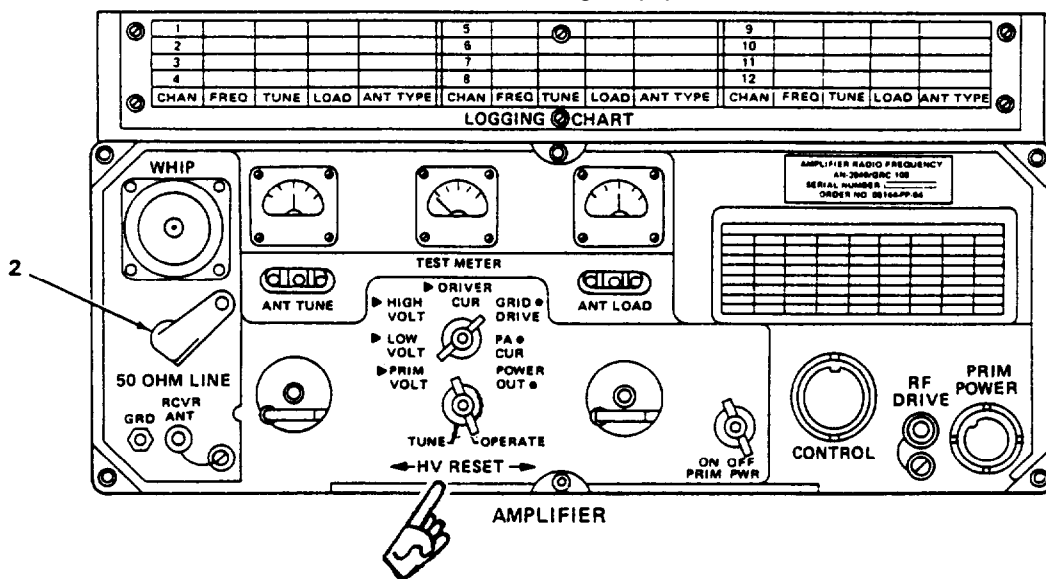
2-30. OPERATION DURING RADIO SILENCE AND OUTPUT POWER MEASUREMENT. (CONT)

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-2568/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.

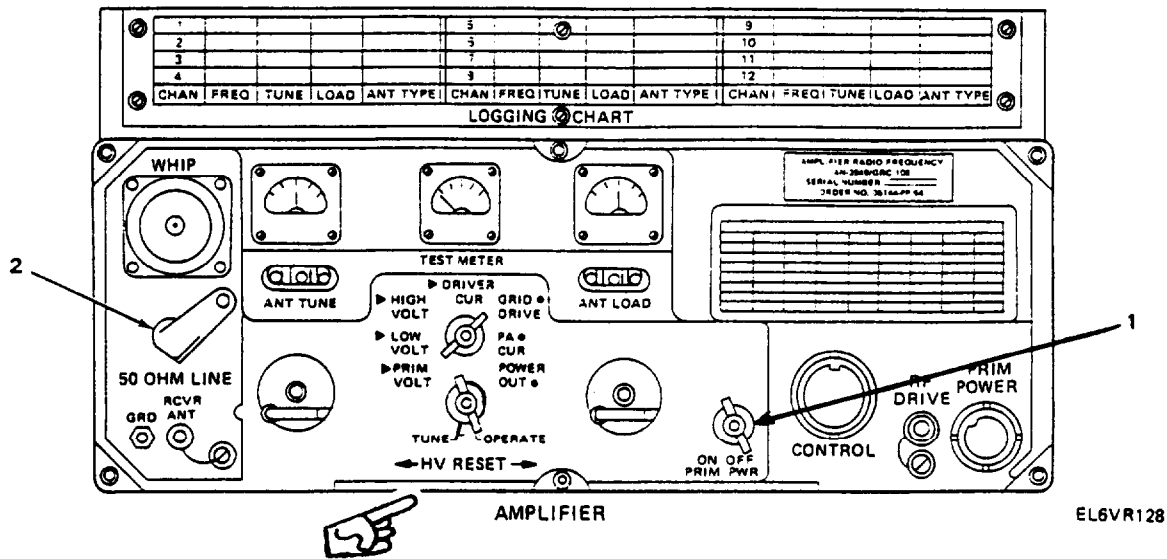
3. Disconnect whip antenna.
4. Connect cable assembly CG-2568A/U to amplifier 50 ohm line connector (2).
5. Perform tuning procedures (para 2-29) for whip antenna.
6. Perform desired mode of operation (Local OWR Operation, para 2-32 or Remote Operation, para 2-34.)

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 Plus NSK	200 watts
NSK	200 watts



8. Set amplified PRIM PWR switch (1) to OFF.

WARNING

Dangerous voltages exist at amplified 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 procedures (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 ovr 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 ovr 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 ovr operation. For AN/GRC-122/142C, D, and E models, prepare AN/UGC-74 for operation (para 2-28).

The two modes of local ovr operation are voice and tty operation. Perform operating procedure applicable to mode of local ovr operation selected (In the AN/GRC-122(*) models with MK-2488/G, local OWR operation is considered back-up only).

NOTE

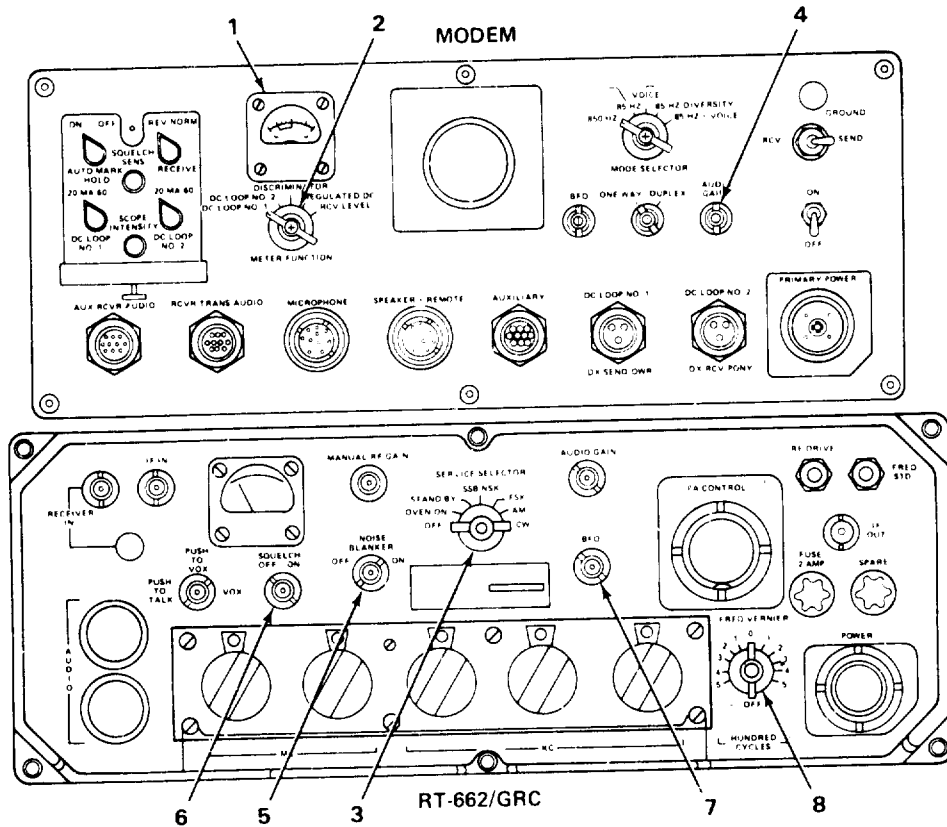
RT-662/GRC MANUAL RF GAIN control setting should not be altered unless RT-662/GRC is being operated in close proximity (10 miles or less) with another radio set. MANUAL RF GAIN control can then be rotated to some counterclockwise position that provides an indication on signal level meter that is roughly 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



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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 SSB NSK AM	cw operation ssb voice operation 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 (age) 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

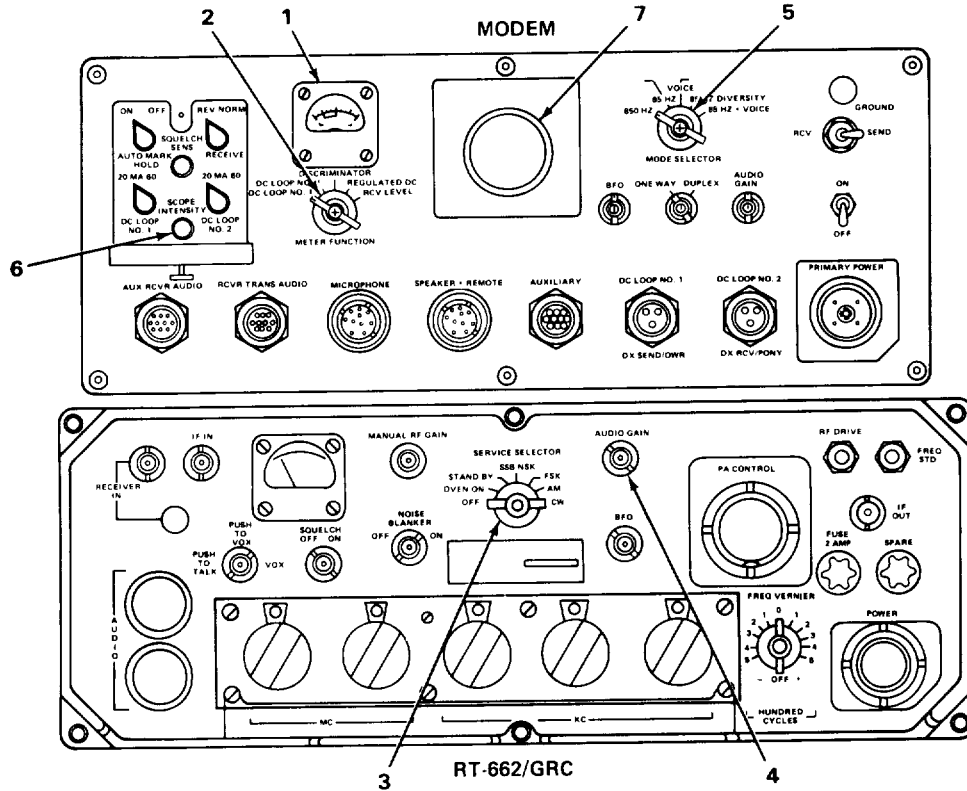
Set LOCK-OUT OVERRIDE switch to OVERRIDE to transmit in steps 9 and 10.

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.

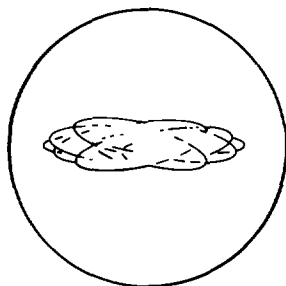
4. Adjust RT-662/GRC AUDIO GAIN control (4) for modem test meter (1) needle indication within RCV level area.

5. Set modem MODE SELECTOR switch (5) for mode of operation desired.

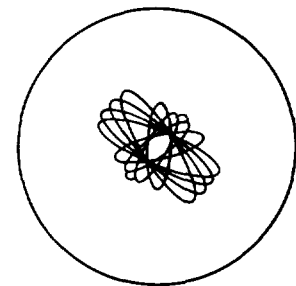
SWITCH POSITION	OPERATION
Voice	ssb nsk
850 HZ	fsk operation
85 Hz	nsk operation
85 Hz DIVERSITY	nsk diversity
85 Hz + VOICE	nsk plus voice

6. Set modem METER FUNCTION switch (2) to DC LOOP NO. 1 to monitor dc loop no. 1.

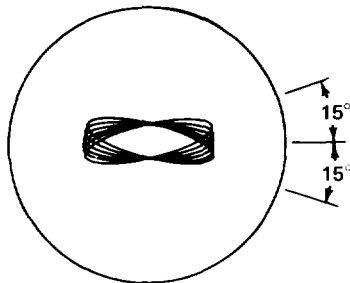
7. Adjust modem SCOPE INTENSITY control (6) for a clear indication on modem crt (7) as illustrated below.



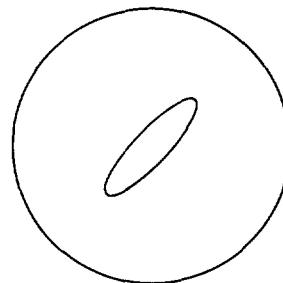
(A)
NSK LOW SIGNAL TO NOISE RATIO



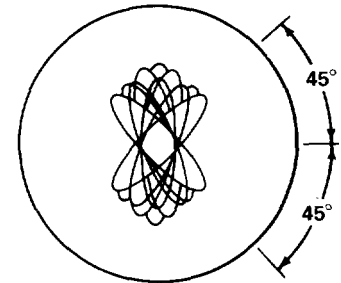
(B)
FSK OUT OF TUNE



(C)
NSK TUNED PROPERLY



(E)
MARK HOLD SIGNAL



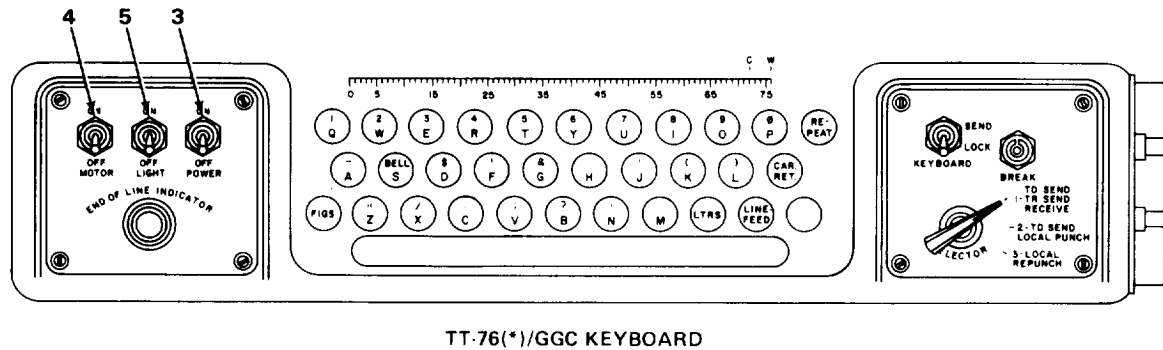
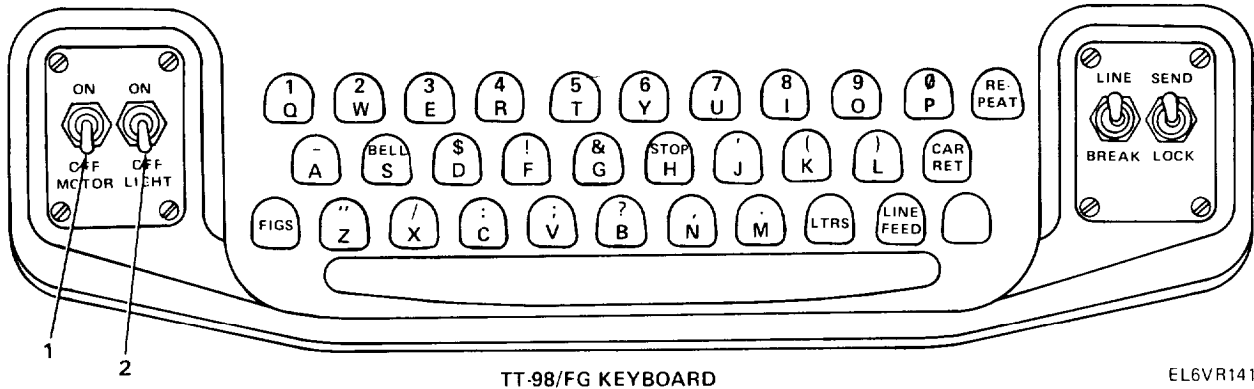
(D)
FSK TUNED PROPERLY

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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)



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

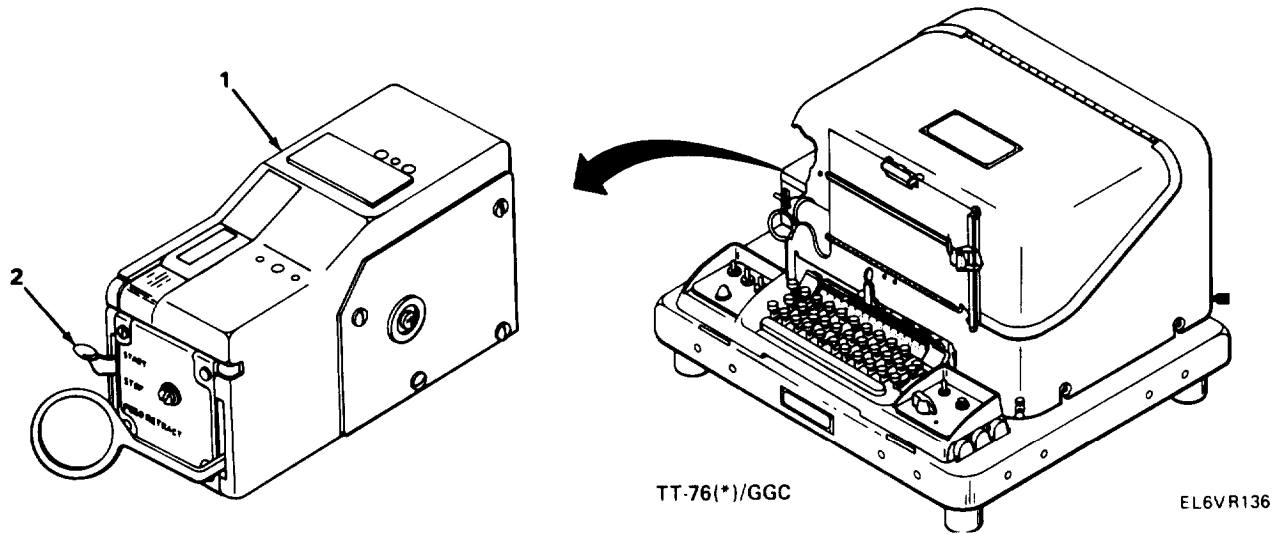
Audio output level of RT-662/GRC must be maintained within receive limits indicated on modem test meter to ensure proper modem operation. If received level is not within receive limits, adjust RT-662/GRC audio gain control for proper meter reading.

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.
14. In AN/GRC-142(*) models with MK-2488/G, set the HOME COPY switch to REC 1 for home copy of transmitted message on teletype connected to J7 of the interconnecting box J-4024/U, or REC 2 for home copy of a transmitted message on teletypewriter connected to J8 or interconnecting box J-4024. The received message will be sent from the J-4024/U to both teletypewriters if the HOME COPY switch on front panel of interconnecting box J-4024/U is set to OFF. Only the teletypewriter not selected for home copy will reproduce incoming messages from distant station.

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 11-5815-602-10.
17. Set TT-76(*)/GGC POWER, MOTOR, and LIGHT switches to ON and operate keyboard.

In models with MK-2488/G, a home copy of the transmitted message is available by placing the interconnecting box J-4024/G HOME COPY front panel switch to either REC 1 or REC 2. The printer or typing reperforator will respond to either keyboard send or transmitter-distributor send. Home copy selection depends on whether the operator wants page copy or a tape copy of the outgoing message. After transmitting, place the HOME COPY switch to OFF if it is desired to receive incoming messages on the same machine used for home copy.

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 (I).
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.

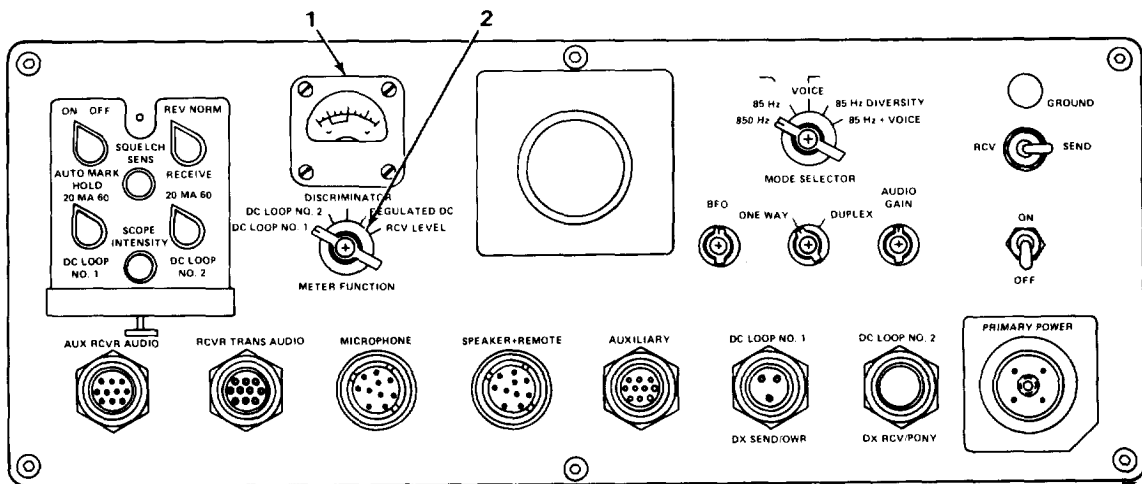
NOTE

RT-662/GRC MANUAL RF GAIN control setting should not be altered unless RT-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.

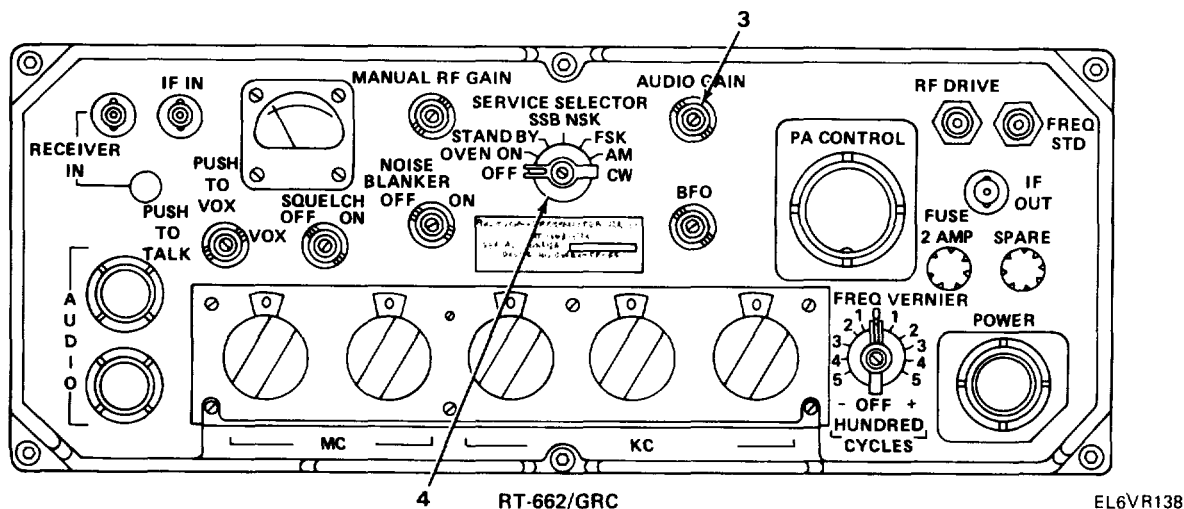
Modem MD-522A/GRC automatic mark-hold circuit automatically switches tty to standby (mark-hold condition) when noise on incoming radio signal becomes so great that no meaningful information can be received. This circuit is energized by setting modem MARK-HOLD switch to ON.

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.

LOCAL DUPLEX CW, SSB VOICE, AND COMPATIBLE AM VOICE OPERATION



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

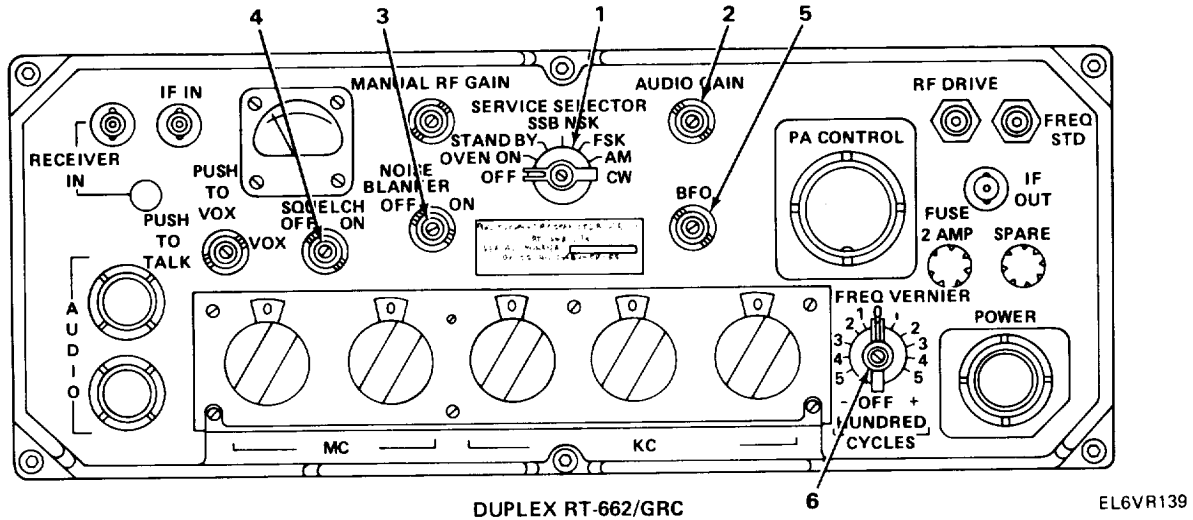
In cw mode, transmitted rf signal is 2 kHz higher than frequency indicated by RT-662/ GRC MC and KC controls.

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)



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

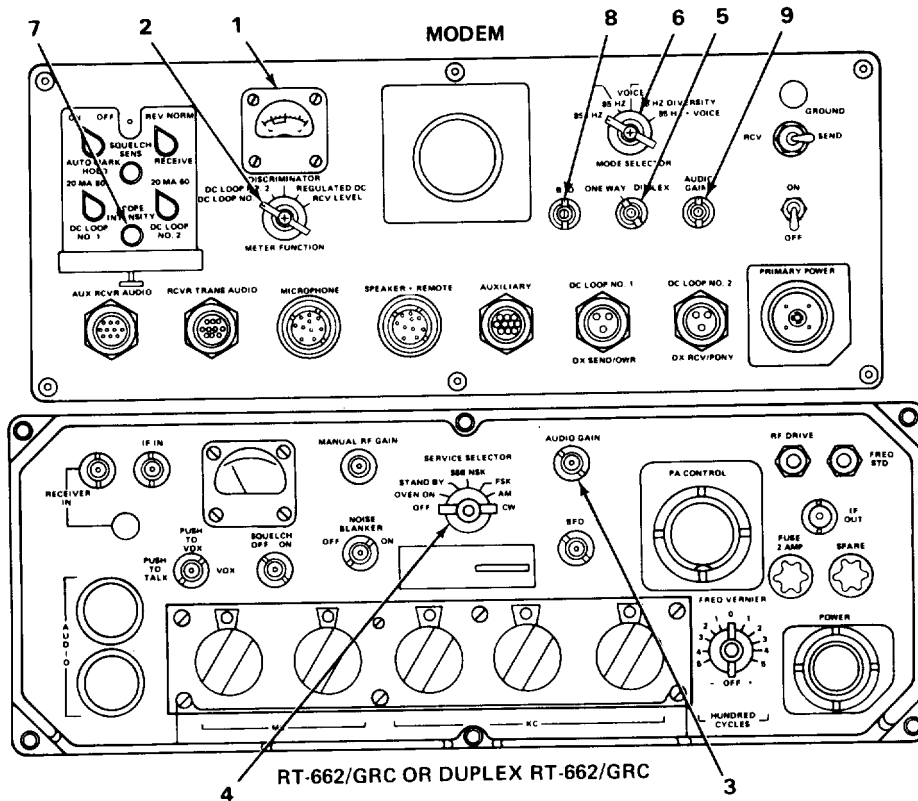
NOTE

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



EL6VR140

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)

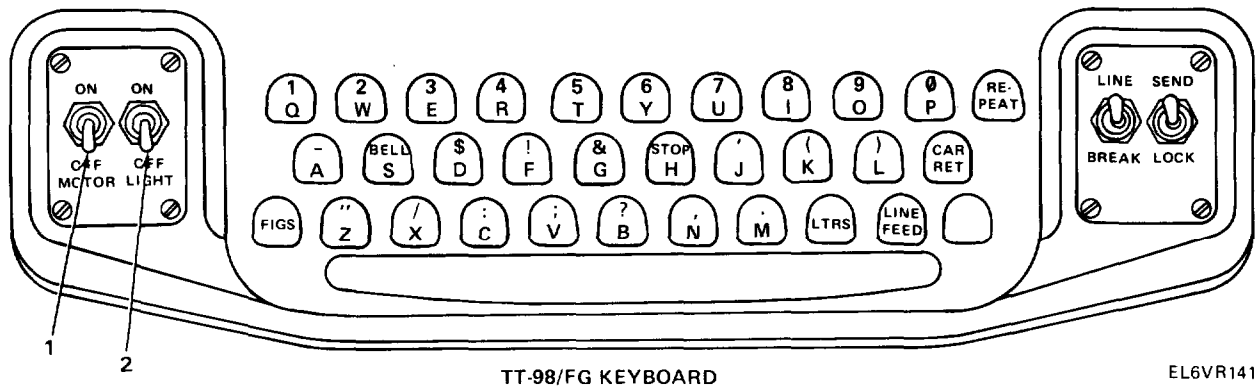
LOCAL DUPLEX TTY OPERATION FSK (850 Hz), SSB NSK (85 Hz), 85 Hz DIVERSITY, OR 85 Hz + VOICE (CONT)

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.

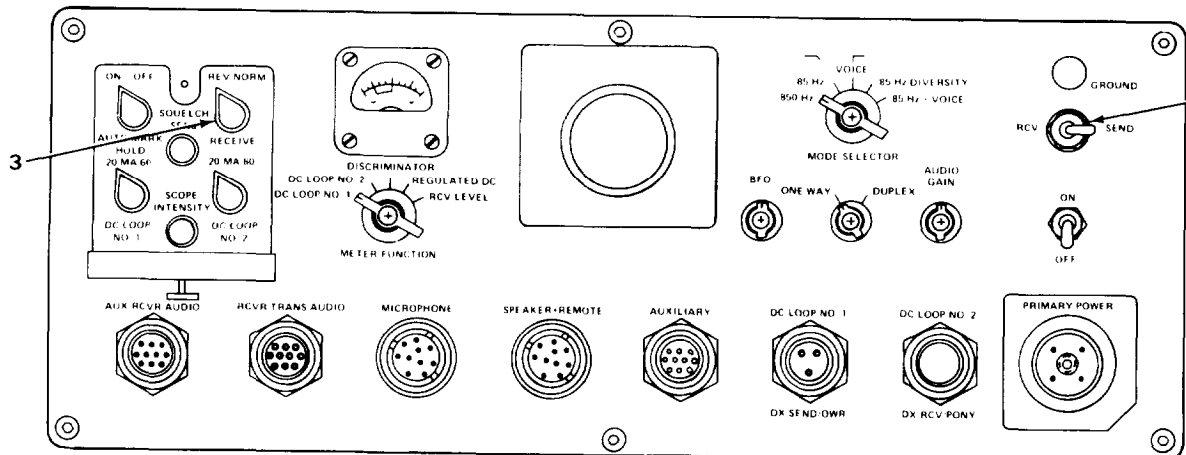
If operation and self-test on AN/UGC-74A(V)3 is completed (para 2-28), AN/UGC-74A(V)3 is ready for reception.



TT-98/FG KEYBOARD

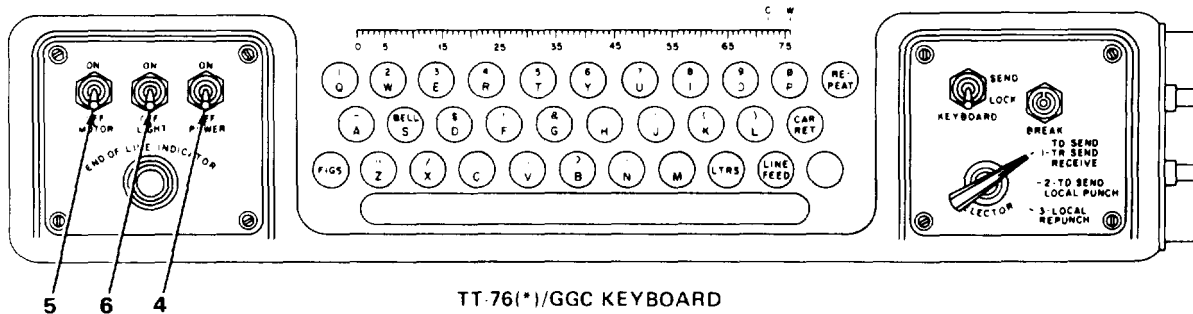
EL6VR141

- 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.

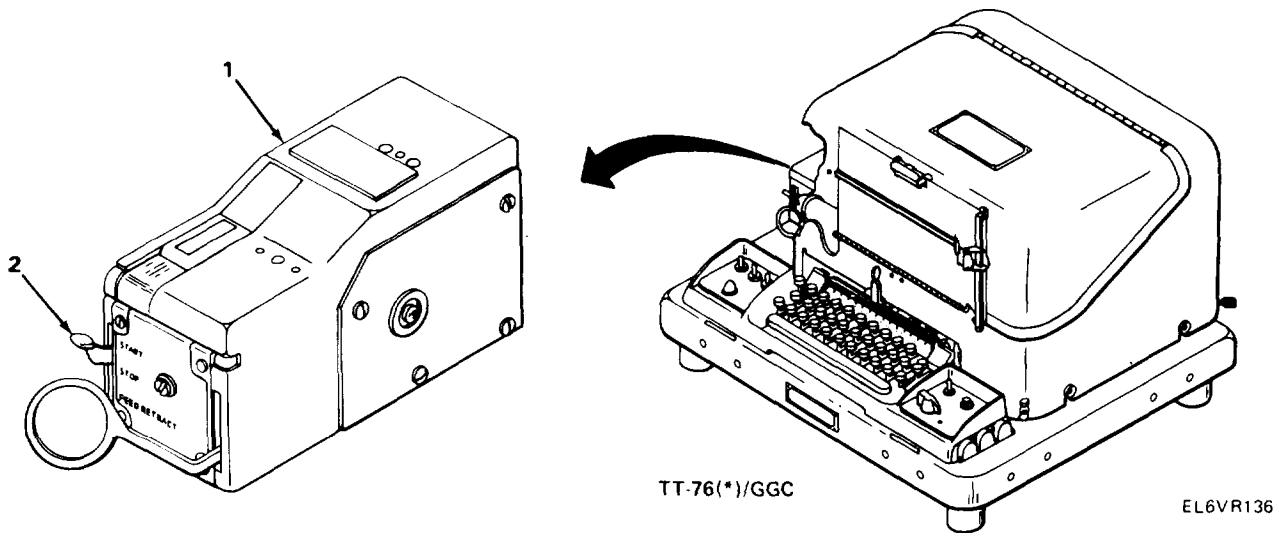
16. Set modem RCV-SEND switch (7) to SEND.
17. Set TT-98/FG MOTOR (1) and LIGHT (2) switches to ON and operate keyboard.
18. Send message from AN/ UGC-74A(V)3 as given in TM 11-5815-602-10.

