TM 11-5815-204-10

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR'S MANUAL

RADIO TELETYPEWRITER SETS AN/GRC-46, AN/GRC-46A, AN/GRC-46B, AND AN/VRC-29

HEADQUARTERS, DEPARTMENT OF THE ARMY

14 SEPTEMBER 1960

WARNING

DANGEROUS VOLTAGES EXIST IN THIS EQUIPMENT

The voltages used in this equipment are high enough to cause death. When the transmitter is operating, high power is present at the antenna and on the antenna lead-in wire. Be careful not to come in contact with the antenna or antenna circuit; severe burns and shock may result.

DON'T TAKE CHANCES!

TM 11-5815-204-10
C 10

CHANGE
NO. 10

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *8 October 1974*

Operator's Manual
RADIO TELETYPEWRITER SETS AN/GRC-46, AN/GRC-46A, AN/GRC-46B, AN/GRC-46C, AND AN/VRC-29

TM 11-5815-204-10, 14 September 1960, is changed as follows:

Delete all reference to "Interconnecting Box J-1194/GRC-46" in the following places in the manual:

Page 4, paragraph 5, 37th line from bottom of chart.
Page 9, figure 4.2.
Page 10, paragraph 14.2.
Page 19, paragraph 21*c* note.
Page 37, paragraph 36*b* chart, last item.

By Order of the Secretary of the Army:

FRED C. WEYAND
General, United States Army
Vice Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:
To be distributed in accordance with DA Form 12-51, Operator maintenance requirements for AN/GRC-46 and AN/VRC-29.

U.S. GOVERNMENT PRINTING OFFICE: 1974-665134/209
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HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., *26 December 1973*

Operator's Manual

RADIO TELETYPEWRITER SETS AN/GRC-46, AN/GRC-46A, AN/GRC-46B, AN/GRC-46C, AND AN/VRC-29

TM 11-5815-204-10, 14 September 1960, is changed as follows:

Page 3, paragraph 2.1. Paragraph 2.1 is superseded by the following:

2.1. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38-750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Report of Packaging and Handling Deficiencies) as prescribed in AR 700-58 (Army)/NAVSUP Pub 378 (Navy)/ AFR 71-4 (Air Force)/and MCO P4030.-29 (Marine Corps).

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38 (Army)/NAVSUP Pub 459 (Navy)/ AFM 75-34 (Air Force)/and MCO P4610.19 (Marine Corps).

Add paragraph 2.2 after paragraph 2.1.

2.2. Reporting of Errors

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL-MA-CR, Fort Monmouth, NJ 07703.

Page 4, paragraph 5. Paragraph 5 is superseded by the following:

5. Items Comprising Operable Radio Teletypewriter Sets AN/GRC-46,AN/GRC-46A, AN/GRC-46B (FSN 5815-543-1760), AN/VRC-29 (FSN 5815-543-1758), and AN/GRC-46C (FSN 5815-082-4205)

FSN	QTY	Nomenclature, part No., and mfr code	Usable on code
		NOTE The part number is followed by the applicable 5-digit Federal supply code for manufacturers (FSCM) identified in SB 708-42 and used to identify manufacturer, distributor, or Government agency, etc. **NOTE** In usable on code column, number 1 refers to AN/GRC-46; number 2 refers to AN/GRC-46A; number 3 refers to AN/GRC-46B; number 4 refers to AN/VRC-29; number 5 refers to AN/GRC-46C.	
5935-666-1649	3	Adapter, Connector UG-306A/U	1,2
5935-847-2600	3	Adapter, Connector UG-306B/U	3,5
5820-633-0344	1	Antenna Mounting Assembly: SC-C-11436 and 114370; 80063	1,2,3,5
5820-698-6202	1	Antenna Mounting Assembly: 01X204964; 98738	2,3,5
5306-543-5898	1	Bolt, Hook: SM-B-114538; 80063	1,2,3,5

FSN	QTY	Nomenclature, part No., and mfr code	Usable on code
6645-633-3597	1	Bracket: SM-B-114537; 80063	1,2,3,5
5815-706-3051	1	Bracket Assembly: (Left hand) SM-B-114266; 80063	4
5815-706-3052	1	Bracket Assembly: (Right hand) 07x202629; 98738	4
5815-706-3053	2	Bracket: 07P200478; 98738	4
7110-082-6109	1	Cabinet, Filing Security: AAF-358C (This item is nonexpendable)	3,5
5995-577-8058	1	Cable Assembly, Power, Electrical CX-4539/U: (5 ft. 0 in.) SM-C-114229; 80063	1,2,3,5
5995-617-1868	1	Cable Assembly, Power, Electrical CX-4540/UP (3 ft 2 in.) SM-C-114244; 80063	1,2,3,5
5995-617-0312	1	Cable Assembly, Power, Electrical CX-4540/U: (4 ft 9 in.) SM-C-114259; 80063	1,2,3,5
5995-681-8589	2	Cable Assembly, Power, Electrical CX-4847/U: (1 ft 10 in.)	4
5995-823-3106	2	Cable Assembly, Power, Electrical CX-4541/U: (6 ft 11 in.) SM-C-114235; 80063	1,2,3,5
5995-889-0899	2	Cable Assembly, Power, Electrical CX-4541/U: (3 ft 1 in.)	4
5995-617-1869	1	Cable Assembly, Power, Electrical CX-4542/U: (8 ft 11 in.)	1,2,3,5
5995-752-2492	1	Cable Assembly, Power, Electrical CX-4551/U: (10 ft 6 in.)	4
5995-681-8584	1	Cable Assembly, Power, Electrical CX-4849/U: (6 ft 3 in.)	4
5995-752-2193	1	Cable Assembly, Power, Electrical CX-6292/U: (12 ft 11 in.)	3,5
5995-617-0313	1	Cable Assembly, Power, Electrical CX-4545/U: (6 ft 5 in.) SM-C-114245; 80063	1,2,3,5
5995-681-8585	1	Cable Assembly, Power, Electrical CX-4850/U: (6 ft 5 in.)	4
5995-823-3031	2	Cable Assembly, Radio Frequency CG-530E/U: (2 ft 11 in.)	1,2,3,5
5995-682-3319	2	Cable Assembly, Radio Frequency CG-530B/U: (1 ft 5 in.)	4
5995-823-2309	1	Cable Assembly, Radio Frequency CG-1127/U: (2 ft 6 in.)	1,2,3,5
5995-682-3312	1	Cable Assembly, Radio Frequency CG-1127/U: (1 ft 7 in.)	4
5995-823-3068	1	Cable Assembly, Radio Frequency CG-409G/U: (4 ft 3 in.)	1,2,3,5
5995-617-1874	1	Cable Assembly, Special Purpose, Electrical CX-4546/U: (3 ft 9 in.) SM-C-114230; 80063	1,2,3,5
5995-617-1876	1	Cable Assembly, Special Purpose, Electrical CX-4547/U: (5 ft 6 in.) SM-C-114242; 80063	1,2,3,5
5995-681-8590	1	Cable Assembly, Special Purpose, Electrical CX-4848/U: (3 ft 6 in.)	4
5995-682-3311	1	Cable Assembly, Special Purpose, Electrical CX-455/1U:	1,2
5815-707-2321	1	Cable and Switch Assembly, Special Purpose: (4 ft 9 in.) 30X204081; 98738 (This item is nonexpendable)	3,4,5
5995-985-7912	1	Cable Assembly, Special Purpose CX-9994/U: (3 ft 0 in.)	1,2,3,5
5995-937-3785	1	Cable Assembly, Special Purpose CX-9994/U: (8 ft 6 in.) SC-D-379946; 80063	1,2,3,5
5995-937-3786	1	Cable Assembly, Special Purpose CX-9995/U: (8 ft 6 in.) SC-D-379947; 80063	1,2,3,5
5995-985-7904	1	Cable Assembly, Special Purpose CX-9996/U: (7 ft 6 in.) SC-D-379948; 80063	1,2,3,5
5995-985-7906	1	Cable Assembly, Special Purpose CX-9997/U: (7 ft 6 in.) SC-D-379949; 80063	1,2,3,5
5995-985-7907	1	Cable Assembly, Special Purpose CX-9998/U: (8 ft 0 in.)	1,2,3,5
5995-985-7918	1	Cable Assembly, Special Purpose CX-1000/U: (8 ft 0 in.)	1,2,3,5
5995-985-8047	1	Cable Assembly, Power, Electrical CX-10064/U: (6 ft 0 in.)	1,2,3,
5995-985-8230	1	Cable Assembly, Special Purpose CX-11078/U: (13 ft 6 in.) SM-D-374571; 80063	5
5995-985-8231	1	Cable Assembly, Special Purpose CX-11079/U: (8 ft 6 in.) SM-D-374570; 80063	5
5340-619-1353	1	Clamp, Loop: (5/8 in. w) SC-B-19491; 80063	1,2,3,5
6645-663-4079	1	Clock, Aircraft, Mechanical: (8 day) A-11-63R; 36922 (This item is nonexpendable)	1,2,3,5
5815-543-1728	1	Converter, Frequency Shift CV-278/GR: (This item is nonexpendable)	1,2,3,4,5
5995-617-1875	1	Cord Assembly, Electrical CX-4549/U: (4 ft 5 in.)	3
5995-682-3309	1	Cord Assembly, Electrical CX-4549/U: (3 ft 3 in.)	4
4140-624-4476	1	Fan, Ventilating, Propeller: 01X202758; 98738 (This item is nonexpendable)	1,2,3,5
	1	Fixture, Lighting: SM-B-114346; 80063	1,2,3,5
6210-633-6731	1	Fixture, Lighting: SM-B-114349; 80063	1,2,3,5
4520-649-8915	1	Heater, Space Multi-Fuel: (15,000 BTU) M52204; 81349	1,2,3,5
5970-240-3845	1	Insulator, Bushing: Sig insulator IN-111	1,2,3,5

FSN	QTY	Nomenclature, part No., and mfr code	Usable on code
5970-405-8971	8	Insulator, Strain: 1123264/20; 81349	1,2,3,5
5815-615-9854	1	Interconnecting Box J-668/GR: SC-DL-113906; 80063 (This item is nonexpendable)	4
5815-082-3925	1	Interconnecting Box J-2491/GR: SM-D-374508; 80063 (This item is nonexpendable)	1,2,3,5
5815-816-0266	1	Interconnecting Box J-1194/GRC: (This item is nonexpendable)	3,5
5815-816-0265	1	Interconnecting Box J-1195/GRC: (This item is nonexpendable)	5
5815-082-3924	1	Interconnecting Box J-2498/GRC: SC-DL-379895; 80063 (This item is nonexpendable)	1,2,3
5815-912-4745	1	Interconnecting Box: Switch, Electronic, SA-1243/GRC SC-D-379916; 80063 (This item is nonexpendable)	1,2,3,5
5965-243-6420	1	Loudspeaker L8-116/U: (This item is nonexpendable)	1,2,3,4,5
5820-543-1672	1	Modulator, Radio Transmitter MD-203/GR: (This item is nonexpendable)	1,2,3,4,5
6125-617-1435	2	Motor-Generator: SM-D-114304 (Wincharger); 80063 (This item is nonexpendable)	1,2,3,4,5
5805-186-9464	2	Mounting MT-791/U: MT-791A/U: (This item is nonexpendable)	1,2,3,4,5
5815-702-6539	1	Plate, Instruction: 63P204968; 98738	4
5815-912-5157	1	Power Supply PP-978/FG; SC-DL-148306B; 80063 (This item is nonexpendable)	1,2,3,5
5820-030-0155	1	Radio Set AN/GRC-19; (This item is nonexpendable)	1,2,3,4,5
5820-030-2969	1	Reel RL-29: (This item is nonexpendable)	1,2,3,5
6210-633-6732	2	Reflector Light: 5429P; 74545	1,2,3,5
5815-503-2760	1	Reperforator-Transmitter TT-76/GGC: (This item is nonexpendable)	1,2,3,4,5
5410-614-4668	1	Seat, Individual: 01X200454-2 (right); 98738 (This item is nonexpendable)	1,2,3,5
5410-633-3603	1	Seat, Individual: SM-C-114302 (rear); 80063 (This item is nonexpendable)	1,2,3,5
5410-542-5868	1	Shelter, Electrical Equipment S-89C/G: (This item is nonexpendable)	1
5410-542-2532	1	Shelter, Electrical Equipment S-114/G: 01P204925; 98738 (This item is nonexpendable)	2
5410-752-9514	1	Shelter, Electrical Equipment S-144/G: SC-DL-37725; 80063 (This item is nonexpendable)	3,5
5815-557-5970	1	Teletypewriter Set AN/UGC-4: (This item is nonexpendable)	1,2,3,4,5
6145-617-0352	250	Wire, Electrical: type C Class B (bare 16 AWG); 81349 (Note: To be requisitioned as required in minimum of 250 ft)	1,2,3,5
5410-542-5887	4	Wire Rope Assembly, Single Leg: 55X200417 (10 ft lg) 98738	
		HEATER, INSTALLATION C/O THE FOLLOWING	
2590-473-6331	1	Bracket: (gas can 5 gallon)	1,2,3,5
7420-222-3088	1	Can, Gas: (5 gallon)	1,2,3,5
6115-679-9153	1	Electrode Igniter: 700808; 78385	1,2,3,5
4720-678-2262	1	Hose Assembly, Metal: SM-B-114330; 80063	1,2,3,5
5430-678-0737	1	Tank, Fuel: SM-C-114305 (1-1/2 gal); 80063	1,2,3
6130-659-1556	1	Vibrator, Interrupter: 94-H; 76854	1,2,3,5

Add paragraph 5.1 after paragraph 5.

5.1 Running Spares

FSN	*Qty*	*Item*	*Usable on code*
5920-284-6795	1	Fuse, cartridge: F04A10ROB; 96906	1,2,3,5
6240-238-8515	2	Lamp, incandescent: 25A30; 24446	1,2,3,5

Page 42, appendix II. Appendix II is superseded by the following:

APPENDIX II

BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

1. Scope

This appendix lists basic issue items required by the crew/operator for installation, operation, and maintenance of Radio Teletypewriter Sets AN/GRC-46, AN/GRC-46A, AN/GRC-46B, AN/GRC-46C, and AN/VRC-29.

2. General

The basic issue items list (Section II) is a list, in alphabetical sequence, of items which are furnished with, and which must be turned in with the end item.

3. Explanation of Columns

The following provides an explanation of columns found in the tabular listings:

a. Illustration. Not applicable.

b. Federal Stock Number. Indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Part number. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements, to identify an item or range of items.

d. Federal Supply Code for Manufacturer (FSCM). The FSCM is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency, etc., and is identified in SB 708-42.

e. Description. Indicates the Federal item name and a minimum description required to identify the item.

f. Unit of Measure (U/M). Indicates the standard of basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation, (e.g., ea, in., pr, etc.). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

g. Quantity Furnished with Equipment (Basic Issue Items Only). Indicates the quantity of the basic issue item furnished with the equipment.

4. Special Information

Usable on codes are included in Column 5. Uncoded items are applicable to all models. Identification of the usable on codes are as follows:

Code	*Used on*
1	AN/GRC-46
2	AN/GRC-46A
3	AN/GRC-46B
4	AN/VRC-29
5	AN/GRC-46C

SECTION II. BASIC ISSUE ITEMS LIST

(1) ILLUSTRATION		(2)	(3)	(4)	(5)		(6)	(7)
(A) FIG. NO.	(B) ITEM NO.	FEDERAL STOCK NUMBER	PART NUMBER	FSCM	DESCRIPTION	USABLE ON CODE	UNIT OF MEAS	QTY FURN WITH EQUIP
		5975-020-8827	SC-DL-75591	80063	ROD, GROUND	1,2,3,5	EA	1
		6660-633-3596	01X202756	98738	VENTILATOR KIT	1,2,3,5	EA	1
					HEATER, INSTALLATION C/O THE FOLLOWING			
		4210-270-4512			EXTINGUISHER, FIRE CARBON DIOXIDE: (5 lb.) (This item is nonexpendable)	2,3,5	EA	1
		5340-682-1508	CD-2414-3-2	13175	PADLOCK	2,3,5	EA	1

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-51, Operator requirements for AN/GRC-46 and AN/VRC-29.

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HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *3 April 1969*

Operator's Manual
RADIO TELETYPEWRITER SETS AN/GRC-46, AN/GRC-46A, AN/GRC-46B, AN/GRC-46C, AND AN/VRC-29

TM 11-5815-204-10, 14 September 1960, is changed as follows:

Note. The parenthetical reference to a previous change (example: page 6 of C 1) indicates that pertinent material was published in that change.

Change the title of the manual as shown above.

Page 3, paragraph 1*a*, line 3. After "AN/GRC-46B," add: AN/GRC-46C.

Last sentence. Delete the last sentence and substitute: The basic issue items list for all models is included in appendix II.

Subparagraph *b*, line 6. After "AN/GRC-46B," add: and AN/GRC-46C.

Subparagraph *c*. After subparagraph *b*, add:

c. Application of MWO 11-5815-204-35/7 to the AN/GRC-46 and the AN/GRC-46A, or application of MWO 11-5815-204-35/4 to the AN/GRC-46B, results in an AN/GRC-46C.

Paragraph 2 (as added by C 5, 27 Mar 63) Delete paragraph 2 and substitute:

2. Indexes of Publications

a. DA Pam 310-4. Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

b. DA Pam 310-7. Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

Paragraph 2.1 (as changed by C 5, 27 Mar 63) Delete paragraph 2.1 and substitute:

2.1. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Use equipment forms and records in accordance with instructions given in TM 38-750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Report of Packaging and Handling Deficiencies) as prescribed in AR 700-58 (Army), NAVSUP Pub 378 (Navy), AFR 71-4 (Air Force), and MCO P4030-29 (Marine Corps).

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38 (Army), NAVSUP Pub 459 (Navy), AFM 75-34 (Air Force), and MCO P4610.19 (Marine Corps).

d. Reporting of Equipment Publication Improvements. The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to Commanding General, U.S. Army Electronics Command, ATTN: AMSEL-ME-NMP-AD, Fort Monmouth, N.J., 07703.

Paragraph 3*a* (page 1 of C 1), last sentence. After "AN/GRC-46B," add: AN/GRC-46C.

Page 4, paragraph 5 (page 3 of C 1). Delete paragraph 5 and substitute:

5. Components

Components of the AN/GRC-46(*) are listed in appendix II. Running spares are illustrated in figure 2.

Page 7, paragraph 7 (page 5 of C 1). Make the following changes:

Subparagraph *a*, fourth sentence. Delete

*This change supersedes C 5, 27 March 1963, and C 7, 27 August 1963.

"KWB-9/TSEC."

Subparagraph *a*.1, lines 5 and 9. Delete "KWB-9/TSEC."

Page 10, paragraph 13 (page 5 of C 1). Delete the second sentence.

Page 11. Make the following changes:

Paragraph 14.1 (page 6 of C 1). After the last sentence, add: The J-1195/GRC-46 is not used in the AN/GRC-46C and the AN/VRC-29.

Paragraph 14.2 (page 6 of C 1). Add paragraphs 14.3, 14.4, and 14.5 and figures 3.1, 3.2, and 3.3 after paragraph 14.2:

14.3 Interconnecting Box J-2491/GRC (fig. 3.1)

The J-2491/GRC is a modified J-668/GR (para 14) used in the AN/GRC-46C. Application of MWO 11-5815-204-35/4 or MWO 11-5815-204-35/7 to the J-668/GR permits it to perform its function with the security equipment in the AN/GRC-46C. The SYNC INPUT jack on the right side is now lettered TTY SIGNAL LINE. The modified left side is shown in figure 3.1.