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. In all AN/GRC-122 models with MK-2488/G, the TT-76(*)/GGC is connected only to the SEND channel. The switch assembly has no control over the TT-76(*)/GGC receiver.



19. Set switch assembly TT-76 OWR-DX-SEND/DX RECEIVE switch to DX SEND.

In all AN/GRC-122 models with MK-2488/G, the TT-76(*)/GGC is connected only to the SEND channel. The switch assembly has no control over the TT-76(*)/GGC receiver.

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. In AN/GRC-122 models without MK-2488/G. In AN/GRC-122 models with MK-2488/G. In AN/GRC-122 models with MK-2488/G, a home copy printed page is available if the HOME COPY switch is set to REC 2.

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.

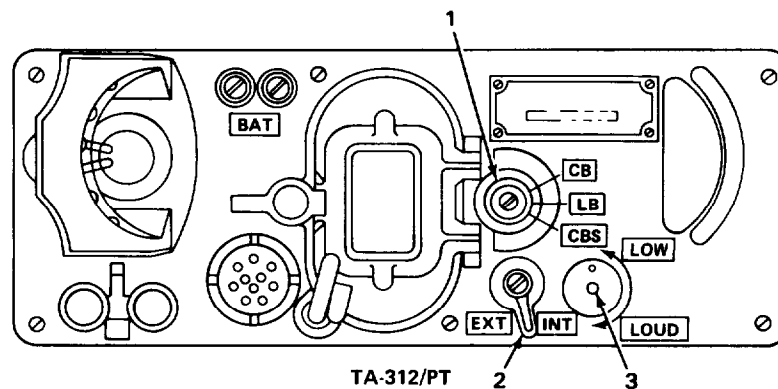
25. Press microphone push-to-talk switch and speak into microphone to transmit, and release push-to-talk switch to receive.

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.



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.

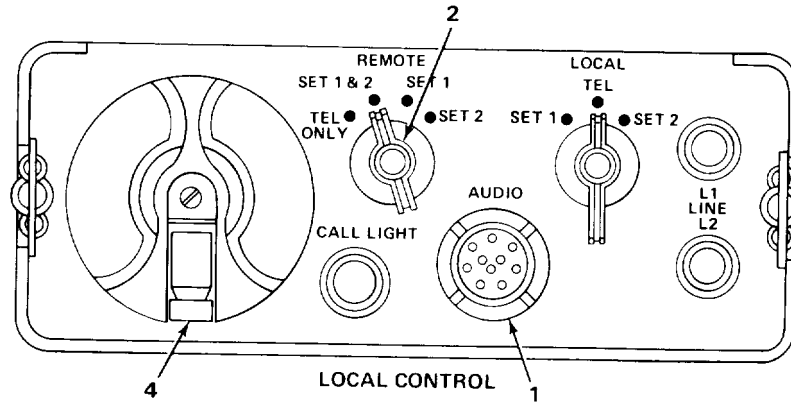
NOTE

During secure operation, TA-312/PT buzzer does not operate but shelter switch assembly call lamp flickers to indicate remote operator is calling.

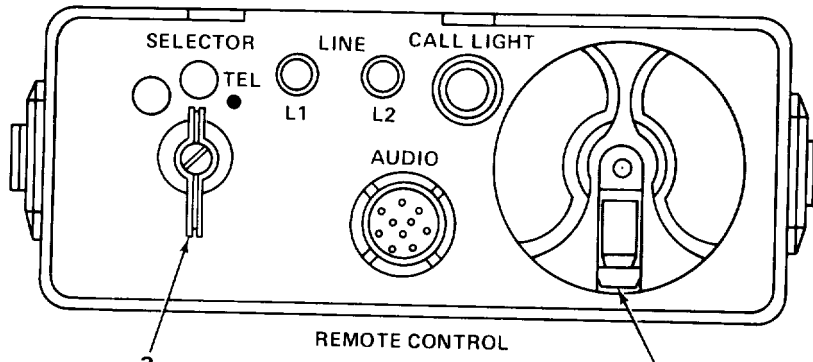
2-34. REMOTE OPERATION. (CONT)

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.

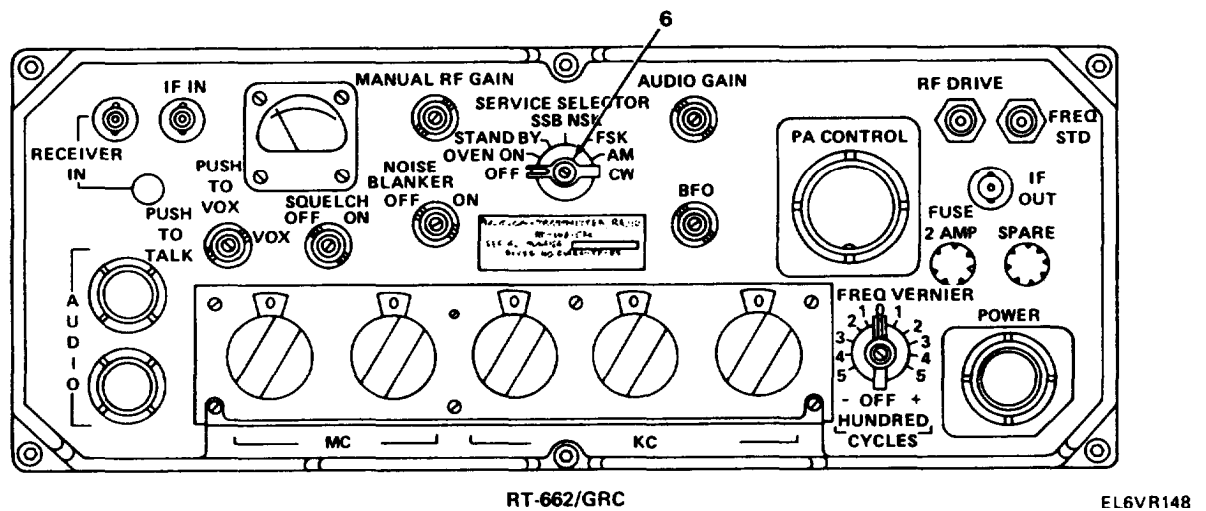
2-34. REMOTE OPERATION. (CONT)

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.



3. At shelter, set RT-662/GRC SERVICE SELECTOR switch (6) for mode of operation required.

SWITCH POSITION

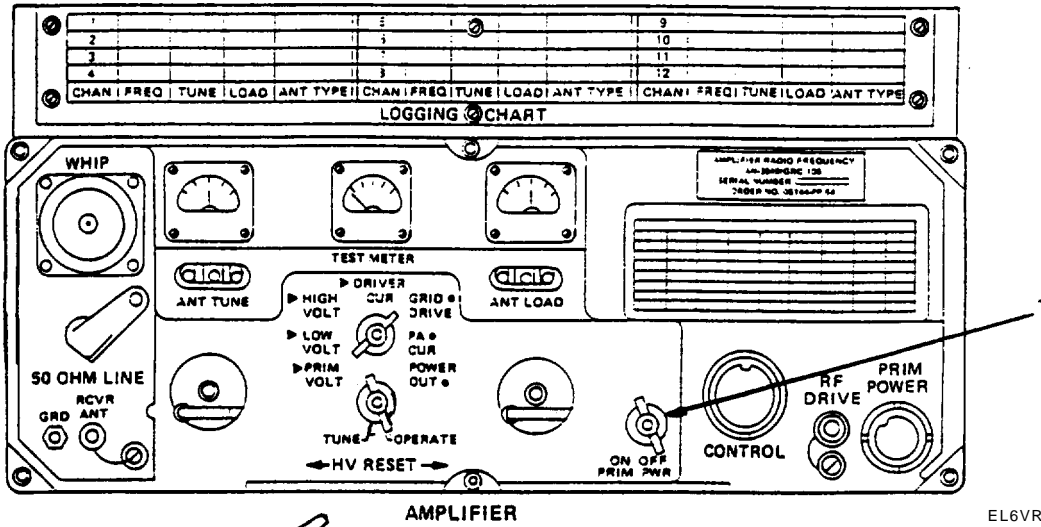
OPERATION

CW
SSB NSK
AM

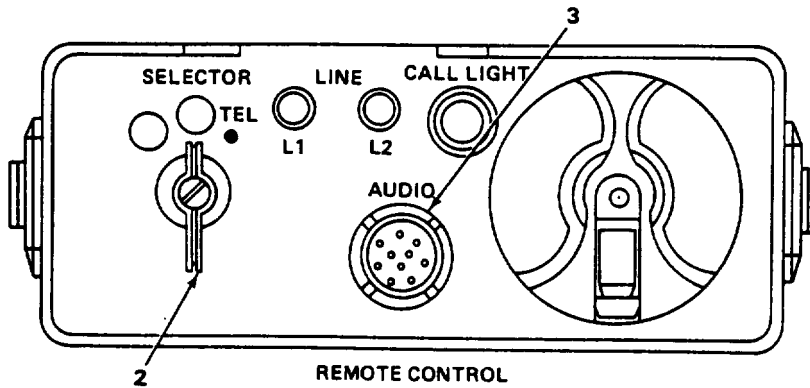
cw operation
ssb voice operation
compatible am.

2-34. REMOTE OPERATION. (CONT)

REMOTE OWR CW, SSB VOICE, OR COMPATIBLE AM VOICE OPERATION (CONT)



EL6VR149



EL6VR150

Transmission and Reception

- 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 (non-secure only)

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.

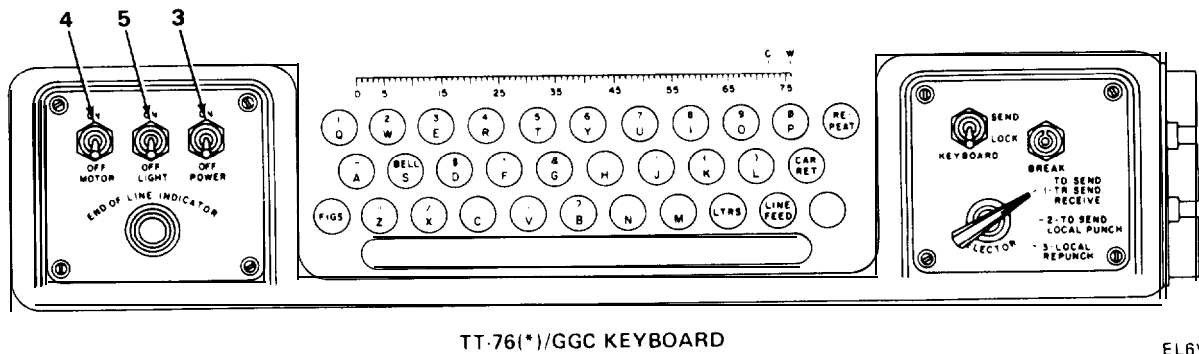
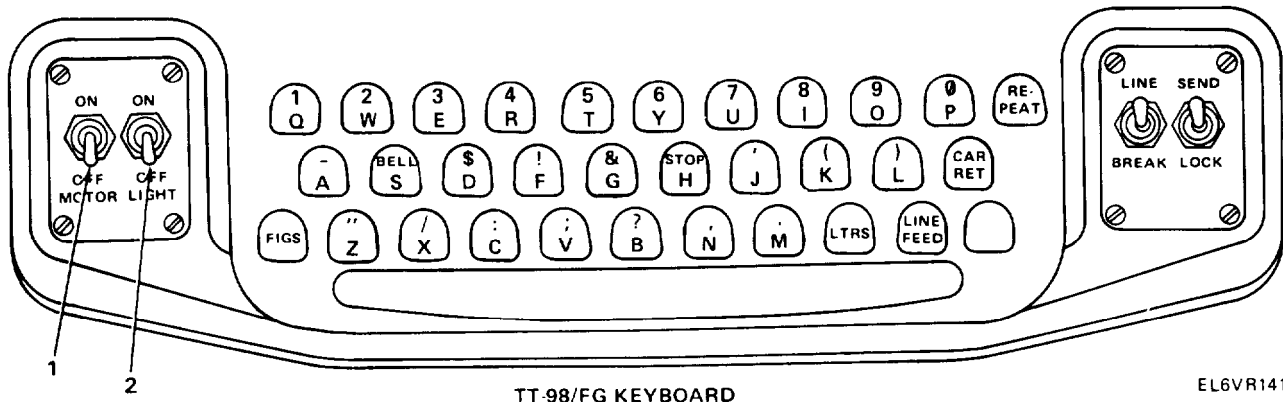
2-34. REMOTE OPERATION. (CONT)

REMOTE OWR FSK, SSB NSK, 85 Hz DIVERSITY, OR 85 Hz + VOICE OPERATION (CONT)

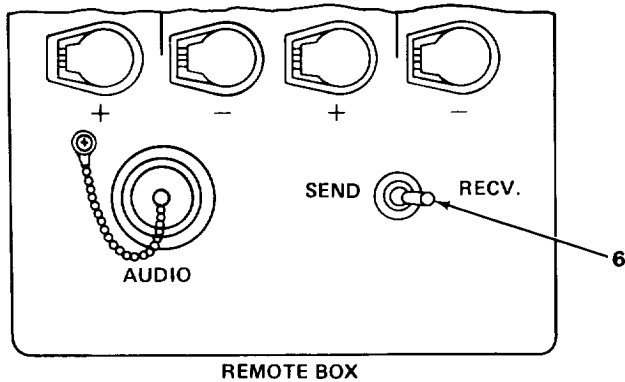
Monitoring Remote Site Transmission or Reception

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.



2-34. REMOTE OPERATION. (CONT)



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.

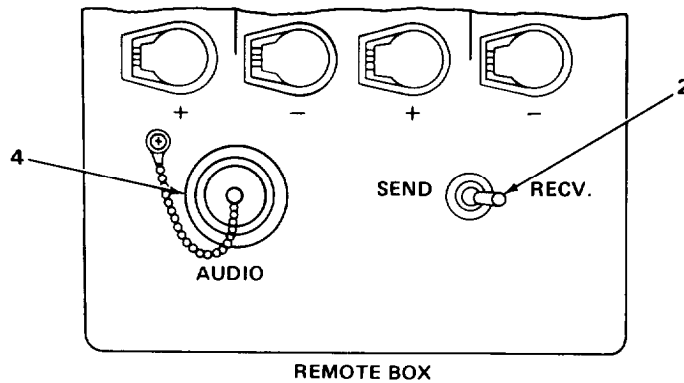
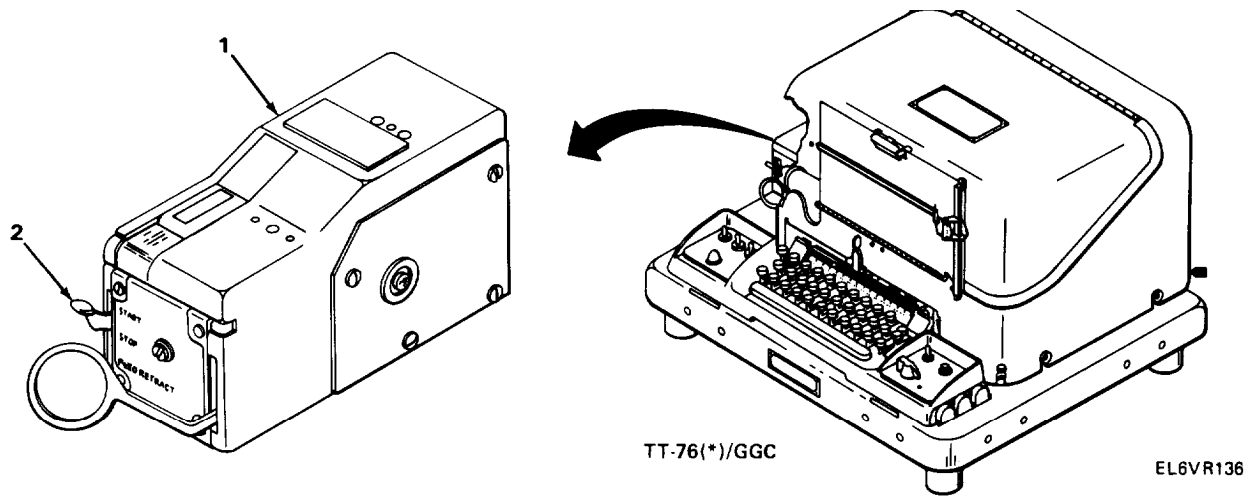
NOTE

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)

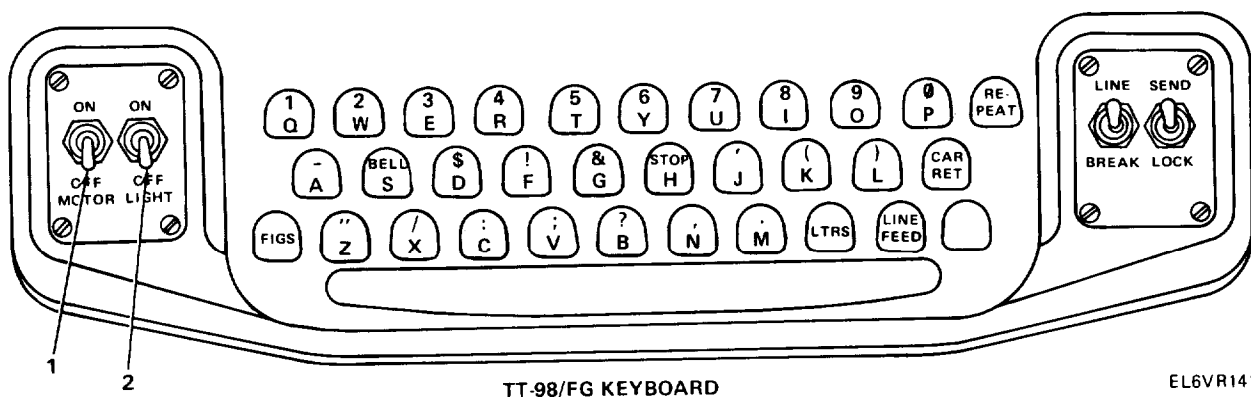
TTY ORDER WIRE (PONY CIRCUIT) OPERATION (AN/GRC-122(*) MODELS)

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.



Reception From Remote Site

NOTE

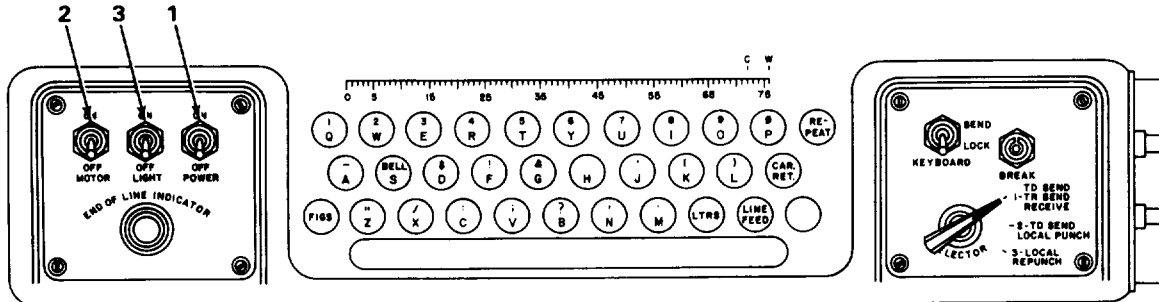
To receive page copy on TT-98/FG from remote site, do step 2. To receive page copy on AN/UGC-74A(V)3 from remote site, do step 3.

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.

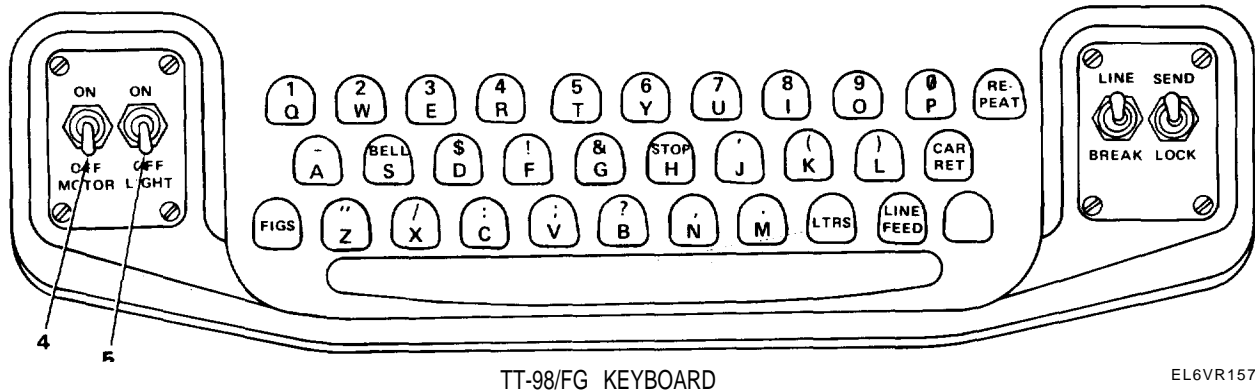
4. At shelter, set TT-76 OWR-DX-SEND/DX RECEIVE switch to DX RECEIVE.
5. At shelter, set TT-76(*)/GGC POWER (1), MOTOR (2), and LIGHT (3) switches to ON for punched tape copy of message from remote site.

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)



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 11-5815-602-10.

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.

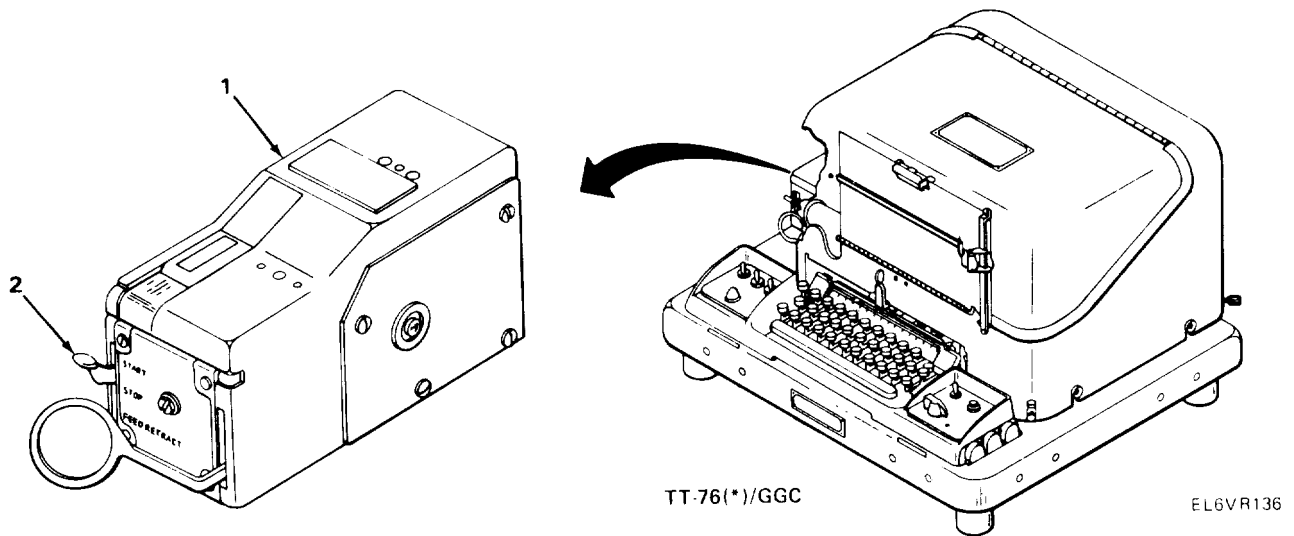
18. At shelter, set TT-76 OWR-DX-SEND/DX-RECEIVE switch to DX-SEND.
19. Set remote TT-76(*)/GGC POWER, MOTOR, and LIGHT to ON, and operate keyboard.

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.

2-34. REMOTE OPERATION (CONT)

REMOTE OWR FSK, SSB NSK 85 HZ DIVERSITY, OR 85 HZ + VOICE OPERATION FOR MODELS WITH MK-2488/G

Perform applicable remote setup procedures for remote equipment (para 2-20.1). OWR operation is the same for all AN/GRC-142(*) models. Duplex circuit operation applies to AN/GRC-122(*) models with MK-2488/G only. Before attempting any remote operations, set up shelter equipment for local OWR mode of operation required (para 2-32).

2-34.1 REMOTE OPERATION OF MODELS WITH MK-2488/G (CONT)

REMOTE OWR, FSK, SSB NSK 85 HZ DIVERSITY, OR 85 HZ + VOICE OPERATION FOR AN/GRC-142 MODELS WITH MK-2488/G ONLY.

Perform remote box and control group telephone operations given in paragraph 2-34.

1. At shelter, set modem and RT-662/GRC controls for same mode of TTY operation selected (local OWR operation, para 2-32) remote OWR TTY operation. Be sure that the modem REC/SEND switches in the REC position.

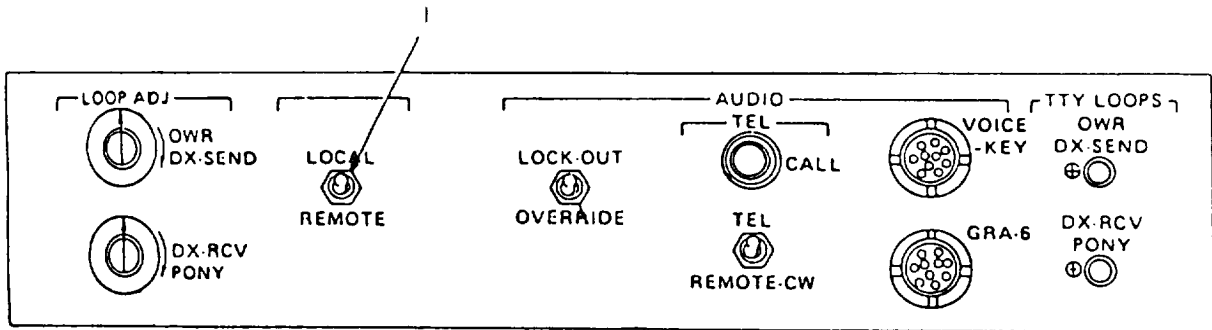
WARNING

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 sock to personnel.

NOTE

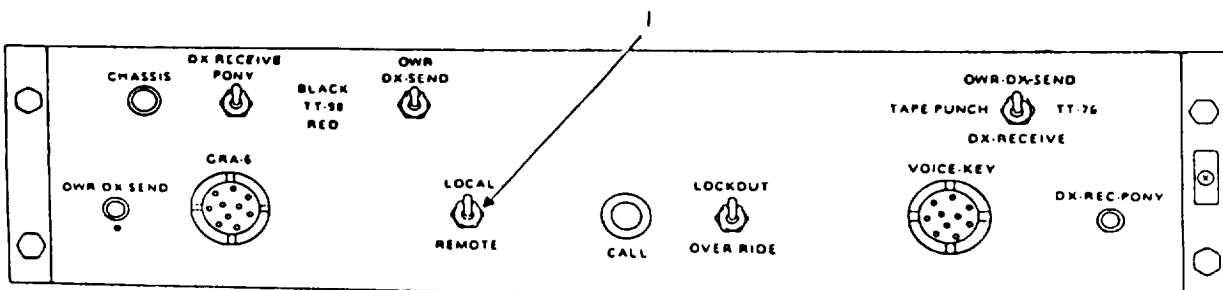
LOCAL-REMOTE switch is located on Switch Assembly SA-1554/GRC-142 in AN/GRC-122/142 Plain and C models with MK-2488/G and Switch Assembly SA- 1650/GRC in AN/GRC-122/142A, B, D and E models with MK-2488/G.

2. At shelter, set switch assembly LOCAL-REMOTE switch (1) to REMOTE.



SWITCH BOX SA-1554/GRC-142 IN

MODELS WITH MK-2488/G



SWITCH ASSEMBLY SA-1650/GRC IN

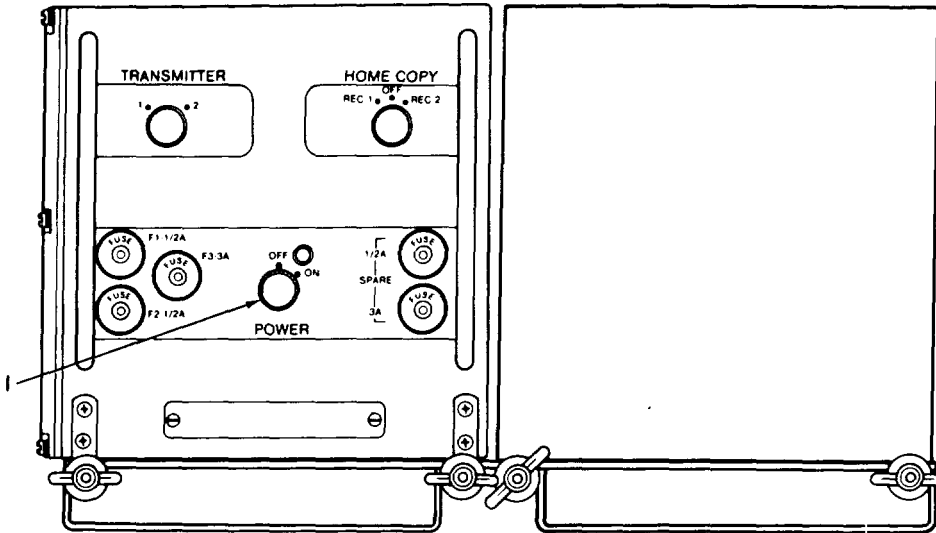
MODELS WITH MK-2488/G

2-34. REMOTE OPERATION (CONT)

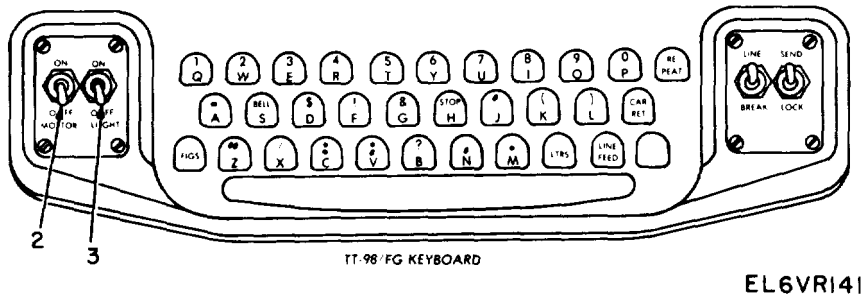
3. If monitoring of remote site transmission and reception is not going to be performed, set the OWR J-4024/U POWER switch (1) to OFF and disconnect the W2 cable phone plug from the OWR-DX-SEND jack (J9 on Switch Box SA-1554/GRC-142 or J19 on Switch Assembly SA-1650/GRC).

CAUTION

Failure to remove the W12 cable connection from the switch assembly will prevent remote operation when the OWR J-4024/U is OFF.

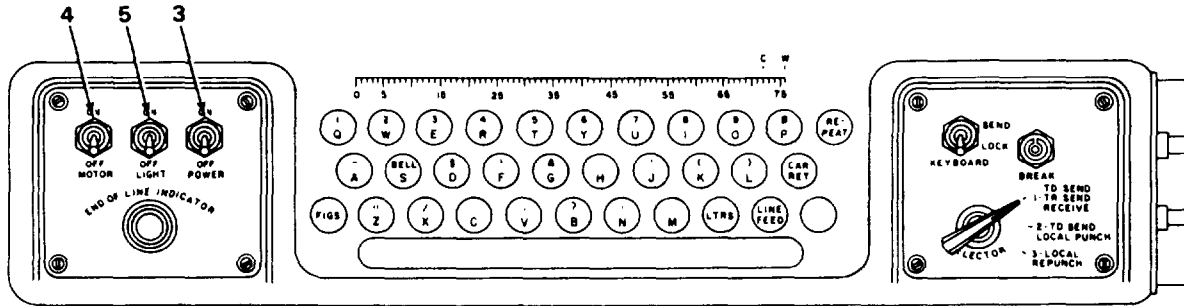


4. When the remote and shelter equipment involved are turned on, check for proper tty dc loop no. 1 current (para 2-22) and adjust if necessary. Do this check at the shelter.



5. At shelter (AN/GRC-142, Plain, A and B models with MK-2488/G) set TT-98/FG MOTOR (1) and LIGHTS (2) switches to ON to print page copy of transmitted or received message.

2-34. REMOTE OPERATION (CONT)



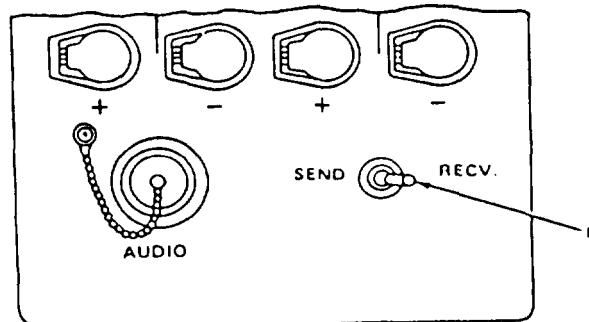
TT76(*)/GGC KEYBOARD

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- 6 If operation and self-test on AN/UGC-74A(V)3 is completed, AN/UGC-74A(V)3 (in AN/GRC-142 C, D and E models with MK-2488/G) will print page copy of transmitted or received message.
- 7 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.

8. Set the remote box SEND-RECEIVE Switch (6) to RECEIVE.



REMOTE BOX

NOTE

To receive page copy at remote site on TT-98/FG, do step 9. To receive page copy at remote site on AN/UGC-74(V)3, do step 10. To receive punched tape copy at remote site on TT-76(*)/GGC, do step 11.

9. Set remote TT-98/FG MOTOR (1) AND LIGHT (2) switches to ON, to print page copy of received message (Remote J-4024/U HOME COPY switch to OFF or REC 1).
10. 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. (Remote J-4024/U HOME COPY switch to OFF or REC 1).
11. Set remote TT-76(*)/GGC POWER (3), MOTOR (4), and LIGHT (5) switches to ON for punched tape copy of received message. (Remote J-4024/U HOME COPY switch to OFF or REC 2).