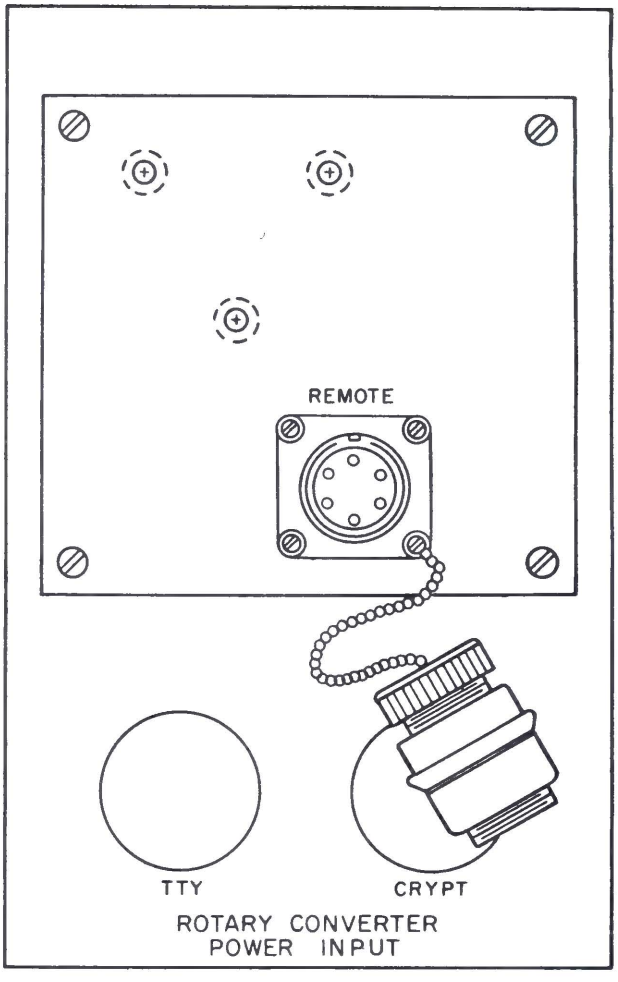


Figure 3.1. Interconnecting Box J-2491/GRC, left side.

14.4. Interconnecting Box J-2498/GRC (fig. 3.2)

The J-2498/GRC is used in the AN/GRC-46C. It completes power and signal circuits when the security equipment is removed, and is mounted and connected in place of the security equipment to permit operation in the clear.

14.5. Switch, Electronic SA-1243/GRC (fig. 3.3)

The SA-1243/GRC is used in the AN/GRC-46C. It is a two-position toggle switch contained in an aluminum housing that is mounted on top of the housing for the SEND-REC-MARK HOLD switch.

Paragraph 15. After the last sentence, add: In the AN/GRC-46C, a box that contains two additional ac outlet receptacles is mounted on top of the filter box, above the existing receptacles.

Paragraph 16 (as apded by C 7, 27 Aug 63). At the end of the paragraph, add: The door locks on these shelters have been modified by MWO 11-5815-224-35/2 to permit locking the door from the inside of thd shelter. The door locks on the shelters of some Radiotelety pewriter Sets AN/GRC-46A have been modified to permit thd door lock to be unlocked from the inside, when it has been inadvertently locked from the outside.

Page 19, paragraph 20. Add the following note after the chart:

Note. The controls and operation of thd J-2491/GRC are identical with those of the J-668/GR.

Add paragraph 21.2 after paragraph 21.1 (page 8 of C 1).

21.2. Switch, Electronic SA-1243/GRC, Operation

In the AN/GRC-46C, the SA-1243/GRC is mounted on the case for the SEND-REC-MARK HOLD switch. Set the two-position toggle switch at the position that corresponds

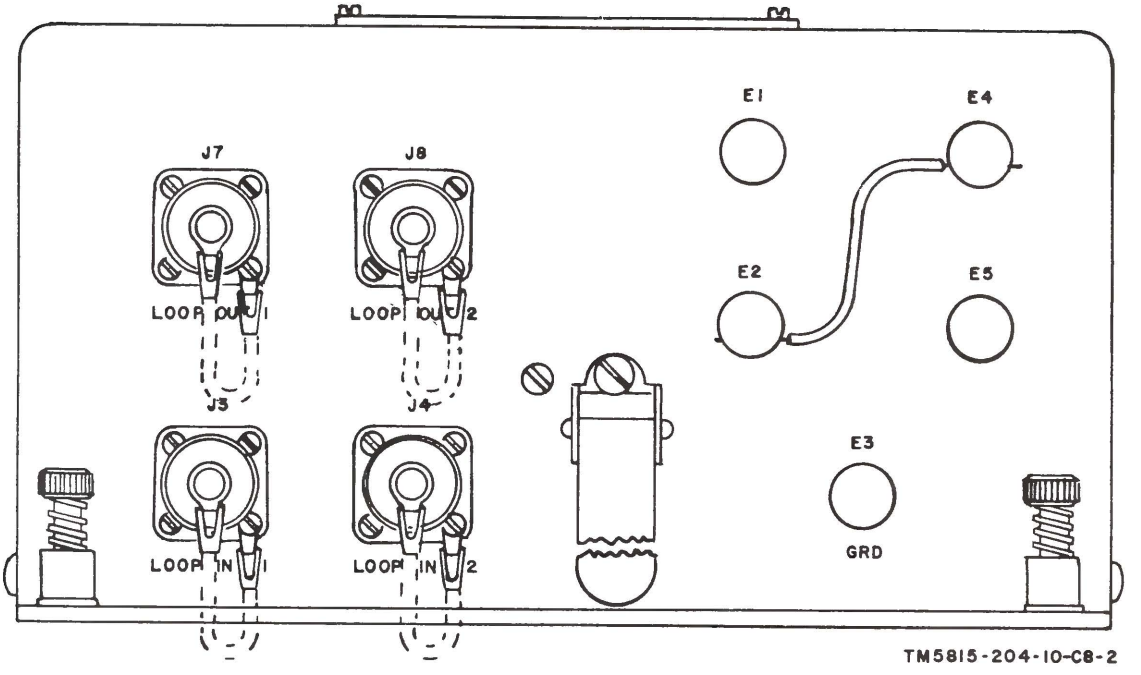


Figure 3.2. Interconnecting Box J-2498/GRC.

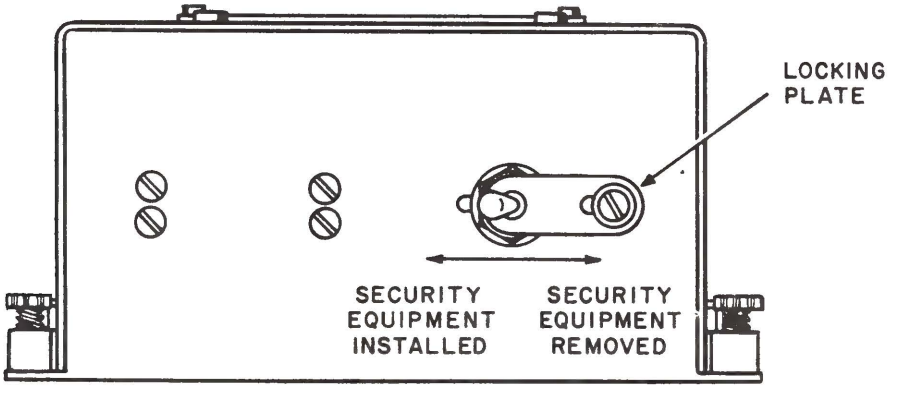


Figure 3.3. Switch, Electronic SA-1243/GRC.

to the type of the installation; with or without security equipment. When the switch is placed in the SECURITY EQUIPMENT INSTALLED position, be sure that the locking plate is in place and that the screw in the plate is tight.

Page 24, Paragraph 27 (page 9 of C 1), heading. Add the following cautions after the heading:

Cautions:

1. Do not apply external power to the loop circuits of the security equipment in the AN/GRC-46C.

2. In the AN/GRC-46C, do not set the AN/UGC-4 DC POWER switch to ON.

Page 26, paragraph 29*b* (page 9 of C 1), heading. After the heading, add: In the AN/GRC-46C, the AN/UGC-4 has no transmitting capability. If the TT-76(*) becomes inoperative, and it is necessary to continue transmitting, remove the cables from terminals 1 and 2 on the TT-76(*) and connect them to terminals 2 and 5 on the AN/UGC-4.

Page 29, paragraphs 32 through 34.3 (as changed by C 5, 27 Mar 63). Delete paragraphs 32 through 34.3 and substitute:

32. Scope of Maintenance

The maintenance duties assigned to the operator of the AN/GRC-46, AN/GRC-46A, AN/

GRC-46B, AN/GRC-46C, and AN/VRC-29 are listed in *a* through *d* below, together with references to paragraphs covering the specific maintenance function. The duties assigned do not require tools or test equipment other than those issued with the equipment.

a. Daily preventive maintenance checks and services chart (para 34.1).

b. Weekly preventive maintenance checks and services chart (para 34.2).

c. Cleaning (para 34.3).

d. Repairs and adjustments.

(1) Replacement of the paper and ribbons in the teletypewriter (TM 11-2225).

(2) Emptying chad container (TM 11-2225).

(3) Operator's maintenance for the page printer, reperforator-transmitter, receiver, and transmitter is given in the applicable technical manual (app I).

(4) Replacement of fuses and lamps.

33. Preventive Maintenance

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, reduce downtime, and assure that the equipment is serviceable.

a. Systematic Care. The procedures given in paragraphs 32, 33, and 34 cover systematic care essential to proper upkeep and operation of the equipment when it is used daily. If the equipment is not used daily, the cleaning operations (para 34.3) must be performed before operation, after any estended shutdown, or once a week while the equipment is kept in standby condition. The other items must be checked before the equipment is placed in operation or after it is turned off, as specified in the applicable paragraph.

b. Preventive Maintenance Checks and Services Charts. The preventive maintenance checks and services charts (para 34.1 and 34.2) outline inspections to be made at a specific interval to determine combat serviceability; that is, to determine that the equipment is in good general (physical) condition, in good operating condition, and likely to remain combat serviceable. To assist operators in determining and maintaining combat serviceability, the charts indicate what to inspect, how to inspect, and what the normal conditions are; the *References* column lists the paragraphs that contain additional information. If the defect cannot be remedied by the operator, higher category maintenance or repair is required. Records and reports of these inspections must be made in accordance with instructions given in TM 38-750.

34. Preventive Maintenance Checks and Services Periods

Maintenance checks and services of the equipment are required daily and weekly. Paragraphs 34.1 and 34.2 specify the items to be inspected and serviced. In addition to the routine daily services and inspection, the equipment should be checked and serviced immediately before going on a mission and as soon after completion of the mission as possible.

34.1. Daily Preventive Maintenance Checks and Services Chart

Sequence No.	Item to be inspected	Procedure	References
1	Completeness	Check to see that equipment is complete	App II.
2	Cleanliness	Inspect cases, racks, mounts, microphone, headsets, and panels for dust, dirt, moisture, and grease.	Para 34.3.
3	Hardware	Check for broken, missing, or loose catches, latches, handles, and hinges; all items should be properly secured.	
4	Cords and cables	Check external cords and cables for cuts, cracked or gouged jackets, fraying, and kinks.	
5	Plugs and receptacles	Check external items for breakage and seating.	
6	Knobs, dials, and switches	Check for proper mechanical action by setting each control to each of its possible settings. Action should be positive without backlash, binding, or scraping.	
7	Antenna system	Check antenna, mast base, and bracket for evidence of damage. Mast bracket should be firmly attached to shelter and mast base properly mounted.	
8	Operational check		Para 35.

34.2. Weekly Preventive Maintenance Checks and Services Chart

Sequence No.	Item to be inspected	Procedure	References
1	Preservation	Check painted surfaces. They must be free of bare spots, rust, and corrosion.	
2	Cases, racks, and mounts	Check to see that items are properly mounted and secure.	
3	Accessible items	Inspect switches, knobs, jacks, motors, and blowers for looseness. Items should be securely mounted.	
4	Air filters	Air filters should be clean and properly fitted in air vents.	
5	Shelter	Inspect for weatherproofing. Door seals and shelter glands should be free of cracks or cuts.	

34.3. Cleaning

The interior surfaces of the radio set should be free of dust, dirt, and fungus.

a. Remove dust and loose dirt with a clean, soft cloth.

***Warning:* Prolonged breathing of cleaning compound is dangerous; make sure adequate ventilation is provided. Cleaning compound is flammable; do not use near a flame. Avoid contact with the skin; wash off any that spills on the hands.**

b. Remove grease, fungus, and ground-in dirt from the cases; use a cloth dampened (not wet) with the cleaning compound (Federal stock No. 7930-395-9542).

***Caution:* Do not press on the glass meter faces when cleaning; the meter may become damaged.**

c. Clean the control panels and control knobs; use a soft cloth. If dirt is difficult to remove, dampen the cloth with water; mild soap may be used to make the cleaning more effective.

Page 30 (as deleted by C 5, 27 Mar 63). Delete figure 15.

Page 41, appendix I (as changed by C 7, 27 Aug 63) Delete and substitute:

APPENDIX I
REFERENCE

Following is a list of applicable references that are available to the operator of Radio Teletypewriter Sets AN/GRC-46(*) and AN/VRC-29:

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.
DA Pam 310-7	U.S. Army Equipment Index of Modification Work Orders.
TB 746-10	Field Instructions for Painting and Preserving Electronics Command Equipment.
TM 9-213	Painting Instructions for Field Use.
TM 11-806	Radio Transmitters T-195/GRC-19, T-195A/GRC-19, and T-195B/GRC-19.
TM 11-5410-201-12P	Operator and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart: Shelter, Electrical Equipment S-89C/G.
TM 11-5410-205-12P	Operator and Organizational Maintenance Repair Parts and Special Tools List: Shelters, Electrical Equipment S-144/G, S-144A/G, S-144B/G, and S-144C/G.
TM 11-5805-210-10	Operator's Manual: Frequency Shift Converter CV-278/GR.
TM 11-5805-295-12P	Operator and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart: Mountings MT-791/U and MT-791A/U.
TM 11-5815-200-12	Organizational Maintenance Manual Including Repair Parts and Special Tools List: Teletypewriter Sets AN/FGC-20, AN/FGC-20X, AN/FGC-21, AN/FGC-64, AN/FGC-66, AN/FGC-67, AN/FGC-67X, AN/UGC-4, AN/UGC-29, AN/UGC-29X, and Teleprinter TT-259/FG.
TM 11-5815-238-12	Organizational Maintenance Manual Including Repair Parts and Special Tools List: Teletypewriter Sets AN/GGC-3 and AN/GGC-3A and Teletypewriter Reperforator-Transmitters TT-76/GGC, TT-76A/GGC, TT-76B/GGC, and TT-76C/GGC.
TM 11-5820-205-10	Operator's Manual: Radio Transmitter Modulator MD-203/GR.
TM 11-5820-295-10	Operator's Manual: Radio Set AN/GRC-19.
TM 11-5820-334-10	Operator's Manual: Radio Receiver R-392/URR.
TM 11-5820-335-10	Operator's Manual: Transmitters, Radio T-195/GRC-19, T-195A/GRC-19, and T-195B/GRC-19.
TM 11-5820-401-10	Operator's Manual: Radio Sets AN/VRC-12 and AN/VRC-43, -44, -45, -46, -47, -48, and - 49.

TM 11-5820-479-12P	Operator and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart: Mast Base MP-65, MP-65A, and MP-65B.
TM 11-5965-222-15P	Operator, Organizational, Field and Depot Maintenance Repair Parts and Special Tool Lists and Maintenance Allocation Chart: Dynamic Loudspeaker LS-166/U.
TM 11-5965-231-15P	Operator, Organizational, Field and Depot Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart: Headset, Electrical H-113/U.
TM 11-6625-261-12	Operator's and Organizational Maintenance Manual: Audio Oscillators TS-382A/U, TS-382B/U, TS-382D/U, TS-382E/U, and TS-382F/U.
TM 11-6625-384-12	Operator's and Organizational Maintenance Manual: Maintenance Kit, Electronic Equipment MK-427/ARC.
TM 38-750	Army Equipment Record Procedures.

Page 42. Delete appendix II (as changed by C 7, 27 Aug 63) and substitute:

APPENDIX II
BASIC ISSUE ITEMS LIST
Section I INTRODUCTION

1. Scope

This appendix lists items comprising an operable equipment and those required for installation, operation, or operator's maintenance for Radio Teletypewriter Sets AN/GRC-46, AN/GRC-46A, AN/GRC-46B, AN/GRC-46C, and AN/VRC-29.

2. Explanation of Columns

The following is a list of explanations of columns in section II.

a. Source, Maintenance, and Recoverability Codes (SMR) Column.

(1) *Source code (S).* The selection status and source for the listed item is the first code indicated in this column. The source code used and its explanation is:

Code	*Explanation*
P	Applies to repair parts that are stocked in or supplied from GSA/DSA, or Army supply system, and authorized for use at indicated maintenance categories.

(2) *Maintenance code (M).* The lowest category of maintenance authorized to install the item is indicated by the second code in the column. The maintenance category code and its explanation is:

Code	*Explanation*
C	Operator/crew

(3) *Recoverability code (R).* The recoverability code is the third code in the column. It indicates whether unserviceable items should be returned for recovery or salvage. Recoverability code and its explanation is as follows:

Note. When no code is indicated in the recoverability column, the part will be considered expendable.

Code	*Explanation*
R	Applies to repair parts and assemblies that are economically repairable at DSU and GSU activities and are normally furnished by supply on an exchange basis.

b. Federal Stock Number Column. This column indicates the Federal stock number for the item.

c. Description Column. This column includes the Federal item name and any additional description of the item which may be required. A part number or other reference number is followed by the applicable five-digit Federal Supply Code for Manufacturers. When required to indicate that the part is used on the models, or serially numbered groups so identified, the numbers 1, 2, 3, 4, etc. are placed under the heading *Usable on Code.* An explanation of the codes used precedes the first item in section II of the basic issue items list.

d. Unit of Measure Column. The unit used

as a basis of measure (e.g., ea, pr, ft, yd, etc.) is given in this column.

e. Quantity Incorporated in Unit Column. The total quantity of the item used in the equipment is given in this column.

f. Quantity Furnished With Equipment Column. This column lists the quantity of the item supplied for initial operation of the equipment and/or the quantities authorized to be kept on hand by the operator for maintenance of the equipment.

g. Illustrations Column.

(1) *Figure number (a).* The number of the illustration in which the item is shown is indicated in this column.

(2) *Item No. or reference designation (b).* The reference designation and/or item number callout used to reference the item in the illustration appears in this column.

3. Federal Supply Codes

This paragraph lists the Federal supply code and the associated manufacturer's name.

Code	*Manufacturer*
24446	General Electric Co
36922	Longines-Wittnauer Watch Co Inc
74545	Hubbell Harvey Inc
76854	Oak Mfg Co
78385	South Wind Div of Stewart Warner Corp
80063	Army Electronics Command
81348	Federal Specifications
81349	Military Specifications
96906	Military Standards
98738	Stewart-Warner Electronics Division of Stewart-Warner Corp

SECTION II. BASIC ISSUE ITEMS

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION Reference Number & Mfr Code	USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) QTY FURN WITH EQUIP	(7) ILLUSTRATIONS (a) FIG. NO.	(b) ITEM NO. OR REFERENCE DESIGNATION
	5815-543-1760	RADIOTELETYPEWRITER SET AN/GRC-46; AN/GRC-46A; AN/GRC-46B: (This item is nonexpendable)					1	
	5815-082-4205	RADIO TELETYPEWRITER SET AN/GRC-46C: (This item is nonexpendable)						
	5815-543-1758	RADIO TELETYPEWRITER SET AN/VRC-29: (This item is nonexpendable)						
		NOTE: Usable on Code 1 refers to AN/GRC-46; 2 refers to AN/GRC-46A; 3 refers to AN/GRC-46B; 4 refers to AN/VRC-29; 5 refers to AN/GRC-46C.						
		TECHNICAL MANUAL TM 11-5815-204-10:	1,2,3,4,5	ea	1	1		
		A quantity of one technical manual is packed with each equipment. Where a valid need exists, additional copies may be requisitioned and kept on hand.						
P-C	5935-666-1649	ADAPTER, CONNECTOR UG-306A/U	1,2	ea	3	3		CP201, CP202, CP203
P-C	5935-847-2600	ADAPTER, CONNECTOR UG-306B/U	3,5	ea	3	3		CP201, CP202, CP203
--C-R	5820-633-0344	ANTENNA MOUNTING ASSEMBLY: SC-C-11436 & 114370; 80063	1,2,3,5	ea	1	1		
--C-R	5820-698-6202	ANTENNA MOUNTING ASSEMBLY: 01X204964; 98738	2,3,5	ea	1	1		
--C	5306-543-5898	BOLT, HOOK: SM-B-114538; 80063	1,2,3,5	ea	1	1		MP2
--C	6645-633-3597	BRACKET: SM-B-114537; 80063	1,2,3,5	ea	1	1		MP1
--C	5815-706-3051	BRACKET ASSEMBLY: (Left hand) SM-B-114266; 80063	4	ea	1	1		MP16
--C	5815-706-3052	BRACKET ASSEMBLY: (Right hand) 07X202629; 98738	4	ea	1	1		MP15
--C	5815-706-3053	BRACKET: 07P200478; 98738	4	ea	2	2		MP17, MP18
--C-R	7110-082-6109	CABINET, FILING SECURITY: AAF-358C (This item is nonexpendable)	3,5 ,5	ea	1	1		
--C-R	5995-577-8058	CABLE ASSEMBLY, POWER, ELECTRICAL CX-4539/U: (5 ft. 0 in.) SM-C-114229; 80063	1,2,3,5	ea	1	1	8	W250
--C-R	5995-617-1868	CABLE ASSEMBLY, POWER, ELECTRICAL CX-4540/U: (3 ft. 2 in.) SM-C-114244; 80063	1,2,3,5	ea	1	1	8	W209
--C-R	5995-617-0312	CABLE ASSEMBLY, POWER, ELECTRICAL CX-4540/U: (4 ft. 9 in.) SM-C-114259; 80063	1,2,3,5	ea	1	1	8	W213
P-C	5995-681-8589	CABLE ASSEMBLY, POWER, ELECTRICAL CX-4847/U: (1 ft. 10 in.)	4	ea	2	2	8	W209, W213
--C-R	5995-823-3106	CABLE ASSEMBLY, POWER, ELECTRICAL CX-4541/U: (6 ft. 11 in.) SM-C-114235; 80063	1,2,3,5	ea	2	2	8	W221, W223
--C-R	5995-889-0899	CABLE ASSEMBLY, POWER, ELECTRICAL CX-4541/U: (3 ft. 1 in.)	4	ea	2	2	8	W221, W223
--C-R	5995-617-1869	CABLE ASSEMBLY, POWER, ELECTRICAL CX-4542/U: (8 ft. 11 in.)	1,2,3,5	ea	1	1	8	W229
--C-R	5995-752-2492	CABLE ASSEMBLY, POWER, ELECTRICAL CX-4551/U: (10 ft. 6 in.)	4	ea	1	1		W237
--C-R	5995-681-8584	CABLE ASSEMBLY, POWER, ELECTRICAL CX-4849/U: (6 ft. 3 in.)	4	ea	1	1		W229
--C-R	5995-752-2193	CABLE ASSEMBLY, POWER, ELECTRICAL CX-6292/U: (12 ft. 11 in.)	3,5	ea	1	1		W231
--C-R	5995-617-0313	CABLE ASSEMBLY, POWER, ELECTRICAL CX-4545/U: (6 ft. 5 in.) SM-C-114245; 80063	1,2,3,5	ea	1	1	8	W247
--C-R	5995-681-8585	CABLE ASSEMBLY, POWER, ELECTRICAL CX-4850/U: (6 ft. 5 in.)	4	ea	1	1	8	W247
--C-R	5995-823-3031	CABLE ASSEMBLY, RADIO FREQUENCY CG-530E/U: (2 ft. 11 in.)	1,2,3,5	ea	2	2	8	W203, W205
--C	5995-682-3319	CABLE ASSEMBLY, RADIO FREQUENCY CG-530B/U: (1 ft. 5 in.)	4	ea	2	2	8	W203, W205
--C-R	5995-823-2309	CABLE ASSEMBLY, RADIO FREQUENCY CG-1127/U: (2 ft. 6 in.) SC-DL-25033; 80063	1,2,3,5	ea	1	1	8	W211
--C	5995-682-3312	CABLE ASSEMBLY, RADIO FREQUENCY CG-1127/U: (1 ft. 7 in.)	4	ea	1	1	8	W211
--C-R	5995-823-3068	CABLE ASSEMBLY, RADIO FREQUENCY CG-409G/U: (4 ft. 3 in.)	1,2,3,5	ea	1	1	8	W207
--C-R	5995-617-1874	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-4546/U: (3 ft. 9 in.) SM-C-114230; 80063	1,2,3,5	ea	1	1	8	W201
--C-R	5995-617-1876	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-4547/U: (5 ft. 6 in.) SM-C-114242; 80063	1,2,3,5	ea	1	1	8	W215

SECTION II BASIC ISSUE ITEMS (CONTINUED)

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION Reference Number & Mfr Code	USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) QTY FURN WITH EQUIP	(7) ILLUSTRATIONS (a) FIG. NO.	(7) ILLUSTRATIONS (b) ITEM NO. OR REFERENCE DESIGNATION
--C-R	5995-681-8590	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-4848/U: (3 ft. 6 in.)	4	ea	1	1		W215
--C-R	5995-682-3311	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-4551/U: (7 ft. 5 in.)	1,2	ea	1	1	8	W235
--C-R	5815-707-2321	CABLE AND SWITCH ASSEMBLY, SPECIAL PURPOSE: (4 ft. 9 in.) 30X204081; 98738 (This item is nonexpendable)	3,4,5	ea	1	1	8	W245
--C-R	5995-985-7912	CABLE, ASSEMBLY, SPECIAL PURPOSE CX-9994/U: (3 ft. 0 in.) SC-D-379945; 80063	1,2,3,5	ea	1	1		W1
--C-R	5995-937-3785	CABLE ASSEMBLY, SPECIAL PURPOSE CX-9994/U: (8 ft. 6 in.) SC-D-379946; 80063	1,2,3,5	ea	1	1		W2
--C-R	5995-937-3786	CABLE ASSEMBLY, SPECIAL PURPOSE CX-9995/U: (8 ft. 6 in.) SC-D-379947; 80063	1,2,3,5	ea	1	1		W3
--C-R	5995-985-7904	CABLE ASSEMBLY, SPECIAL PURPOSE CX-9996/U: (7 ft. 6 in.) SC-D-379948; 80063	1,2,3,5	ea	1	1		W4
--C-R	5995-985-7906	CABLE ASSEMBLY, SPECIAL PURPOSE CX-9997/U: (7 ft. 6 in.) SC-D-379949; 80063	1,2,3,5	ea	1	1		W5
--C-R	5995-985-7907	CABLE ASSEMBLY, SPECIAL PURPOSE CX-9998/U: (8 ft. 0 in.) SC-D-379950; 80063	1,2,3,5	ea	1	1		W6
--C-R	5995-985-7918	CABLE ASSEMBLY, SPECIAL PURPOSE CX-10000/U: (8 ft. 0 in.) SC-D-379951; 80063	1,2,3,5	ea	1	1		W7
--C-R	5995-985-8047	CABLE ASSEMBLY, POWER, ELECTRICAL CX-10064/U: (6 ft. 0 in.) SC-D-351064; 80063	1,2,3	ea	1	1		W9
--C-R	5995-985-8230	CABLE ASSEMBLY, SPECIAL PURPOSE CX-11078/U: (13 ft. 6 in.) SM-D-374571; 80063	5	ea	1	1		W233
--C-R	5995-985-8231	CABLE ASSEMBLY, SPECIAL PURPOSE CX-11079/U: (8 ft. 6 in.) SM-D-374570; 80063	5	ea	1	1		W261
--C	5340-619-1353	CLAMP, LOOP: (5/8 in. w.) SC-B-19491; 80063	1,2,3,5	ea	1	1	2	
--C-R	6645-663-4079	CLOCK, AIRCRAFT, MECHANICAL: (8 day) A-11-63R; 36922 (This item is nonexpendable)	1,2,3,5	ea	1	1	1	M1
--C-R	5815-543-1728	CONVERTER, FREQUENCY SHIFT CV-278/GR: (This item is nonexpendable)	1,2,3,4,5	ea	1	1	1	
--C-R	5995-617-1875	CORD ASSEMBLY, ELECTRICAL CX-4549/U: (4 ft. 5 in.)	3	ea	1	1		W219
--C-R	5995-682-3309	CORD ASSEMBLY, ELECTRICAL CX-4549/U: (3 ft. 3 in.)	4	ea	1	1		W219
--C-R	4140-624-4476	FAN, VENTILATING, PROPELLER: 01X202758; 98738 (This item is nonexpendable)	1,2,3,5	ea	1	1		
--C		FIXTURE, LIGHTING: SM-B-114346; 80063	1,2,3,5	ea	1	1		MP15
--C	6210-633-6731	FIXTURE, LIGHTING: SM-B-114349; 80063	1,2,3,5	ea	1	1		MP16
--C-R	4520-649-8915	HEATER, SPACE MULTI-FUEL: (15,000 BTU) M52204; 81349	1,2,3,5	ea	1	1		
--C	5970-240-3845	INSULATOR, BUSHING: Sig insulator IN-111	1,2,3,5	ea	1	1	7	
--C	5970-405-8971	INSULATOR, STRAIN: 1123264/20; 81349	1,2,3,5	ea	8	8		
--C-R	5815-615-9854	INTERCONNECTING BOX J-668/GR: SC-DL-113906; 80063 (This item is nonexpendable)	4	ea	1	1	3, 4	
--C-R	5815-082-3925	INTERCONNECTING BOX J-2491/GR: SM-D-374508; 80063 (This item is nonexpendable)	1,2,3,5	ea	1	1	3.1	
--C-R	5815-816-0266	INTERCONNECTING BOX J-1194/GRC: (This item is nonexpendable)	3,5	ea	1	1		
--C-R	5815-816-0265	INTERCONNECTING BOX J-1195/GRC: (This item is nonexpendable)	5	ea	1	1		
--C-R	5815-082-3924	INTERCONNECTING BOX J-2498/GRC: SC-DL-379895; 80063 (This item is nonexpendable)	1,2,3	ea	1	1	3.2	
--C-R	5815-912-4745	INTERCONNECTING BOX: SWITCH, ELECTRONIC, SA-1243/GRC SC-D-379916; 80063 (This item is nonexpendable)	1,2,3,5	ea	1	1	3.3	
P-C	6240-238-8515	LAMP, INCANDESCENT: 25A30; 24446	1,2,3,5	ea	2	2		
--C-R	5965-243-6420	LOUDSPEAKER L8-166/U: (This item is nonexpendable)	1,2,3,4,5	ea	1	1	1	
--C-R	5820-543-1672	MODULATOR, RADIO TRANSMITTER MD-203/GR: (This item is nonexpendable)	1,2,3,4,5	ea	1	1		

SECTION II. BASIC ISSUE ITEMS (CONTINUED)

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION Reference Number & Mfr Code	USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) QTY FURN WITH EQUIP	(7) ILLUSTRATIONS (a) FIG. NO.	(7) ILLUSTRATIONS (b) ITEM NO. OR REFERENCE DESIGNATION
--C-R	6125-617-1435	MOTOR-GENERATOR: SM-D-114304 (Wincharger); 80063 (This item is nonexpendable).	1,2,3,4,5	ea	2	2	1, 5	
--C-R	5805-186-9464	MOUNTING MT-791/U; MT-791A/U: (This item is nonexpendable)	1,2,3,4,5	ea	2	2	1	
--C	5815-702-6539	PLATE, INSTRUCTION: 63P204968; 98738	4	ea	1	1		MP19
--C-R	5815-912-5157	POWER SUPPLY PP-978/FG; SC-DL-148306B; 80063 (This item is nonexpendable)	1,2,3,5	ea	1	1		
--C-R	5820-030-0155	RADIO SET AN/GRC-19: (This item is nonexpendable)	1,2,3,4,5	ea	1	1	1	
--C-R	5820-030-2969	REEL RL-29: (This item is nonexpendable)	1,2,3,5,	ea	1	1		
--C	6210-633-6732	REFLECTOR LIGHT: 5429P; 74545	1,2,3,5	ea	2	2		MP17, MP18
--C-R	5815-503-2760	REPERFORATOR-TRANSMITTER TT-76/GGC: (This item is nonexpendable)	1,2,3,4,5	ea	1	1	1	
--C	5975-020-8827	ROD, GROUND: SC-DL-75591; 80063	1,2,3,5	ea	1	1	6	
--C-R	5410-614-4668	SEAT, INDIVIDUAL: 01X200454-2 (right); 98738 (This item is nonexpendable)	1,2,3,5	ea	1	1	1	
--C-R	5410-633-3603	SEAT, INDIVIDUAL: SM-C-114302 (rear); 80063 (This item is nonexpendable)	1,2,3,5	ea	1	1	1	
--C-R	5410-542-5868	SHELTER, ELECTRICAL EQUIPMENT S-89C/G: (This item is nonexpendable)	1	ea	1	1	7	
--C-R	5410-542-2532	SHELTER, ELECTRICAL EQUIPMENT S-144/G: 01P204925; 98738 (This item is nonexpendable)	2	ea	1	1	9	
--C-R	5410-752-9514	SHELTER, ELECTRICAL EQUIPMENT S-144/G: SC-DL-37725; 80063 (This item is nonexpendable)	3,5	ea	1	1		
--C-R	5815-557-5970	TELETYPEWRITER SET AN/UGC-4: (This item is nonexpendable)	1,2,3,4,5	ea	1	1	1	
--C-R	6660-633-3596	VENTILATOR KIT: 01X202756; 98738	1,2,3,5	ea	1	1		
--C	6145-617-0352	WIRE, ELECTRICAL: type C Class B (bare 16 AWG); 81349 (Note: To be requisitioned as required in minimum of 250 ft.)	1,2,3,5	ft	250	250		W1
--C	5410-542-5887	WIRE ROPE ASSEMBLY, SINGLE LEG: 55X200417 (10 ft. lg.); 98738	1,2,3,5	ea	4	4		A7, A21, A22, A23
		HEATER, INSTALLATION C/O THE FOLLOWING						
--C	2590-473-6331	BRACKET: (gas can 5 gallon)	1,2,3,5	ea	1	1		
--C	7240-222-3088	CAN, GAS: (5 gallon)	1,2,3,5	ea	1	1		
--C	6115-679-9153	ELECTRODE IGNITER: 700808; 78385	1,2,3,5	ea	1	1	2	
--C-R	4210-270-4512	EXTINGUISHER, FIRE CARBON DIOXIDE: (5 lb.) (This item is nonexpendable)	2,3,5	ea	1	1		
--C	5920-284-6795	FUSE, CARTRIDGE: FO4A10R0B; 96906	1,2,3,5	ea	1	5	2	
--C	4720-678-2262	HOSE ASSEMBLY, METAL: SM-B-114330; 80063	1,2,3,5	ea	1	1		
--C	5340-682-1508	PADLOCK: CD-2414-3-2; 13175	2,3,5	ea	1	1		
--C	5430-678-0737	TANK, FUEL: SM-C-114305 (1-1/2 gal.); 80063	1,2,3	ea	1	1	6	MP10
--C	6130-659-1556	VIBRATOR, INTERRUPTER: 94-H; 76854	1,2,3,5	ea	1	2		G1
		NO ACCESSORIES, TOOLS OR TEST EQUIPMENT ARE TO BE ISSUED WITH THIS EQUIPMENT						
		NO BASIC ISSUE ITEMS ARE MOUNTED IN OR ON THIS EQUIPMENT						

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

Distribution:

To be distributed in accordance with DA Form 12-51, Operator requirements for AN/GRC-46 and AN/VRC-29 radio sets.

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TECHNICAL MANUAL

Operator's Manual

RADIO TELETYPEWRITER SETS AN/GRC-46, AN/GRC-46A, AN/GRC-46B, AND AN/VRC-29

TM 11-5815-204-10
CHANGES No. 3

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *7 May 1962*

TM 11-5815-204-10, 14 September 1960, is changed as follows:

Page 38, after paragraph 37, add:

37.1. Alternate Method for Remote Operation

The RTT sets may be operated from a remote site by using Radio Set Control Group OA-1754/GRC (fig. 16) and Control Group AN/GRA-6 (TM 11-5038). Maximum distance from the RTT set is 2 miles. Cw or fsk operation at the remote site is possible.

a. Cw Mode (fig. 17).

(1) Plug the RE-479/GRC (receptacle J101) into the T-195/GRC-19 AUDIO receptacle.

(2) Remove FUSE 15 AMP 24 VOLT fuse cap from the T-195/GRC-19. Substitute the modified fuse cap supplied as part of the RE-479/GRC.

(3) Insert connector P101 of the WS-16/U into the jack of the modified fuse cap.

(4) Mount the SA-708/GRC at the remote site as convenient. Use the angle bracket as required.

(5) Connect Key, Telegraph KY-116/U to receptacle J1 on the SA-708/GRC through a cable assembly such as CX-1852/U.

(6) Connect an appropriate two-conductor line, not exceeding 2 miles in length, between the LINE binding posts of the RE-479/GRC and the LINE binding posts of the SA-708/GRC.

(7) At the local site, place the SERVICE SELECTOR switch of the T-195/GRC-19 at CW. At the remote site, set the FSK ON switch located on the SA-708/GRC in the down (off) position. The set is then ready for operation.

b. Fsk Mode (fig. 18).

(1) Remove the jumper wire connecting terminals E2 and E5 (TTY LINE) on Interconnecting Box J-668/GR. Reconnect the jumper wire between terminals E3 and E4.

(2) Insert one end of a suitable two-conductor line such as WD-1/TT (not to exceed 2 miles in length) into J-668/GR terminals E2 and E5. At the remote site, connect the other end of the line to a teletypewriter set. Use the binding posts prescribed for two-wire operation.

(3) Connect one end of another two-conductor line (not to exceed 2 miles in length) to J-668/GR terminals E4 and E5. At the remote site, connect the other end of the line to the LINE binding posts of the SA-708/GRC.

(4) Install Control Group AN/GRA-6 between local and remote sites as required. This provides a voice and fsk monitoring capability.

(5) The RE-479/GRC is not used for remote fsk operation.

(6) The SERVICE SELECTOR switch on the T-195/GRC-19 must be at VOICE/FSK. The SEND-RECEIVE-MARK HOLD switch located on the teletypewriter shelf must be at RECEIVE. At the remote site, the FSK ON switch located on the SA-708/GRC must be in the up (on) position during teletypewriter transmission and in the down (off) position for reception.