2-34. REMOTE OPERATION (CONT)

Remote Keyboard Transmission in models with MK-2488/G

NOTE

To transmit from TT-98/FG keyboard, do steps 12, 13, 14 and 18. To transmit from AN/UGC-74A(V)3 keyboard, do steps 12, 13, 15 and 18. To transmit from TT-76(*)/GGC keyboard do steps 12, 16, 17 and 18.

12. Set remote box SEND-RECEIVE switch (6) to SEND.
13. Set remote J-4024/U TRANSMIT switch to position "2".
14. Set remote TT-98/FG MOTOR (1) and LIGHT (2) switches to ON and operate keyboard.
15. Send message from AN/UGC-74A(V)3 as given in TM 11-5815-602-10.
16. Set remote J-4024/U TRANSMIT switch to position "1".
17. Set remote TT-76(*)/GGC POWER (3), MOTOR (4), and LIGHT (5) switches to ON and operate keyboard.
18. When transmission is complete, set remote box SEND-RECEIVE switch (6) to RECEIVE.

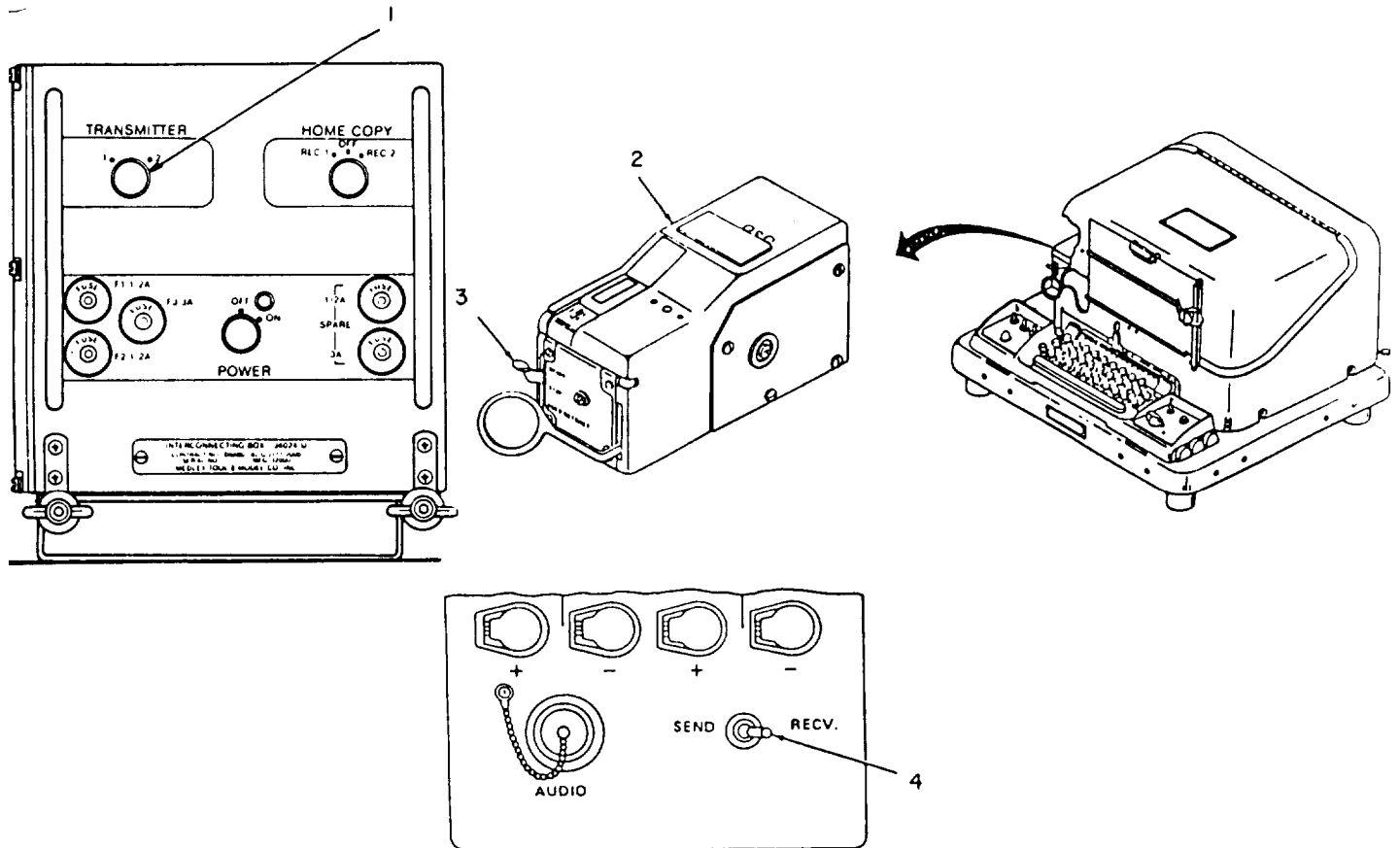
NOTE

Punched tape copy of transmitted message is made when transmitting from either remote TTY if the J-4024/U HOME COPY switch (3) is set to REC 1. A printed page copy of the transmitted message is made when transmitting from either remote TTY if the remote J-4024/U HOME COPY switch is set to REC 2.

2-34. REMOTE OPERATION (CONT)

REMOTE OWR FSK, SSB NSK, 85 Hz DIVERSITY, OR 85 Hz + VOICE OPERATION (CONT)
AN/GRC-142(*) MODELS WITH MK-2488/G ONLY.

Remote Punched Tape Transmission



19. Set remote J-4024/U TRANSMIT switch (2) to position " 1".
 20. Set remote TT-76(*)/GGC POWER, MOTOR, and LIGHT switches to ON.
 21. Insert prepared punched tape into remote TT-76(*)/GGC transmitter-distributor (2).
 - 22 Set remote box SEND-RECEIVE switch (4) to SEND.
 23. Set remote TT-76(*)/GGC START-STOP-FEED RETRACT switch (3) to START, to transmit message
 24. After message is sent, set TT-76(*)/GGC START-STOP-FEED RETRACT switch (3) to STOP.
 25. Set remote box SEND-RECEIVE switch (4) to RECEIVE.
- 85 Hz + Voice Remote Transmission and Reception
26. Connect microphone to remote box AUDIO connector (5).
 27. Press microphone push-to-talk button to transmit voice and release push-to-talk button for voice reception.

2-34. REMOTE OPERATION (CONT)

REMOTE DUPLEX FSK, SSB NSK, OR 85 Hz DIVERSITY OPERATION AN/GRC-122(*) MODELS WITH MK-2488/G ONLY

Remote duplex TTY operation is similar to local duplex operation except that duplex 85 Hz voice operation is not possible from remote side. Perform remote box and control group telephone operations given in paragraph 2-34.

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.

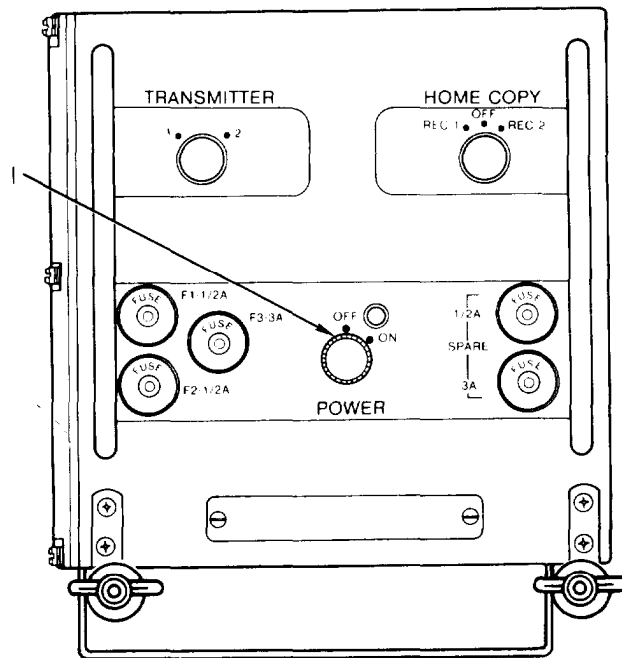
WARNING

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.

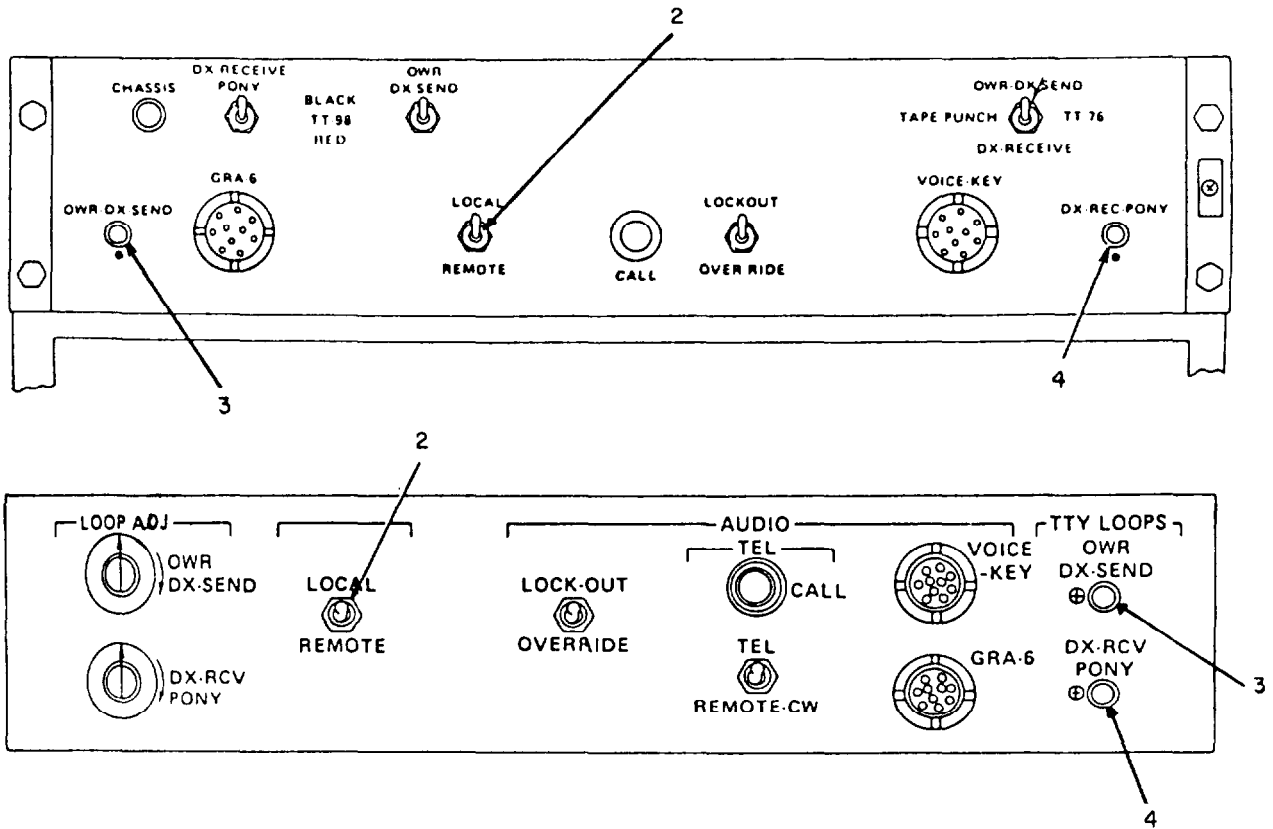
NOTE

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-122/142A, B, D, and E models.

2. At the shelter, set the OWR and Duplex J-4024/U POWER switches (1) to OFF.



2-34. REMOTE OPERATION (CONT)



3. At the shelter, set the switch assembly LOCAL-REMOTE switch (2) to REMOTE.
4. At the shelter, disconnect the W11 and W12 cable phone plugs from the switch assembly OWR-DX - SEND jack (3) and the DX-REC-PONY jack (4) (J8 and J9 on Switch Box SA-1554/GRC-142 in the AN/GRC-122 Plain and C models with MK-2488/G or J18 on Switch Assembly SA-1650/GRC in the AN/GRC-122A, B, D and E models with MK-2488/G).

CAUTION

Failure to remote the W11 and W12 cable connections from the switch assembly will prevent remote operation when OWR and duplex J-4024/U's are OFF.

5. When remote and shelter equipment are turned on 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) AN/GRC-122(*) MODELS WITH MK-2488/G ONLY

Monitoring Remote Transmission and Reception.

Monitoring of remote site transmission or reception in the AN/GRC-122(*) models with MK-2488/G is not possible when the J-4024/U's and DLED's in the OWR and Duplex positions are Installed for normal Local duplex operation. If it is essential that remote site transmissions and receptions be monitored in the shelter, the OWR and Duplex J-4024/U must both be connected to W11 and W12 respectively for OWR OPERATION (see para 2-21.1 for OWR installation procedures). The DLED's must also be set up for OWR operation (half duplex). When the configuration of the J-4024/U's and DLED's in the AN/GRC-122(*) models with MK-2488/G have been modified for OWR operation, monitoring of the remote site transmissions and receptions can be performed as follows:

NOTE

To monitor remote site transmitted message on TT-98/FG, do step 6. To monitor remote site transmitted message on AN/UGC-74(A/V)3, do step 7. For punched tape copy of remote site transmitted message do step 8.

6. At shelter (AN/GRC-122 Plain, A and B models with MK-2488/G), set TT-98/FG MOTOR and LIGHT switches to ON to print page copy of transmitted message.
7. If operation and self-test on AN/UGC-74A(V)3 is (para 2-28), AN/UGC-74A(V)3 (AN/GRC-122 C, D & E models with MK-2488/G) will print page copy of transmitted message
8. At shelter, (AN/GRC-122(*) models with MK-2488/G) set TT-75(*)/GGC POWER, MOTOR, and LIGHT switches to ON for punched tape copy of transmitted message

Monitoring Remote Reception.

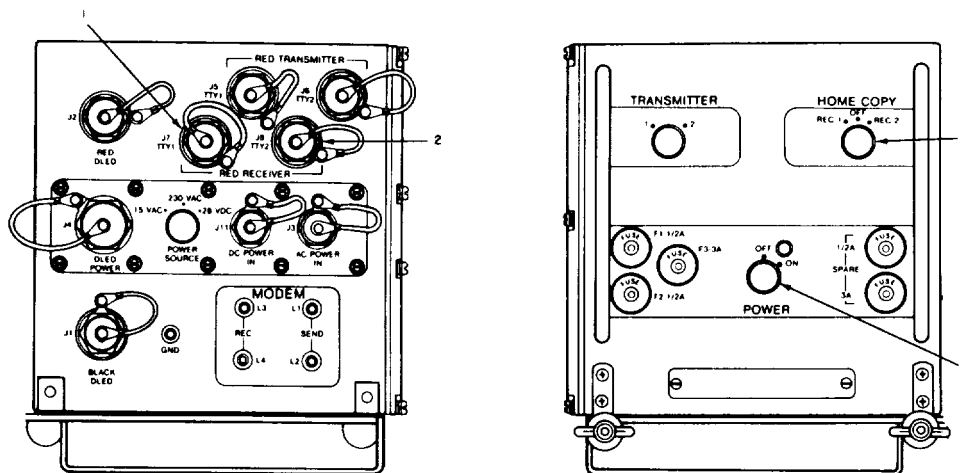
NOTE

To monitor remote site received message on TT-98/FG, do step 9. To monitor site received message on AN/UGC-74A(V)3, do step 10. For punched tape copy of remote received message on TT-76(*)/GGC do steps 11, 12, and 13.

9. At shelter, set duplex TT-98/FG MOTOR and LIGHT switches to ON to print page copy of received message.
10. 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.

2-34. REMOTE OPERATION (CONT)

REMOTE DUPLEX FSK, SSB NSK OR 85 Hz DIVERSITY OPERATION FOR AN/GRC-122 MODELS WITH MK-2488/G ONLY (CONT)



NOTE

TT-76(*)/GGC is not able to receive punched tape copy unless it is connected to the Duplex J-4024/U.

11. At the shelter disconnect the W5 connector from the OWR J-4024/U J7 (1) and connect it to J8, TTY RECEIVE (2) on the Duplex J-4024/U.
12. Make sure that the Duplex J-4024/U HOME COPY switch (3) is set to OFF and the POWER switch (4) is set to ON.
13. 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 14.
 To receive page copy at remote site on AN/UGC-74A(V)3, do step 15. To receive punched taped copy of message on TT-76(*)/GGC, do steps 13 and 14.

14. At remote site, set remote duplex TT-98/FG MOTOR and LIGHT switches to ON, to print page copy of received message. Remote J-4024/U HOME COPY switch to OFF or REC.

2-34. REMOTE OPERATION (CONT)

REMOTE DUPLEX FSK, SSB NSK OR 85 Hz DIVERSITY OPERATION FOR AN/GRC-122 MODELS WITH MK-2488/G (CONT)

15. 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. (Remote J-4024/U HOME COPY switch to OFF or REC 2).
16. At shelter, set TT-76(*)/GGC POWER, MOTOR, and LIGHT switches to ON, for punched tape copy of received message. (Remote J-4024/U HOME COPY switch to OFF or REC 2).

Remote Keyboard Transmission

NOTE

To transmit from remote TT-98/FG keyboard do steps 17, 18, and 19. To transmit from remote AN/UGC-74A(V) 3 keyboard, do steps 17, 18 and 20. To transmit from remote TT-76(*)/GGC keyboard do steps 21 and 22.

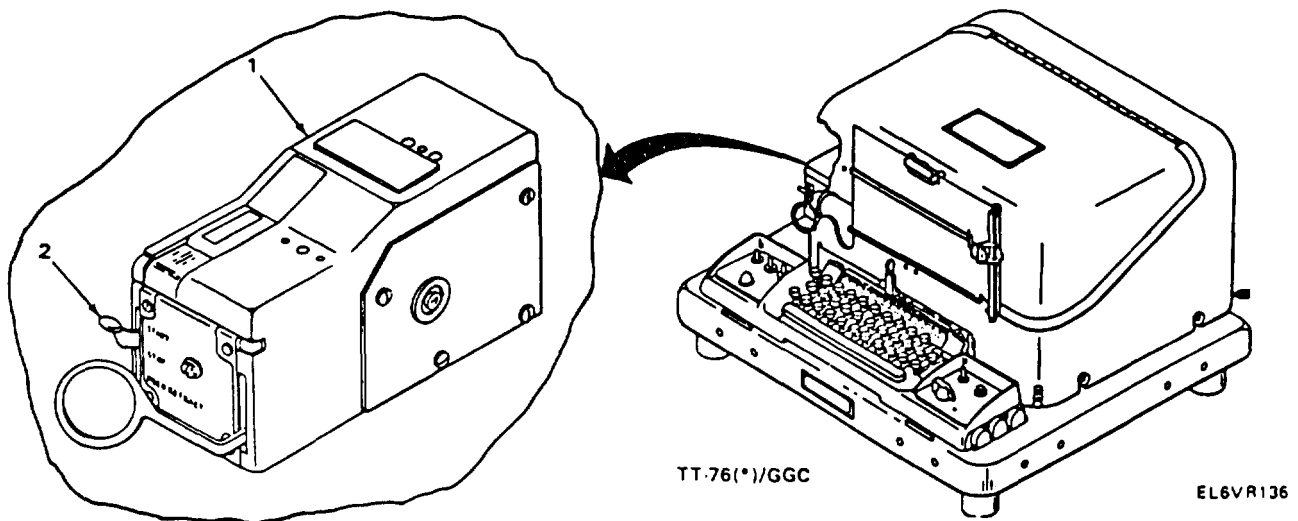
NOTE

A HOME COPY of the transmitted message can be made on punched tape or printer page, To obtain a punched tape of the transmitted message, set the HOME COPY switch on the remote J-4024/U to REC 1. To obtain a printed page COPY of the transmitted message, set the HOME COPY switch on the Remote J-4024/U to REC 2.

17. Set remote box SEND-RECEIVE switch to SEND.
18. Set remote J-4024/U TRANSMIT switch to "2".
19. Set remote TT-98/FG MOTOR and LIGHT switches to ON and operate keyboard.
20. Send message from AN/UGC-74A(V)3, as given in TM 11-5815-602-12.
21. Set remote J-4024/U TRANSMIT switch to "1".
22. Set remote TT-76(*)/GGC POWER, MOTOR, and LIGHT to ON, and operate keyboard.

Remote Punched Tape Transmission (TD)

23. Set the remote J-4024/U TRANSMIT switch to "1".
24. Set remote TT-76(*)/GGC POWER, MOTOR, and LIGHT switches to ON.
25. Set remote box SEND-RECEIVE switch to SEND.

2-34. REMOTE OPERATION (CONT)**REMOTE DUPLEX FSK, SSB NSK, OR 85 Hz DIVERSITY OPERATION AN/GRC-122(*) MODELS WITH MK-2488/G ONLY (CONT)**

26. Insert prepared punched tape into remote TT-76(*)/GGC transmitter-distributor (1).

27. Set remote TT-76(*)/GGC START-STOP-FEED RETRACT LEVER (2) TO START.

28. After message is sent, set remote box SEND-RECEIVE switch to STOP.

29. SET TT-76(*)/GGC START-STOP FEED RETRACT lever (2) to STOP.

2-35. STOPPING PROCEDURES.

AN/GRC-122/142(*) radio sets maybe 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 procedures (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. In models with MK-2488/G, set the POWER switch on each J-4024/U and DLED to 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.

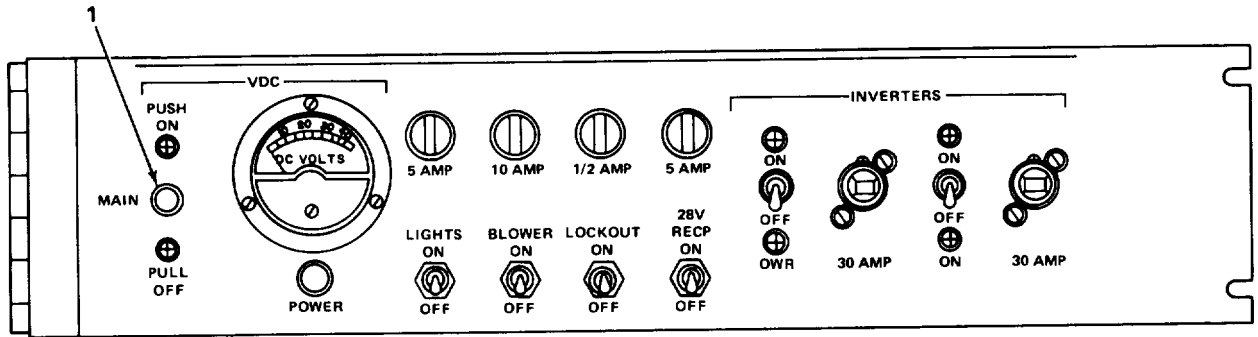
To shut down shelter in an emergency, do the following steps:

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



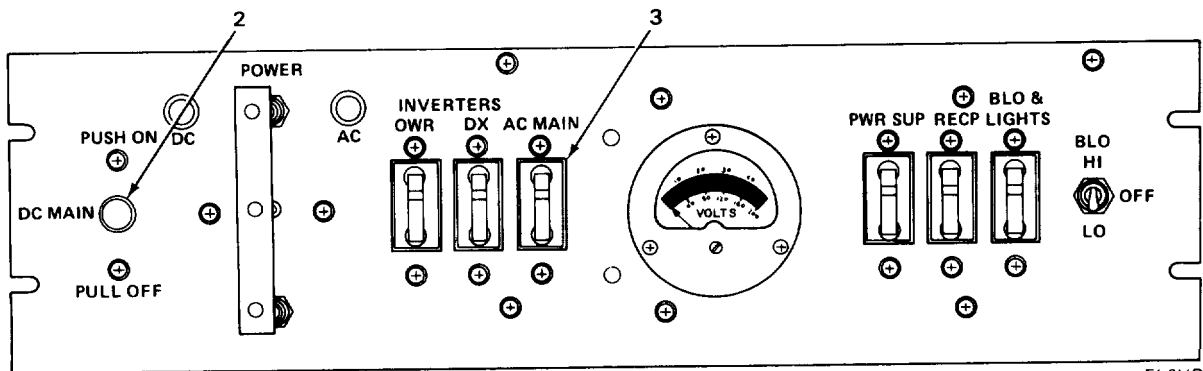
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NOTE

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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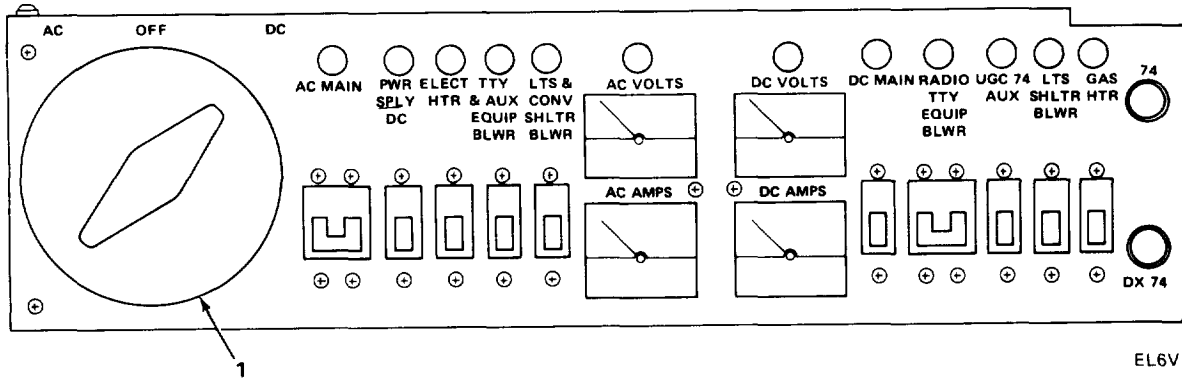
NOTE

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
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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
Anti jamming	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.

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 maybe 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.

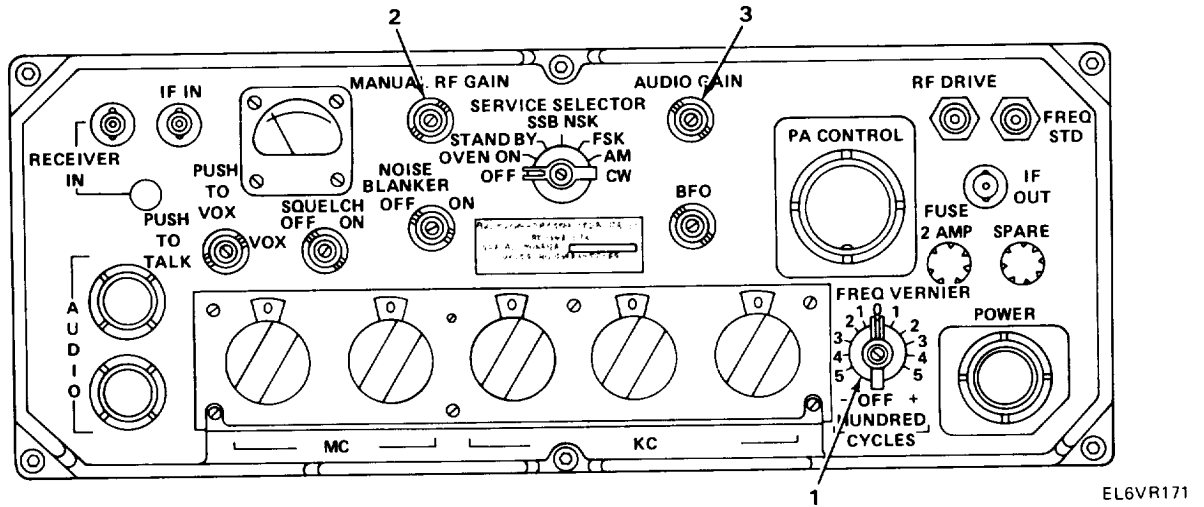
2-43. RECOGNITION AND IDENTIFICATION OF JAMMING. (CONT)

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.

244. 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 ovr 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.

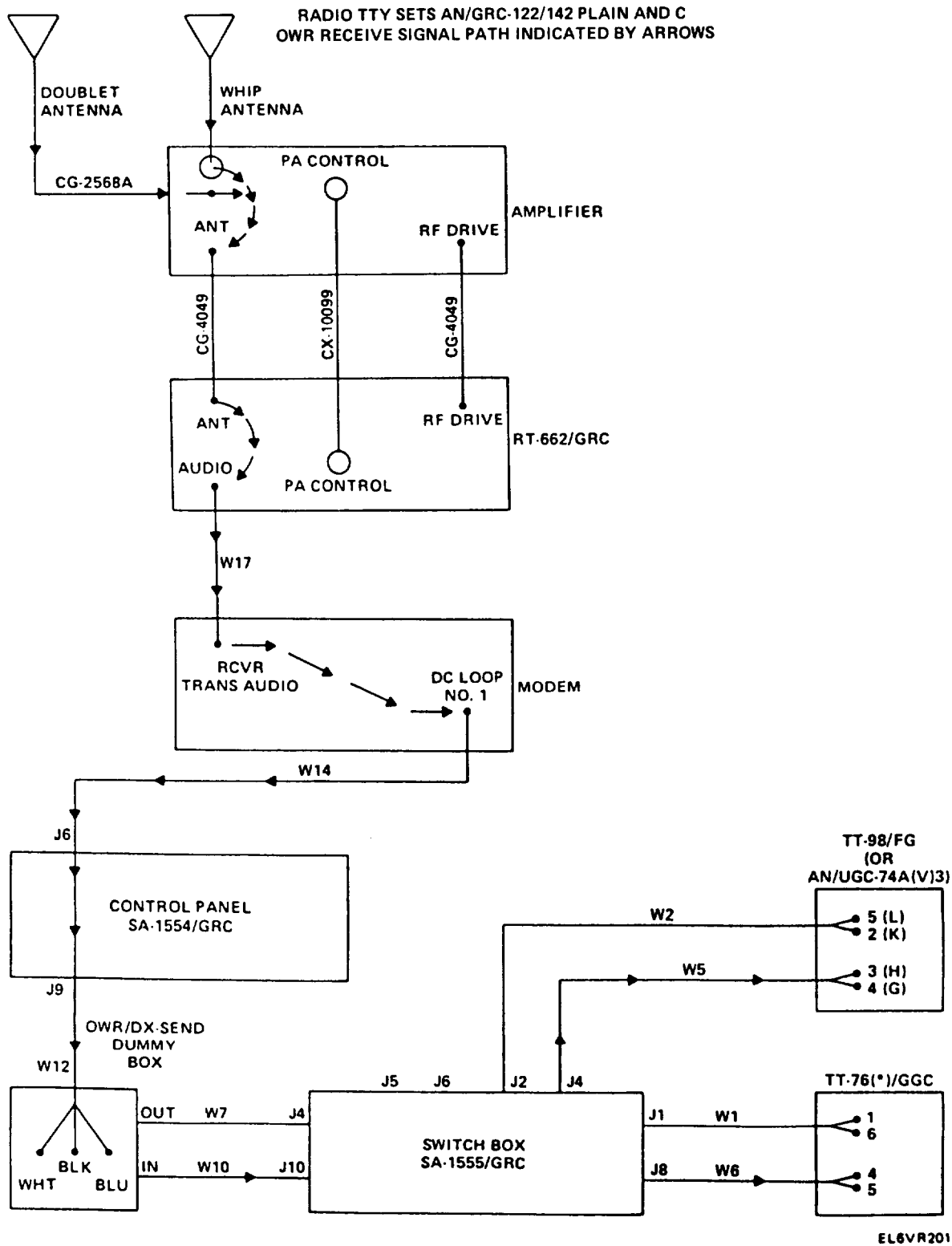
3-2. SYMPTOM INDEX.

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3-2. SYMPTOM INDEX. (CONT)

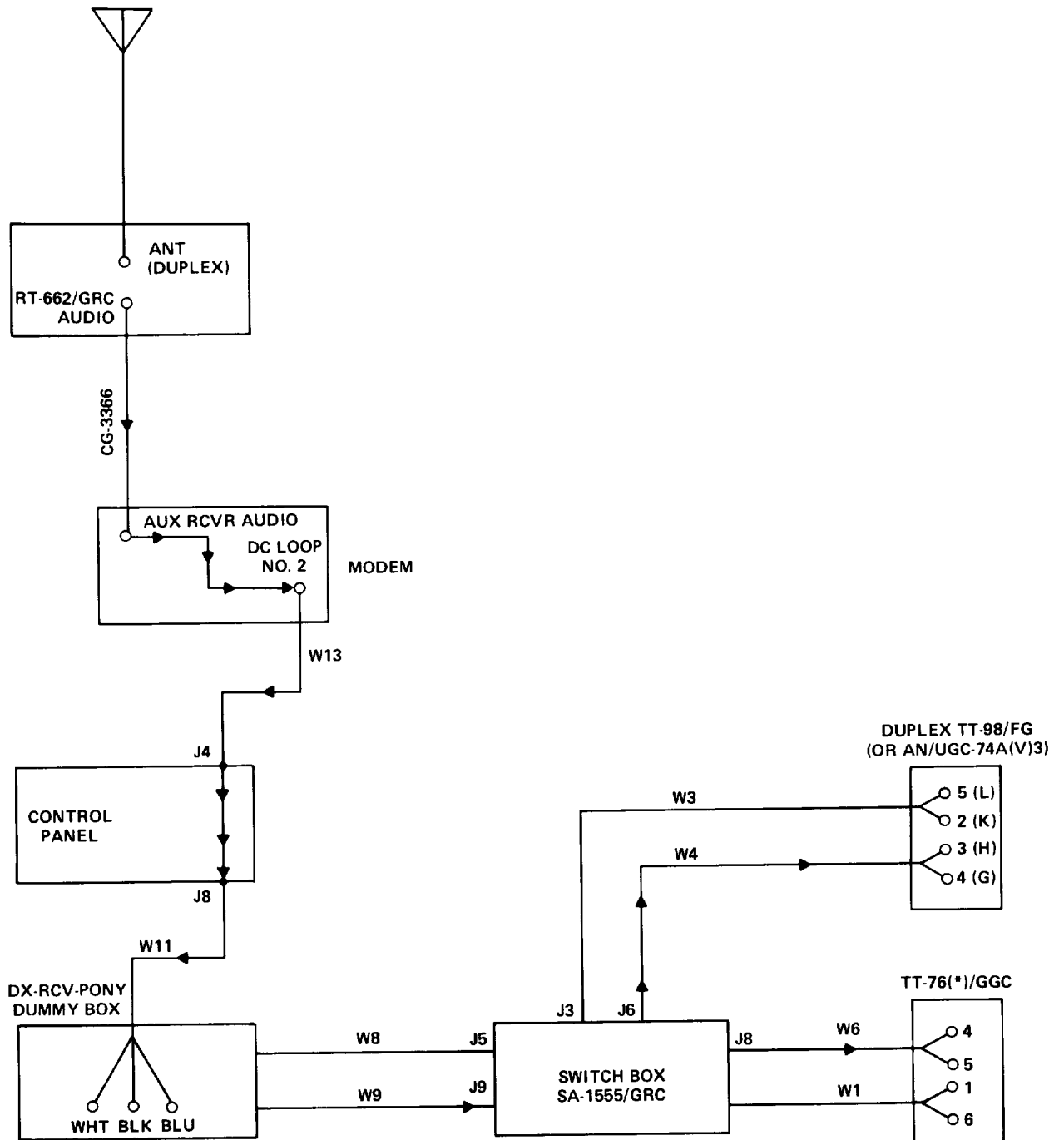
	Page
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3-3. SIGNAL CABLING DIAGRAMS.