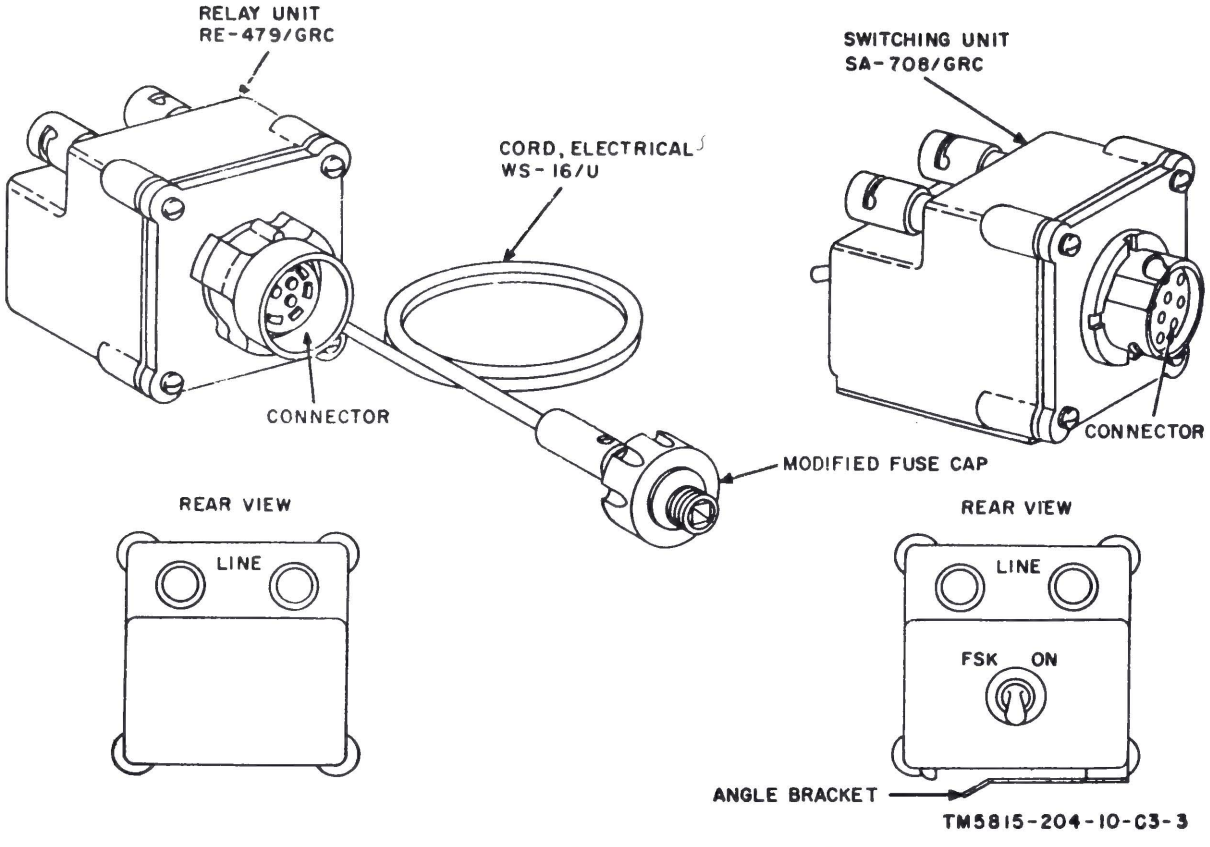


Figure 16. (Added) *Radio Set Control Group OA-1754/GRC.*

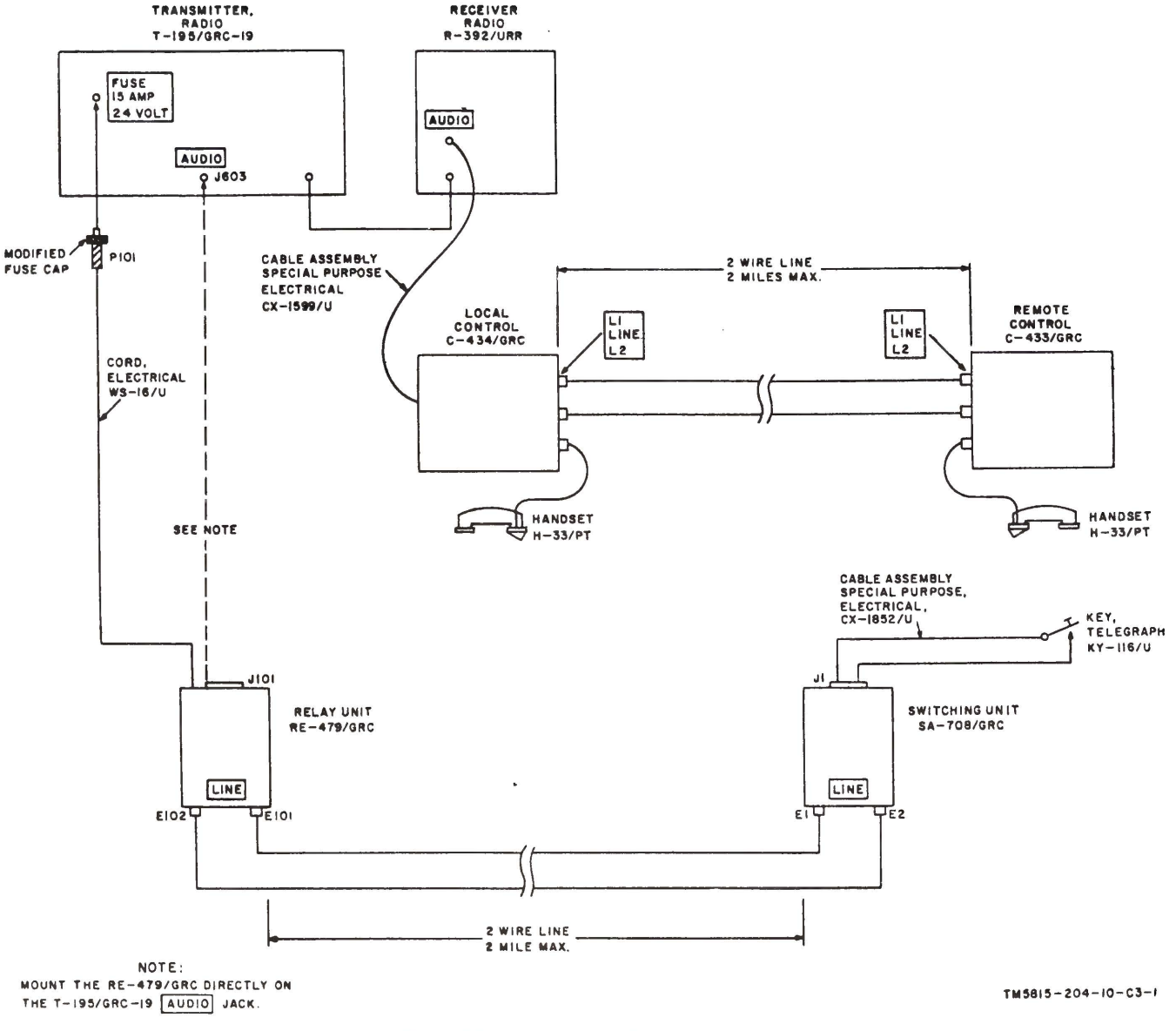


Figure 17. (Added) *Connections for remote cw operation.*

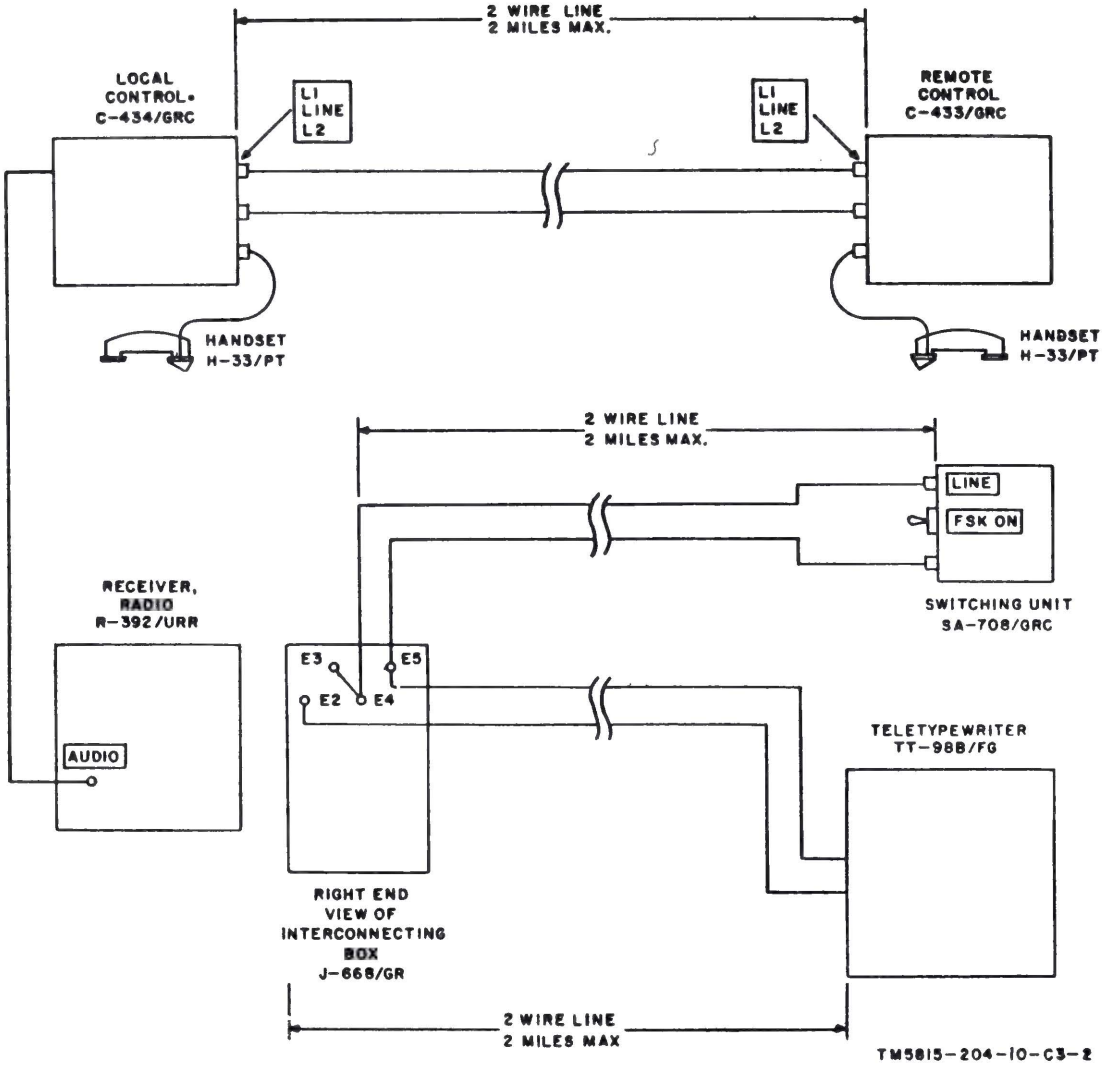


Figure 18. (Added) *Connections for remote fsk operation.*

BY ORDER OF THE SECRETARY OF THE ARMY:

G. H. DECKER,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

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Sig Dep (12)
WRAMC (1)
USA Trans Tml Comd (1)
Army Tml (1)
POE (1)
OSA (1)
1st GM Bde (2)
USAEPG (2)
AFIP (1)
AMS (1)
Army Pictorial Cen (2)
EMC (1)
Yuma Test Sta (2)
USACA (3)
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USASSAMWO (1)
USASEA (1)
USARCARIB Sig Agcy (1)
USA Sig Msl Spt Agcy (13)
Sig Fld Maint Shops (3)
USA Corps (3)
Def Log Svc Cen (1)
JBUSMC (2)
Units organized under following TOE's:

1-7 (2)
1-17 (2)
1-25 (2)
1-26 (2)
1-57 (2)
1-67 (2)
1-75 (2)
1-76 (2)
1-78 (2)
1-127 (2)
1-137 (2)
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6-500 AA (2)
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10-500 AA-AD (2)
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11-166 (2)
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11-237 (2)
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11-587 (2)
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17-65 (2)
17-66 (2)
17-77 (2)
17-85 (2)
17-86 (2)
17-115 (2)
17-116 (2)

Units organized under following TOE's—Continued

29–5 (2)
29–21 (2)
29–35 (2)
29–36 (2)
29–56 (2)
29–65 (2)
32–57 (2)
33–105 (2)
33–106 (2)
39–52 (2)
44–12 (2)
44–15 (2)
44–16 (2)
44–35 (2)
44–36 (2)
44–85 (2)
44–86 (2)
44–235 (2)
44–236 (2)
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44–436 (2)
44–437 (2)
44–445 (2)
44–446 (2)
44–447 (2)
44–448 (2)
44–500 AA–AD (2)
44–535 (2)
44–536 (2)
44–537 (2)
44–544 (2)
44–545 (2)
44–546 (2)
44–547 (2)
44–548 (2)
55–11 (2)
55–12 (2)
55–16 (2)
55–46 (2)
55–57 (2)
55–75 (2)
55–76 (2)
55–79 (2)
55–116 (2)
55 12[illegible] (2)
55–158 (2)
55–456 (2)
55–457 (2)
55–468 (2)
55–469 (2)
55–500 AA–AE (2)
57 (2)
57–5 (2)

NG: State AG (3); units—same as Active Army except allowance is one copy to each unit.
USAR: None.
For explanation of abbreviations used, see AR 320–50.

U.S. GOVERNMENT PRINTING OFFICE: 1968 - 302-018/2773
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TECHNICAL MANUAL

Operator's Manual

RADIO TELETYPEWRITER SETS
AN/GRC-46, AN/GRC-46A, AN/GRC-46B, AND AN/VRC-29

TM 11-5815-204-10
CHANGES No. 1

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *8 February 1961*

TM 11-5815-204-10, 14 September 1960, is changed as follows:

Page 2, figure 1. Delete the caption and substitute:

Radio Teletypewriter Sets AN/GRC-46 and AN/GRC-46A, interior view, major components installed.

Page 3, paragraph 1*b*. After the last sentence, add: For official nomenclature of the security equipment, see the appropriate technical manual.

Paragraph 3*a*. After the last sentence, add: Security equipment may be used with the AN/GRC-46, AN/GRC-46A, AN/GRC-46B, and AN/VRC-29.

Page 4, paragraph 4. Add after subparagraph *b*.

b.1. Interconnecting Box J-1195/GRC-46 (fig. 4.1).

Power receptacle	1.
Jacks	2 for KWB-9/TSEC signal lines. 1 for J-668/GR signal line. 3 for TT-76(*)/GGC signal lines.
Input voltage	120 volts dc.
Input signals	Teletypewriter dc impulses.
Output signals	Teletypewriter dc impulses.

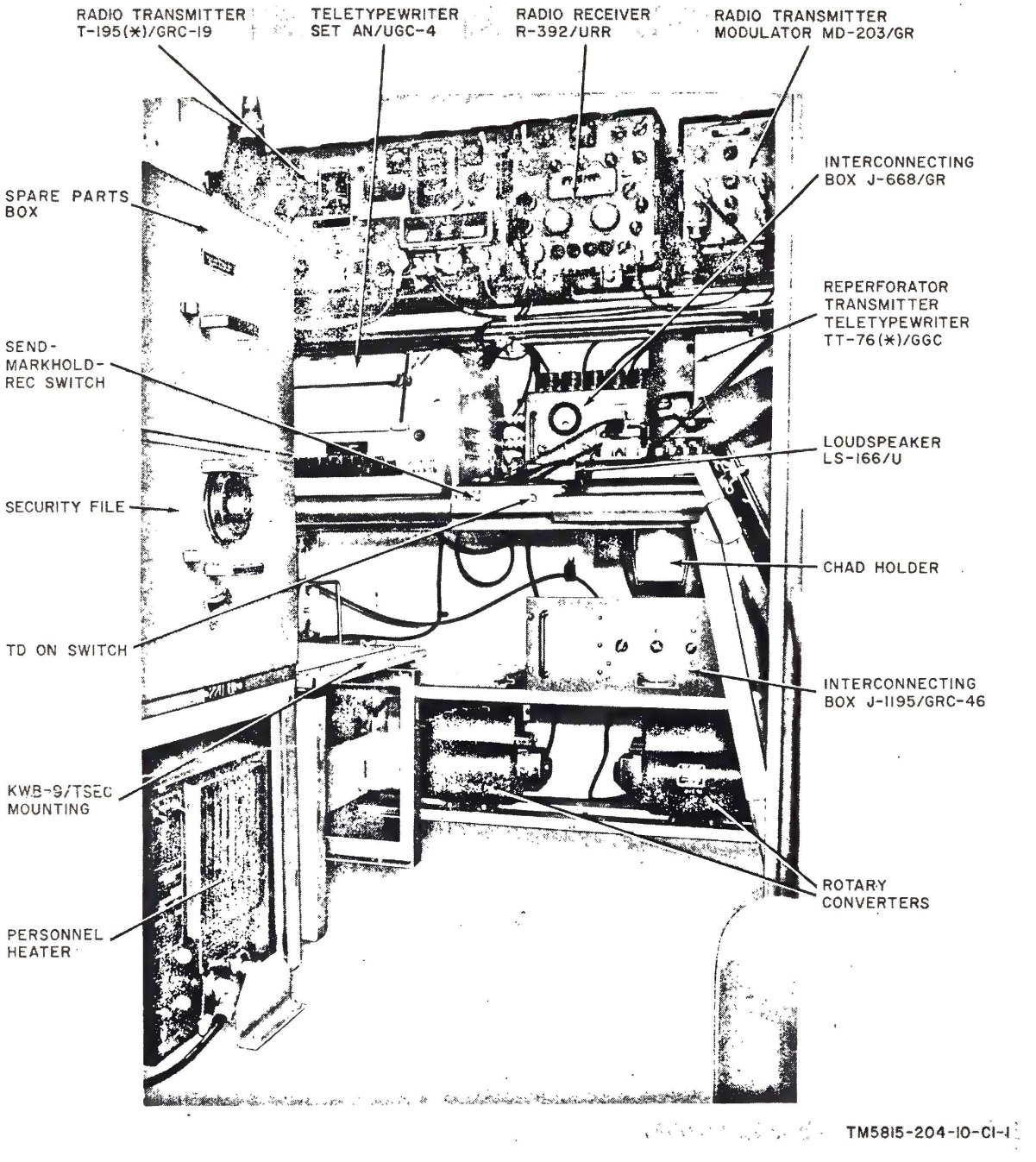


Figure 1.1. (Added) *Radio Teletypewriter Set AN/GRC–46B, interior view, major components installed.*

Paragraph 5. Delete subparagraph *a* and substitute:

a. Radio Teletypewriter Set AN/GRC–46(*) Components.

Quantity (ea)	Item	Fig. No.	Component of			Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb)
			AN/GRC–46	AN/GRC–46A	AN/GRC–46B				
1	Radio Set AN/GRC–19 (refer to TM 11–5820–295–10).	------	X	X	X				
	Consisting of:								
	1 Radio Transmitter T–195(*)/GRC–19	1							
	1 Radio Receiver R–392/URR	1							
1	Loudspeaker LS–166/U	1	X	X	X	5	5½	3½	1
1	Modulator, Radio Transmitter MD–203/GR	1	X	X	X	9¼	14¾	7½	23½
2	Mounting MT–791/U; MT–791A/U	1	X	X	X	3½	12⅞	8½	15
1	Converter, Frequency Shift CV–278/GR	1	X	X	X	9½	14¾	7½	19½
1	Interconnecting Box J–668/GR	1	X	X	X	6	7	16	12¼
1	Teletypewriter Set AN/UGC–4	1	X	X	X				
	consisting of:								
	1 Teletypewriter TT–98B/FG	------	------	------	------	11¼	20$^{9}/_{16}$	17⅛	54
	1 Power Supply PP–978/FG	------	------	------	------	4	4	9	7
1	Reperforator-Transmitter, Teletypewriter TT–76(*)/GGC.	1	X	X	X	21	18	12	45
2	Motor generator (rotary converter) (Wincharger model SS688).	1, 5	X	X	X	9	12½	6½	40
1	Cord CG–409C/U (4 ft 3 in.)	8	X	X	X	------	------	------	$^{3}/_{16}$
2	Cable Assembly, Radio Frequency CG–530B/U (2 ft 11 in.).	8	X	X	X	------	------	------	$^{3}/_{16}$
1	Cable Assembly, Radio Frequency CG–1127/U (2 ft 6 in.).	8	X	X	X	------	------	------	$^{3}/_{16}$
1	Cable Assembly, Radio Frequency CG–1127/U (1 ft)	8	X	X	X	------	------	------	¼
1	Cable Assembly, Power, Electrical CX–4539/U (4 ft 9 in.).	8	X	X	X	------	------	------	$^{3}/_{16}$
1	Cable Assembly, Power, Electrical CX–4540/U (4 ft 6 in.).	8	X	X	X	------	------	------	$^{11}/_{16}$
1	Cable Assembly, Power, Electrical CX–4540/U (3 ft 2 in.).	8	X	X	X	------	------	------	$^{11}/_{16}$
2	Cable Assembly, Power, Electrical CX–4541/U (6 ft 11 in.).	8	X	X	X	------	------	------	⅝
1	Cable Assembly, Power, Electrical CX–4542/U (8 ft 11 in.).	8	X	X	X	------	------	------	⅞
1	Cable Assembly, Power, Electrical CX–4543/U (10 ft 3 in.).	8	X	X	------	------	------	------	⅞
1	Cable Assembly, Power, Electrical CX–4544/U (12 ft 8 in.).	8	X	X	------	------	------	------	1
1	Cable Assembly, Power, Electrical CX–4545/U (6 ft 5 in.).	8	X	X	X	------	------	------	⅝
1	Cord Assembly, Electrical CX–4546/U (3 ft 9 in.).	8	X	X	X	------	------	------	⅜
1	Cable Assembly, Special Purpose, Electrical CX–4547/U (5 ft 6 in.)	8	X	X	X	------	------	------	¾
2	Cord Assembly, Electrical CX–4548/U (5 ft 11 in.)	8	X	X					
1	Cord Assembly, Electrical CX–4549/U (4 ft 5 in.)	8	X	X	X	------	------	------	$^{5}/_{16}$
2	Cord Assembly, Electrical CX–4551/U (7 ft 5 in.)	8	X	X	X	------	------	------	½
1	Cord Assembly, Electrical CX–4551/U (9 ft 3 in.)	8	X	X	------	------	------	------	½
1	Cord Assembly, Electrical CX–4551/U (8 ft 2 in.)	8	------	------	X	------	------	------	⅜