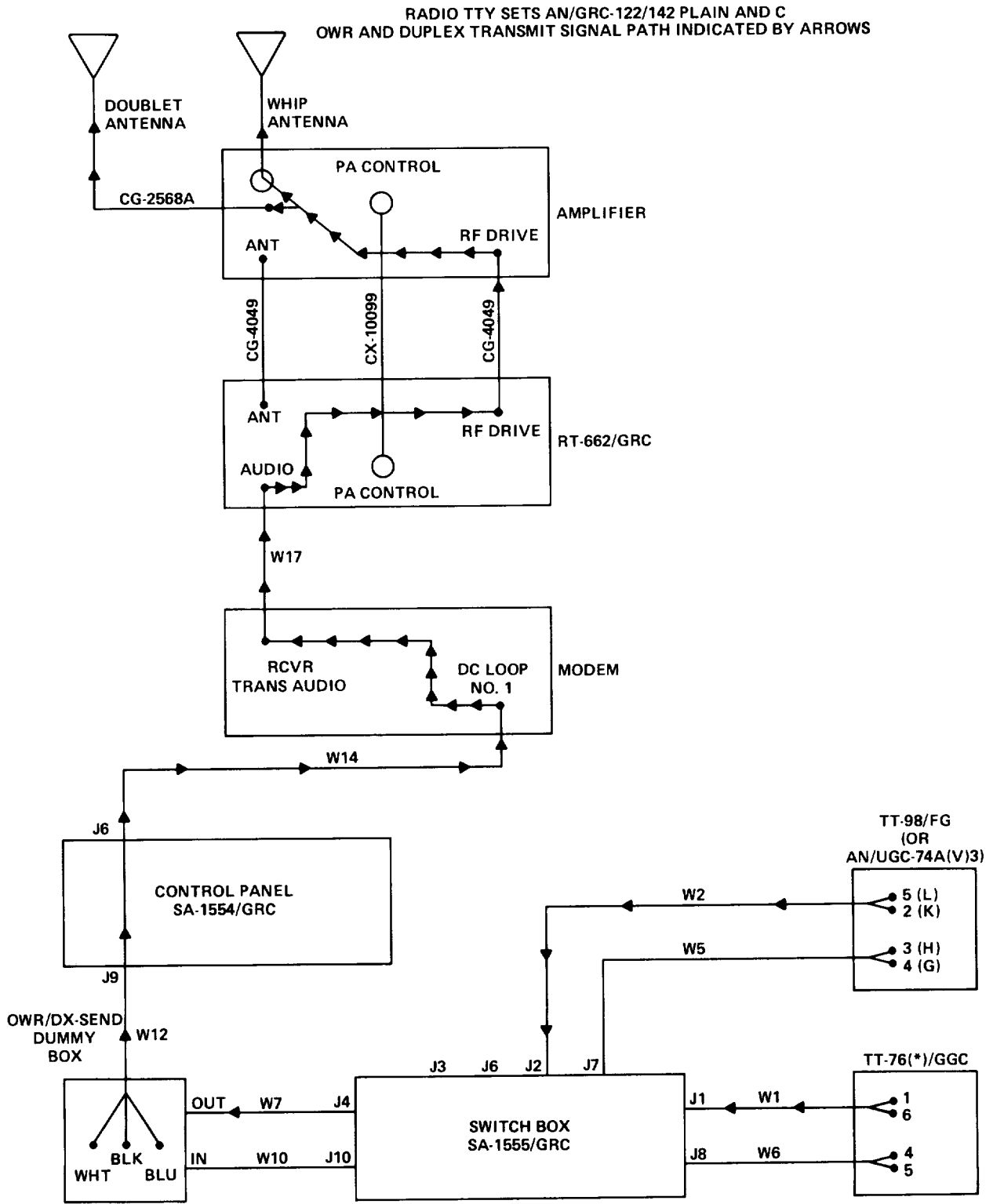
3-3. SIGNAL CABLING DIAGRAMS. (CONT)

RADIO TTY SETS AN/GRC-122/142 PLAIN AND C
 DUPLEX RECEIVE SIGNAL PATH INDICATED BY ARROWS



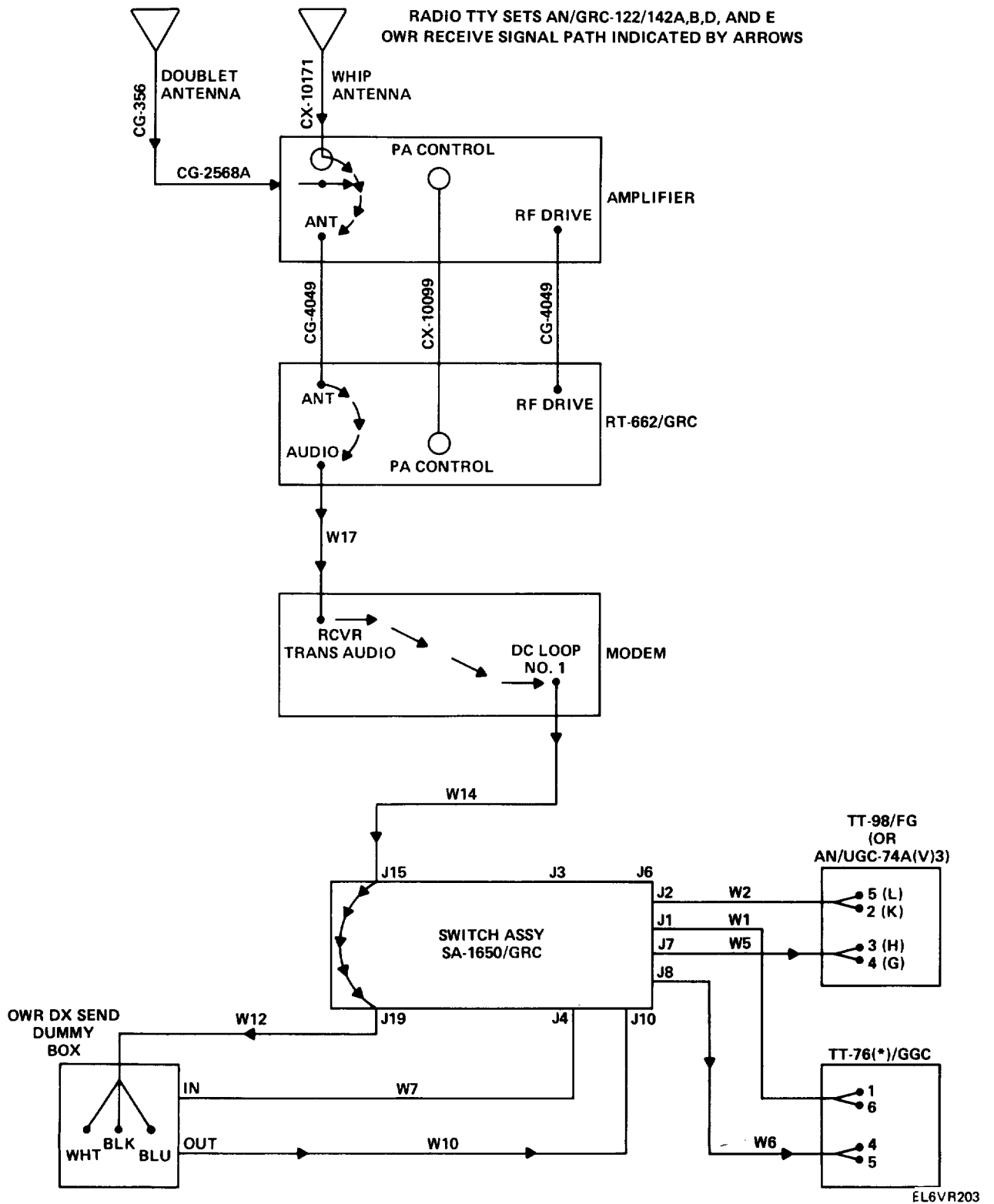
EL6VR205

3-3. SIGNAL CABLING DIAGRAMS. (CONT)



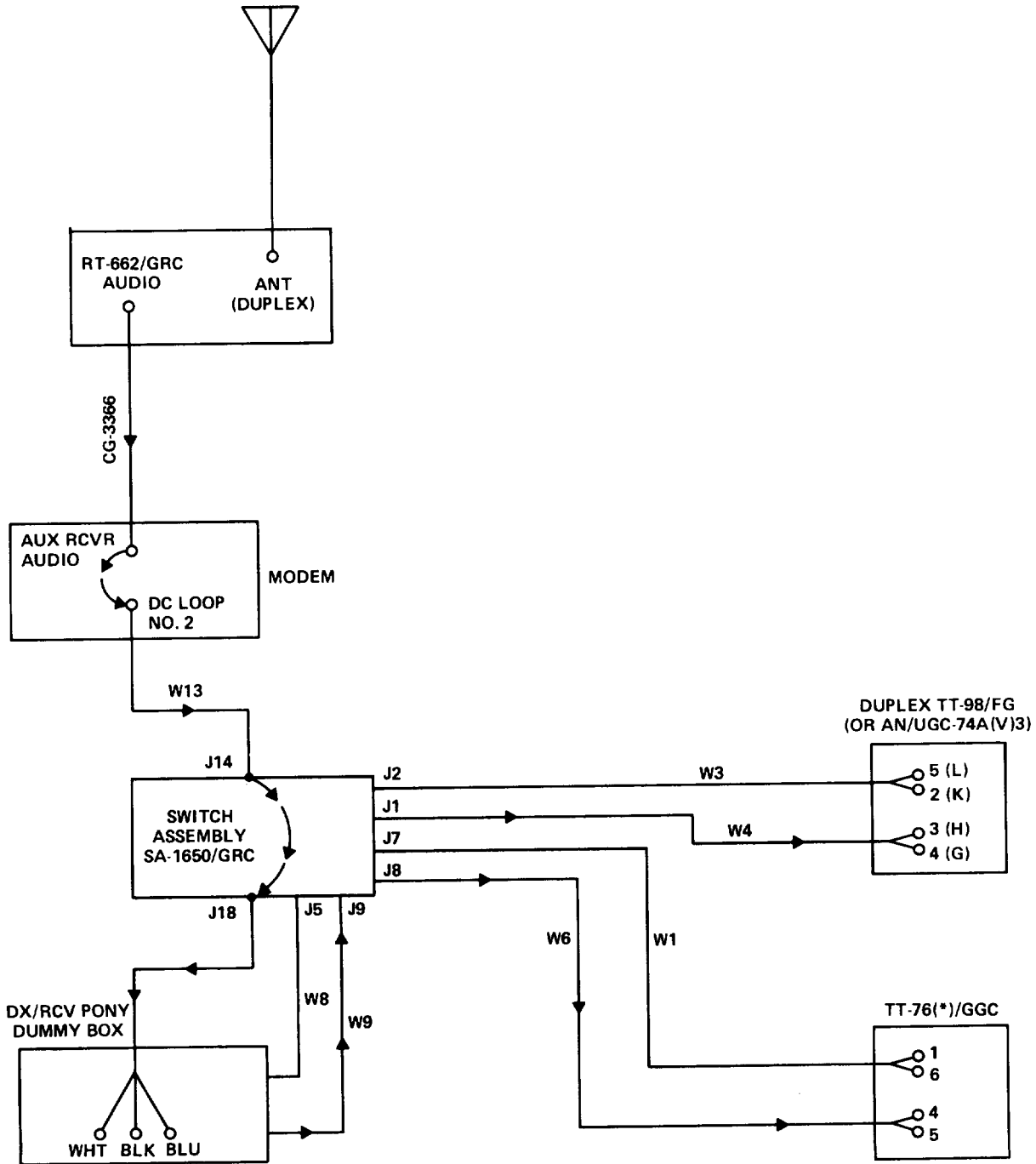
EL6VR202

3-3. SIGNAL CABLING DIAGRAMS. (CONT)



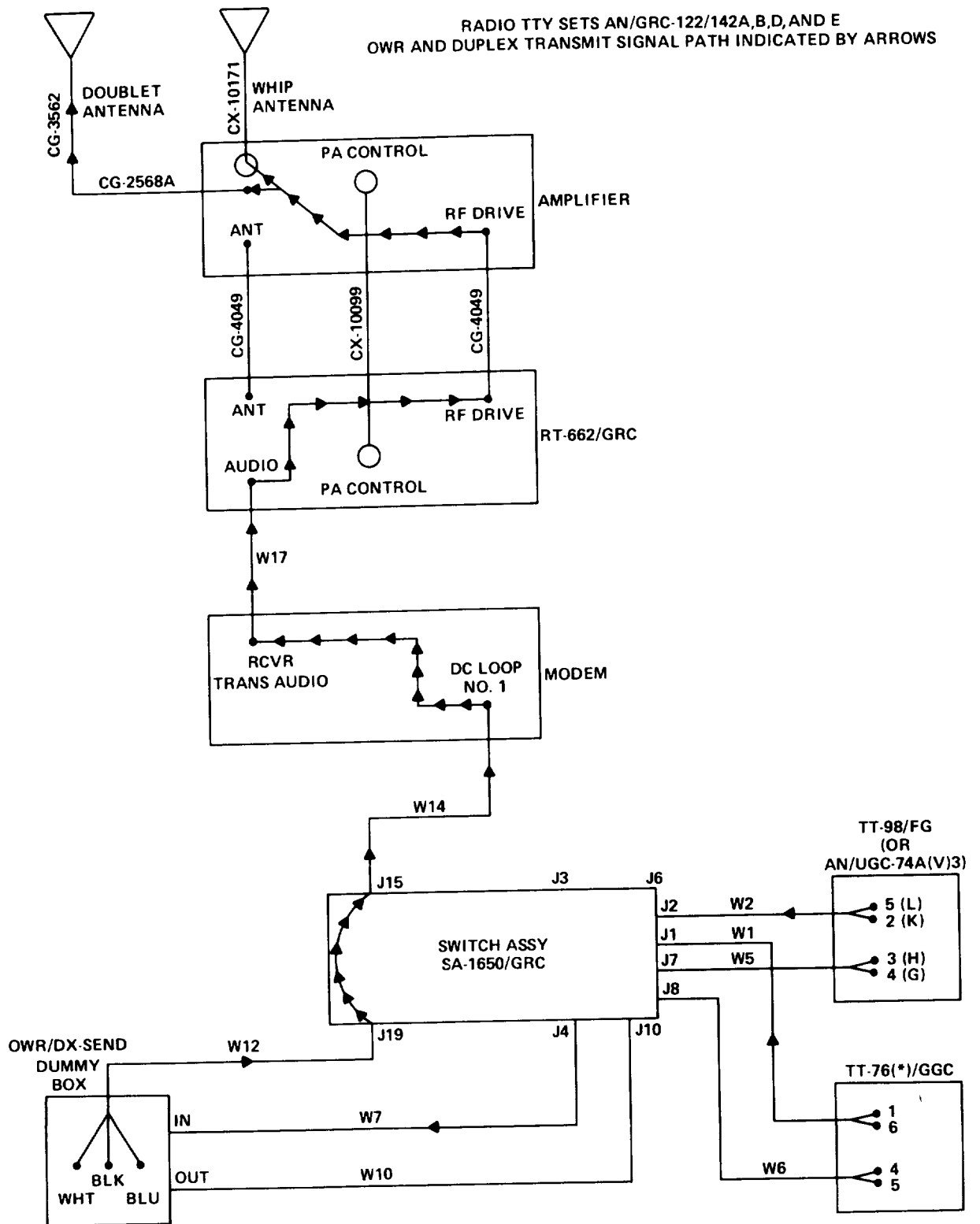
3-3. SIGNAL CABLING DIAGRAMS. (CONT)

RADIO TTY SETS AN/GRC-122/142A, B, D, AND E
 DUPLEX RECEIVE SIGNAL PATH INDICATED BY ARROWS



EL6V R206

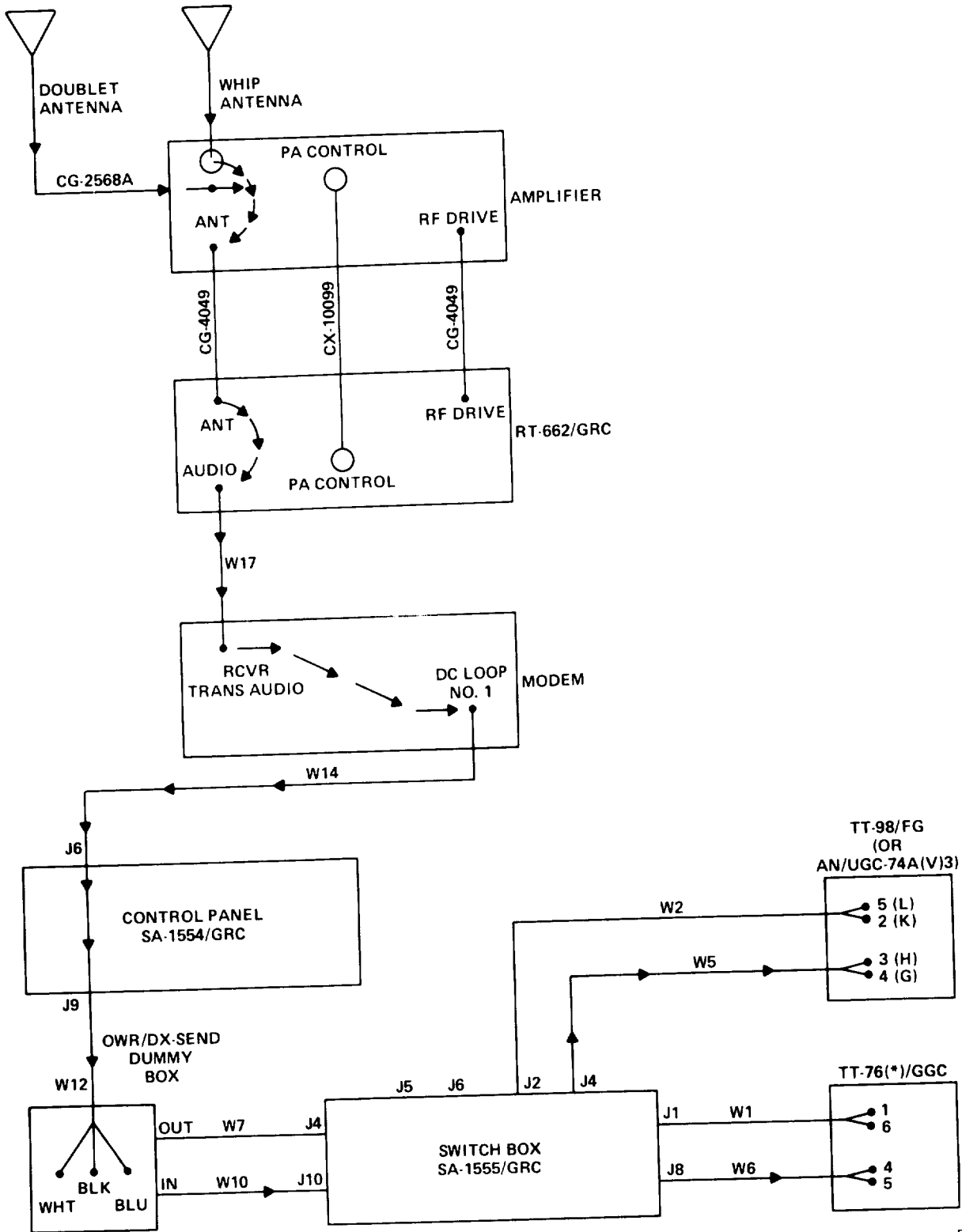
3-3. SIGNAL CABLING DIAGRAMS. (CONT)



EL6VR204

3-3. SIGNAL CABLING DIAGRAMS

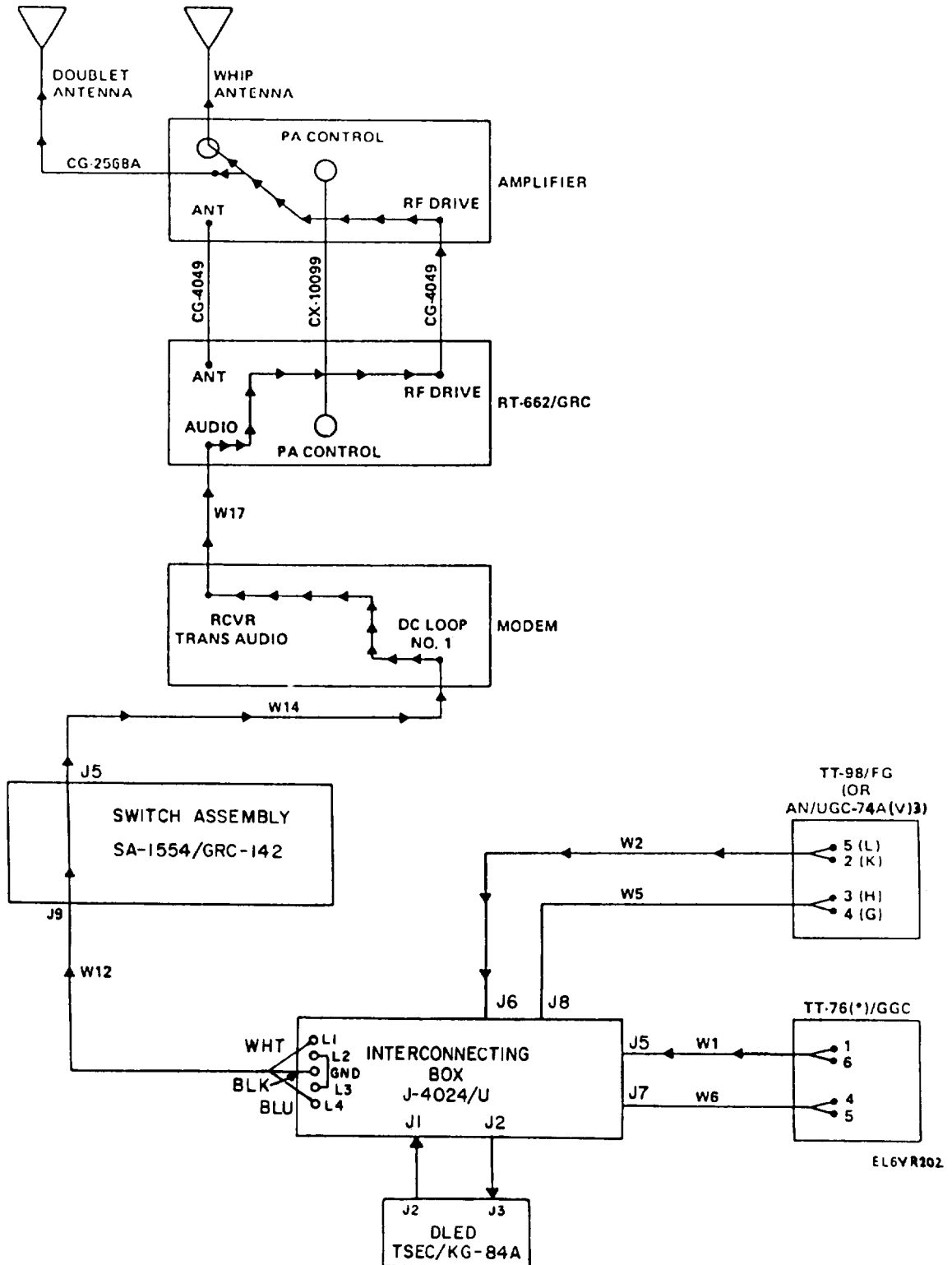
RADIO TTY SETS AN/GRC-122/142 PLAIN AND C MODELS OWR AND DUPLEX RECEIVE SIGNAL PATH INDICATED BY ARROWS.



EL6VR201

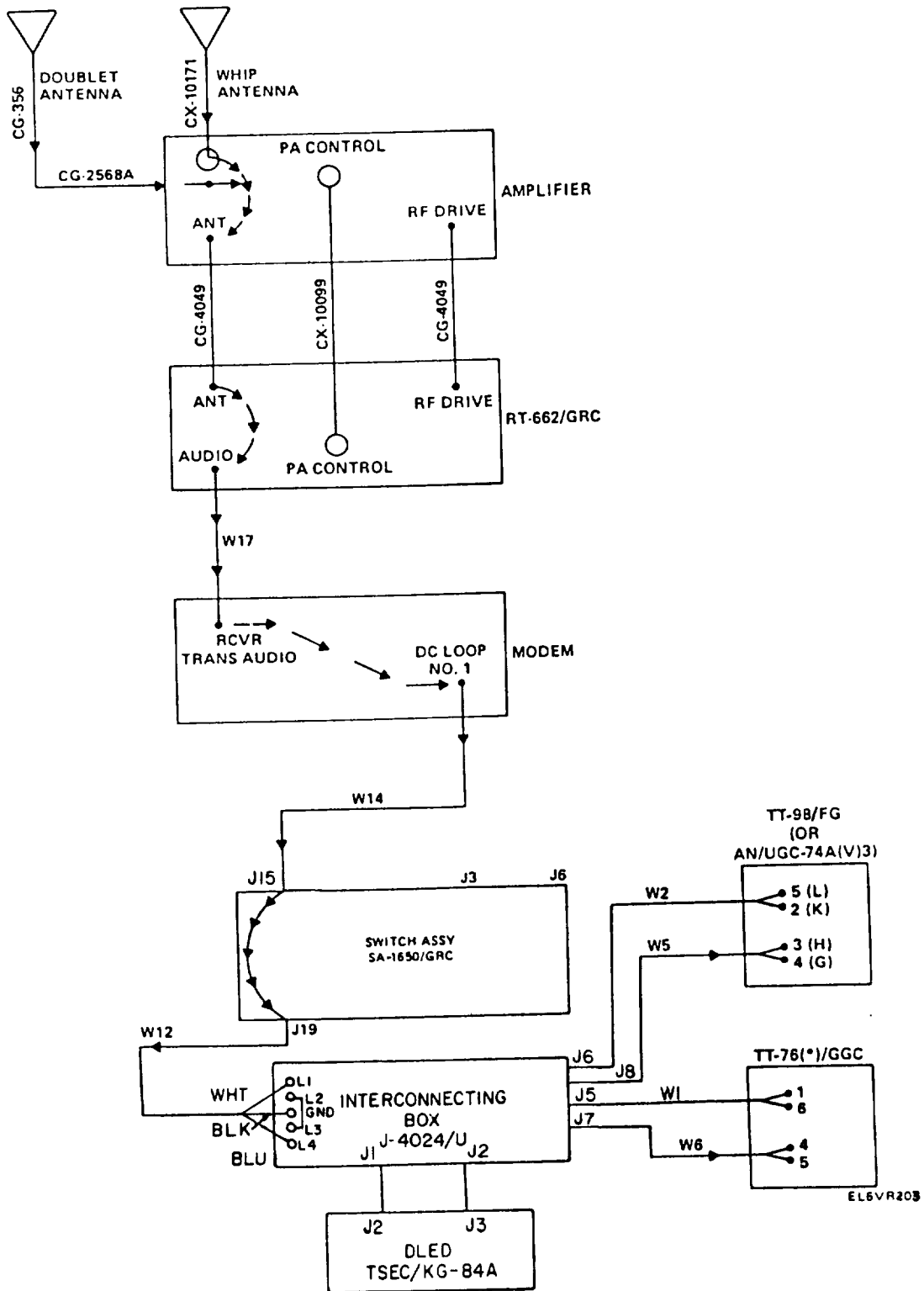
3-3. SIGNAL CABLING DIAGRAMS (CONT)

RADIO TTY SETS AN/GRC-142 PLAIN AND C MODELS WITH MK-2488/G OWR TRANSMIT SIGNAL PATH INDICATED BY ARROWS



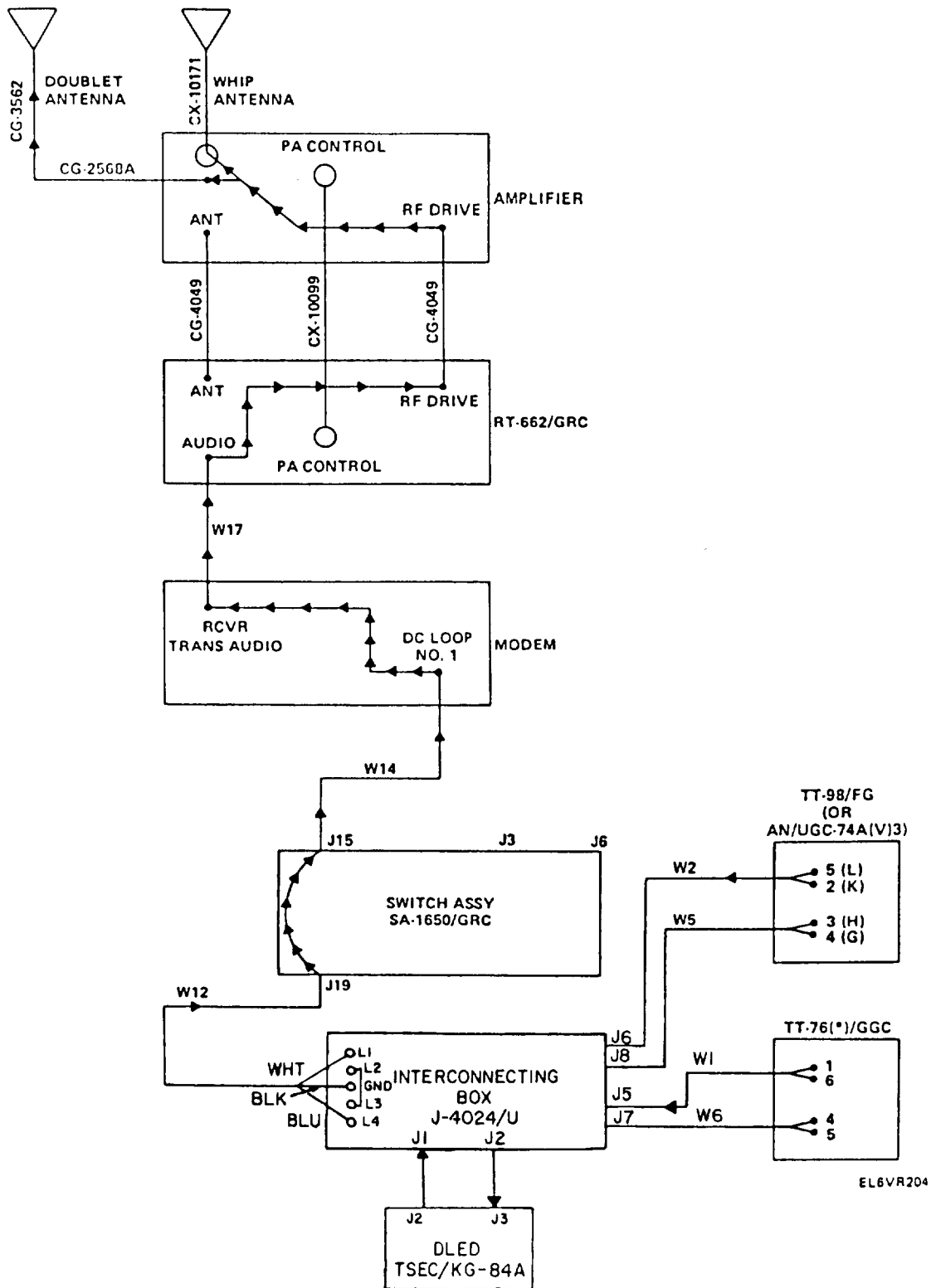
3-3. SIGNAL CABLING DIAGRAMS (CONT)

RADIO TTY SETS AN/GRC-142 A, B, D AND E MODELS WITH MK-2488/G OWR RECEIVE SIGNAL PATH INDICATED BY ARROWS



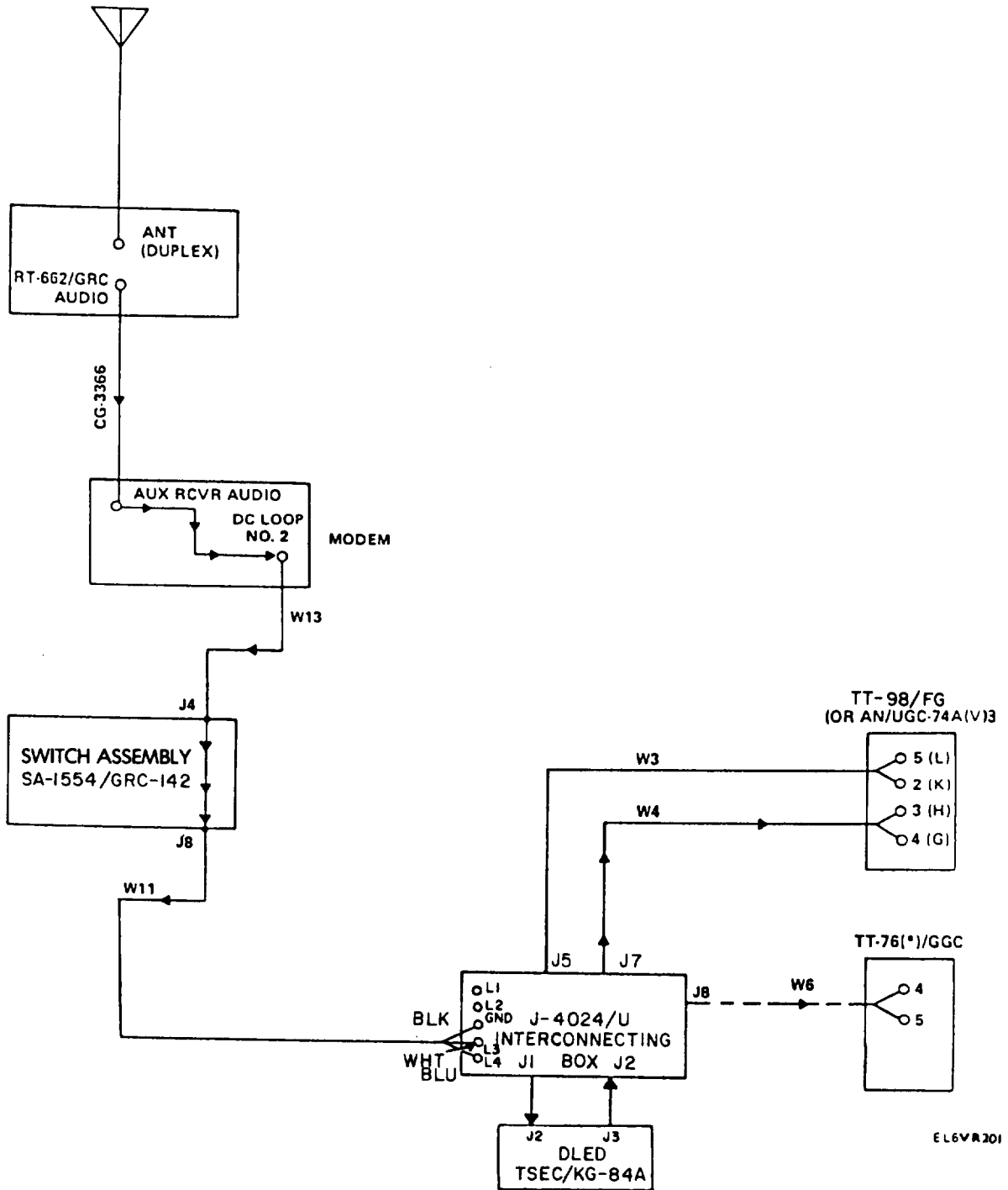
3-3/ SIGNAL CABLING DIAGRAMS (CONT)