Quantity (ea)	Item	Fig. No.	Component of			Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb)
			AN/GRC-46	AN/GRC-46A	AN/GRC-46B				
1	Cord Assembly, Electrical CX-4551/U (10 ft 8 in.)	8			X				5/16
1	Cord Assembly, Electrical CX-4548/U (9 ft 7 in.)	8			X				5/16
1	Cord Assembly, Electrical CX-4549/U (6 ft 3 in.)	8			X				9/32
1	Cable Assembly, Power, Electrical CX-6292/U (12 ft 11 in.)				X				1
1	Cable Assembly, Power, Electrical CX-6293/U (13 ft 1 in.)				X				1½
1	Cable Assembly, Power, Electrical CX-6294/U (7 ft 10 in.)				X				½
1	Cable Assembly, Power, Electrical CX-6536/U (8 ft 6 in.)				X				5/16
1	Cable Assembly, Power, Electrical CX-6537/U (13 ft 9 in.)				X				⅜
1	Electrical Equipment Shelter S-89C/G	7	X			59	77½	57	625
	or								
	Electrical Equipment Shelter, Lightweight, including the following items:	6		X		59	77½	57	320
	3 seats, individual	1							23
	1 fan, ventilating, propeller								5
	2 fixtures, lighting								1 5/16
	2 lamps, incandescent								1/16
	2 reflectors, light								3/16
	1 clock, aircraft, mechanical w/mtg bracket								9/16
	1 padlock								3/16
	1 extinguisher, fire, carbon dioxide								5
1	Electrical Equipment Shelter S-144/G including the following items				X				
	1 seat, individual	1							231½
	1 seat (jump)	1							12
	1 fan, ventilating, propeller								5
	2 fixtures, lighting								5/16
	2 lamps, incandescent								1/16
	1 clock, aircraft, mechanical w/mtg bracket								9/16
	2 reflectors, light								3/16
	1 padlock								3/16
	1 extinguisher, fire, carbon dioxide								5
1	Rack, electrical equipment	1	X			27	54	26	21
1	Rack, electrical equipment (security)	1	X			2	54	26	16½
1	Rack, electrical equipment	1		X		25¼	54⅜	24¼	20
1	Rack, electrical equipment	1			X	25¼	54	24	20
1	Rack, electrical equipment (security)	1		X	X	2	54	24	16½
1	Rod, ground	6	X	X	X		46½	½	2½
2	Cording diagrams (on wall)		X	X	X				5/8
1	Reel RL-29		X	X	X				¾
3	Adapters, Connector UG-306/U		X	X	X				⅛
1	Thermostatic control (on wall)				X	5½	2	2½	7/16
1	Clamp, loop: antenna rope clamp		X	X	X				1/16
2	Technical Manuals TM 11-5815-204-10		X	X	X				
1	Set running spares (c below)		X	X	X				
1	Rack, security file				X	16	20	21½	5½
1	KWB-9/TSEC mounting	1. 1			X	16½	17¾	21½	14
1	Interconnecting Box J-1195/GRC-46	4. 1			X	7	7¼	18	4½
1	Security file w/instructions	1. 1			X	24	20	18½	220
1	Interconnecting Box J-1194/GRC-46	4. 2			X	4¼	3	6	1½

Page 6, paragraph 5*b* chart. Add after line 14:

Quantity (ea)	Item	Fig. No.	Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb)
1	Interconnecting Box J–1195/GRC–46.	4. 1	7	7¼	18	4⅛
1	Interconnecting Box J–1194/GRC–46.	4. 2	4¼	3	6	1½

Page 7, paragraph 7*a*. After the third sentence, add: In the AN/GRC–46B, the KWB–9/TSEC security equipment is mounted on a rack in the space identical with that occupied by the roadside operator's set in the AN/GRC–46 and AN/GRC–46A.

Page 9, paragraph 7, make the following changes: Add subparagraph *a*.1.

a.1. In the S–144/G, a metal file cabinet with two drawers is mounted on the rack above the heater (fig. 1.1). The lower file drawer has a combination lock and is the security file; the upper drawer is the spare parts box. The KWB–9/TSEC security equipment is mounted on a rack next to the file cabinet. The top frame of the rack is shock mounted. A plate, which is fastened to the KWB–9/TSEC security equipment, is secured to the top of the rack with four ¼-turn wing-type fasteners for quick removal.

In subparagraph *b*, line 4, change "AN/GRC–446(*)" to: AN/GRC–46(*).

Page 10, paragraph 13. After the first sentence, add: In the AN/GRC–46B, the transmitter-distributor unit of the TT–76(*)/GCC is modified for use with the KWB–9/TSEC equipment.

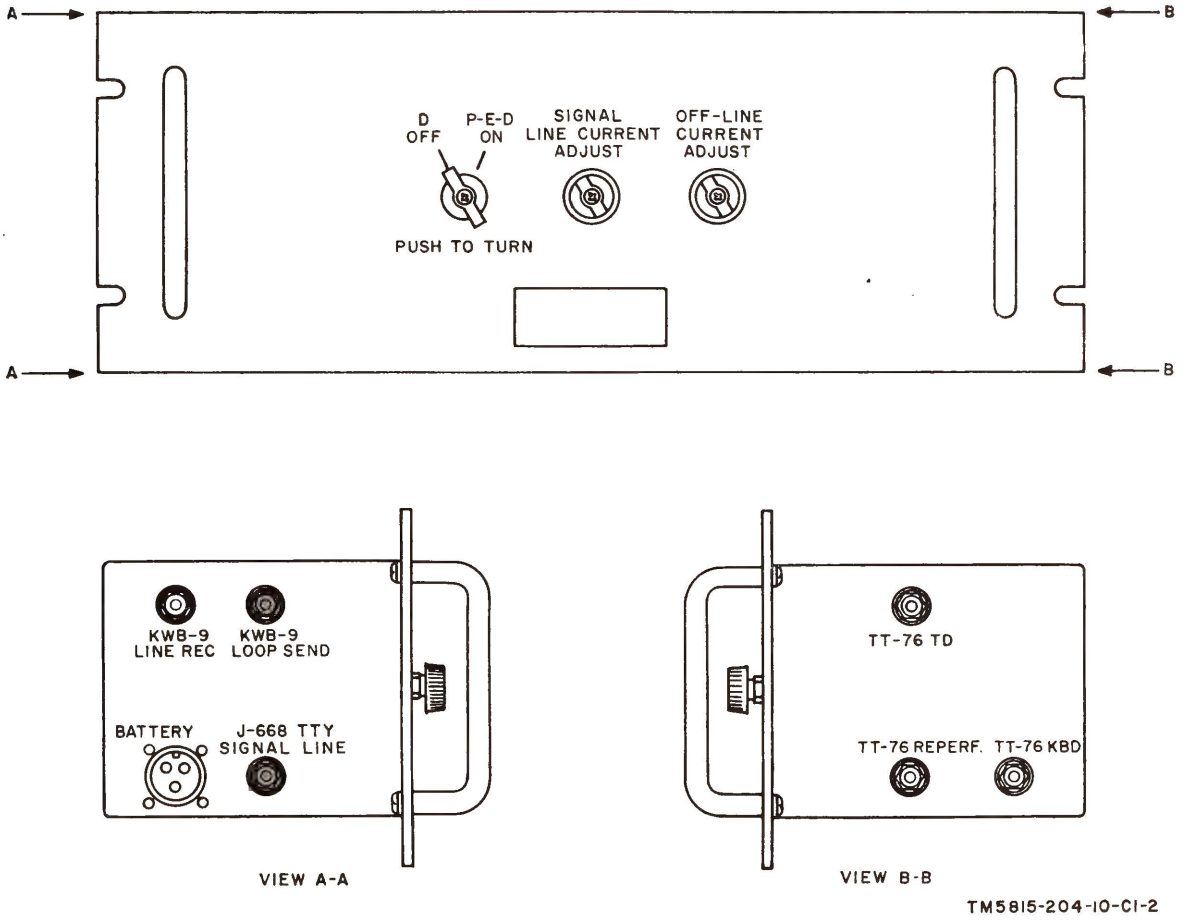


Figure 4.1. (Added) *Interconnecting Box J–1195/GRC–46, operating controls and receptacles.*

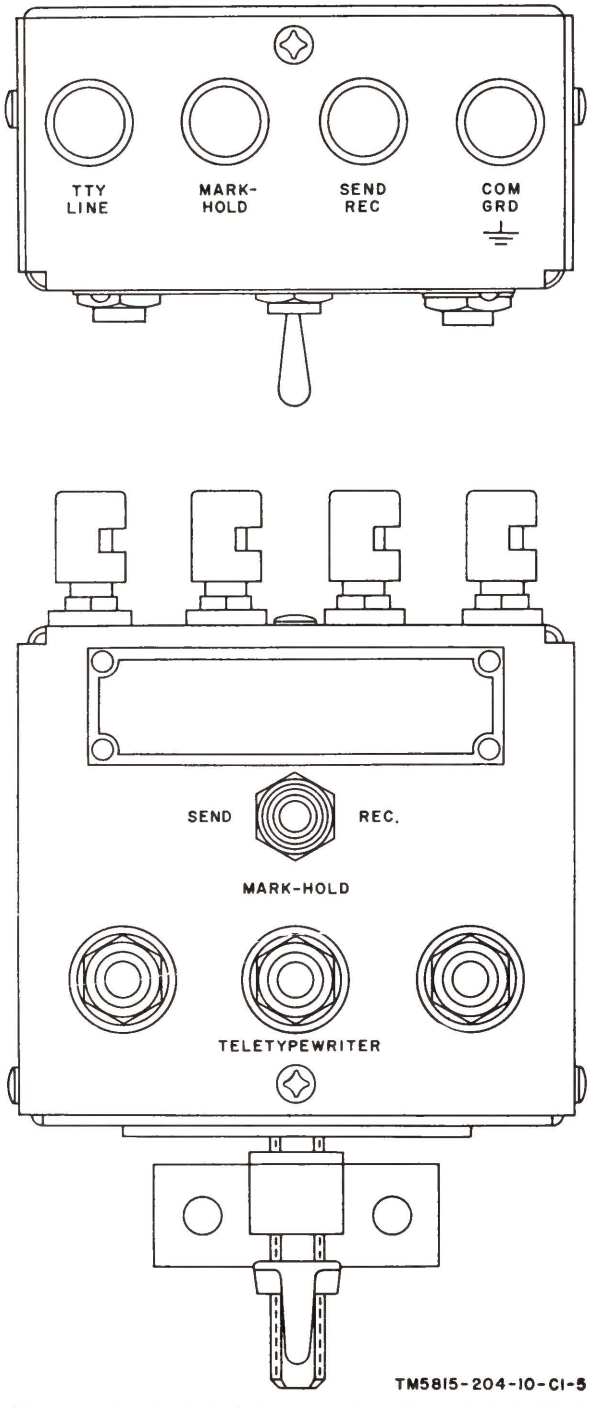


Figure 4.2. (Added) *Interconnecting Box J–1194/GRC, operating controls and receptacles.*

14.1. Interconnecting Box J–1195/GRC–46

(fig. 1.1, 4.1)

(Added)

Interconnecting Box J–1195/GRC–46 serves as interconnecting equipment for the power and signal wiring between the teletypewriters and the KWB–9/TSEC security equipment. Handles on the front panel protect the knobs and help in removal of the unit. The manual controls are mounted on the front panel. A cable receptacle and phone jacks are mounted on the sides of the chassis behind the panel.

14.2. Interconnecting Box J–1194/GRC–46

(fig. 4.2)

(Added)

Interconnecting Box J–1194/GRC–46 is used in remote operation of the AN/GRC–46B. The SEND-MARK HOLD-REC switch for the remote site is incorporated in the unit. Three phone jacks provide for plugging in the teletypewriter equipment, and four binding posts for connecting the four line wires at the remote site to the J–668/GR at the shelter.

Paragraph 16. Make the following changes: Delete the fourth and fifth sentences and substitute: The S–144/G and the lightweight shelter are constructed of aluminum sheets $\frac{1}{32}$ inch thick with styrofoam insulation. The S–89C/G shelter is constructed of aluminum sheets $\frac{3}{32}$ inch thick and ¼-inch plywood with fiberglass insulation.

After the last sentence, add: The S–144/G has a metal file case and an additional rack for mounting the security equipment.

Page 12, paragraph 17, chart. In Type column, line 1, change "CG–409/U" to: CG–409C/U.

Page 13, paragraph 17, chart. In Lengths AN/GRC–46 (*) column, line 6, change "12 ft 1 in." to: 12 ft 11 in.

Page 15, paragraph 17, chart, Type column. Make the following changes:

Add after line 1: (AN/GRC–46 and AN/GRC–46A).

Add after line 2: (AN/GRC–46 and AN/GRC–46A).

Page 16. paragraph 17, chart. After first entry and before the note add:

Type	Lengths		Type & No. of conductors	Type of connectors	Connects			
					From		To	
	AN/GRC-46(*)	AN/VRC-29			Unit	Receptacle	Unit	Receptacle
CX-4548/U (AN/GRC-46B).	9 ft 7 in.	None	Two-conductor, rubber-covered.	Plug, Telephone PJ-055B each end.	J-1195/GRC-46	KWB-9 LOOP SEND	KWB-9/TSEC	BLK SEND
CX-4549/U (AN/GRC-46B).	6 ft 3 in.	None	Two-conductor, rubber-covered.	Connector, Plug, Electrical AN3106A-14S-7S one end; 1 plug, phone tip (red), 1 plug, phone tip (black) on other end.	AN/UGC-4	+ and − terminal	J-1195/GRC-46	BATTERY
CX-4551/U (AN/GRC-46B).	10 ft 8 in.	None	Two-conductor, rubber-covered.	2 terminal lugs one end; plug, Telephone PJ-055B on other end.	AN/UGC-4	Terminals 3 and 4	KWB-9/TSEC	REC RED
CX-4551/U (AN/GRC-46B).	8 ft 2 in.	None	Two-conductor, rubber-covered.	2 terminal lugs one end; Plug, Telephone PJ-055B on other end.	J 1195/GRC-46	KWB-9 LINE REC	KWB-9/TSEC	SEND & REC
CX-6536/U (AN/GRC-46B).	8 ft 6 in.	None	Two-conductor, rubber-covered.	2 terminal lugs one end; tinned on other end.	TT-76(*)/GGC	TB-5	TD ON switch	
CX-6537/U	13 ft 9 in.	None	Two-conductor, rubber-covered.	Plug, Telephone PJ-055B one end; 2 terminal lugs other end.	TT-76(*)/GGC	TB-5	KWB-9/TSEC	TD CONT BLU

20.1. Interconnecting Box J–1195/GRC–46 Controls

(fig. 4.1)

(Added)

Control	Function
D OFF—P–E–D ON function selector switch	Two-position rotary switch used for routing the signal line current into sending and receiving circuits of teletypewriters when the KWB–9/TSEC is used.
	Position — *Action* P–E–D ON — Switches the KWB–9/TSEC send loop into the Reperforator-Transmitter, Teletypewriter TT–76(*)/GGC keyboard and transmitter-distributor circuits. D OFF — The KWB–9/TSEC LOOP SEND jack is disconnected from the keyboard and transmitter-distributor circuits.
SIGNAL LINE CURRENT ADJUST	Permits adjustment of the signal line current.
OFF-LINE CURRENT ADJUST	Permits adjustment of the off-line current. Not effective with function selector switch in the P–E–D ON position.

Paragraph 21*c*. Add after subparagraph *c*.

Note. In remote operation of Radio Teletypewriter Set AN/GRC–46B, the SEND-MARK HOLD-REC switch of Interconnecting Box J–1194/GRC–46 performs the same functions as described in *a* through *c* above.

Add paragraph 21.1 after paragraph 21:

21.1. SEND-MARK HOLD-REC switch

(fig. 10.1)

In the AN/GRC–46B equipments, a push switch is added to the right side of the SEND-MARK HOLD-REC switch and is marked TD ON. The TD ON switch must be pressed for clear text operation of the transmitter-distributor in the modified TT–76(*)GGC.

Figure 10. Add to end of caption: (AN/GRC–46 and AN/GRC–46A).

Page 22, paragraph 24. Make the following changes:

Delete the third sentence and substitute:

The three modes of operation are described in *a* through *c* below.

Add subparagraph *c*.

c. Security Equipment Operation. For security equipment operation, refer to KAO–33/TSEC, Instructions for TSEC/KWB–9.

Page 24, paragraph 26, chart. Make the following changes: After "Interconnecting Box J–668/GR", add:

Component	Control	Position
Interconnecting Box J–1195/GRC–46 (AN/GRC–46B).	D OFF—P–E–D ON switch.	P–E–D ON
KWB–9/TSEC (AN/GRC–46B.	POWER switch	OFF
	P–C switch	P

In Control column, line 13, change "Distributor level" to: START-STOP lever.

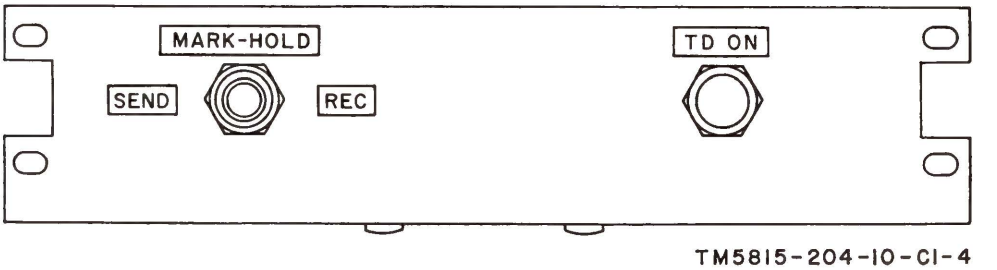


Figure 10.1. (Added) *SEND-MARK HOLD-REC switch (AN/GRC–46B).*

Paragraph 27, chart. Add to the chart:

Unit	Control	Action
J–668/GR (AN/GRC–46B)	CRYPT switch	Place at ON, for teletypewriter and reperforator operation.
KWB–9/TSEC (AN/GRC–46B)	POWER switch	Place at ON, for teletypewriter and reperforator operation.

Page 25, paragraph 29*a*, chart. Add after unit "J–668/GR":

Unit	Control	Action
Teletypewriter shelf (AN/GRC–46B).	SEND-MARK HOLD REC	Place at MARK HOLD.
J–1195/GRC–46 (AN/GRC–46B)	D OFF-P–E–D ON	Turn to D OFF. Adjust OFF-LINE CURRENT ADJUST control on J–1195/GRC–46 for a 60-ma indication on the line current meter of KWB–9/TSEC.
Teletypewriter shelf	SEND-MARK HOLD REC switch.	Place at REC.

Page 26, paragraph 29*b*, chart. Add after unit "AN/UGC–4":

Unit	Control	Action
Teletypewriter shelf (AN/GRC–46B).	TD ON	Depress for unit to transmit.

Page 27, paragraph 29*c*(4), chart. Add to chart:

Unit	Control	Action
Teletypewriter shelf (AN/GRC–46B).	TD ON	Depress for unit to transmit.

Page 28, paragraph 29*c*(5). After the second sentence, add: The TD ON switch must be pressed for the reperforator-transmitter to transmit clear text in the AN/GRC–46B equipment.

Paragraph 31, chart. Add to the chart:

Unit	Control	Action
KWB–9/TSEC (AN/GRC–46B).	POWER switch.	Place at OFF.

Page 35, paragraph 35*c*, chart, Action column. Add to step 60: Press TD ON switch in the AN/GRC–46B equipment.

Page 37, paragraph 36. Delete subparagraph *b* and substitute:

b. Auxiliary Equipment Needed. The following additional items are required to operate a remote page printer in conjunction with the RTT set:

Number required	Item
1	Teletypewriter Set AN/UGC–4.
1	Four-conductor telephone cable, maximum length 5,280 feet, color-coded leads, if possible.
1	Double-pole, three-position switch, SEND-REC-MARK HOLD switch or equivalent (AN/GRC–46 and AN/GRC–46A).
	(Interconnecting Box J–1194/GRC–46 in the AN/GRC–46B).

BY ORDER OF THE SECRETARY OF THE ARMY:

G. H. DECKER,
General, United States Army,
Chief of Staff.

Official:

R. V. LEE,
Major General, United States Army,
The Adjutant General.

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1–7
1–17
1–26
1–57
1–67
5–5
5–6
5–15
5–16
5–214
5–215
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9–66
9–86
9–87
9–217
9–227
9–377
9–500 AA–AC
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10–22
10–45
10–157
10–347
10–348
10–377
10–536
11–5
11–7
11–16
11–37
11–38
11–39
11–55
11–57
11–96
11–97
11–98
11–117
11–155
11–165
11–166
11–167
11–237
11–500 AA–AE (4)
11–500 RA–RT (4)
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11–587
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44–447
44–448
44–500 AA–AB
44–535
44–536
44–537
44–544
44–545
44–546
44–547
44–548
44–549
55–11
55–12
55–16
55–46
55–57
55–75
55–76
55–79
55–116
55–126
55–500 AA–AE
57
57–5
10–46
17–55
39–72
44–36

NG: State AG (3) Units same as Active Army except allowance is one copy to each unit.
USAR: None.
For explanation of abbreviations used, see AR 320–50.

U.S. GOVERNMENT PRINTING OFFICE: 1961

TECHNICAL MANUAL
No. 11-5815-204-10

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *14 September 1960*

RADIO TELETYPEWRITER SETS AN/GRC-46, AN/GRC-46A, AN/GRC-46B, AND AN/VRC-29

			Paragraph	Page
CHAPTER	1.	INTRODUCTION		
Section	I.	General		
		Scope	1	3
		Forms and records	2	3
	II.	Description and data		
		Purpose and use	3	3
		Technical characteristics	4	3
		Components	5	4
		Common names	6	7
		Description of RTT set	7	7
		Description of Radio Transmitter T/195(*)GRC-19	8	9
		Description of Radio Receiver R-392/URR	9	9
		Description of Converter, Frequency Shift CV-278/GR	10	9
		Description of Modulator, Radio Transmitter MD-203/GR	11	9
		Description of Teletypewriter Set AN/UGC-4	12	9
		Reperforator-Transmitter Teletypewriter TT-76(*)/GGC	13	10
		Interconnecting Box J-668/GR	14	10
		Motor generators (rotary converters)	15	11
		Shelters	16	11
		Cables	17	12
		Differences in models	18	18
CHAPTER	2.	OPERATING INSTRUCTIONS		
Section	I.	Controls and instruments		
		General	19	19
		Interconnecting Box J-668 GR controls	20	19
		SEND-REC-MARK HOLD switch	21	19
		Blackout switch	22	19
		Heater controls	23	21
	II.	Operation		
		Types of operation	24	22
		Preparation for operation	25	23
		Preliminary starting procedure	26	23
		Starting procedure	27	24
		Voice or cw operation	28	24
		Frequency-shift keying (radioteletypewriter) operation	29	25
		Antijamming	30	28
		Stopping procedure	31	28

*This manual supersedes TM 11-5815-204-10, 13 November 1958, including C1, 14 March 1960, TM 11-5815-224-10P, 16 March 1959, TM 11-5815-223-10P, 16 March 1959, and first echelon portion of TM 11-5820-273-12P, March 1959.

CHAPTER	3.	MAINTENANCE INSTRUCTIONS		
		Scope of operator's maintenance	32	
		Preventive maintenance	33	29
		Visual inspection	34	29
		Operational checklist	35	29
CHAPTER	4.	MATERIAL USED IN CONJUNCTION WITH RTT SET		
		Purpose of auxiliary equipment	36	37
		Operation of Teletypewriter Set AN/UGC-4 from remote site	37	37
CHAPTER	5.	SHIPMENT AND LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE		
		Disassembly of equipment	38	39
		Authority for demolition	39	39
		Methods of destruction	40	39
APPENDIX	I.	REFERENCES		41
	II.	BASIC ISSUE ITEMS LIST		42

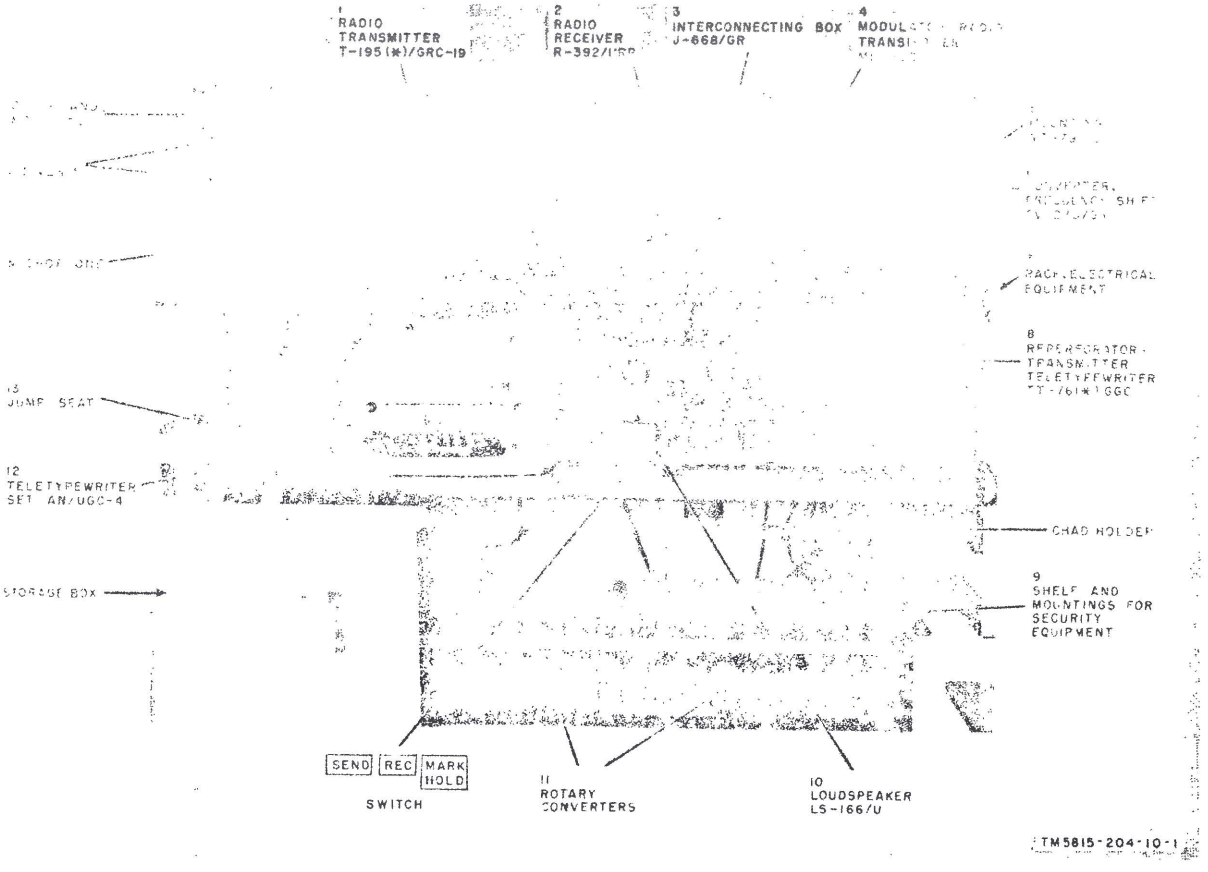


Figure 1. Radio Teletypewriter Set AN/GRC-46(*), interior view, major components installed.

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual describes Radio Teletypewriter Sets AN/GRC–46, AN/GRC–46A, AN/GRC–46B, and AN/VRC–29 and covers their operation and operator's maintenance. It includes operating instructions and inspection and cleaning procedures for the equipment. A list of references is contained in appendix I. The basic issue items list for the AN/GRC–46, AN/GRC–46A, and the AN/VRC–29 is included in appendix II.

b. Official nomenclature followed by (*) is used to indicate all models of the equipment covered in this manual. Thus Radio Teletypewriter Set AN/GRC–46(*) represents Radio Teletypewriter Set AN/GRC–46, AN/GRC–46A, and AN/GRC–46B. Radio Transmitter T–195(*)/GRC–19 represents Radio Transmitter T–195/GRC–19 and T–195A/GRC–19. Reperforator-Transmitter Teletypewriter TT–76(*)/GGC represents Reperforator-Transmitter Teletypewriter TT–76A/GGC and TT–76B/GGC.

2. Forms and Records

a. Unsatisfactory Equipment Report. Fill out and forward DD Form 787–1 (Electronic Failure Report—Signal Equipment) to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS-MLM, Fort Monmouth, N. J. as prescribed in AR 700–38.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700–58.

c. Preventive Maintenance Form. Prepare DA Form 11–238 (fig. 15) (Maintenance Checklist for Signal Equipment (Sound Equipment, Radio, Direction Finding, Radar, Carrier, Radiosonde, and Television)), in accordance with the instructions on the form.

d. Parts List Form. Forward DA Form 2028 (Recommended Changes to DA Technical Manual Parts Lists or Supply Manuals 7, 8 and 9) direct to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS-MLM, Fort Monmouth, N. J., with any comments on parts listings in appendix II.

e. Comments on Manual. Forward all other comments on this publication directly to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS-PA-2d, Fort Monmouth, N. J.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

a. Radio Teletypewriter Set AN/GRC–46(*) and Radio Teletypewriter Set AN/VRC–29 (fig. 1) are similar, except that the AN/GRC–46(*) is a shelter-housed transportable radio teletypewriter terminal and the AN/VRC–29 is mounted in an armored vehicle (M–59). They provide facilities for amplitude-modulated (am.) voice, continuous wave (cw), and frequency-shift-keyed (fsk) radio teletypewriter signals. Teletypewriter operation may be one-way reversible (half-duplex without break-in) or full-duplex. Full-duplex operation requires the use of an additional antenna.

b. The AN/GRC–46(*) and AN/VRC–29 are used in radio nets. They may be netted with other equipment of the same type or with other radio teletypewriter sets with similar characteristics and frequencies, such as Radio Set AN/GRC–26, AN/GRC–26A, AN/GRC–26B, AN/GRC–26C, and AN/GRC–26D.

4. Technical Characteristics

a. Radio Teletypewriter Set AN/GRC–46(*).

Frequency range:	
Transmitter	1.5 to 20 mc (in 10 bands).
Receiver	0.5 to 32 mc.
Reliable distance range	50 miles.

Types of operation	Am. voice (A3), and frequency shift keying (F1) simultaneously or independently, or cw (A1).
Method of tuning	Manual or automatic (7 preset channels).
Antenna requirements	15-foot whip, 50-ohm unbalanced antenna, or transformer-fed doublet.
Power:	
Input	2.5 kw at 27.5 volts dc.
Output	13 to 100 watts, depending on frequency of transmission and type of antenna used. (See TM 11-5820-295-10).

b. Interconnecting Box J-668/GR (fig. 3).

Main power circuit breaker.	Rated at 100 amperes.
Main power receptacles ..	9.
Jacks	1 for sync input. 1 for sync output. 3 for teletypewriter signal lines.
Binding posts	4 for remote control teletypewriters.
Current metering	0-100 ma dc meter.
Power voltage metering.	0-50 vdc meter.
Input voltage	27.5 vdc.
Input signals	Teletypewriter dc impulses.
Output signals	Teletypewriter dc impulses.

c. Motor Generator (Rotary Converter) (fig. 5).

Output	115 ±5 volts ac at 60 cycles with 350-watt load.
Regulation	15% maximum with 0- to 400-watt load.
Radio noise	Suppressed.
Power output	400 watts maximum at unity power factor.
Efficiency	55% minimum at 350-watt load.
Input voltage	27.5 vdc.
Input current	24 amperes maximum.

5. Components

The components of Radio Teletypewriter Set AN/GRC-46(*) are listed in *a* below; the AN/VRC-29 in *b* below. Running spares for both sets are listed in *c* below.

a. Radio Teletypewriter Set AN/GRC-46(*) Components.

(cc) Quantity	Item	Fig. No.	Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb)
1	Radio Set AN/GRC-19 (Refer to TM 11-5820-295-10.) Consisting of:					
	1 Radio Transmitter T-195(*)/GRC-19	1				
	1 Radio Receiver R-395/URR	1				
1	Loudspeaker LS-166/U	1	5	5½	3½	1
1	Modulator, Radio Transmitter MD-203/GR	1	9¼	14¾	7½	23½
2	Mounting MT-791/U; MT-791A/U	1	3½	12⅞	8½	15
1	Converter, Frequency Shift CV-278/GR	1	9½	14¾	7½	19½
1	Interconnecting Box J-668/GR	1	6	7	16	12¼
1	Teletypewriter Set AN/UGC-4 consisting of:					
	1 Teletypewriter TT-98B/FG		11¼	20 9/16	17⅛	54
	1 Power Supply PP-978/FG		4	4	9	7
1	Reperforator-Transmitter, Teletypewriter TT-76(*)/GGC.	1	21	18	12	45
2	Motor generator (rotary converter) (Wincharger model SS688).	1,5	9	12½	6½	40
1	Cord CG-409C/U (4 ft 3 in.)	8				3/16
2	Cable Assembly, Radio Frequency CG-530B/U (2 ft 11 in.).	8				3/16
1	Cable Assembly, Radio Frequency CG-1127/U (2 ft 6 in.).	8				3/16
1	Cable Assembly, Radio Frequency CG-1127/U (1 ft).	8				3/16
1	Cable Assembly, Power, Electrical CX-4539/U (4 ft 9 in.).	8				3/16
1	Cable Assembly, Power, Electrical CX-4540/U (4 ft 6 in.).	8				11/16

Quantity (ea)	Item	Fig. No.	Height (in.)	Depth (in.)	weight (in.)	Unit weight (lb)
1	Cable Assembly, Power, Electrical CX–4540/U (3 ft 2 in.).	8				11/16
2	Cable Assembly, Power, Electrical CX–4541/U (6 ft 11 in.).	8				⅝
1	Cable Assembly, Power, Electrical CX–4542/U (8 ft 11 in.) (AN/GRC–46 and AN/GRC–46A).	8				⅞
1	Cable Assembly, Power, Electrical CX–4543/U (10 ft 3 in.) (AN/GRC–46 and AN/GRC–46A).	8				⅞
1	Cable Assembly, Power, Electrical CX–4544/U (12 ft 8 in).	8				1
1	Cable Assembly, Power, Electrical CX–4545/U (6 ft 5 in.).	8				⅝
1	Cord Assembly, Electrical CX–4546/U (3 ft 9 in.).	8				⅜
1	Cable Assembly, Special Purpose, Electrical CX–4547/U (5 ft 6 in.).	8				¾
2	Cord Assembly, Electrical CX–4548/U (5 ft 11 in.).	8				5/16
1	Cord Assembly, Electrical CX–4549/U (4 ft 5 in.).	8				5/16
2	Cord Assembly, Electrical CX–4551/U (7 ft 5 in.).	8				⅜
1	Cord Assembly, Electrical CX–4551/U (9 ft 3 in.).	8				½
1	Cable Assembly, Power, Electrical CX–6294/U (7 ft 10 in.) (AN/GRC–46B).					½
1	Cable Assembly, Power, Electrical CX–6293/U (13 ft 1 in.) (AN/GRC–46B).					1½
1	Cable Assembly, Power, Electrical CX–6292/U (12 ft 1 in.) (AN/GRC–46B).					1
1	Electrical Equipment Shelter S–89C/G (AN/GRC–46) or	7	59	77½	57	625
1	Electrical Equipment Shelter Lightweight (AN/GRC–46A) or	6	59	77½	57	320
1	Electrical Equipment Shelter S–144/G (AN/GRC–46B) with the following items installed:		62⅝	74	57	300
	3 Seat, individual	1				
	1 Fan, ventilating, propeller					
	2 Fixture, lighting					
	2 Lamp, incandescent					
	1 Clock, aircraft, mechanical w/mtg bracket.					
	1 Padlock					
	1 Extinguisher, fire, carbon dioxide					5
	1 Rack, electrical equipment (AN/GRC–46)	1	27	54	26	
	1 Rack, electrical equipment: security equipment rack (AN/GRC–46).	1	2	54	26	
	1 Rack, electrical equipment (AN/GRC–46A).	1	25¼	54⅜	24¼	
	1 Rack, electrical equipment: security equipment rack AN/GRC–46A).	1	2	54	24	
	1 Rack, electrical equipment (AN/GRC–46B).	1	25¼	54	24	
	1 Rack, electrical equipment: security equipment rack (AN/GRC–46B).	1	2	54	24	
	2 Reflectors; light		1¾	6	3½	
	1 Rod, Ground	6		46½	½	
	1 Cording diagram (on wall)					
	1 Reel RL–29					
	3 Adapters, connector: Mil type UG–306/U.					
	1 Clamp, loop: antenna rope clamp.					
	2 Technical Manuals TM 11–5815–204–10.					
	1 set Running spares (c below)					

b. Radio Teletypewriter Set AN/VRC-29 Components.

Quantity (ea)	Item	Fig. No.	Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb)
1	Radio Set AN/GRC-19 (Refer to TM 11-5820-295-10) consisting of:					
	1 Radio Transmitter T-195(*)/GRC	1				
	1 Radio Receiver R-392/URR	1				
1	Loudspeaker LS-166/U	1	5	5½	3½	1
1	Modulator, Radio Transmitter MD-203/GR	1	9¼	14¾	7½	23½
2	Mounting MT-791/U; MT-791A/U	1	3½	12⅞	8½	15
1	Converter, Frequency Shift CV-278/GR	1	9¼	14¾	7½	19½
1	Reperforator-Transmitter, Teletypewriter TT-76(*)/GGC.	1	21	18	12	45
1	Teletypewriter Set AN/UGC-4 consisting of: 1 Teletypewriter TT-98B/FG 1 Power Supply PP-978/FG	1	11¼	20 9/16	17⅛	54
1	Interconnecting Box J-668/GR	3	6	7	16	12¼
2	Motor generator (rotary converter) (Wincharger model SS688).	5	9	12½	6½	40
1	Cord CG-409C/U (3 ft 3 in.)	8				⅛
2	Cable Assembly, Radio Frequency CG-530B/U (1 ft 5 in.).	8				⅛
1	Cable Assembly, Radio Frequency CG-1127/U (1 ft 7 in.).	8				⅛
1	Cable Assembly, Radio Frequency CG-1127/U (1 ft).	8				1/10
1	Cable Assembly, Power, Electrical CX-4539/U (5 ft 2 in.).	8				1⅝
2	Cable Assembly, Power, Electrical CX-4541/U (3 ft 1 in.).	8				¼
1	Cord Assembly, Electrical CX-4546/U (6 ft 4 in.).	8				⅝
2	Cord Assembly, Electrical CX-4548/U (5 ft 11 in.).	8				5/16
1	Cord Assembly, Electrical CX-4549/U (3 ft 3 in.).	8				¼
1	Cord Assembly, Electrical CX-4551/U (3 ft 4 in.).	8				3/16
1	Cord Assembly, Electrical CX-4551/U (7 ft 5 in.).	8				⅜
1	Cord Assembly, Electrical CX-4551/U (6 ft 4 in.).	8				5/16
2	Cable Assembly, Power, Electrical CX-4847/U (1 ft 10 in.).	8				7/16
1	Cable Assembly, Special Purpose, Electrical CX-4848/U (3 ft 6 in.).	8				½
1	Cable Assembly, Power, Electrical CX-4849/U (6 ft 3 in.).	8				½
1	Cable Assembly, Power, Electrical CX-4850/U (6 ft 5 in.).	8				⅝
1	Cord Assembly, Electrical CX-4854/U (9 ft 1 in.).	8				7/16
1	Cord Assembly, Electrical CX-4855/U (9 ft 1 in.).	8				7/16
1	Cable and Switch Assembly, Special Purpose (4 ft 9 in.).	8				½
2	Technical Manual TM 11-5815-204-10.					

Note. Equipment equivalent to that furnished as part of the shelter of AN/GRC-46(*)*a* above is not part of AN/VRC-29, but is provided as part of the armored vehicle.

c. Running Spares (fig. 2).