RADIO TTY SETS AN/GRC-142A, B, D AND C MODELS WITH MK-2488/G OWR TRANSMIT SIGNAL PATH INDICATED BY ARROWS



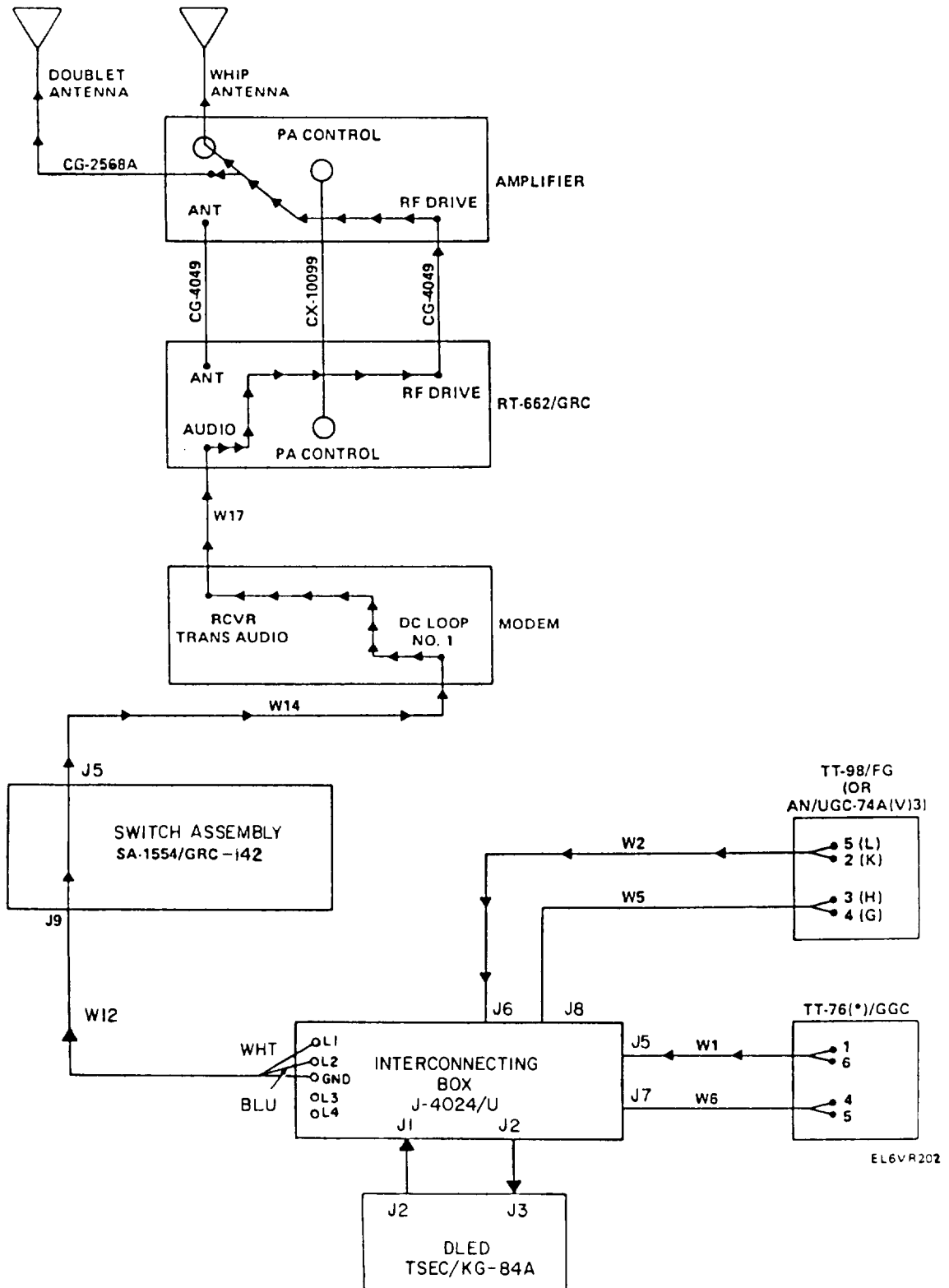
3-3. SIGNAL CABLING (CONT)

RADIO TTY SETS AN/GRC-122 PLAIN AND C MODELS WITH MK-2488/G DUPLEX RECEIVE SIGNAL PATH INDICATED BY ARROWS.



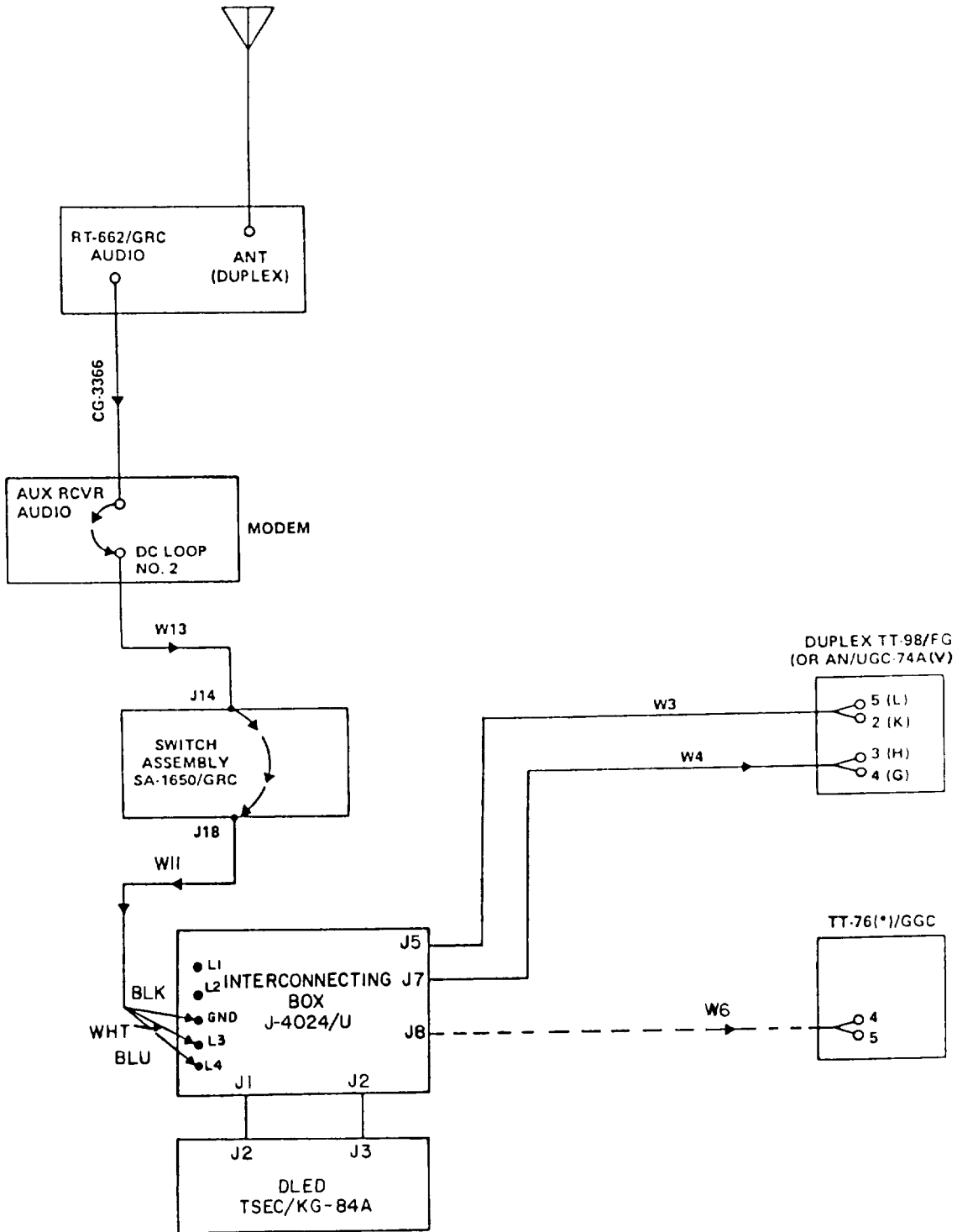
3-3. SIGNAL CABLING (CONT)

RADIO TTY SETS AN/GRC-122 PLAIN AND C MODELS WITH MK-2488/G DUPLEX TRANSMIT SIGNAL PATH INDICATED BY ARROWS.



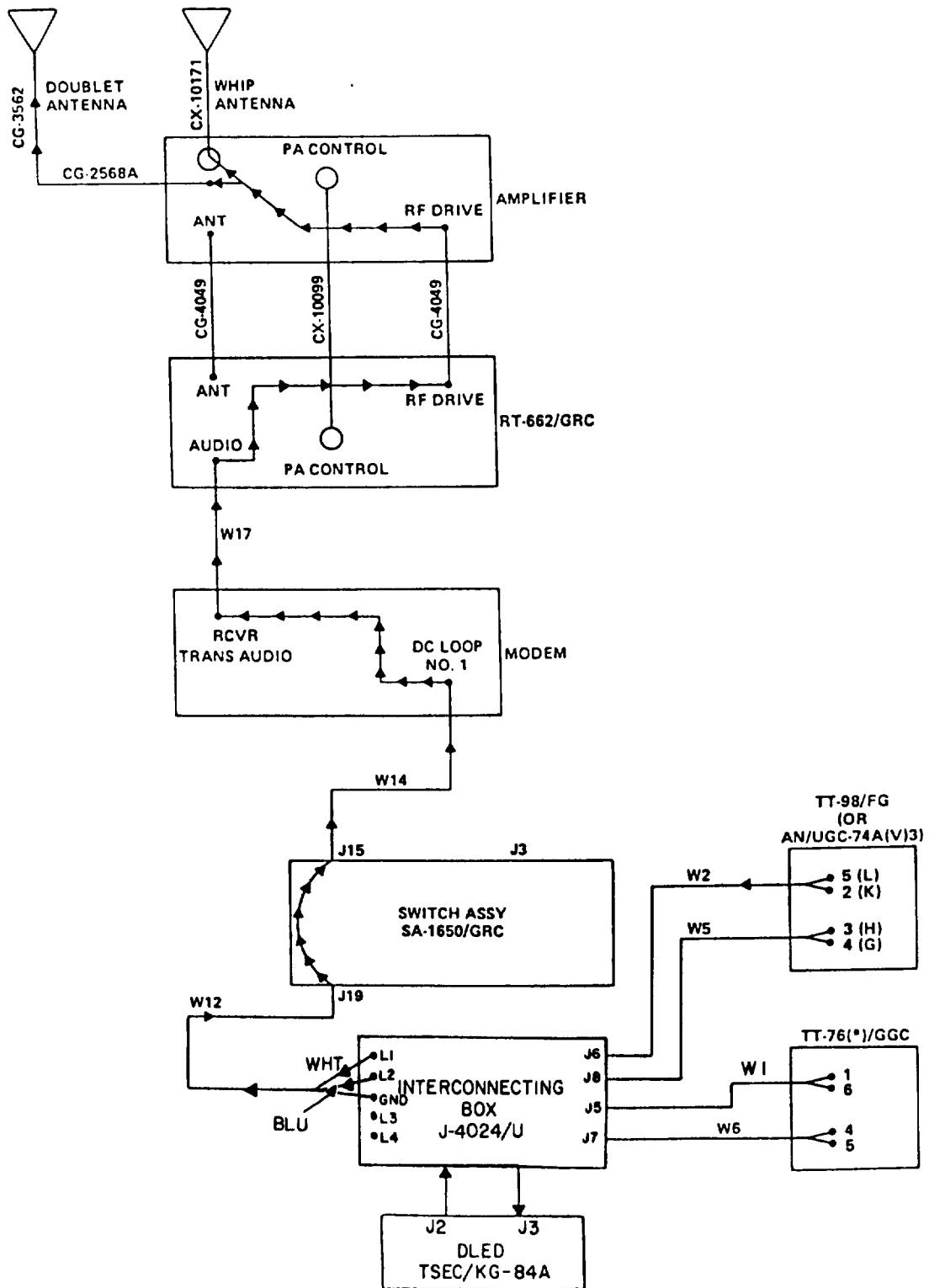
3-3. SIGNAL CABLING (CONT)

RADIO TTY SETS AN/GRC-122 A, B, D AND E MODELS WITH MK-2488/G DUPLEX RECEIVE SIGNAL PATH INDICATED BY ARROWS.



3-3. SIGNAL CABLING DIAGRAMS (CONT)

RADIO TTY SETS AN/GRC-122A, B, D AND E MODELS WITH MK-2488/G DUPLEX TRANSMIT SIGNAL PATH INDICATED BY ARROWS.



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 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 PP-4763(*)/GRC for proper connection to 25 amp outlet.

- b. If voltage is present, check dc power cord of power supply 4763(*)/GRC for proper connect 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. Radio tuning procedure cannot be accomplished.

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

1. Radio tuning procedure cannot be accomplished. (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. In all models with MK-2488/G:

- a. Check that the J-4024/U and DLED power is ON in the channel.
- b. If power is ON, refer to higher level of maintenance.
- c. If power is not ON, refer to MALFUNCTION 1 on page 3-10.8.

3-4. TROUBLESHOOTING (CONT).

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

OPERATION (CONTD)

- 2 Voltage Standing Wave Ratio VSWR on ME-165G indicates in red area when doublet is used.

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 11-5820-520-10.

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 11-5820-520-10.

If problem persists, refer to a higher level of maintenance.

3-4. TROUBLESHOOTING (CONT).

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

OPERATION (CONTD)

Step 5. 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.

Step 6. In all models with MK-2488/G:

- a. When monitoring remote site transmissions and receptions, check that the Shelter J-4024/U and DLED power is ON in the channel.
- b. If not monitoring remote site transmissions and receptions to check that W11 and/or W12 are disconnected from the switch assembly.
- c. If problem persists, refer to higher level maintenance.
- d. If power on J-4024/U or DLED does not come on when POWER switches are set to ON, refer to MALFUNCTION 1 on page 3-10.8.

3-4. TROUBLESHOOTING (CONT).**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

3. Low power output.

Check that doublet antenna is installed properly (para 2-13) and antenna feed line is undamaged.

- a. If doublet antenna is improperly set up, reconstruct.
- b. If problem persists, refer to higher level of maintenance.

4. No reception in any mode of operation.

Check for defective amplifier, refer to TM 11-5820-520-12.

If problem persists, refer to a higher level of maintenance.

5. No loop current.

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 11-5820-520-10.

If RT-662/GRC is defective, refer to a higher level of maintenance.

Step 3. Check for defective modem MD-522A/GRC, 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 -24 (TT-76(*)/GGC).

If problem persists, refer to a higher level of maintenance

3-4. TROUBLESHOOTING (CONT).

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

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 -24 (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

Step 4. Check cable W-12. Observe meter on MODEM for ZERO reading.

If meter indicates 20 ma, refer to a higher level of maintenance

Step 5. Check for defective COMSEC equipment by disconnecting cables from COMSEC equipment and connecting to dummy box. (Only in models without MK-2488/G).

If teletypes work properly, COMSEC equipment is defective. Refer problem to COMSEC technician.

8. No reception or no transmission in any mode of operation except duplex or pony circuit (AN/G RC-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 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 11-5820-520-10.

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.

Step 6. In all AN/GRC-122 models with MK-2488/G:

- a. Check that J-4024/U and DLED power is ON. If power is ON, refer to higher level maintenance.
- b. If power does not come on when J-4024/U and DLED power switches are set to ON, refer to MALFUNCTION 13.

3-4. TROUBLESHOOTING. (CONT)

MALFUNCTION

TEST OR INSPECTION

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
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Switch Assembly Indicator Lamp Replacement (AN/GRC-122/142A, B, D, and E Models)	3-11	3-25
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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 Reperator-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 maybe 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

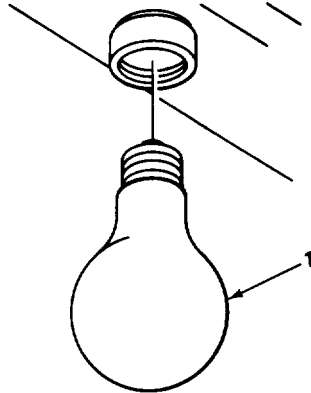
Fumes of TRICHLOROTRIFLUOROETHANE are poisonous. Provide adequate ventilation whenever you use TRICHLOROTRIFLUOROETHANE. Do not use solvent near heat or open flame. TRICHLOROTRIFLUOROETHANE will not burn, but heat changes the gas into poisonous, irritating fumes. DO NOT breathe fumes or vapors. TRICHLOROTRIFLUOROETHANE 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).

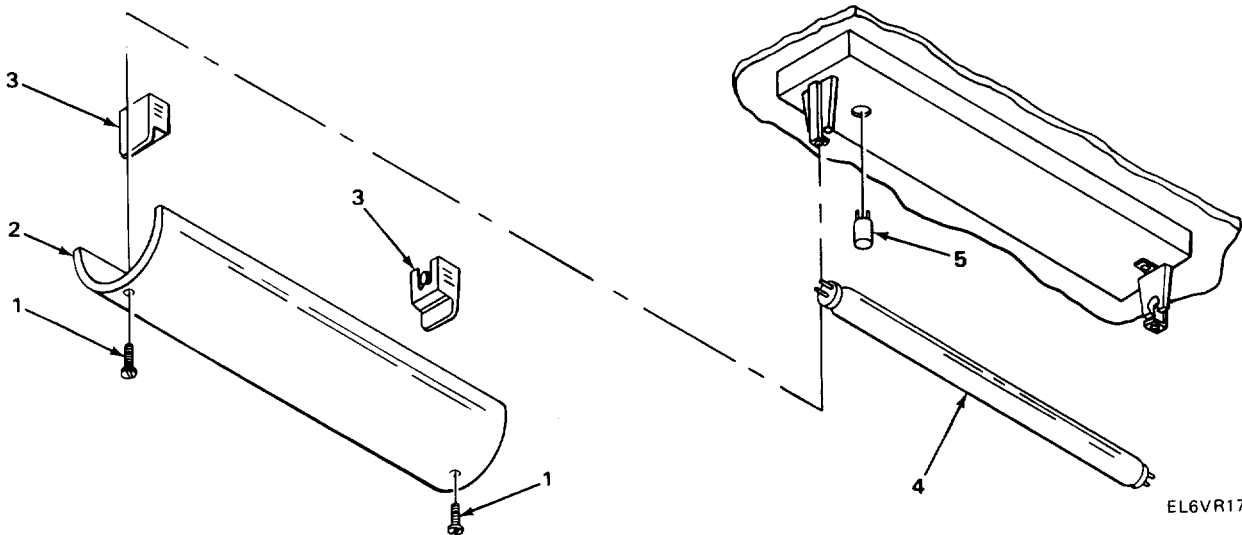
INSTALLATION

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 align 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. Align 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 align pins on ends of lamp with slots in lampholder. Pull down and out.
4. Push starter (5) in, turn to right, and pull out.

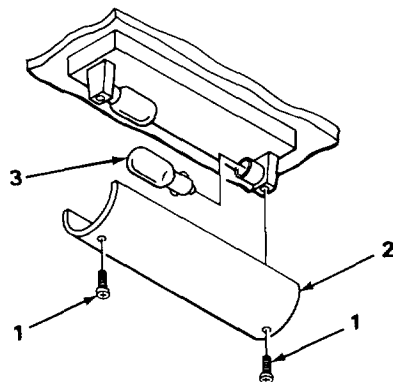
STARTER INSTALLATION

1. Push starter (5) in and turn to left.
2. Grasp each end of fluorescent lamp (4) firmly. Align 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

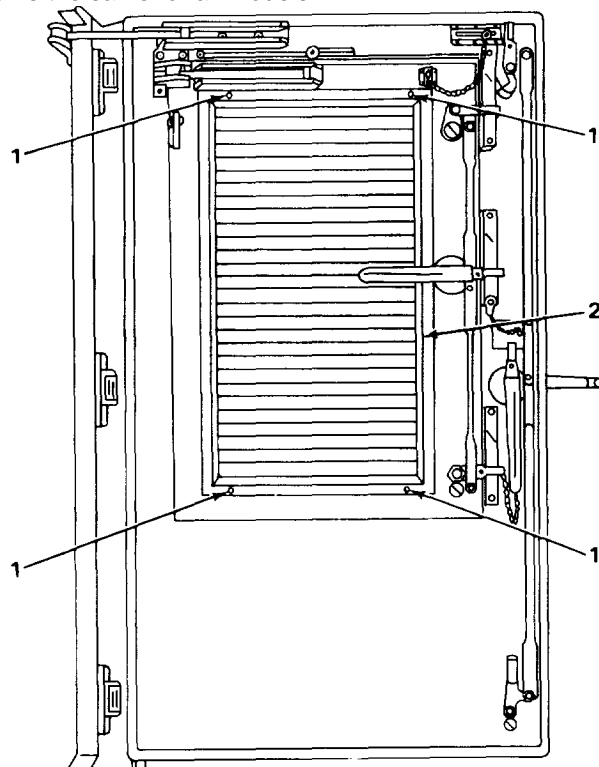
1. Using screwdriver, remove screws (1) and cover (2).
2. Press lamp (3) in, turn counterclockwise and remove.

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.



3-10. CLEANING OF SHELTER DOOR AIR FILTER. (CONT)

REMOVAL

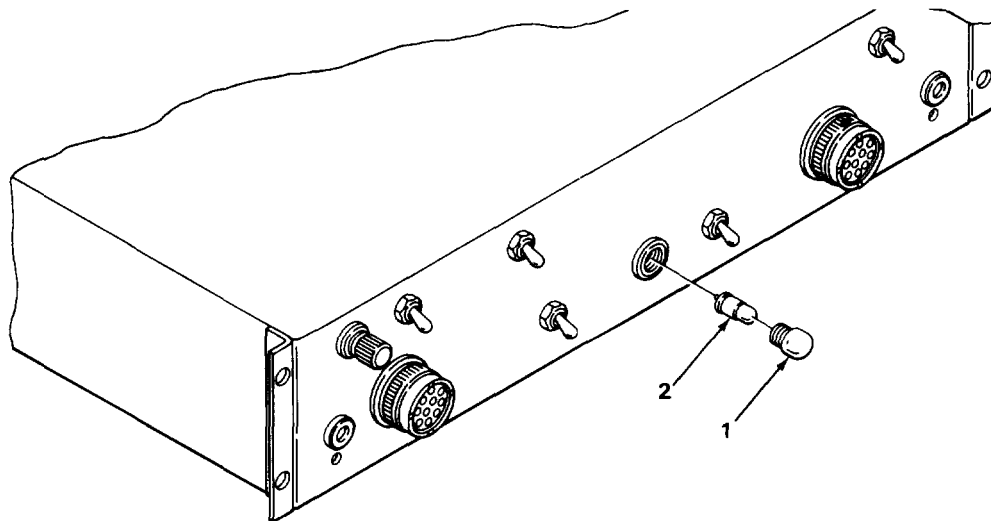
1. Using screwdriver, remove four screws (1).
2. Remove louvered section (2) of door.
3. Remove filter from louvered section (2) of door.
4. Wash filter in soapy water and air dry.

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

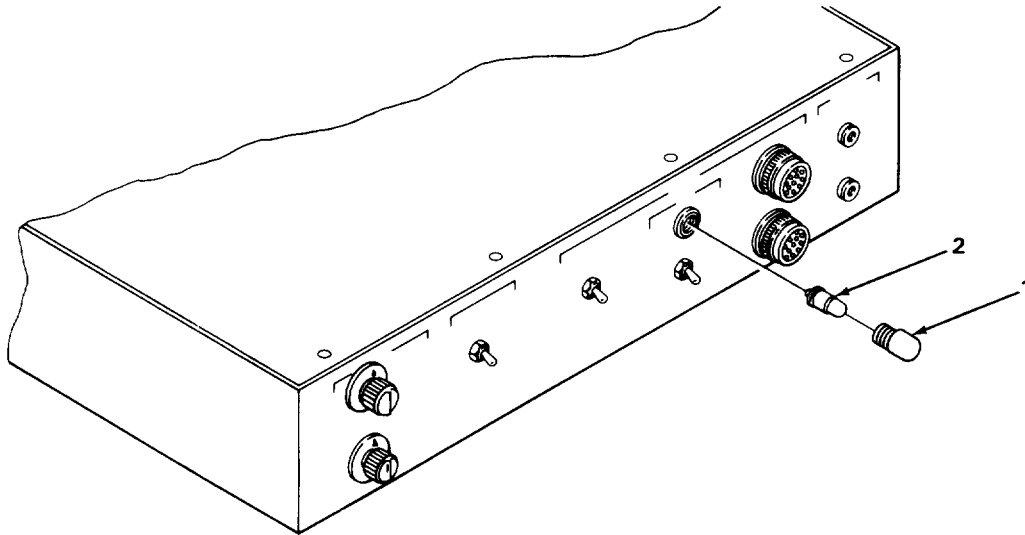
1. Remove lens (1) by turning counterclockwise.
2. Remove lamp (2) by pushing it in and turning counterclockwise.

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

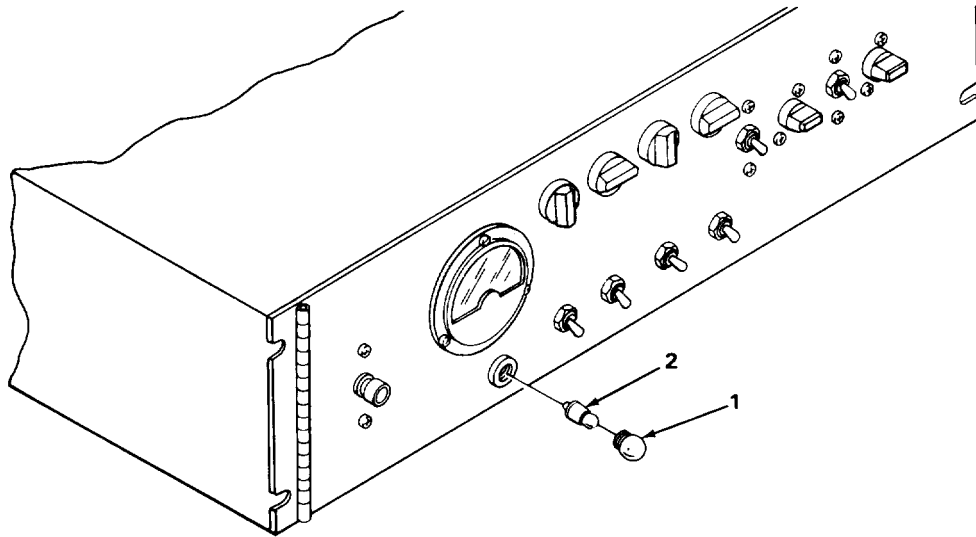
1. Remove lens (1) by turning counterclockwise.
2. Remove lamp (2) by pushing it in and turning counterclockwise.

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).

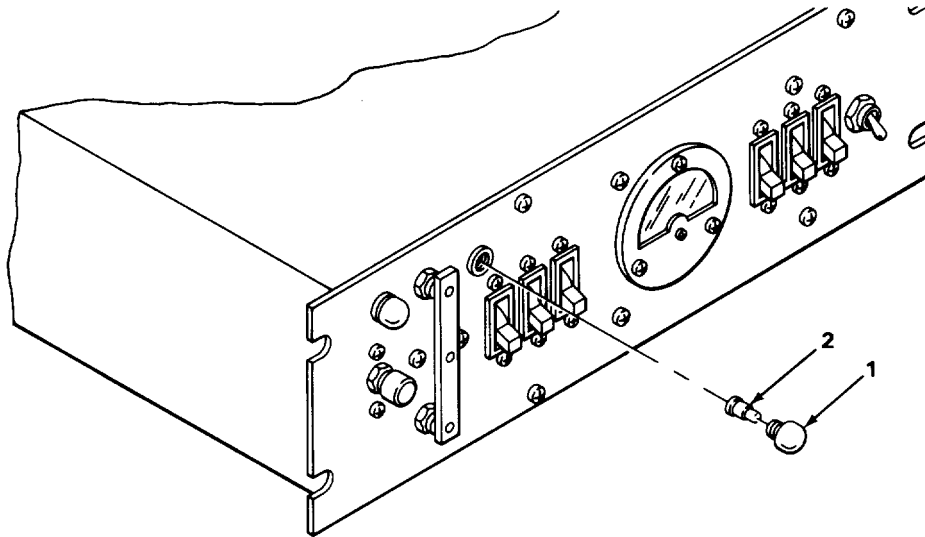
INSTALLATION

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).

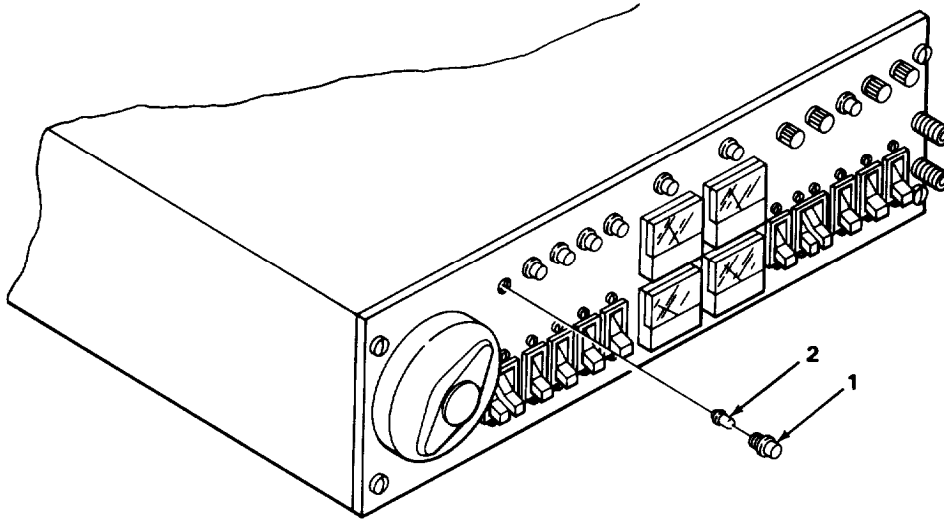
INSTALLATION

1. Insert lamp (2) into lens (1).
2. Install lens (1).

3-15. POWER DISTRIBUTION PANEL SB-F-960672 INDICATOR LAMP REPLACEMENT (AN/GRC-122/1420 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.

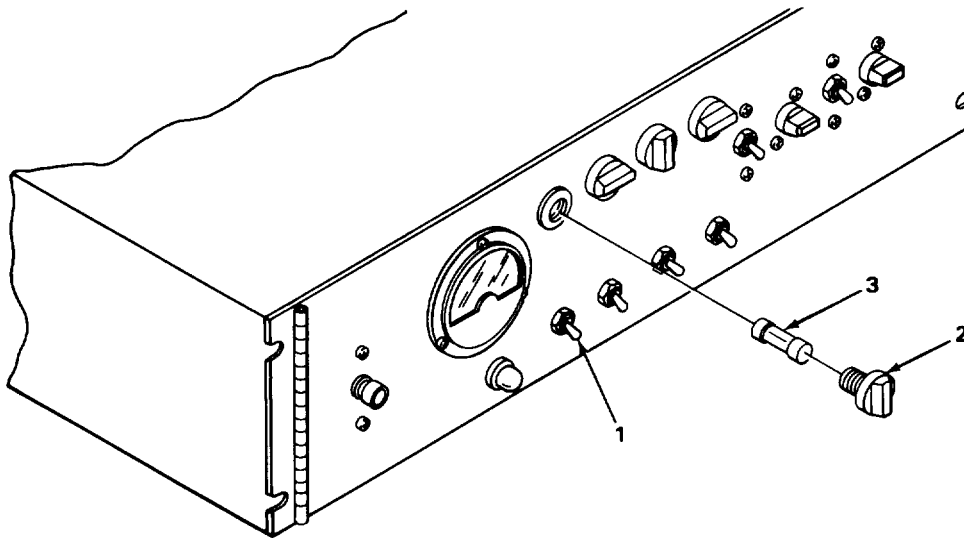
INSTALLATION

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 (DISREP)	SF FORM 361
Report of Discrepancy (ROD)	SF FORM 364
Quality Deficiency Report (Category 11)	SF FORM 368

A-3. PAMPHLETS.

The Standard Army Publications System (STARPUBS)	DA PAM 310-10-2
The Army Maintenance Management System (TAMMS)	DA PAM 738-750

A-4. REGULATIONS.

Discrepancy in Shipment Report (DISREP)(SF 361)	AR 55-38
Identification and Distribution of DA Publications and Issue of Agency and Command Administration Publications	AR 310-2
Report of Packaging and Handling Deficiencies	AR 735-11-2

A-5. PAMPHLETS.