Quantity (ea)	Description
1	Clamp, loop: antenna rope clamp.
1	Electrode igniter: ignites fuel for heater.
1	Vibrator, interrupter: 24 vdc power output.
2	Fuse cartridge: ¼ amp, 250 volts.
2	Fuse cartridge: 10 amp, 32 volts.
4	Fuse cartridge: 30 amp, 32 volts.
1	Relay armature: 2 windings, dc, 160 ohms, 27.5 volts.

6. Common Names

Components of the AN/GRC–46(*) and the AN/VRC–29 and their assigned common names are listed below.

Item	Common name
Radio Teletypewriter Set AN/GRC–46(*) and AN/VRC–29.	RTT set.
Radio Transmitter T–195(*)/GRC–19.	Transmitter.
Radio Receiver R–392/URR	Receiver.
Modulator, Radio Transmitter MD–203/GR.	Modulator.
Converter, Frequency Shift CV–278/GR.	Frequency-shift converter.
Interconnecting Box J–668/GR	Junction box.
Reperforator-Transmitter Teletypewriter TT–76(*)/GGC.	Reperforator-transmitter.
Teletypewriter Set AN/UGC–4	Page printer.
Motor Generator	Rotary converter.

7. Description of RTT Set

(fig. 1)

a. The components of the AN/GRC–46(*), except for the antenna, are mounted inside the shelter. Space for mounting security equipment is provided on a shelf under the teletypewriter equipment. For operator's use, jump seats on each side of the shelter can be pulled down in front of the page printer and reperforator-transmitter. A third jump seat is provided near the door directly across from the storage cabinet and heater. The page printer and reperforator-transmitter are secured to sliding shelves which may be pulled out to reach the distribution box and cabling mounted near the front wall. Intake and exhaust air vents in the shelter wall are connected to the transmitter by flexible tubing to provide for cooling of the transmitter. All the operating

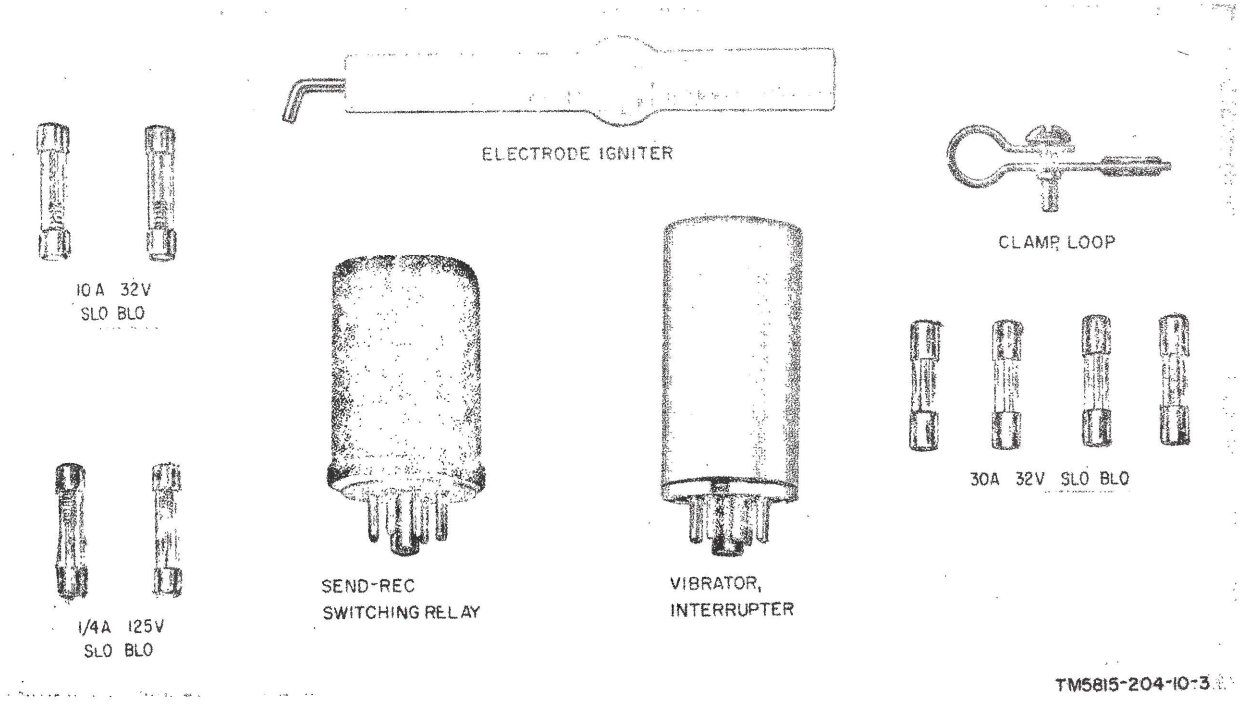


Figure 2. Running spares.

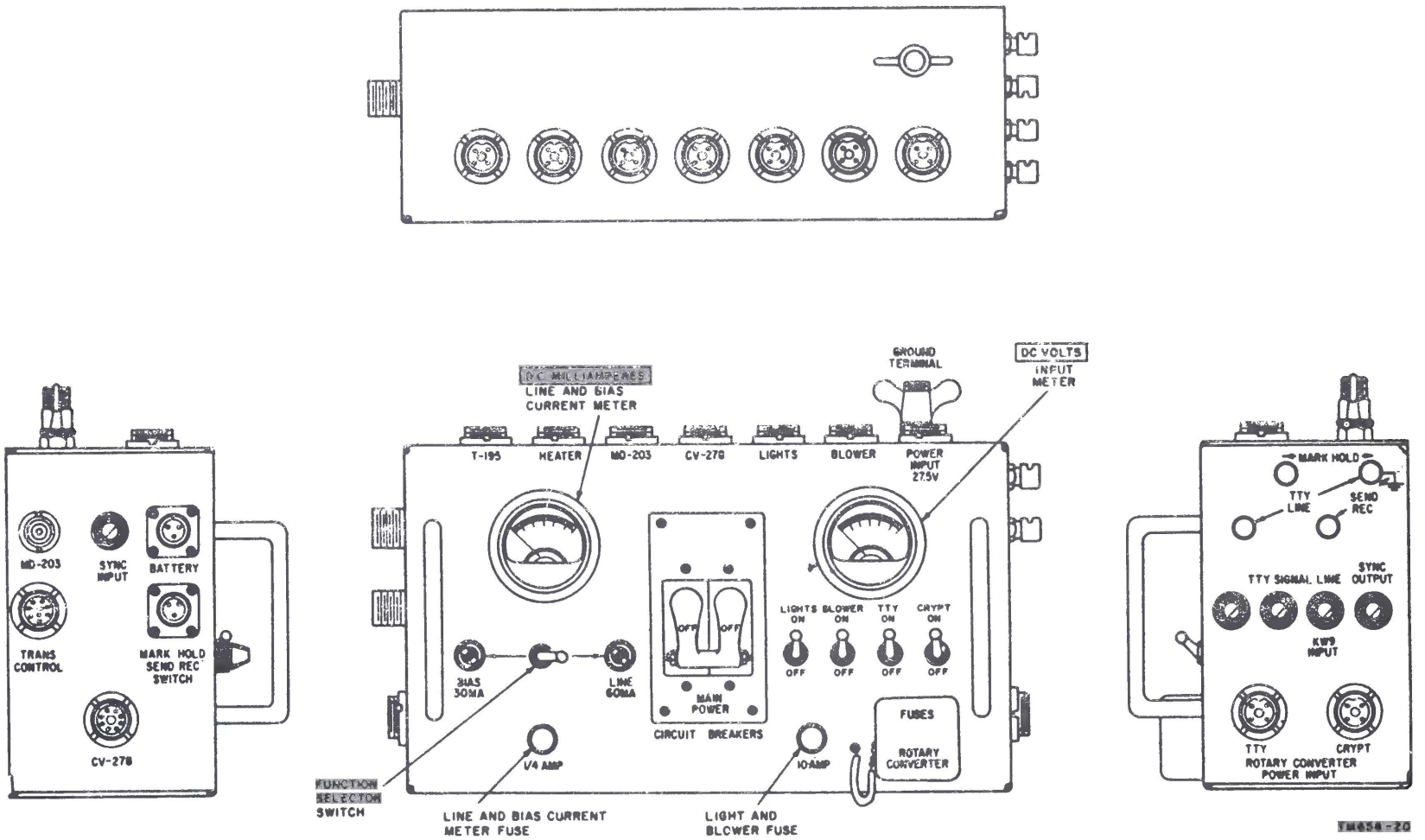


Figure 3. Interconnecting Box J-668/GR, operating controls and receptacles.

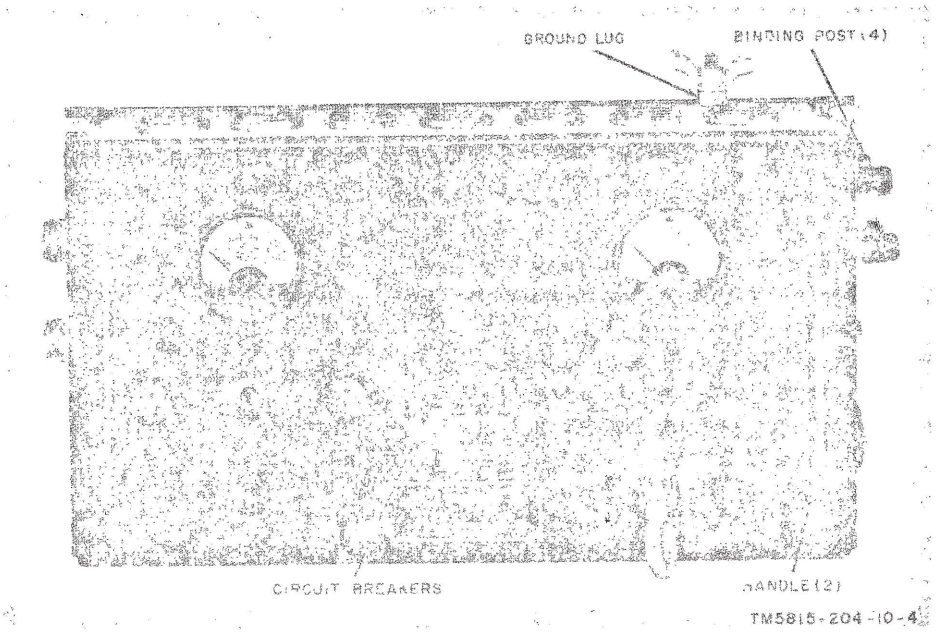


Figure 4. Interconnecting Box J–668/GR.

radio equipment of AN/GRC–46(*) is mounted on shelves across the front of the shelter.

b. All the operating components of the AN/VRC–29 are mounted inside an armored vehicle similarly to the manner in which the AN/GRC–446(*) components are installed in a shelter.

8. Description of Radio Transmitter T–195(*)/GRC–19

(fig. 1)

The forced-air-cooled transmitter is used for transmitting cw, voice, and frequency-shift radioteletype and voice signals at the same time, in a frequency range of 1.5 to 20 megacycles (mc). Refer to TM 11–806 for a detailed description.

9. Description of Radio Receiver R–392/URR

(fig. 1)

The receiver is a superheterodyne type used for receiving cw, modulated continuous wave (mcw), voice, frequency-shift radioteletype, or frequency-shift radioteletype and voice signals at the same time. Refer to TM 11–5820–334–10 for a detailed description.

10. Description of Converter, Frequency Shift CV–278/GR

(fig. 1)

The frequency-shift converter is a demodulator used to convert fsk signals received by the receiver to direct current (dc) teletypewriter pulses. Refer to TM 11–5805–210–10 for a detailed description.

11. Description of Modulator, Radio Transmitter MD–203/GR

(fig. 1)

The modulator is used in conjunction with the transmitter to provide frequency-shift keying for radioteletype transmissions. It is connected to the transmitter and must be in operation when the transmitter is on. Refer to TM 11–5820–205–10 for a detailed description.

12. Description of Teletypewriter Set AN/UGC–4

(fig. 1)

Teletypewriter TT–98B/FG and Power Supply PP–978/FG comprise Teletypewriter Set AN/UGC–4. Both are mounted on one frame and provide printed copies of the teletype-

writer messages transmitted and received by the RTT set. Refer to TM 11–5815–200–10 for a detailed description.

13. Reperforator-Transmitter Teletypewriter TT–76(*)/GGC

(fig. 1)

The reperforator-transmitter provides printed and perforated paper-tape copies of teletypewriter messages. Refer to TM 11–2225 for a detailed description.

14. Interconnecting Box J–668/GR

(fig. 1, 3, and 4)

Interconnecting Box J–668/GR is the termination and interconnecting equipment for all power and signal wiring (except the antennas) of the RTT set. It contains the necessary cable

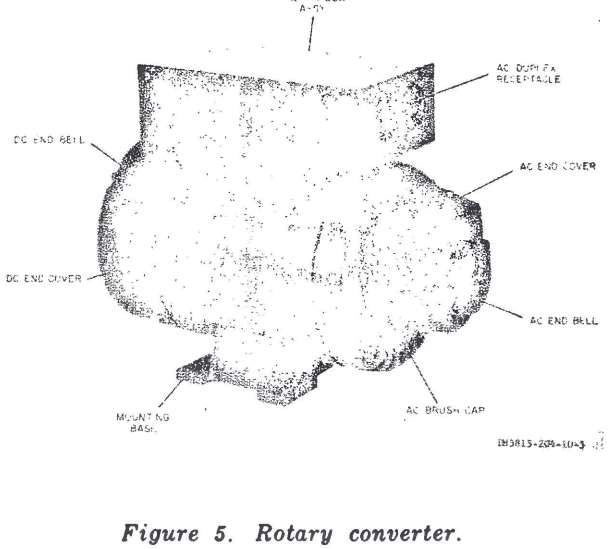


Figure 5. Rotary converter.

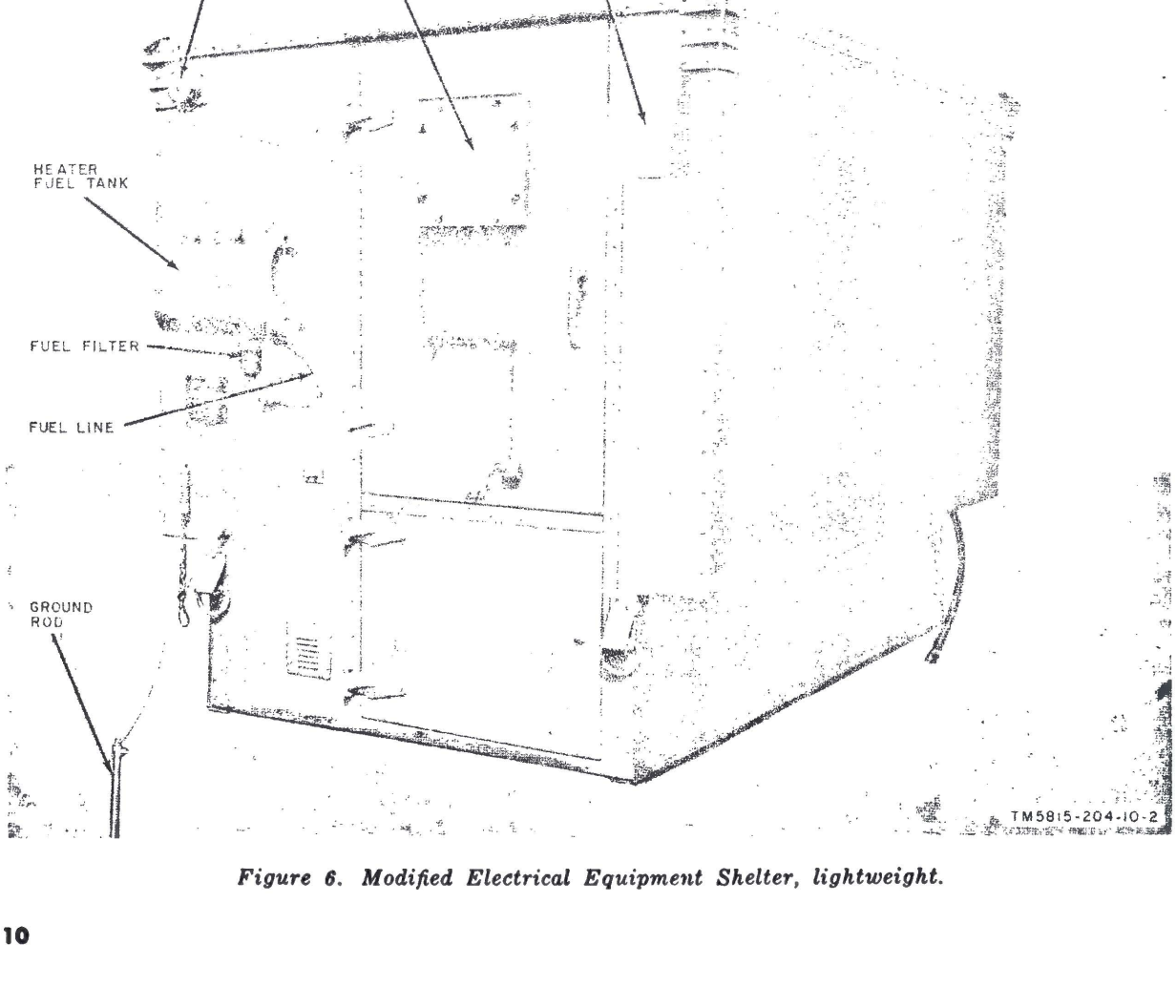


Figure 6. Modified Electrical Equipment Shelter, lightweight.

receptacles, binding posts, switches, fuses, and meters. These components are mounted on the two ends, top, and front panel. Handles on the front panel permit removal of panel and chassis assembly of the interconnecting box from its case.

15. Motor Generators (Rotary Converters) (fig. 1 and 5)

The rotary converters are single armature machines with fan ventilation and air ducts at the bottom of the endbells. They are supported on mounting feet, and inspection covers are on the endbells. The brush caps, on the outside, house the alternating current (ac) brushes on one end and the dc brushes on the other end. A filter box that contains the filter parts is mounted on the top of each rotary converter. Ac output receptacles are mounted on the filter box. The rotary converters are used to provide 110 volts ac for the ac motors of components of the RTT set. One is used for the teletypewriter equipment, and the other for security equipment.

16. Shelters (AN/GRC–46(*))

The shelters of the various models of the AN/GRC–46(*) are similar, but not identical. They are designed for installation on a ¾-ton truck, or on the ground. They also can be transported by helicopter. The S–144/G and the lightweight shelter are constructed of aluminum and plywood and are insulated with fiberglass. The S–89C/G is constructed of steel and plywood. They contain racks, shelves, and other mounting facilities required for installation of other AN/GRC–46(*) components. The main differences between the S–89C/G (AN/GRC–46) and the lightweight (AN/GRC–46A) are apparent by comparing figures 6 and 7. The S–144/G (AN/GRC–46B) (fig. 9) is somewhat larger than the S–89C/G (para 5*a*) but is similar in appearance to the shelter of the AN/GRC–46A. The door on the S–144/G is mounted to swing right and the exhaust fan is mounted to the left of the door.