Consolidated Index of Army Publications and Blank Forms	DA Pam 25-30
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 Communications - Electronics Equipment.	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 SO141 B/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-280 B/G (5410-00-117-2868), S-280 B/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

Installation of Communications Electronic Equipment Hookup of Electrical Cables to Mobile Generator Sets on Fielded Equipment to Meet Electrical Safety Standards TB 43-0125

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 4210-00-926-1 161) and 208V, 3 Phase, 4 Wire, 400 Cycle (Redmanson Model CE-6A-400A) (4120-00-926-1 162) TM 5-4120-289-15

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) T M 1 1 - 5 0 3 8

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 11-5805-387-20 P-2

A-7. TECHNICAL MANUALS (CONT)

Unit and Intermediate Direct Support Maintenance Manual for Dedicated Loop Encryption Device TSEC/KG-84A (NSN 5810-01-1 46-3260) .	(FOUO) TM 11-5810-277-23
Operators'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 (5815-00-032-4200) and Teleprinter, TT-259/FG (5815-00-68808761)(TO31W4-2FGC20-31)	TM 11-5815-200-12
Operator's and Organizational Maintenance Manual for Teletypewriter Sets GC-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- 98-4438), 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-722-G (5815-01-017-9172)	TM 11-11-5815-206-12
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 Teletypewriters 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, 77-76/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 (B11) and Additional Authorization List for Radio Teletypewriter Sets, AN/GRC-122 (NSN 5815-00-401-9719) AN/G RC-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/G RC-142A (NSN 5815 -00-168-1 556) AN/GRC-142B (NSN 5815-00-443-551 1) AN/G RC-142C (NSN 5815-01-100-6815) AN/GRC-142D (NSN5815-01-104-7264) AN/GRC-142E (NSN5815-01-095-6258)	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 5815-00-99-3048)	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 11-5815-602-10

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 11-5815-602-24

Operator's, Organizational and Direct Support Maintenance Manual:
 Installation Kit, Electronics Equipment MK-2488/G
 (NSN 5815-01-215-6183) TM 11-5815-616-13

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), AN-155A/U (5985-507-6261), and AB-155BJU
 (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 Tools List 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 11-5820-520-10

Operator's and Organizational Maintenance Manual: Power Supplies
 PP-4763/GRC (NSN 5820-00-937-7690) and PP-4763A (5820-00-
 13-9768) 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 (NSN 5965-00-644-0333) 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
 AM/URM-105 and AN/URM-105C (Including Multimeters ME-77/U
 and ME-77 C/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 Materiel 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:

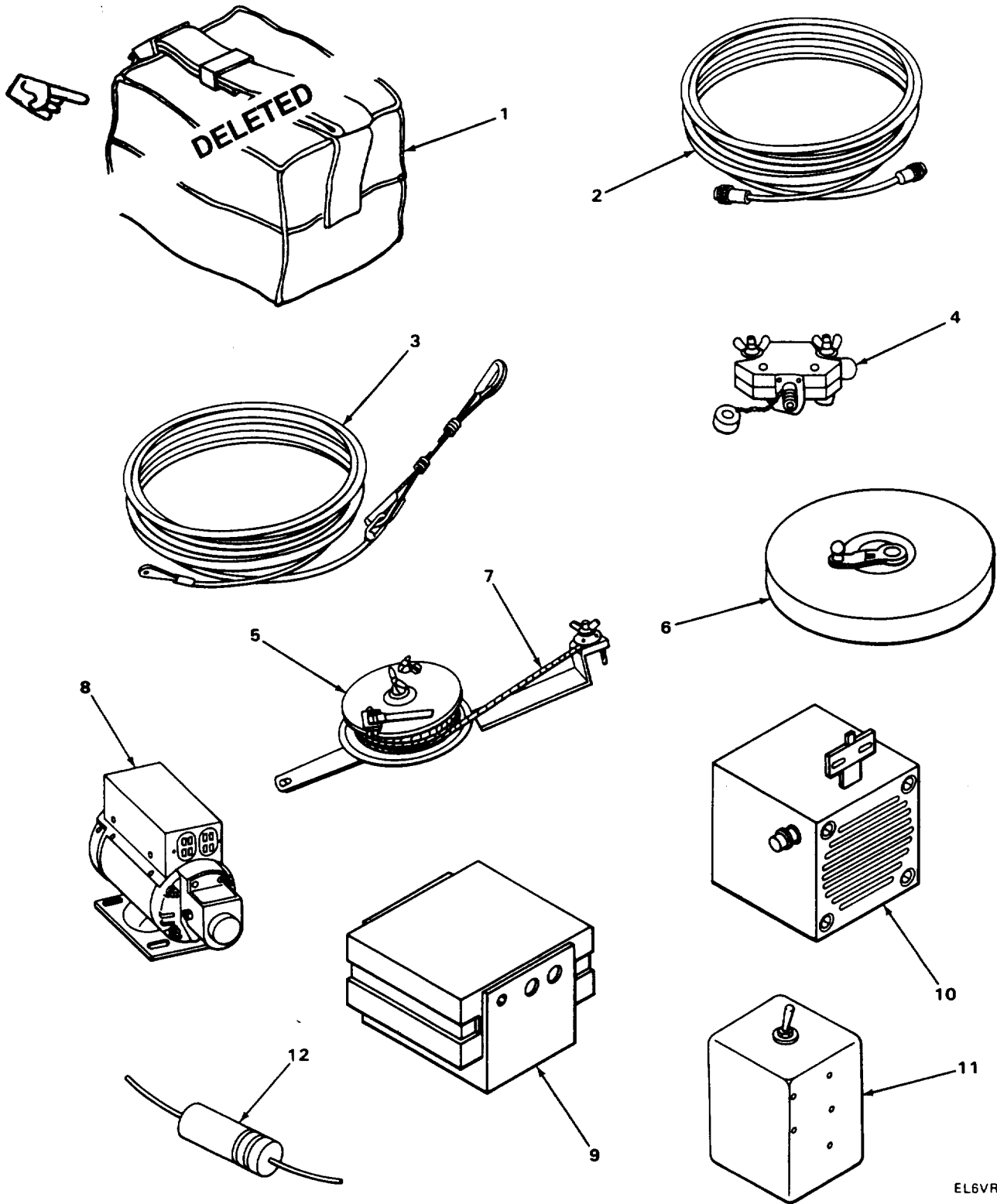
CODE	USED ON
PAA	All AN/GRC-122(*) Models
PAB	Model AN/GRC-122
PAC	Model AN/GRC-122A
PAD	Model AN/GRC-122B
PAE	Model AN/GRC-122C
PAF	Model AN/GRC-122D
PAG	Model AN/GRC-122E
PAH	All AN/GRC-142(*) Models
PAI	Model AN/GRC-142
PAJ	Model AN/GRC-142A
PAK	Model AN/GRC-142B
PAL	Model AN/GRC-142C
PAM	Model AN/GRC-142D
PAN	Model AN/GRC-142E
PAO	All models
PAP	All models with MK-2488/G only.

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 (es, in., pr).

e. Column 5, Qty Req'd (Quantity Required). Indicates the quantity of the item authorized to be used with/on the equipment.

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Section II COMPONENTS OF END ITEM



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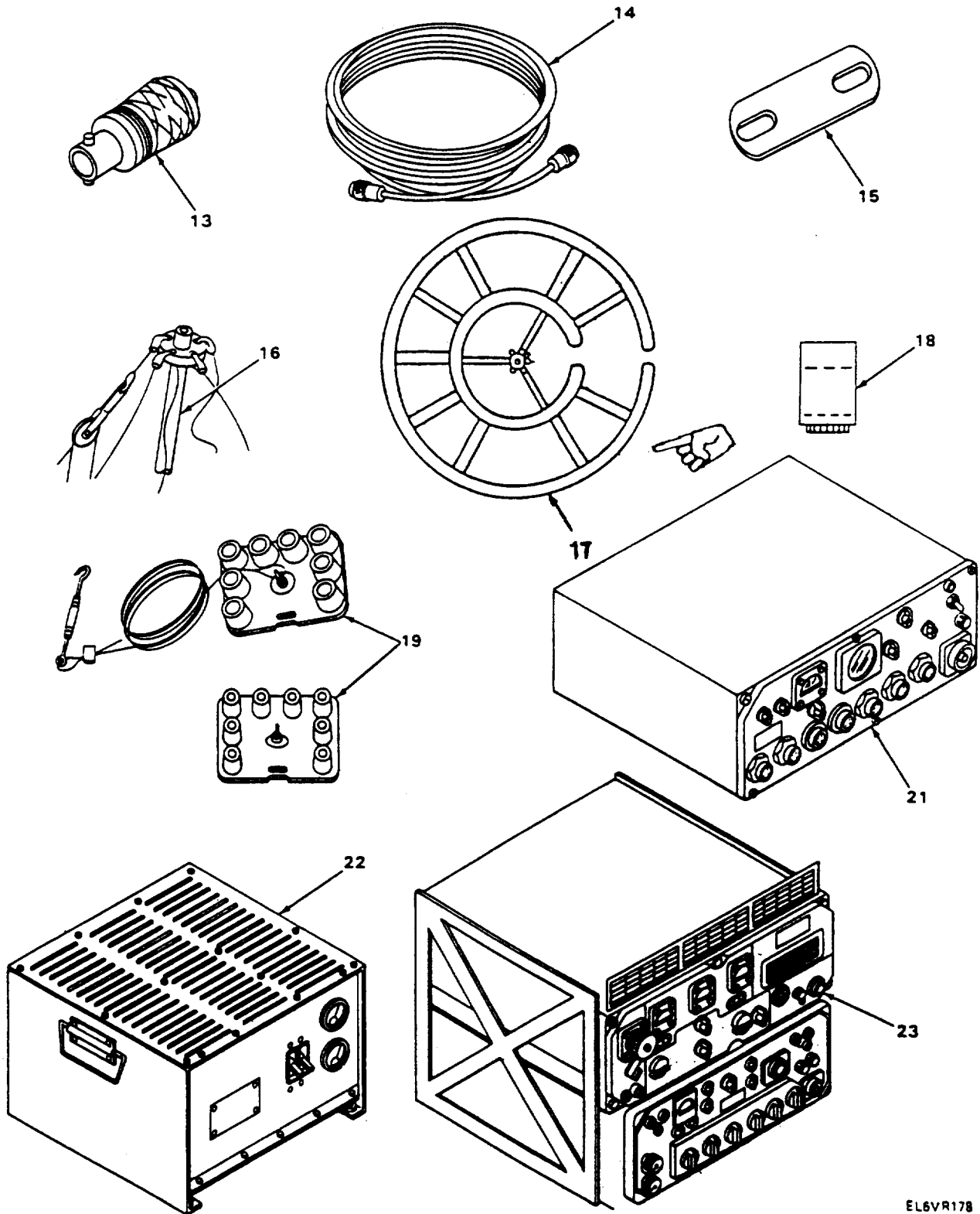
COMPONENTS OF END ITEM (CONT)

TM 11-5815-334-10

(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		ITEM DELETED			
2	5995-00-823-2176	CABLE ASSEMBLY CX-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	5210-00-897-6077	TAPE MEASURING (81349) MIL-6-55371		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-5230/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)



EL6VR178

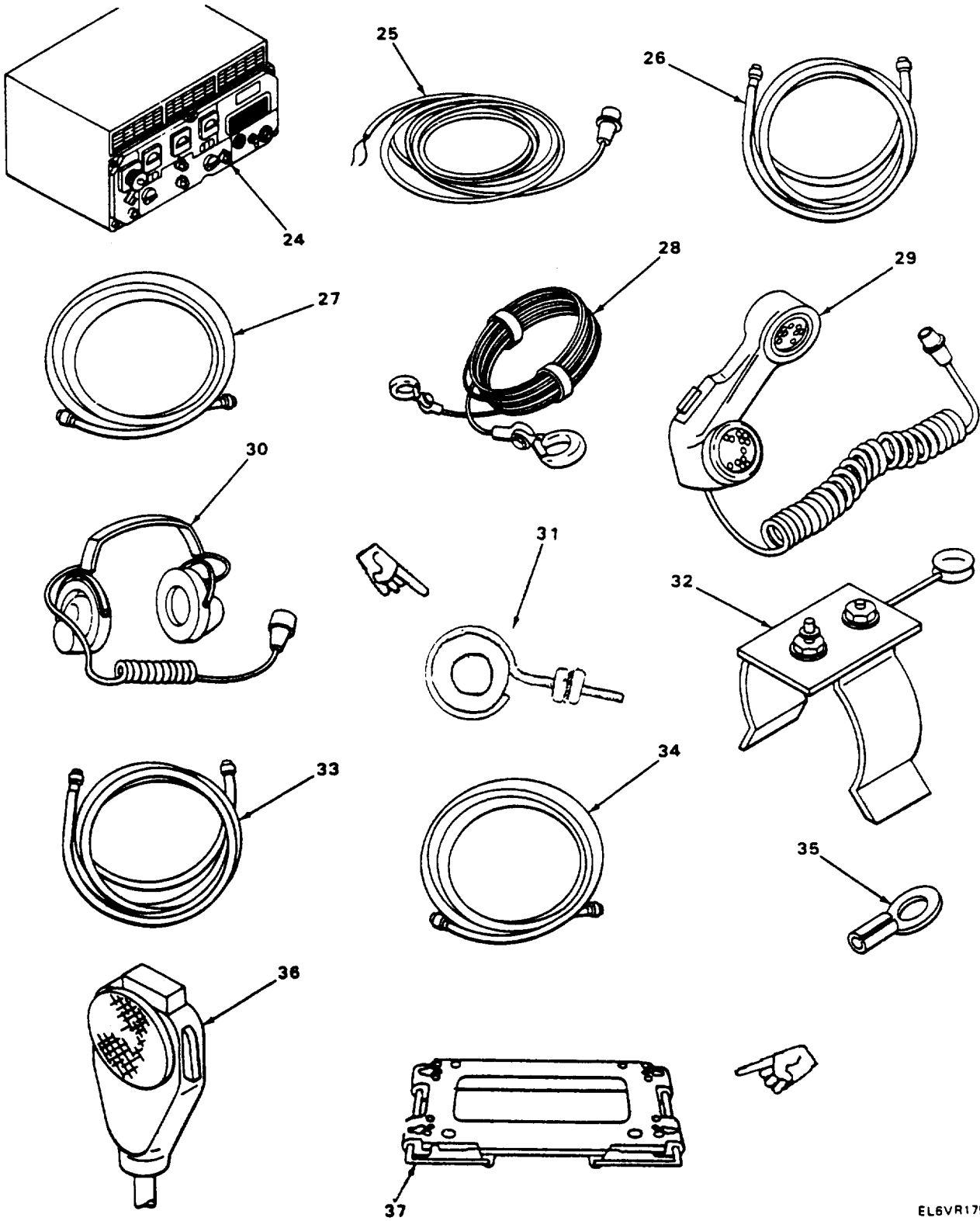
COMPONENTS OF END ITEM (CONT)

TM 11-5815-334-10

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	DESCRIPTION FSCM AND PART NUMBER	USUABLE 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	2*
14	5995-00-521-0309	CABLE ASSEMBLY CG-55C/U		EA	2*
14	5995-00-752-1362	OR CABLE ASSEMBLY CG-692A/U (80063) SD-D-7881		EA	2*
15	5970-00-405-8971	INSULATOR (81349) MIL-I-23264/20		EA	24*
16	5820-00-227-7168	MASTS, MAST SECTION, MS-44 SCD-1155		EA	8
17	8130-00-656-1090	REEL, CABLE RC-435 (80058) SC-M-69296		EA	1
18	5940-01-006-4487	SPLICE, SPLIT BOLT BURGANDY KS-90 OR EQUIVALENT (09922) S-10-S		EA	36*
19	5820-00-497-8634	CARRING DEVICE MX-387/GRA-4 SCD-28057		EA	6
21	5815-00-919-4800	MODEM, RADIO TELETYPEWRITER MD-522A/GRC (80058) SM-D-583326	PAB,PAE	EA	1
21	5815-00-999-5277	OR MODEM, RADIO TELETYPEWRITER MD-5221GRC (80058)	PAI,PAL	EA	1
22	5820-00-937-7690	POWER SUPPLY PP-47630/GRC (80058) BS030-50PPX2	PAO	EA	1
22	5620-00-113-9768	OR POWER SUPPLY-PP-4763A/GRC (80058)	PAO	EA	1
23	5820-00-402-2263	RADIO SET AN/GRC-106 (80058) MIL-R-55002 CONSISTING OF:	PAO	EA	1
23	5820-00-223-7548	OR RADIO SET A/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)



EL6VR179

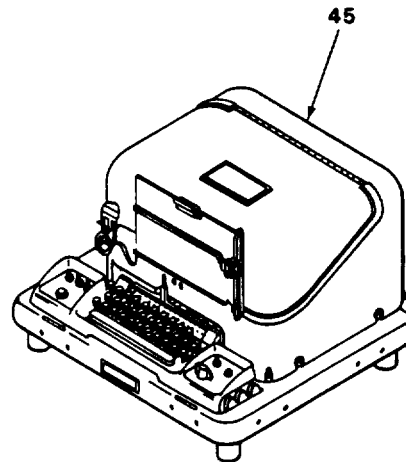
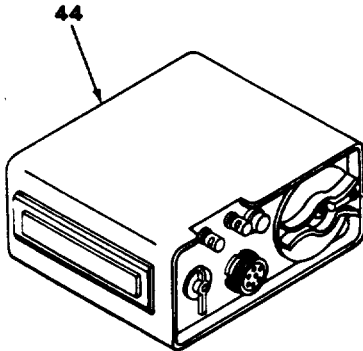
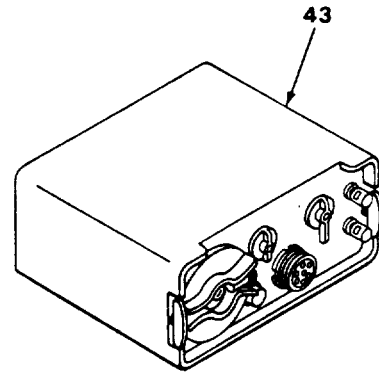
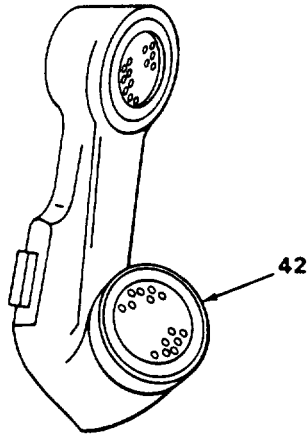
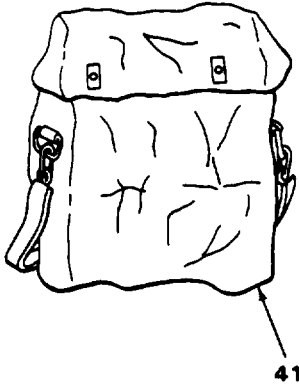
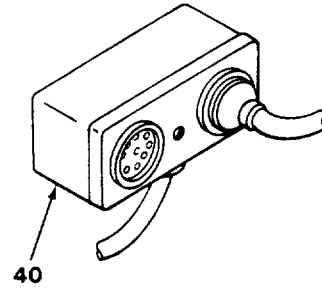
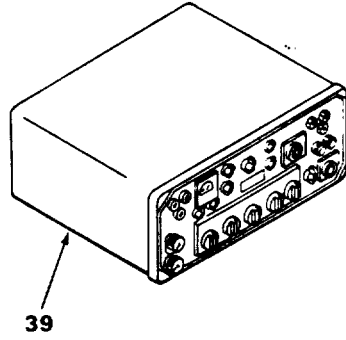
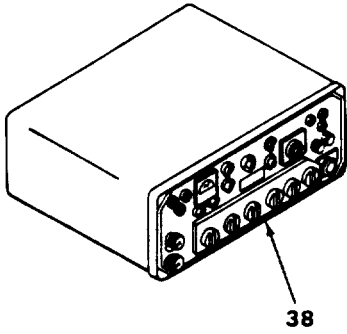
COMPONENTS OF END ITEM (CONT)

TM 11-5815-334-10

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USUABLE 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
25	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-4090/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-330P/T (81349) MIL-H-11134		EA	1
30	5965-00-226-2915	HEADSET, ELECTRICAL H-227/U (81349) MIL-E-55119		EA	2*
31	5870-00-498-3745	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-29B/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)



EL6VR180

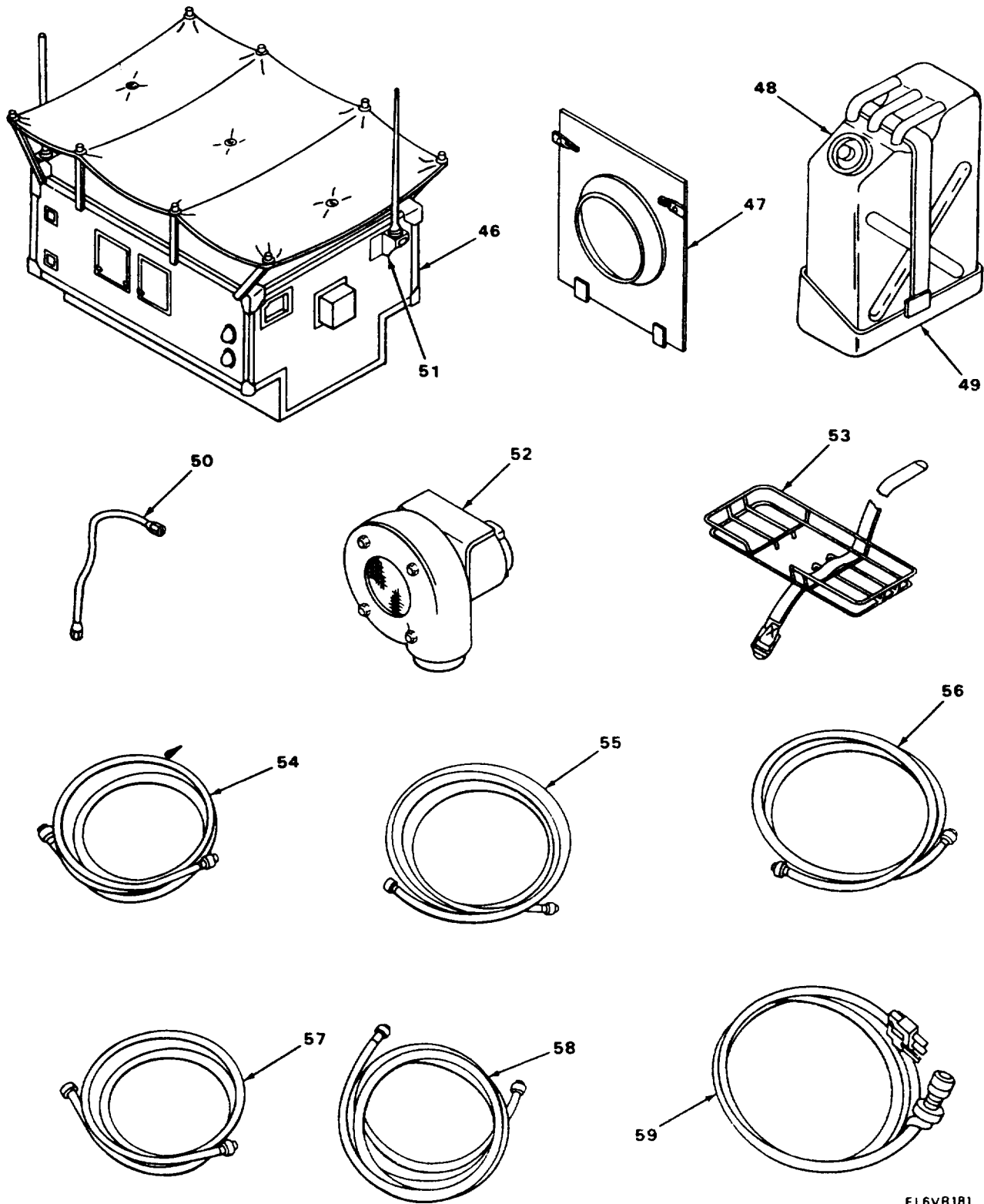
COMPONENTS OF END ITEM (CONT)

TM 11-5815-334-10

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USUABLE 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-108 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-330PT (81349) MIL-H-11134		EA	1
43	5820-00-170-4781	LOCAL CONTROL C-434/GRC (81349) MIL-R-13028		EA	1
44	55820-00-170-5171	REMOTE CONTROL C-433/GRC (81349) MIL-R-13028		EA	1
45	5815-00-553-6061	REPERFORATOR-TRANSMITTER TT-760/GRC (80058) SM-D-134701	PAO	EA	1

* One half the quantity is used in AN/GRC-142 models

COMPONENTS OF END ITEM (CONT)



EL6VR1B1

COMPONENTS OF END ITEM (CONT)

TM 11-5815-334-10

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USUABLE ON CODE	(4) U/M	(5) QTY REQ'D
46	5411-00-432-7295	SHELTER FACILITY (80058) S-504/GRC-142 CONSISTING OF: OR	PAB,PAI	EA	1
46	5411-00-432-7295	SHELTER FACILITY (80058) S-504A/GRC-142A CONSISTING OF: OR	PAC,PAJ	EA	1
46	5411-01-116-9583	SHELTER FACILITY (80058) S504B/GRC-142 CONSISTING OF:	PAE,PAL	EA	1
46	5411-01-115-6254	SHELTER, FACILITY (80058) S504B/GRC-142 CONSISTING OF:	PAF,PAM	EA	1
46	5411 -00-432-2342	SHELTER FACILITY (80058) S-502/GRC-142B CONSISTING OF:	PAD,PAK	EA	1
46	5411 -01-115-6252	SHELTER FACILITY (80058) S502A/GRC-142 CONSISTING OF:	PAG,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	4720-00-480-0073	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

* One half the quantity is used in AN/GRC-142 models.

COMPONENTS OF END ITEM (CONT)

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USUABLE ON CODE	(4) U/M	(5) QTY REQ'D
52		BLOWER ASSEMBLY (MODIFIED) SC-D-960736	PAF,PAG, PAM,PAN	EA	1
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	PAB,PAE, PAI,PAL	EA	1
53		HOLDER, TELEPHONE (80063) SM-D-603209	PAC,PAD, PAF,PAG, PAJ,PAK, PAM,PAN	EA	1
54	5995-00-494-8261	CABLE ASSEMBLY CG-2568A SC-DL-612865 (6 FT, 6 IN.)	PC,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,PAQ, PAJ,PAK, PAM,PAN	EA	1
54	5995-00-935-0389	CABLE ASSEMBLY CX-2340/A (80058) (9 FT)	PAB,PAE, PAI,PAL	EA	1
54	5995-00-421-1730	CABLE ASSEMBLY CX-3384/U SM-C-603918 (2 FT)	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

* One half the quantity is used in AN/GRC-142 models.

COMPONENTS OF END ITEM (CONT)

TM 11-5815-334-10

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USUABLE ON CODE	(4) U/M	(5) QTY REQ'D
54	5995-00-937-8620	CABLE ASSEMBLY CX-10507/G (80058) SM-C-603101 (4 FT, 5 IN.)	PAF,PAG, PAM,PAN	EA	1
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 (80056) 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	5995-00-246-4426	CABLE ASSEMBLY CX-10511/G (80058) SM-C-603105 (6 FT)	PAB,PAC, PAD,PAI, PAJ,PAK	EA	1
56	5995-00-248-4431	CABLE ASSEMBLY CX-10512G5-6 (80058) PL-SM-A603885 (6 FT)	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	5995-00-251-9104	CABLE ASSEMBLY CX-10513/G SC-DL-612831 (10 FT)	PAO	EA	2
56	5995-00-935-2542	CABLE ASSEMBLY CX-10514G (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
56	5595-00-937-8460	CABLE ASSEMBLY CX-10515/G (80058) SM-C-603889 (6 FT)	PAO	EA	1

* One half the quantity is used in AN/GRC-142 models.

COMPONENTS OF END ITEM (CONT)

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USUABLE ON CODE	(4) U/M	(5) QTY REQ'D
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	5995-01-129-2231	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
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	E A	1

* One half the quantity is used in AN/GRC-142 models.

COMPONENTS OF END ITEM (CONT)

TM 11 -5815-334-10

(1) ILLUS NO.	NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USUABLE ON CODE	(4) U/M	(5) QTY REQ'D
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	5995-01-129-2230	CABLE ASSEMBLY CX-10526/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	5995-01-130-9890	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
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

* One half the quantity is used in AN/GRC-142 models.

COMPONENTS OF END ITEM (CONT)

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USUABLE ON CODE	(4) U/M	(5) QTY REQ'D
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-1192/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
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

* One half the quantity is used in AN/GRC-142 models.

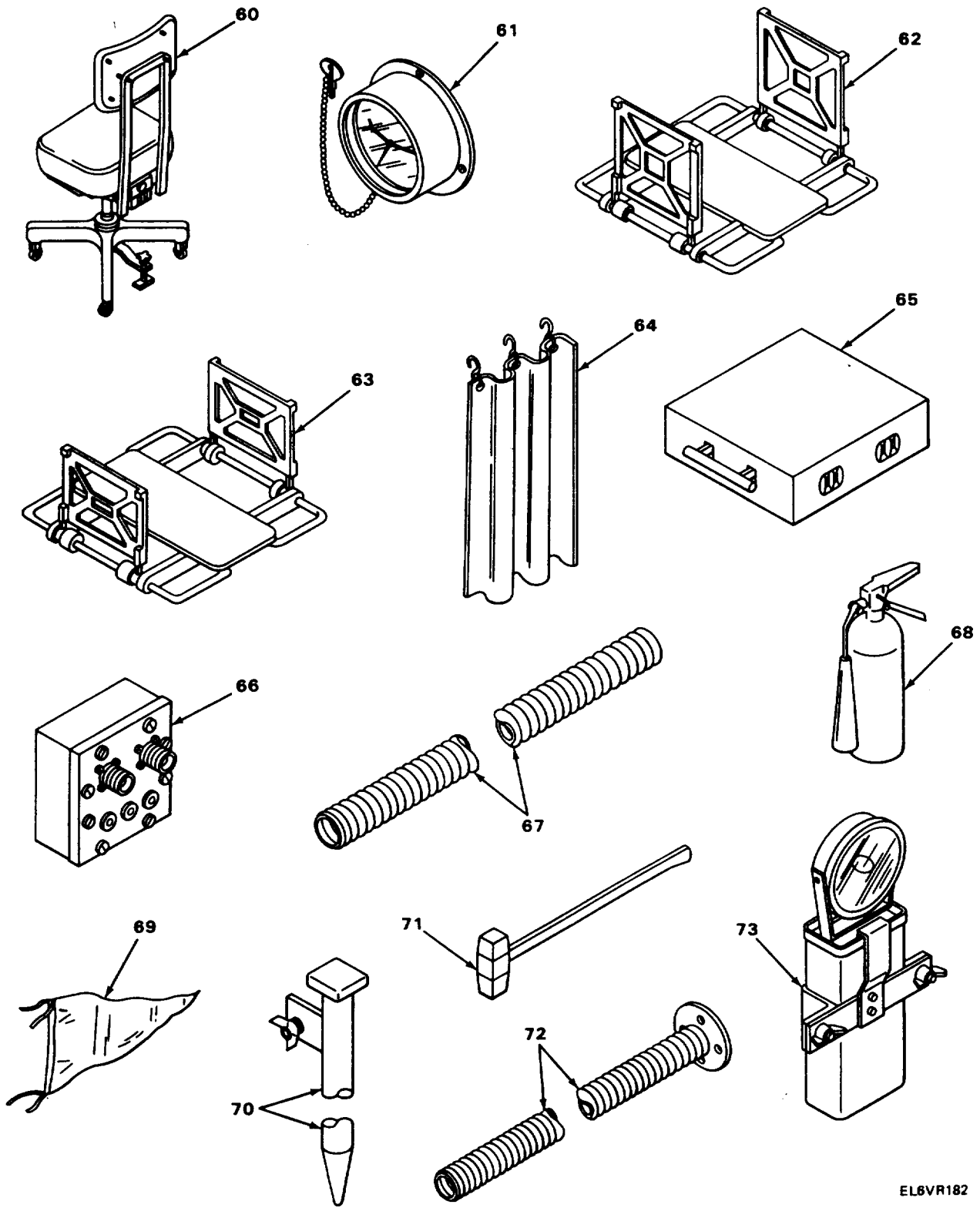
COMPONENTS OF END ITEM (CONT)

TM 11-5815-334-10

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USUABLE ON CODE	(4) U/M	(5) QTY REQ'D
58		CABLE ASSEMBLY, AC POWER SC-D-960027-003	PAE,PAL	EA	1
58	5995-01-234-1237	CABLE ASSEMBLY, SIGNAL SC-D-960624-000 (6 FT)	PAF,PAG, PAM,PAN	EA	1
58	5995-01-237-4895	CABLE ASSEMBLY, SIGNAL FRONT SC-D-960624-005	PAE,PAL PAN	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, PAO,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

* One half the quantity is used in AN/GRC-142 models.

COMPONENTS OF END ITEM (CONT)



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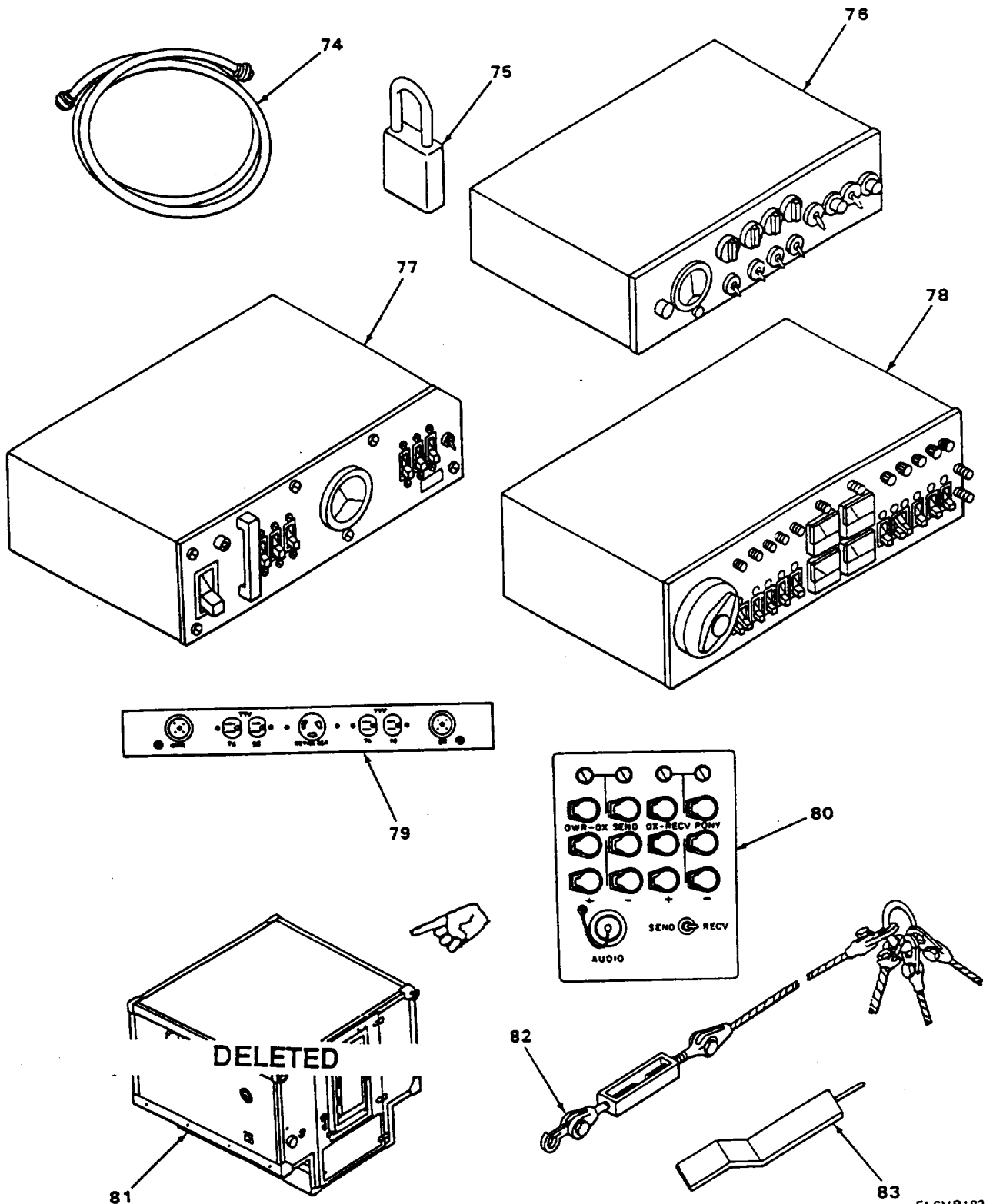
COMPONENTS OF END ITEM (CONT)

TM 11-5815-334-10

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USUABLE ON CODE	(4) U/M	(5) QTY REC'D
60	7110-00-438-4659	CHAIR (80063) SM-D-613130	PAO	EA	1
61	6645-00-410-2395	CLOCK 1.5V	PAO	EA	1
62	5820-00-226-5727	CROSS BAR, LONG (80063) SM-C-50068	PAA	EA	4*
63	5820-00-078-5615	CROSS BAR, SHORT (80063) SC-DL-502745	PAH	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 J2276/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/BACKET (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	4720-00-089-2635	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

* One half the quantity is used in AN/GRC-142 models.

COMPONENTS OF END ITEM (CONT)



COMPONENTS OF END ITEM (CONT)

TM 11-5815-334-10

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USUABLE 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 17.2 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 (11 FT)	PAO	EA	1
75	5340-00-682-1508	PADLOCK (80063) SM-D-555531-1	PAO	EA	1
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-900672	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

* One half the quantity is used in AN/GRC-142 models.

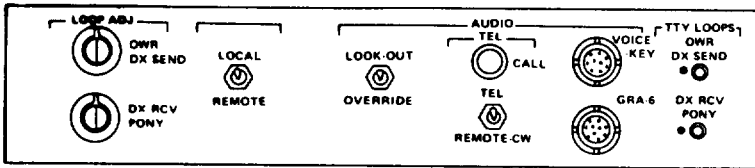
COMPONENTS OF END ITEM (CONT)

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) USUABLE ON CODE	(5) QTY REQ'D
82	8940-00-115-6380	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

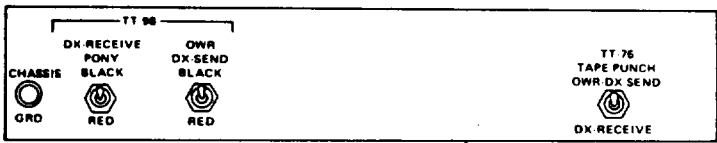
* One half the quantity is used in AN/GRC-142 models.

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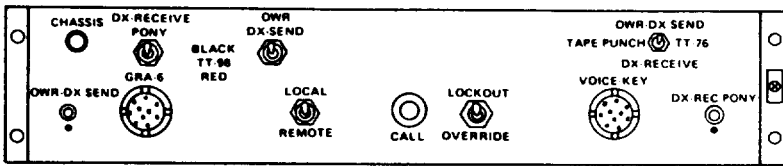
COMPONENTS OF END ITEM (CONT)



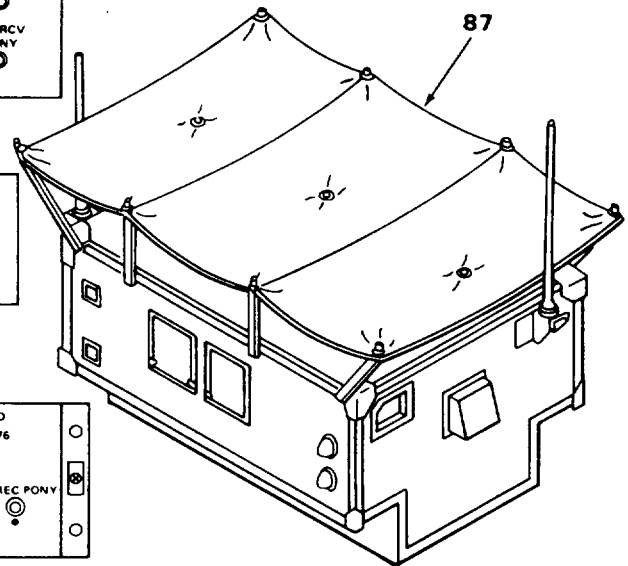
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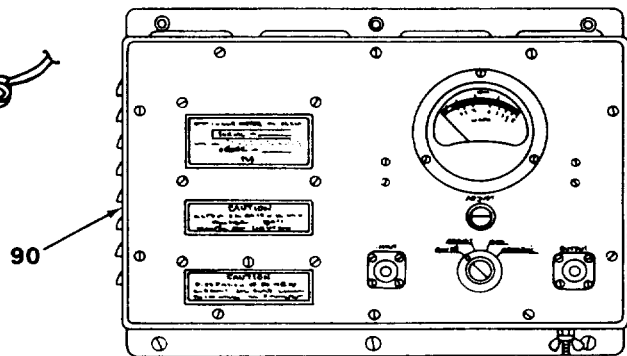
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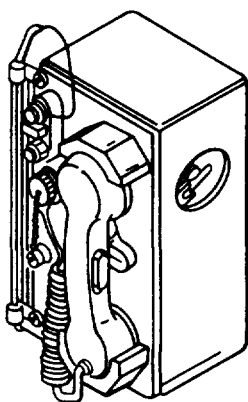
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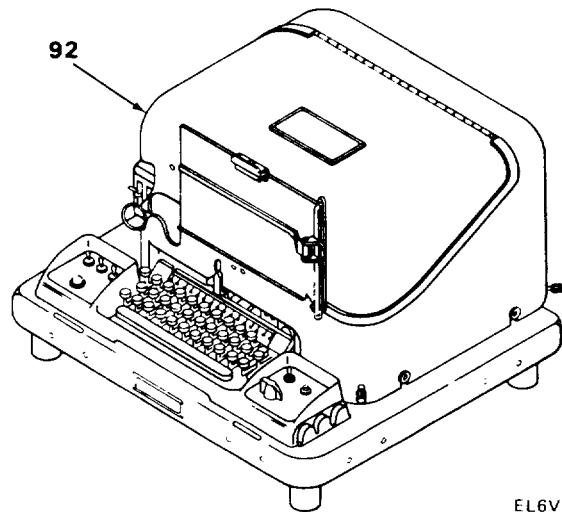
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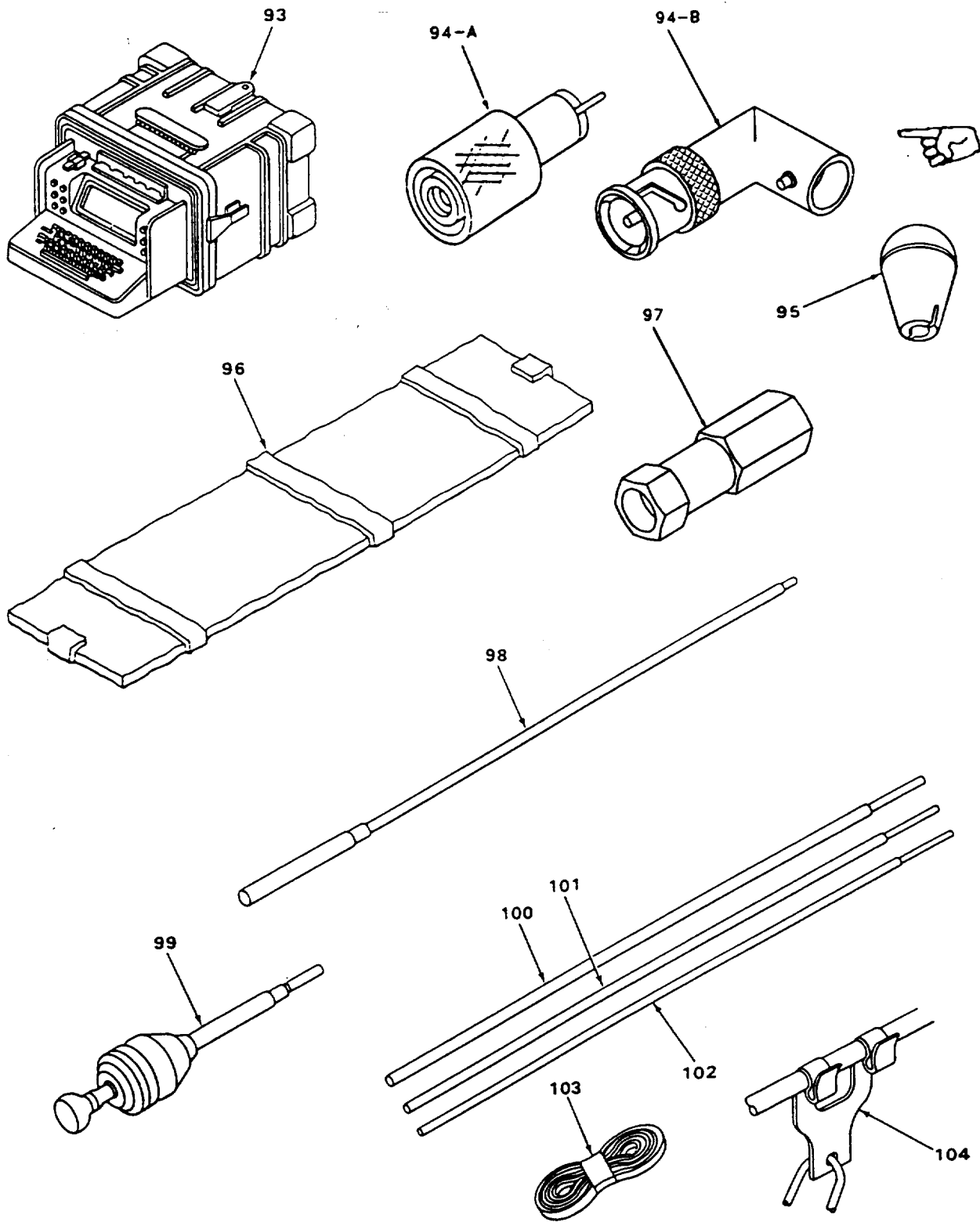
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COMPONENTS OF END ITEM (CONT)

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USUABLE 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
89	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 (80056)	PAO	EA	1
91	5805-00-543-0012	TELEPHONE SET TA-312/PT (80058) MIL-T-14358	PAO	EA	1
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)



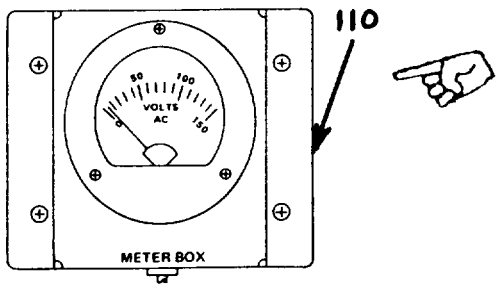
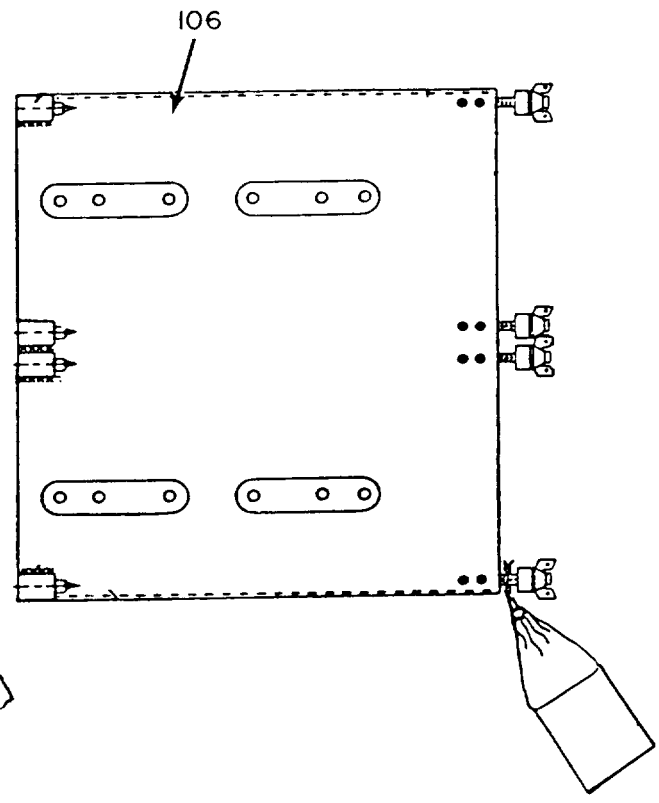
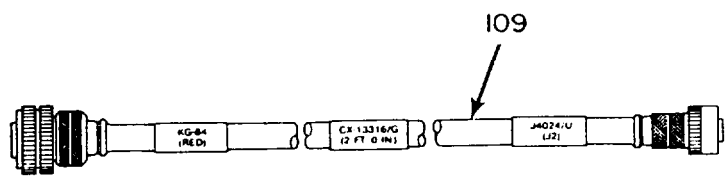
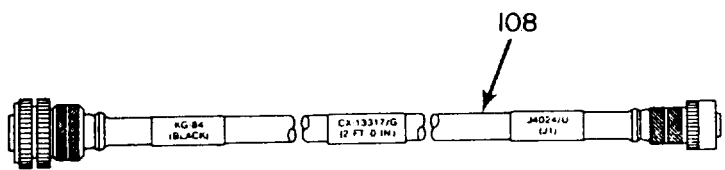
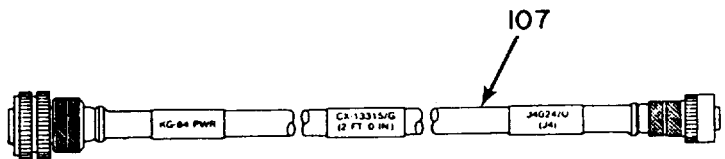
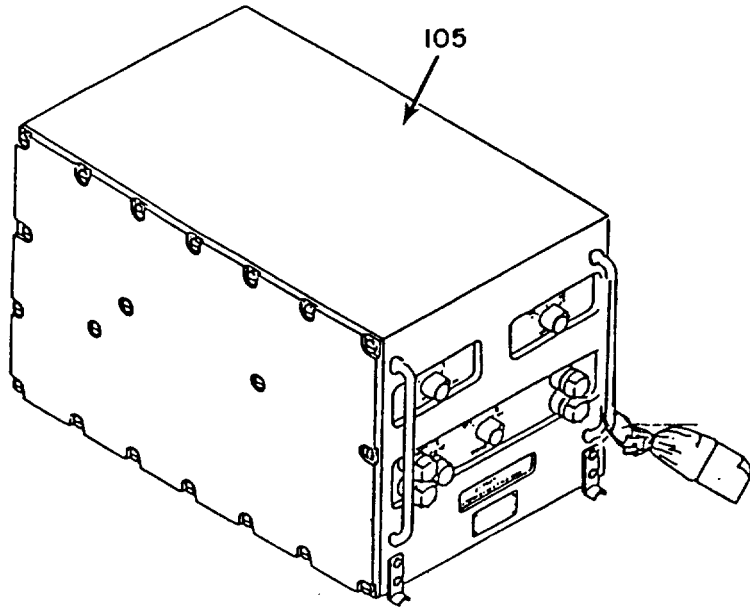
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COMPONENTS OF END ITEM (CONT)

TM 11-5815-334-10

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USUABLE 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*
		OR			
93	5815-01-214-6237	TERMINAL, COMMUNICATIONS AN/UGC-74B(V)3	PAE,PAL PAF,PAM PAG,PAN	EA	2*
		WHIP ANTENNA CONSISTING OF:			
94-A	5935-00-259-0205	ADAPTER CONNECTOR UG-201/U (80058) MIL-A-55-339/20	PAO	EA	1
94-B	5935-00-847-2600	ADAPTER, CONNECTOR UG-306B/U (81349) MS35368-306B	PAO	EA	1
95	5965-00-930-7223	ANTENNA TIP ASSEMBLY (80063) SC-C-446046	PAO	EA	2*
96	5820-00-200-2329	BAG CW-206/GR (80058) SC-DL-23003	PAO	EA	1
97	5620-00-571-1628	CLAMP (80063) SM-B-356781	PAO	EA	2*
98	5620-00-078-4769	COVER, ANTENNA (80063) SM-D-500428	PAO	EA	2*
99	5620-00-078-4770	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	5885-00-238-7474	MAST SECTION MS-118A (80063) SC-D-12521	PAO	E A	2*
103	4020-00-073-3276	ROPE (81349) MIL-C-43588 (40 FT)	PAO	EA	1
104	5820-00-906-6416	ANTENNA TIEDOWN KIT (80063) SC-C-446180	PAO	EA	4

* One half the quantity is used in AN/GRC-142 models.



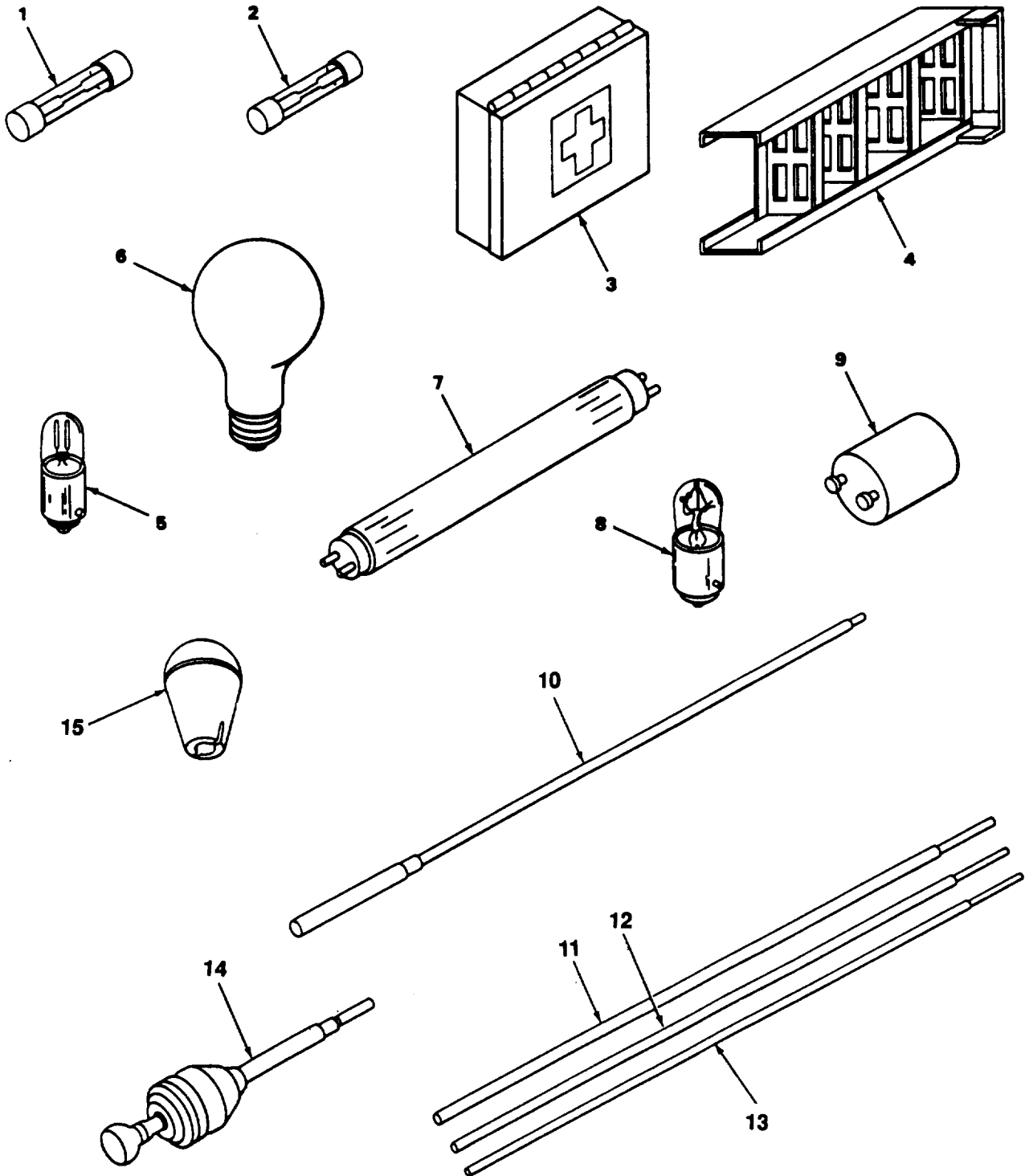
COMPONENTS OF END ITEM (CONT)

TM 11-5815-334-10

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USUABLE ON CODE	(4) U/M	(5) QTY REQ'D
105		INTERCONNECTING BOX	PAP	EA	1
106	5815-01-219-2666	MOUNTING BASE MT-6442/U	PAP	EA	1
107	5995-01-216-1969	CABLE ASSEMBLY, POWER, ELECTRICAL CX-13315/G	PAP	EA	1
106	5995-01-216-1999	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-13316/G	PAP	EA	1
109	5995-01-216-2000	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-13317/G	PAP	EA	1
110	6625-00-069-7166	VOLTMETER, A.C. ME-345/GRC	PAB,PAE, PAI,PAL	EA	1

* One half the quantity is used in AN/GRC-142 models

Section III BASIC ISSUE ITEMS



BASIC ISSUE ITEMS (CONT)

TM 11-5815-334-10

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USUABLE 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 1/1 6 AMP (FOR TT-98/FG) (81349) MIL-5-15160/2	PAB,PAC, PAD,PAI, PAJ,PAK	EA	3
1	5920-00-131-9817	FUSE 1.6 125V (FOR TT-7220/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-7220/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	5920-00-581-4144	FUSE 2A 250V (FOR TT-760/ GGC) (81535) BTL65626A	PAO	EA	2
1	5920-00-228-7882	FUSE 2A (FOR TT-98F/G) (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 F03B32V30A (81349) MIL-F-15160-03	PAO	EA	10
3	6545-00-922-1200	KIT, FIRST AID (80063) SM-D-539483	PAO	EA	1
4	2540-00-848-8483	LADDER MX-3543/G (80063) SC-D-147189	PAO	EA	1
5	6240-00-223-9100	LAMP, GLOW (FOR N/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

BASIC ISSUE ITEMS

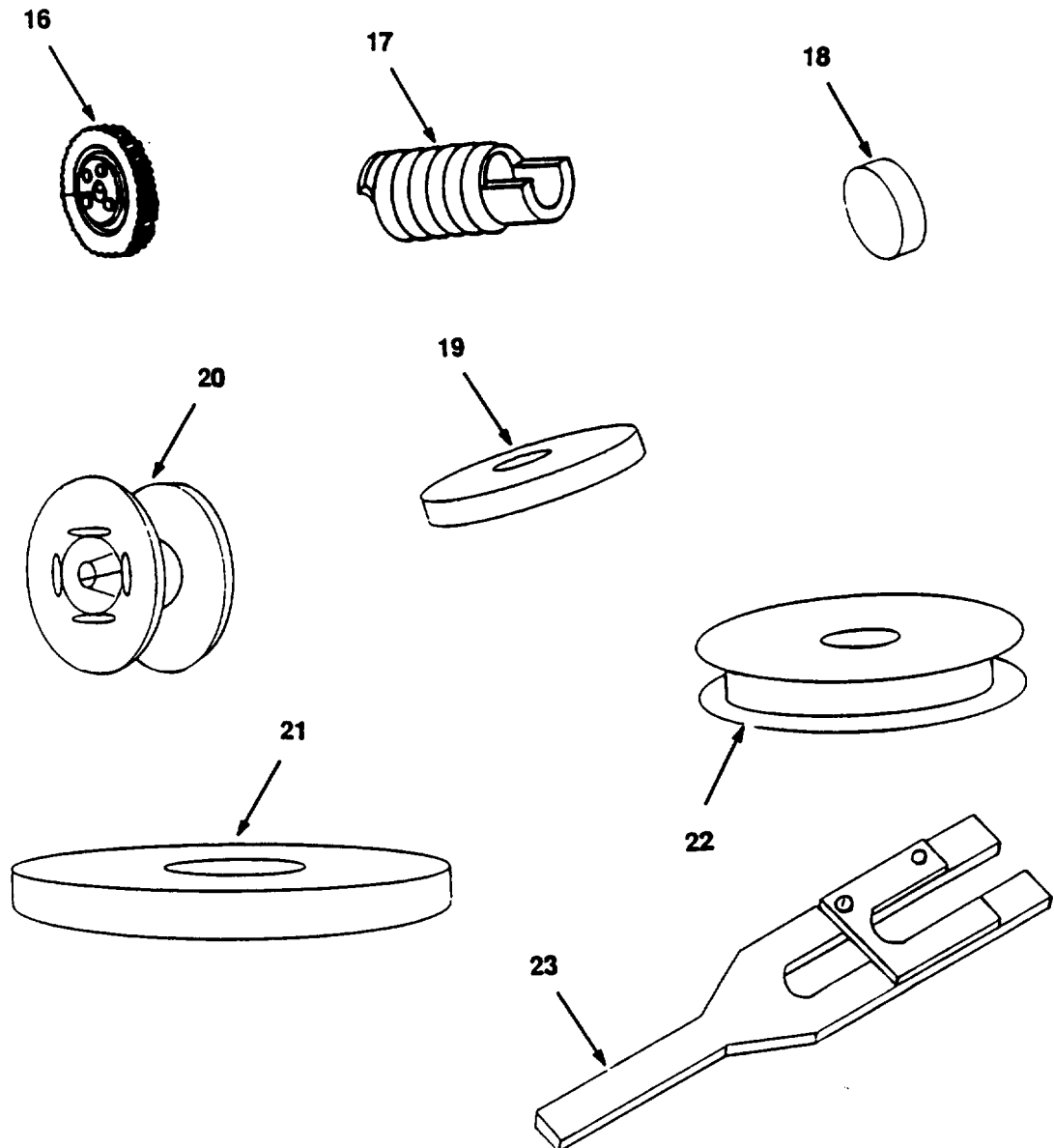
(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USUABLE ON CODE	(4) U/M	(5) QTY REQ'D
6	6240-00-617-1717	LAMP, INCANDESCENT (FOR TT-76()/GGC) (08806) MS15617A	PAB,PAC, PAD,PAE, PAG,PAI, PAJ,PAK, PAL	EA	1
6	6240-00-892-6102	LAMP 120V 10W (FOR TT-722()/TG) (08108)	PAB,PAC, 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	6250-00-194-4794	FLUORESCENT LAMP STARTER	PAF,PAG, PAM, PAN	EA	2
10	5820-00-078-4769	COVER, ANTENNA (80063) SM-D-500428	PAO	EA	2*
11	5985-00-199-8831	MAST SECTION MS-116A (80063) SC-D-12521	PAO	EA	6*
12	5985-00-115-7149	MAST SECTION MS-117A (80063) SC-D-12521	PAO	EA	2*
13	5985-00-238-7474	MAST SECTION MS-118A (80063) SC-D-12521	PAO	EA	2*
14	5820-00-078-4770	MAST BASE AB-652-GR (80058) AB652UR	PAO	EA	2*
15	5985-00-930-7223	ANTENNA TIP ASSEMBLY (80063) SC-C-446046	PAO	EA	2*
16	5815-00-378-5593	GEAR, WORM WHEEL: 60 wpm Kleinschmidt, p/n 50352A	PAO	EA	1
17	5815-00-351-7944	GEAR, WORM WHEEL 100 wpm Sig dwg SC-B-70478	PAO	EA	1
18	5815-00-203-1678	GEAR, WORM: 80 wpm, Sig dwg SC-B-69681	PAO	EA	1
19	5815-00-203-1327	GEAR, WORM: 100 wpm, Sig dwg SC-B-70842	PAO	EA	1

* One half the quantity is used in AN/GRC-142 models.

BASIC ISSUE ITEMS (CONT)

(1) ILLUS NO.	NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USUABLE ON CODE	(4) U/M	(5) QTY REQ'D
20	5815-00-356-3227	SPOOL, PRINTING RIBBON: Kleinschmidt p/n 10900	PAO	EA	1
21	7530-00-634-6237	TAPE, TELETYPEWRITER, perforator Fed Spec UU-T-120, 7/8 inch	PAO	ROLL	1
22	7510-00-082-2648	RIBBON, TELETYPEWRITER Fed Spec DDD-R-311d, Type 1, Grade 1, Class 1	PAO		1
23	5815-00-224-9717	FORK, TUNING: Sig dwg SC-DL-70237	PAO	EA	1
	TM 11-5815-238-10	TECHNICAL MANUAL		EA	1
		DA PAM 25-30		EA	1

* One half the quantity is used in AN/GRC-142 models.



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 (without MK-2488/G)
PAP	All models (with MK-2488/G)

Section II ADDITIONAL AUTHORIZATION LIST

NATIONAL STOCK NUMBER	DESCRIPTION (2) FSCM AND PART NUMBER	USUABLE ON CODE	(3) U/M REQ'D
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
6115-00-738-6340	GENERATOR SET, GASOLINE ENGINE DRIVEN TRAILER MOUNTED PU-620/M (80058) MIL-P-52557	PAO,PAP	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,PAP	EA 1
5815-00-553-6061	REPERFORATOR-TRANSMITTER TT-76()/GRC (80058) SM-D-134701	PAO,PAP	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	TERIMNAL, 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,PAP	

Section II ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION FSCM AND PART NUMBER	USABLE ON CODE	(3) U/M	(4) QTY AUTH
5810-01-118-7766	COMMUNICATIONS SECURITY EQUIPMENT TSEC/KW-7	PAO	EA	1
5810-01-250-6618	COMMUNICATIONS SECURITY EQUIPMENT TSEC/KG-84, KG-84A OR	PAP	EA	1
5810-01-250-6618	COMMUNICATIONS SECURITY EQUIPMENT TSEC/KG-84(*)	PAP	EA	1

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, Expendable 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

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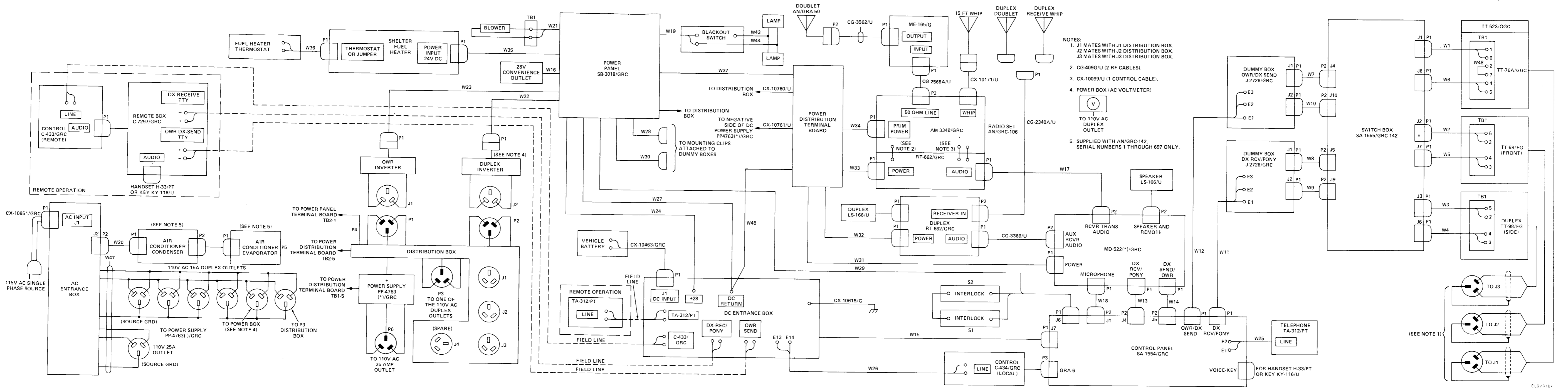
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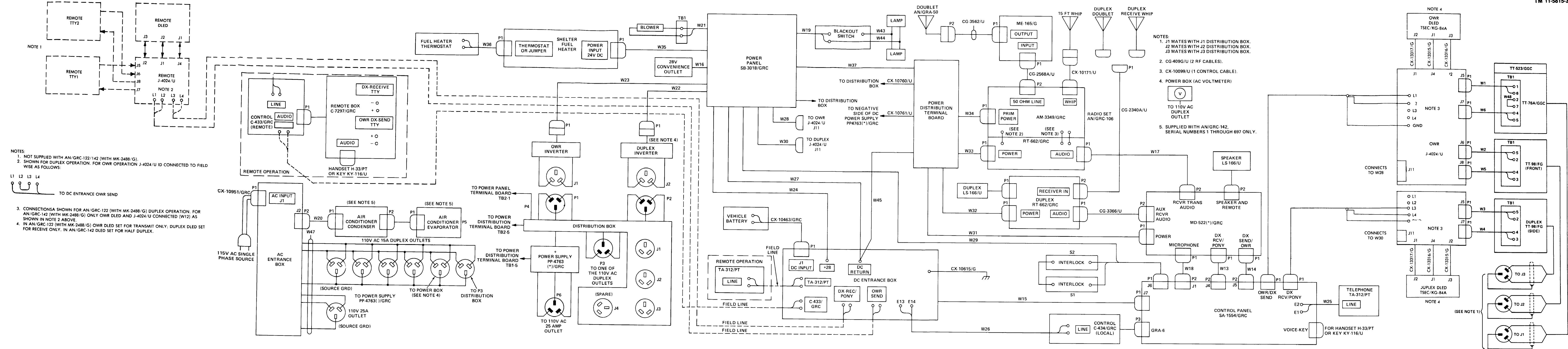
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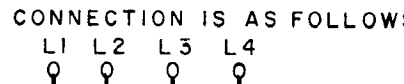
FO-1. Radio Teletypewriter Sets AN/GRC-122/142(*) Cording Diagram.

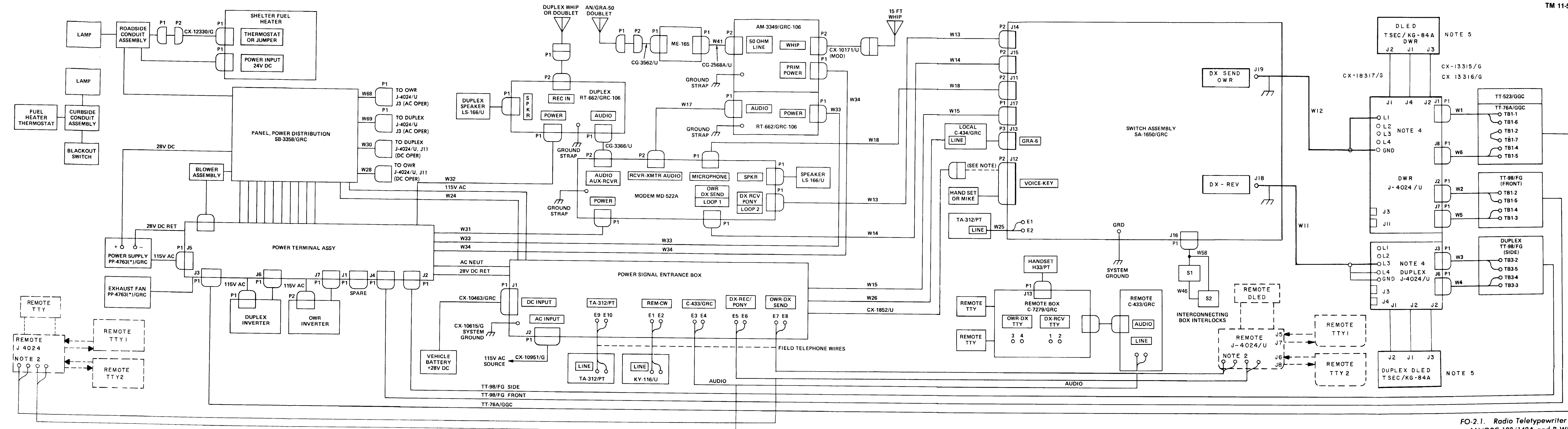


- NOTE 1
NOTE 2
NOTE 3
NOTE 4
- NOT SUPPLIED WITH AN/GRC-122/142 (WITH MK-2488/G).
 - SHOWN FOR DUPLEX OPERATION. FOR OWR OPERATION J-4024/U IS CONNECTED TO FIELD WISE AS FOLLOWS.
 - CONNECTIONS SHOWN FOR AN/GRC-122 (WITH MK-2488/G) DUPLEX OPERATION. FOR AN/GRC-142 (WITH MK-2488/G) ONLY OWR DLED AND J-4024/U CONNECTED (W12) AS SHOWN IN NOTE 2 ABOVE.
 - IN AN/GRC-122 (WITH MK-2488/G) OWR DLED SET FOR TRANSMIT ONLY; DUPLEX DLED SET FOR RECEIVE ONLY. IN AN/GRC-142 DLED SET FOR HALF DUPLEX.

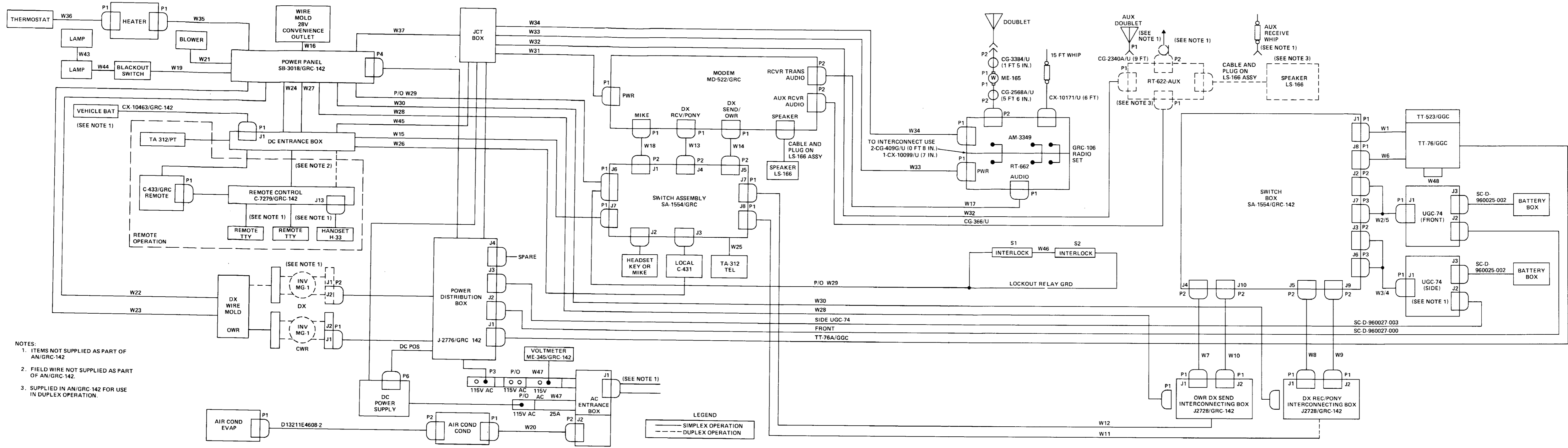
- NOTES:
- J1 MATES WITH J1 DISTRIBUTION BOX. J2 MATES WITH J2 DISTRIBUTION BOX. J3 MATES WITH J3 DISTRIBUTION BOX.
 - CG-409G/U (2 RF CABLES).
 - CX-10099/U (1 CONTROL CABLE).
 - POWER BOX (AC VOLTMETER)
 - SUPPLIED WITH AN/GRC-142. SERIAL NUMBERS 1 THROUGH 697 ONLY.

FO-1.1. RADIO TELETYPEWRITER SETS DIAGRAM IN ALL MODELS WITH MK-2488/G.

- NOTE:
1. FOR OPERATION OF REMOTE KEY REPLACE HANDSET WITH THIS CONNECTOR.
 2. SHOWN FOR DUPLEX OPERATION FOR OWR OPERATION CONNECTION IS AS FOLLOWS:

 3. NOT SUPPLIED WITH AN/GRC-122/142 A & B (WITH MK-2488/G)
 4. CONNECTIONS SHOWN FOR DUPLEX AN/GRC-122 A & B (WITH MK-2488/G). FOR AN/GRC-142 A & B (WITH MARK-2488/G) ONLY OWR J-4024/U AND DLED CONNECTED TO (W12) AS SHOWN IN NOTE 2 ABOVE
 5. IN AN/GRC-122 A & B (WITH MK-2488/G) OWR DLED SET FOR TRANSMIT ONLY. IN AN/GRC-142 A & B (WITH MK-2488/G) OWR DLED SET FOR HALF DUPLEX.

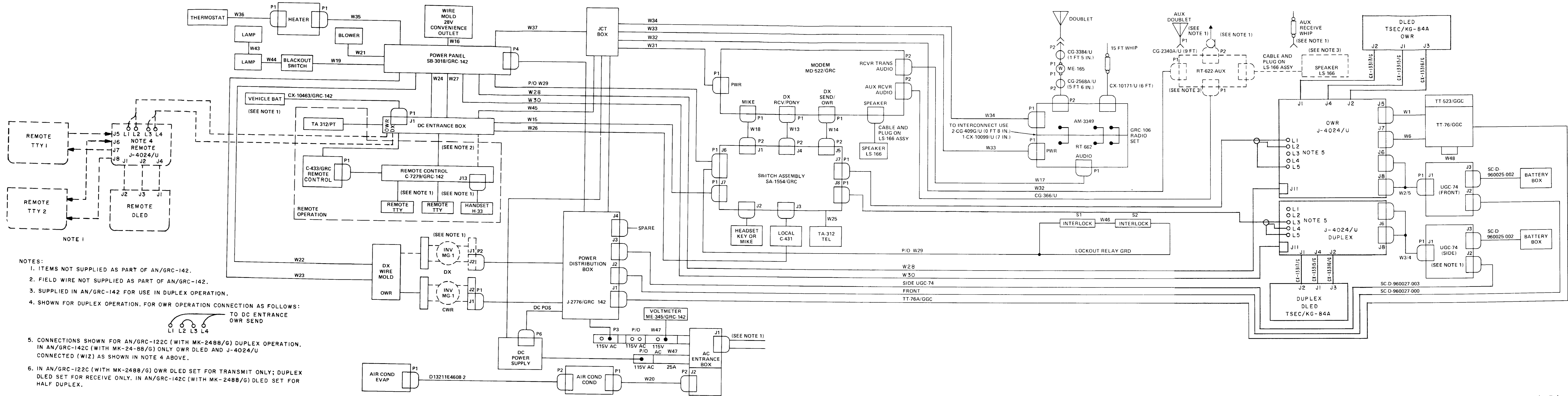


FO-2.1. Radio Teletypewriter Sets AN/GRC-122/142A and B With MK-2488/G Cording Diagram.



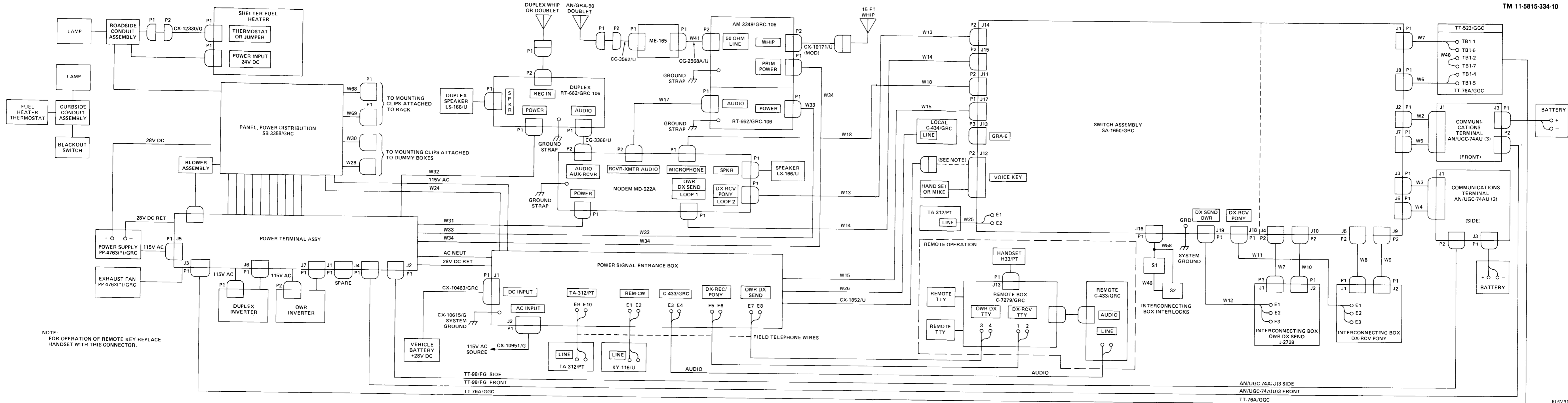
- NOTES:
1. ITEMS NOT SUPPLIED AS PART OF AN/GRC-142
 2. FIELD WIRE NOT SUPPLIED AS PART OF AN/GRC-142.
 3. SUPPLIED IN AN/GRC-142 FOR USE IN DUPLEX OPERATION.

FO-3. Radio Teletypewriter Sets
 AN/GRC-122/142C 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.
 4. SHOWN FOR DUPLEX OPERATION. FOR OWR OPERATION CONNECTION AS FOLLOWS:
 TO DC ENTRANCE OWR SEND
 L1 L2 L3 L4
 5. CONNECTIONS SHOWN FOR AN/GRC-122C (WITH MK-2488/G) DUPLEX OPERATION. IN AN/GRC-142C (WITH MK-24-88/G) ONLY OWR DLED AND J-4024/U CONNECTED (WIZ) AS SHOWN IN NOTE 4 ABOVE.
 6. IN AN/GRC-122C (WITH MK-2488/G) OWR DLED SET FOR TRANSMIT ONLY; DUPLEX DLED SET FOR RECEIVE ONLY. IN AN/GRC-142C (WITH MK-2488/G) DLED SET FOR HALF DUPLEX.

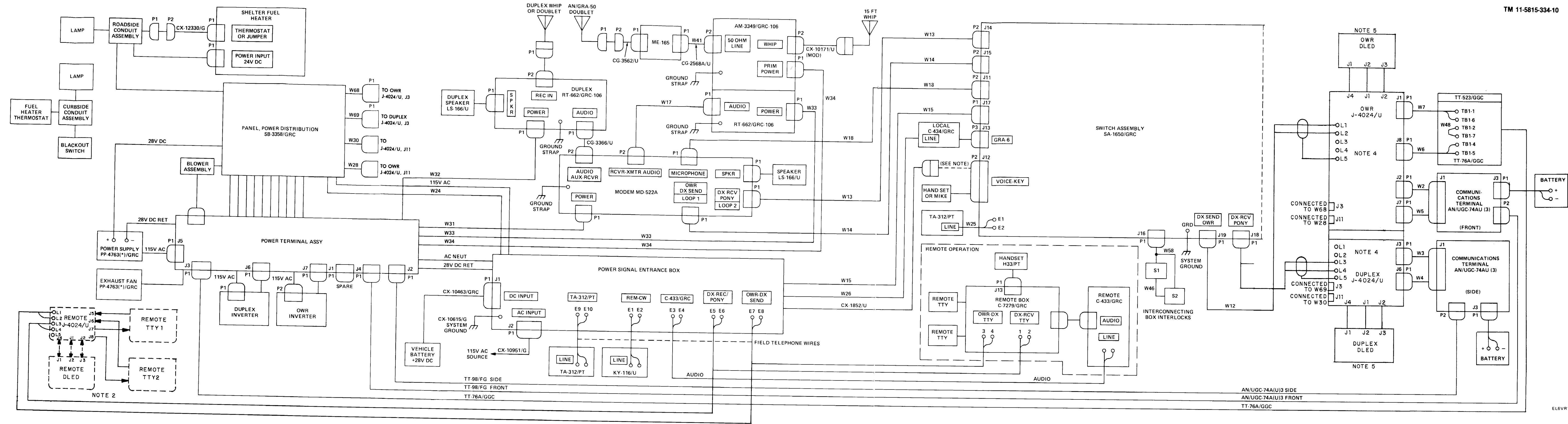
FO-3.1. Radio Teletypewriter Sets AN/GRC-122/142C (With MK-2488/G) Cording Diagram.



NOTE:
FOR OPERATION OF REMOTE KEY REPLACE
HANDSET WITH THIS CONNECTOR.

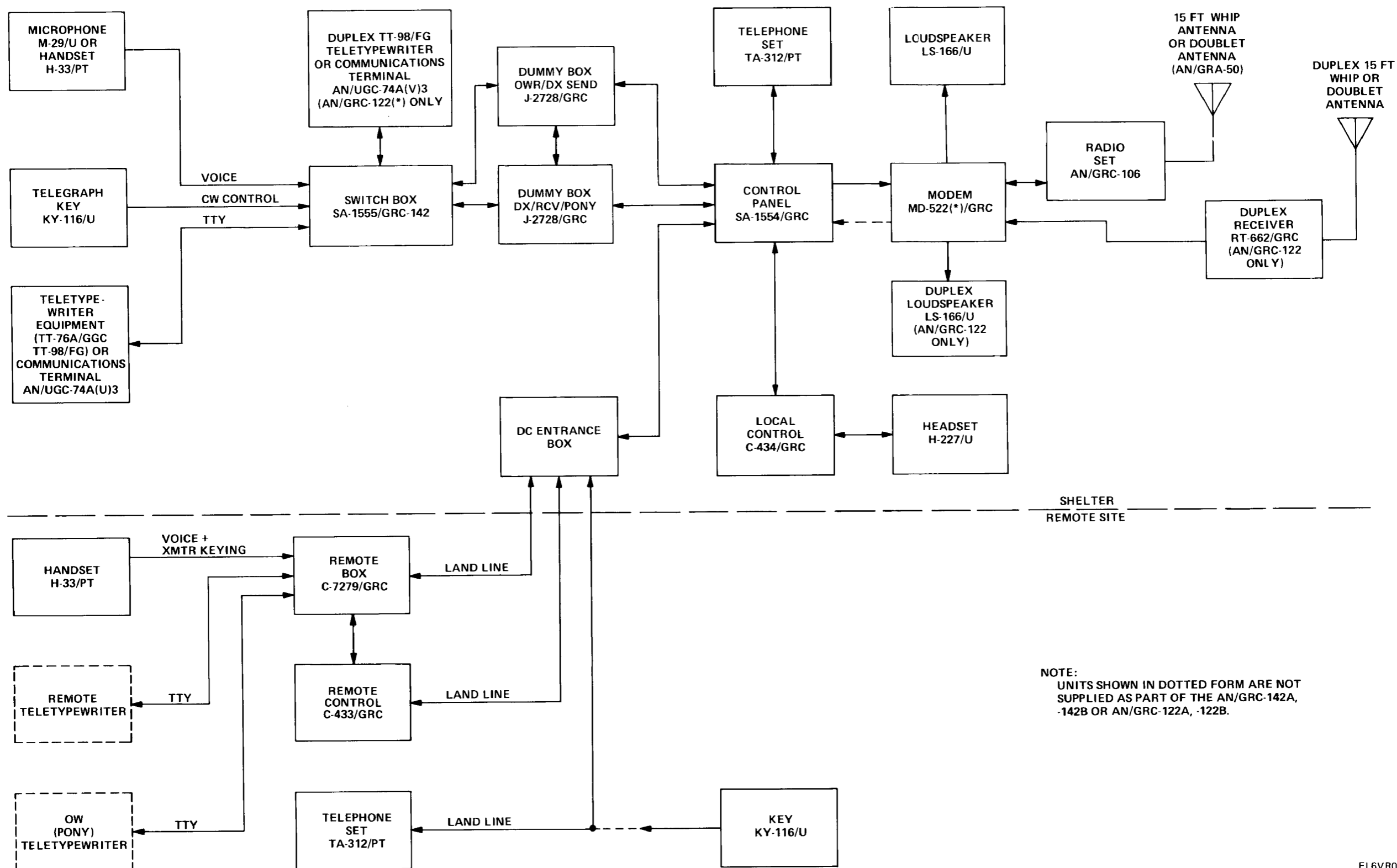
FO-4. Radio Teletypewriter Sets
AN/GRC-122/142D and E Cording
Diagrams.

EL6VR190



- NOTES:
1. FOR OPERATION OF REMOTE KEY REPLACE HANDSET WITH THIS CONNECTOR.
 2. NOT SUPPLIED WITH AN/GRC-122/142 D & E (WITH MK-2488/G).
 3. SHOWN CONNECTED FOR DUPLEX OPERATION. FOR OWR OPERATION CONNECT J-4024/U AS FOLLOWS:
- TO POWER SIGNAL ENT. BOX: E7, E8 OWR-DX SEND
4. CONNECTIONS SHOWN FOR DUPLEX OPERATION OF AN/GRC-122 D & E (WITH MK-2488/G). FOR AN/GRC-142 D & E (WITH MK-2488/G) ONLY OWR J-4024/U AND DLED CONNECTED (TO W12) AS SHOWN IN NOTE 3 ABOVE.
 5. IN AN/GRC-122 D & E (WITH MK-24-88/G) OWR DLED TRANSMIT ONLY, DUPLEX DLED RECEIVE ONLY. IN AN/GRC-142 D & E (WITH MK-2488/G) OWR DLED SET FOR HALF DUPLEX.

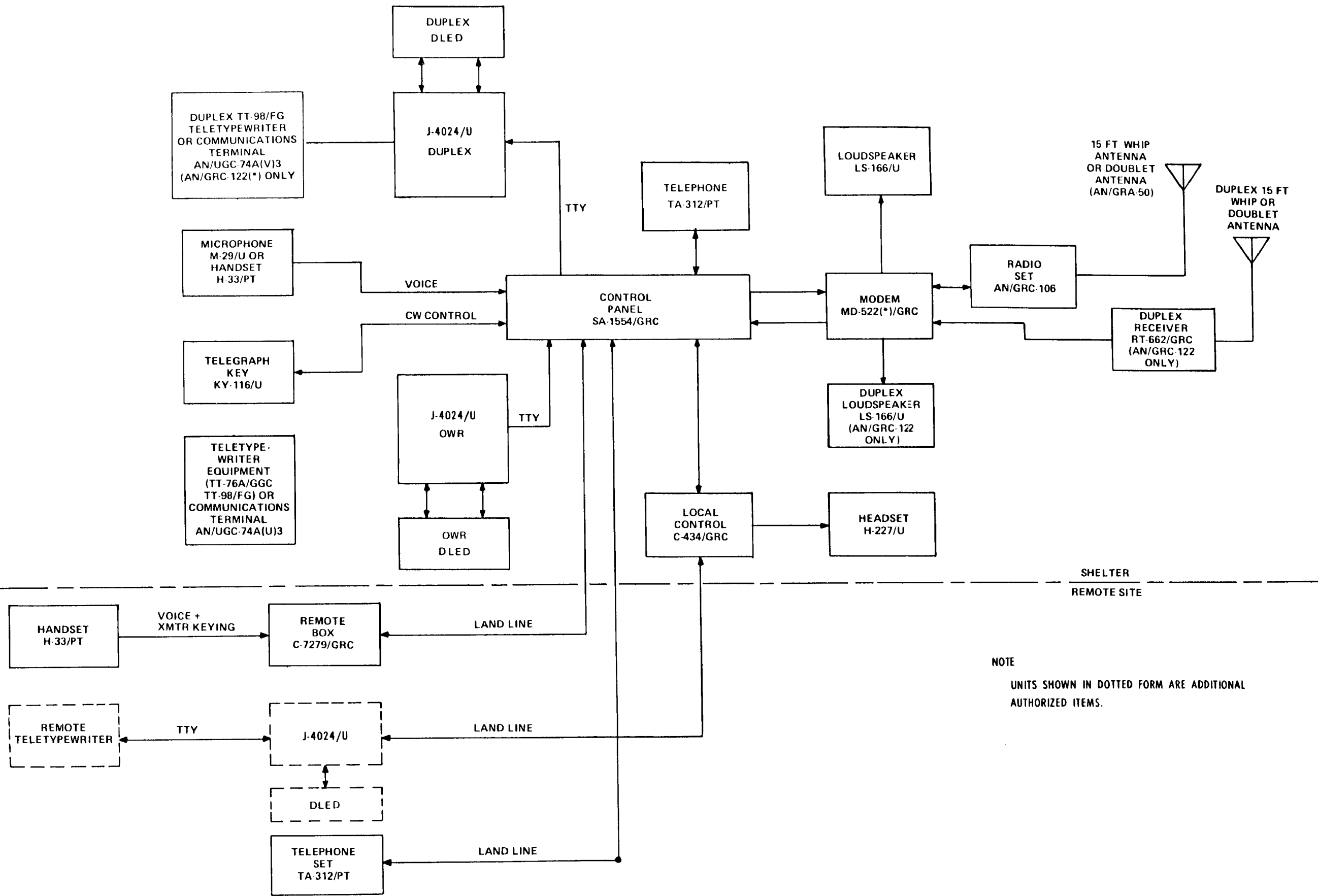
FO-4.1. RADIO TELETYPEWRITER SETS AN/GRC-122/142D AND E WITH MK-88/G CORDING DIAGRAM.



NOTE:
 UNITS SHOWN IN DOTTED FORM ARE NOT SUPPLIED AS PART OF THE AN/GRC-142A, -142B OR AN/GRC-122A, -122B.

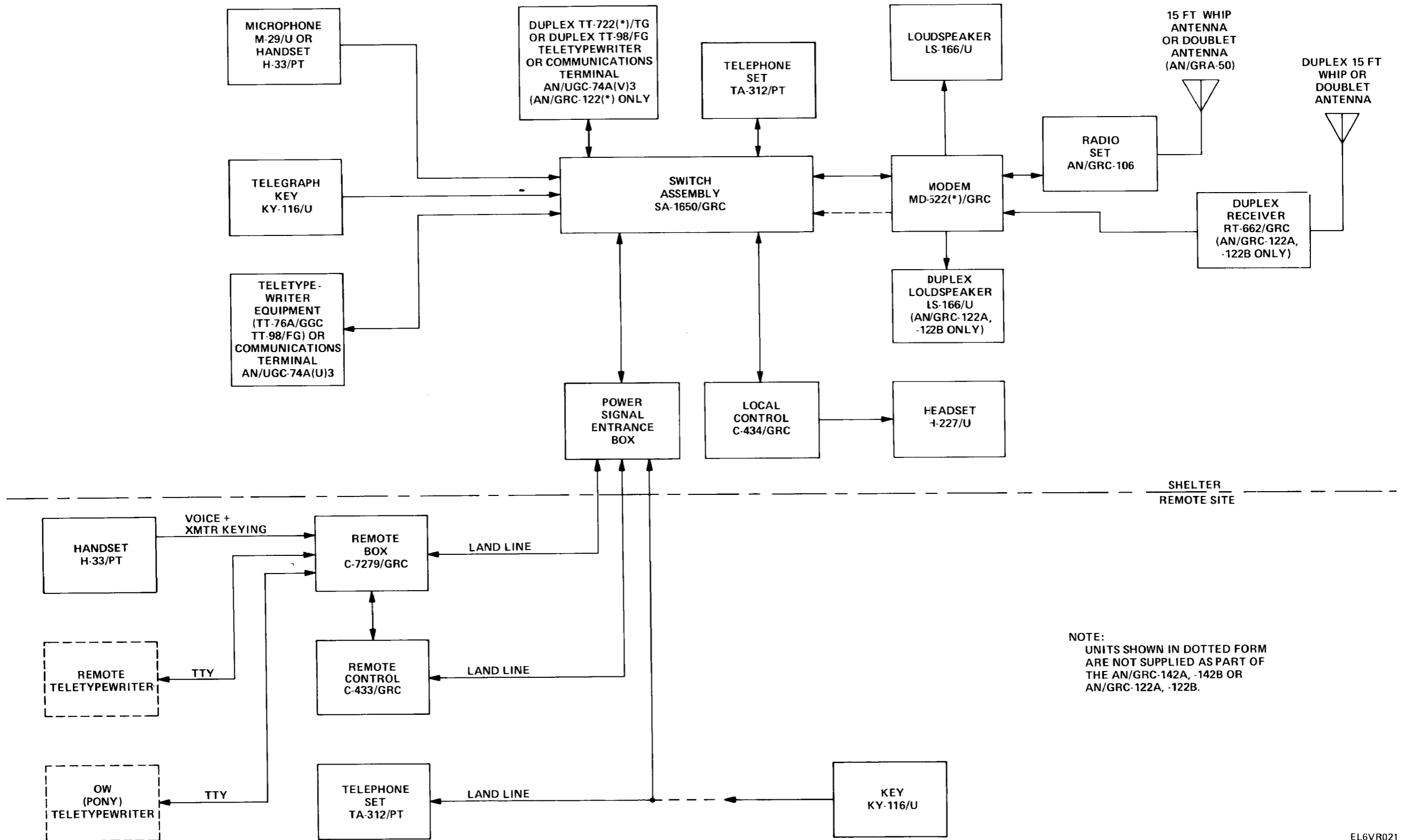
EL6VR020

FO-5. Radio Set AN/GRC-122/142
 Plain and C Block Diagram.



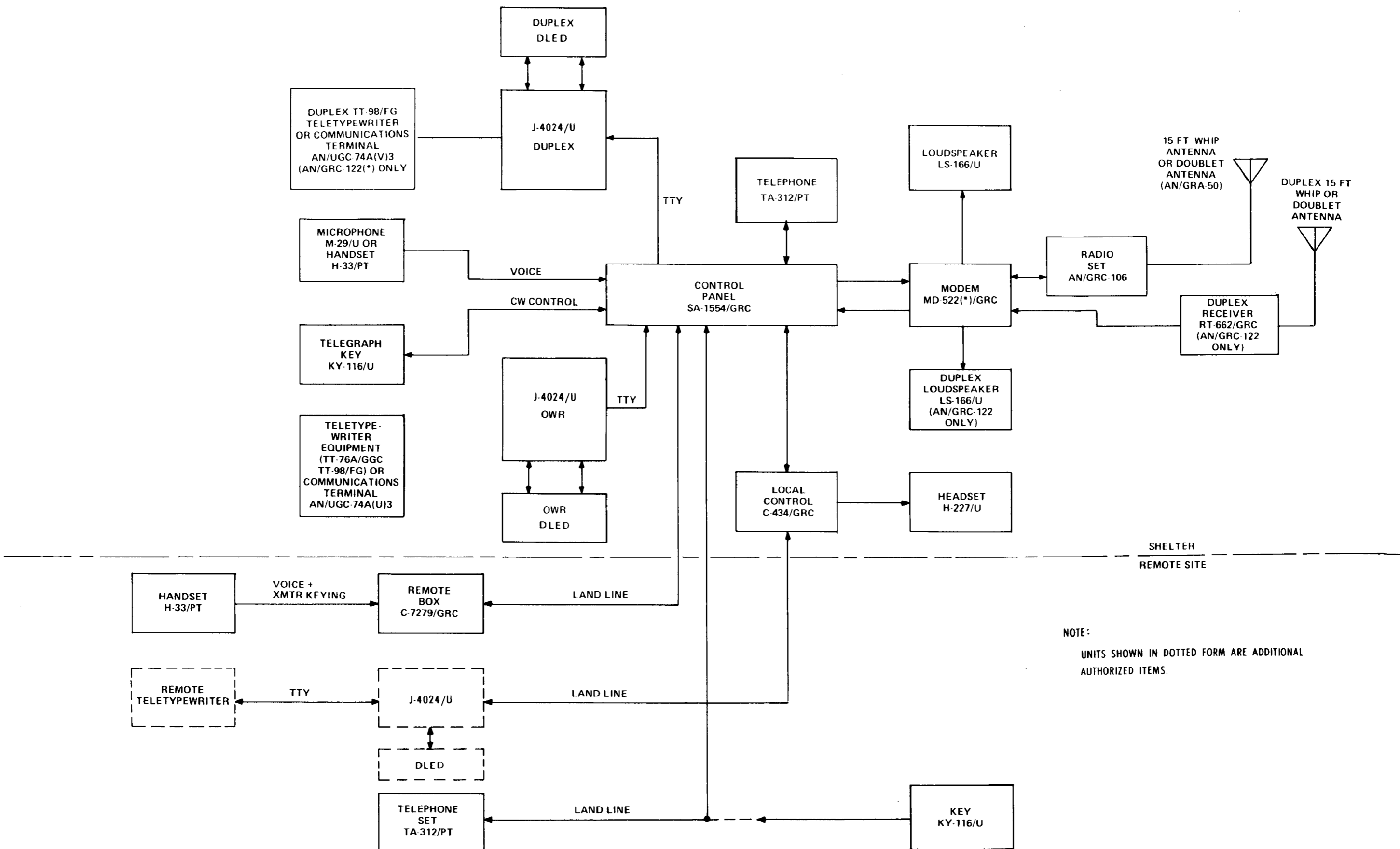
NOTE
 UNITS SHOWN IN DOTTED FORM ARE ADDITIONAL
 AUTHORIZED ITEMS.

FO-5.1 INTERCONNECTION OF UNITS WITHIN AN/GRC-122A, B, D AND E MODELS WITH MK-2488/G AND AN/GRC-142 A, B, D AND E MODELS WITH MK-2488/G.



EL6VR021

FO-6. Radio Set AN/GRC-122/142A, B, D, and E Block Diagram.



NOTE:
UNITS SHOWN IN DOTTED FORM ARE ADDITIONAL AUTHORIZED ITEMS.

FO-6.1. INTERCONNECTING OF UNITS WITHIN AN/GRC-122 PLAIN AND C MODELS WITH MK-2488/G AND AN/GRC-142 PLAIN AND C MODELS WITH MK-2488/G.

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/GRG-142 and
AN/GRC-122.

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



THEN... JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT. FOLD IT AND DROP IT IN THE MAIL!

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 Commander
 Stateside Army Depot
 ATTN: AMSEL-US
 Stateside, N.J. 07703-5007

DATE SENT
 10 July 1975

PUBLICATION NUMBER
 TM 11-5840-340-20P

PUBLICATION DATE
 23 Jan 78

PUBLICATION TITLE
 Radar Set AN/PRC-76

BE EXACT. PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	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

TEAR ALONG PERFORATED LINE

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER
 SSG I. M. DeSpirito of 999-1776

SIGN HERE



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TM 11-5815-334-10

PUBLICATION DATE

5 Mar 85

PUBLICATION TITLE

Radio Teletypewriter Sets

BE EXACT... PIN-POINT WHERE IT IS

PAGE
NO

PARA-
GRAPH

FIGURE
NO

TABLE
NO

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US Army Communications-Electronics Command
and Fort Monmouth
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TEAR ALONG PERFORATED LINE

THE METRIC SYSTEM AND EQUIVALENTS

WEIGHT MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
 1 Kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
 1 Kilogram = 1000 Grams = 2.2 lb.
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
 1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
 1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
 1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

TEMPERATURE

$5/9(^{\circ}\text{F} - 32) = ^{\circ}\text{C}$
 212° Fahrenheit is equivalent to 100° Celsius
 90° Fahrenheit is equivalent to 32.2° Celsius
 32° Fahrenheit is equivalent to 0° Celsius
 $9/5^{\circ}\text{C} + 32 = ^{\circ}\text{F}$

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
its	Liters	0.473
arts	Liters	0.946
allons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
ers	Gallons	0.264
ms	Ounces	0.035
ograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pounds-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
ometers per Liter	Miles per Gallon	2.354
ometers per Hour	Miles per Hour	0.621



PIN: 057349-004