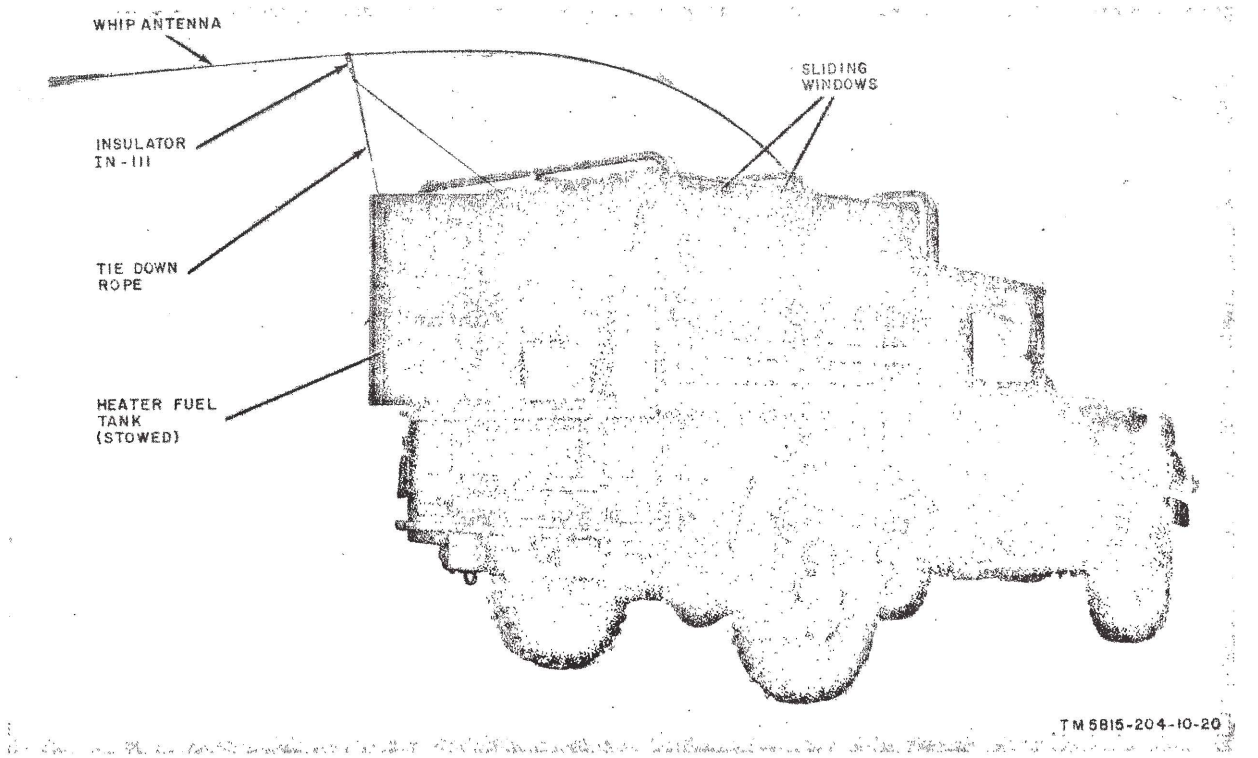


Figure 7. Electrical Equipment Shelter S–89C/G, mounted on a vehicle.

17. Cables
(fig. 8)

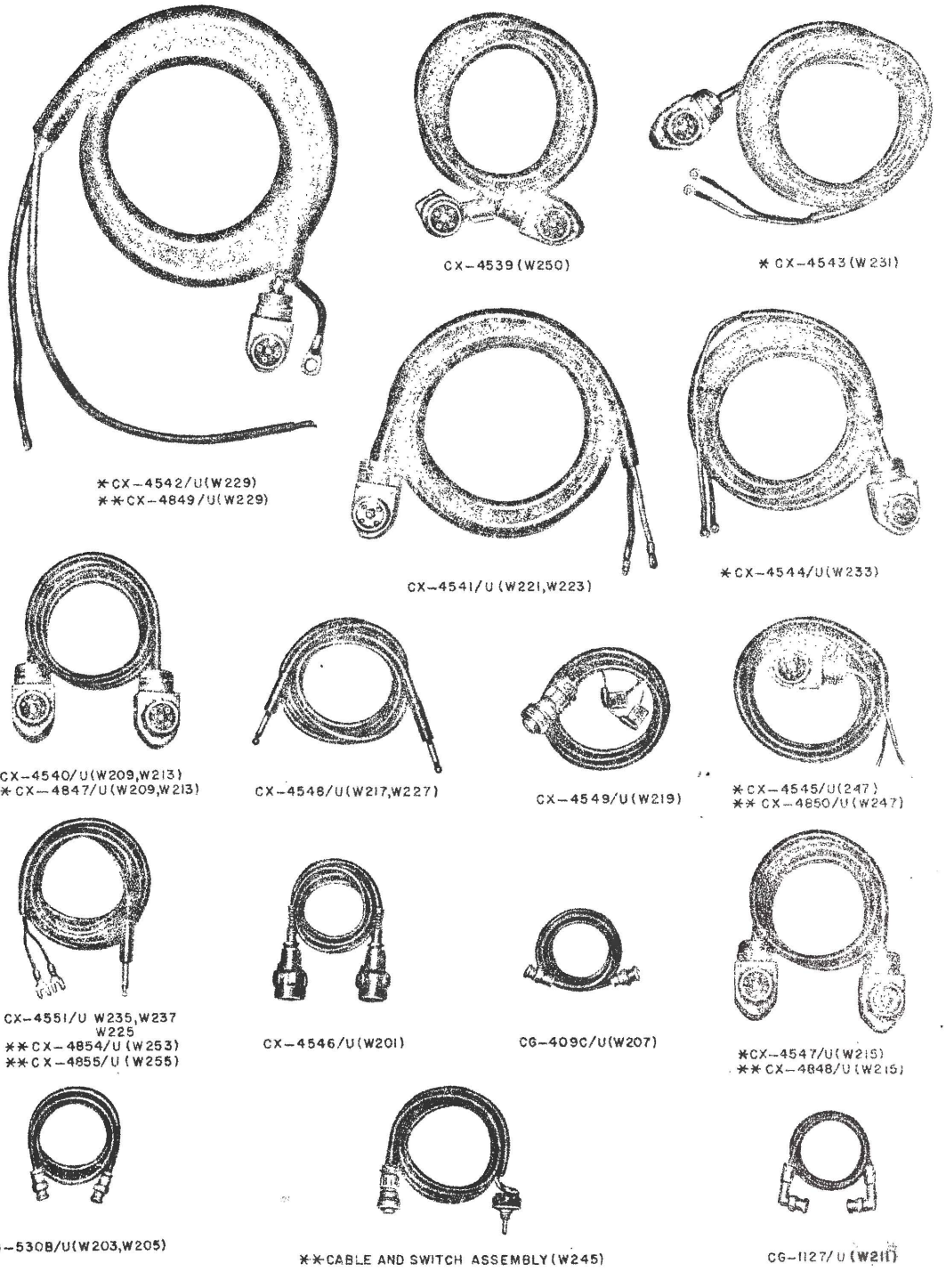
Type	Lengths		Type & No. of conductors	Type of connectors	Connects			
					From		To	
	AN/GRC-46(*)	AN/VRC-29			Unit	Receptacle	Unit	Receptacle
CG-409/U	4 ft 3 in.	3 ft 3 in.	Radio Frequency Cable RG-58/U.	Radio Frequency Plug UG-88/U each end.	J-668/GR	MD-203 (left side)	MD-202/GR	KEYING INPUT
CG-530B/U	2 ft 11 in.	1 ft 5 in.	RG-62A/U coaxial cable.	Plug UG-260B/U each end.	T-195(*)GRC-19	MO OUT	MD-203/GR	MO INPUT
CG-530B/U	2 ft 11 in.	1 ft 5 in.	RG-62A/U coaxial cable.	Plug UG-260B/U each end.	MD-203/GR	FSK OUTPUT	T-195(*)GRC-19	FSK INPUT
CG-1127/U	2 ft 6 in.	1 ft 7 in.	Radio Frequency Cable RG-58C/U.	Connector, Plug UG-913/U each end.	R-392/URR	IF OUT	CV-278/GR	INPUT
CG-1127/U	1 ft	1 ft	Radio Frequency Cable RG-58C/U.	Connector, Plug UG-913/U each end.	T-195(*)GRC-19	RECEIVER ANTENNA	R-392/URR	ANT.
CX-4539/U	4 ft 9 in.	5 ft 2 in.	Two-conductor, rubber covered.	Connector, plug, electrical each end.	J-668/GR	T-195	T-195(*)GRC-19	24 VOLTS DC
CX-4540/U	4 ft 6 in.	None	Two-conductor, rubber covered.	Connector, Plug, Electrical CS-1320-(1)(P)(375) each end.	CV-278/GR	27.5 VOLTS DC	J-668/GR	CV-278 (on top)
CX-4540/U	3 ft 2 in.	None	Two-conductor, rubber covered.	Connector, Plug, Electrical CS-1320-(1)(P)(375) each end.	MD-203/GR	27.5 VOLTS DC	J-668/GR	MD-203 (on top)
CX-4847/U	None	1 ft 10 in.	Two-conductor, rubber covered.	Connector, Plug, Electrical CS-1320-(1)(P)(375) each end.	CV-278/GR	27.5 VOLTS DC	J-668/GR	CV-278 (on top)
CX-4847/U	None	1 ft 10 in.	Two-conductor, rubber covered.	Connector, Plug, Electrical CS-1320-(1)(P)(375) each end.	MD-203/GR	27.5 VOLTS DC	J-668/GR	MD-203 (on top)
CX-4541/U	6 ft 11 in.	3 ft 1 in.	Two-conductor, rubber covered.	Two terminal lugs, one end; Connector Plug, Electrical, CS-1320 (1)(P)(690) on other end.	J-668/GR	ROTARY CONVERTOR POWER INPUT TTY (right side)	TTY rotary converter	DC terminals (E221, E222)

Type	Lengths		Type & No. of conductors	Type of connectors	Connects			
					From		To	
	AN/GRC-46(*)	AN/VRC-29			Unit	Receptacle	Unit	Receptacle
CX-4541/U	6 ft 11 in.	3 ft 1 in.	Two-conductor, rubber covered.	Two terminal lugs, one end; Connector, Plug, Electrical, CS-1320 (1)(P)(690) on other end.	J-668/GR	ROTARY CONVERTOR POWER INPUT CRYPT (right side)	Crypt rotary converter	DC terminals E223, E224)
CX-4542/U	8 ft 11 in.	None	Two-conductor, rubber covered.	Terminal lug (black wire), Connector, Plug, Electrical AN3108B-18-6S (white wire), one end; tinned on other end.	J-668/GR	POWER INPUT 27.5V	Vehicular electrical system.	
CX-4849/U	None	6 ft 3 in.	Two-conductor, rubber covered.	Terminal lug (black wire), Connector, Plug, Electrical AN3108B-18-6S (white wire), one end; tinned on other end.	J-668/GR	POWER INPUT 27.5V	Vehicular electrical system.	
CX-4543/U (AN/GRC-46 and AN/GRC-46A)	10 ft 3 in.	None	Two-conductor, rubber covered.	2 terminal lugs one end; Connector, Plug, Electrical CS-1320 (1)(P)(375) on other end.	J-668/GR	BLOWER	Blower	
CX-4544/U (AN/GRC-46 and AN/GRC-46A)	12 ft 8 in.	None	Two-conductor, rubber covered.	2 terminal lugs one end; Connector, Plug, Electrical type CS-1320(1)(P)(375) on other end.	J-668/GR	HEATER	Heater	
CX-6292/U (AN/GRC-46B)	12 ft 1 in.	None	Two-conductor, rubber covered.	2 terminal lugs one end; Connector, Plug, Electrical MS3108B-12S-3P on other end.	J-668/GR	BLOWER	Blower	

Type	Lengths		Type & No. of conductors	Type of connectors	Connects			
					From		To	
	AN/GRC-46(*)	AN/VRC-29			Unit	Receptacle	Unit	Receptacle
CX-6293/U (AN/GRC-46B	13 ft 1 in.	None	Two-conductor, rubber covered.	Connector, Plug, Electrical MS3108B-14S-7S(C) on one end; Connector, Plug, Electrical CS-1320 (1)(P)(375) on other end.	J-668/GR	HEATER	Heater	
CX-6294/U (AN/GRC-46B	7 ft 10 in.	None	Two-conductor, rubber covered.	2 terminal lugs, one end; Connector, Plug Electrical MS3108B-12S-3P on other end.	Heater		Thermostat	
CX-4545/U	6 ft 5 in.	None	Two-conductor, rubber covered.	Connector, Plug, Electrical CS-1320(1)(P)(375) one end; tinned on other end.	J-668/GR	LIGHTS	Lights and door switch	
CX-4850/U	None	6 ft 5 in.	Two-conductor, rubber covered.	Connector, Plug, Electrical CS-1320(1)(P)(375) one end; tinned on other end.	J-668/GR	LIGHTS	Lights	
CX-4546/U	3 ft 9 in.	6 ft 4 in.	Two-conductor, rubber covered.	Connector, Plug U-77/U each end.	J-668/GR	TRANS CON-TROL	R-392/URR	AUDIO
CX-4547/U	5 ft 6 in.	None	Four-conductor, rubber covered.	Connector, Plug, Electrical CS-1320(1)(P)(343) each end.	J-668/GR	CV-278	CV-278/GR	PRINTER
CX-4848/U	None	3 ft 6 in.	Four-conductor, rubber covered.	Connector, Plug, Electrical CS-1320(1)(P)(343) each end.	J-668/GR	CV-278	CV-278/GR	PRINTER
CX-4548/U	5 ft 11 in.	5 ft 11 in.	Two-conductor, rubber covered.	Plug, Telephone PJ-055B each end.	J-668/GR	SYNC INPUT	Security equipment	
CX-4548/U	5 ft 11 in.	5 ft 11 in.	Two-conductor, rubber covered.	Plug, Telephone PJ-055B each end.	J-668/GR	SYNC OUTPUT	Security equipment	

Type	Lengths		Type & No. of conductors	Type of connectors	Connects			
					From		To	
	AN/GRC-46(*)	AN/VRC-29			Unit	Receptacle	Unit	Receptacle
CX-4549/U	4 ft 5 in.	3 ft 3 in.	Two-conductor, rubber covered.	Connector, Plug, Electrical AN3106A-14S-7S one end; 1 plug, phone tip red) 1 plug, phone tip (black) on other end.	J-668/GR	BATTERY	AN/UGC-4	Red plug to positive jack. Black plug to negative jack.
CX-4551/U	9 ft 3 in.	6 ft 4 in.	Two-conductor, rubber covered.	2 terminal lugs one end; Plug, Telephone PJ-055B on other end.	TT-76(*)/GGC	REC	AN/UGC-4	Black lead to terminal 3. White lead to terminal 4.
CX-4551/U	7 ft 5 in.	3 ft 4 in.	Two-conductor, rubber covered.	2 terminal lugs one end; Plug, Telephone PJ-055B on other end.	J-668/GR	TTY SIGNAL LINES (J16)	AN/UGC-4	Black lead to terminal 1. White lead to terminal 2.
CX-4551/U	7 ft 5 in.	7 ft 5 in.	Two-conductor, rubber covered.	2 terminal lugs one end; Plug, Telephone PJ-055B on other end.	Used with security equipment.			
CX-4854/U	None	9 ft 1 in.	Two-conductor, rubber covered.	2 terminal lugs one end; Plug, Telephone PJ-055B on other end.	TT-76(*)/GGC (gray plug).		J-668/GR	TTY SIGNAL LINES (J17)
CX-4855/U	None	9 ft 1 in.	Two-conductor, rubber covered.	2 terminal lugs one end; Plug, Telephone PJ-055B on other end.	TT-66(*)/GGC (red plug).		J-668/GR	TTY SIGNAL LINES KW9 IN

Type	Lengths		Type & No. of conductors	Type of connectors	Connects			
					From		To	
	AN/GRC-46(*)	AN/VRC-29			Unit	Receptacle	Unit	Receptacle
Cable and switch assembly, special purpose	None	4 ft 9 in.	Three-conductor, rubber covered.	Connector, Plug, Electrical AN3106A-14S-7P one end; double-pole, three-position toggle switch.	J-668/GR	MARK HOLD-SEND-REC SWITCH		
Note. Cables described below are part of Radio Set AN/GRC-19.								
CX-1599/U	9 ft 9 in.		Eight-conductor, rubber-covered.	Connector, Plug, Electrical Amphenol type No. 164-4FS(500) on one end; Connector, Plug, Electrical Amphenol type No. 164-44FS(500) on other end.	T-195(*)/GRC-19	RECEIVER CONT	R-392/URR	POWER INPUT
CX-1852/U	6 ft		Two-conductor, rubber covered.	Connector, Plug U-77/U on one end; 2 terminal lugs on other end.	T-195(*)/GRC-19	AUDIO	To microphone or telegraph key	
CX-1334/U	3 ft 3 in.		Two-conductor, rubber covered.	Connector, Plug U-77/U on one end; JAN type JJ-026 jack on the other end.	R-392/URR	AUDIO	To headset or loudspeaker	
Wire W-146	6 ft		Single-conductor, stranded, polyethylene and cotton-braid insulation.		T-195(*)/GRC-19	WHIP ANTENNA	Antenna	



*USED IN AN/GRC-46
**USED IN AN/VRC-29

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Figure 8. AN/GRC-46(*) and AN/VRC-29 power and signal cables.

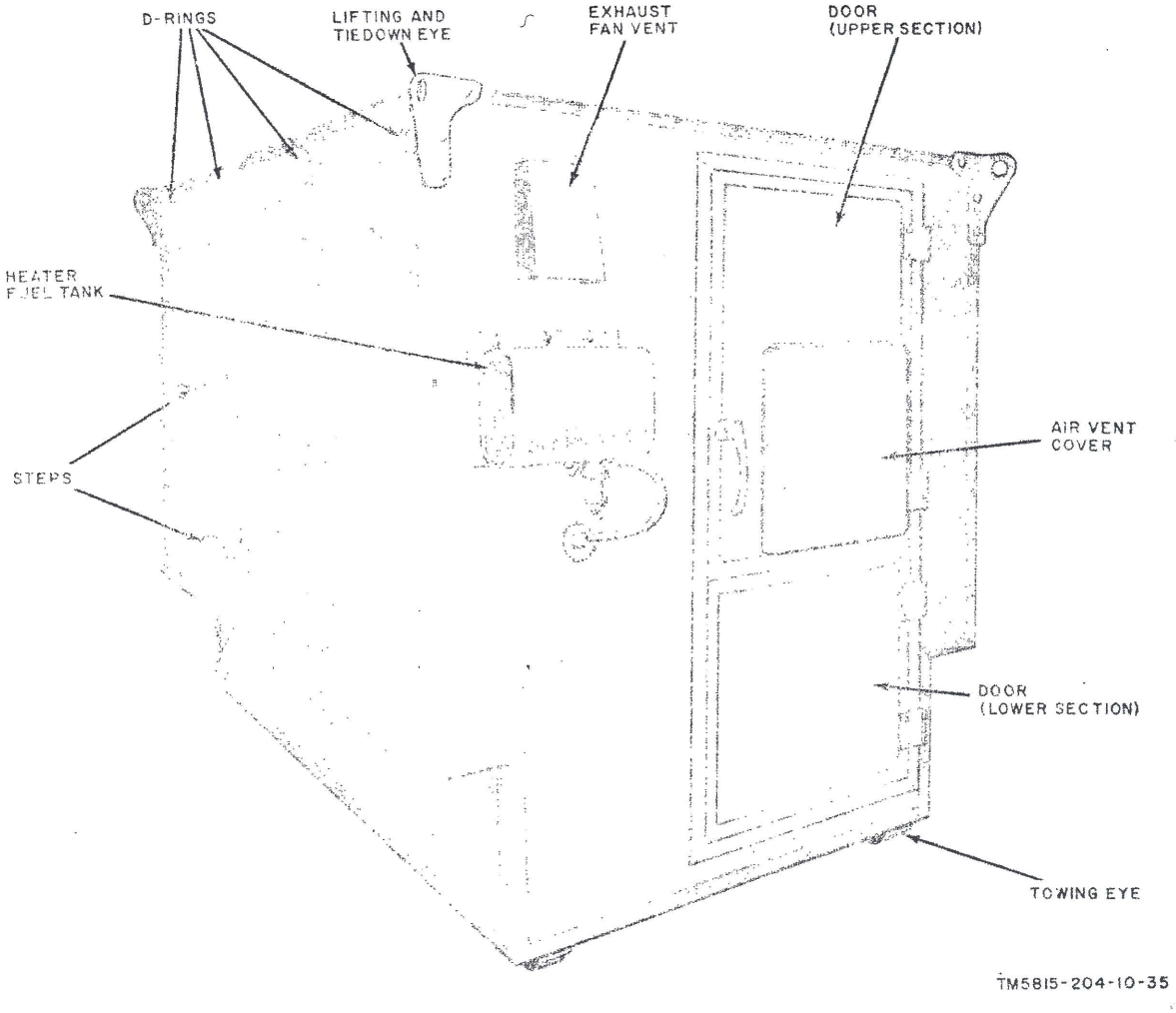


Figure 9. Electrical Equipment Shelter S–144/G.

18. Differences in Models

Item	AN/GRC–46	AN/GRC–46A	AN/GRC–46B
Electrical Equipment Shelter	S–89C/G	Lightweight	S–144/G
Shelter material	Steel	Aluminum	Aluminum
Weight less crate	1,400 lb	1,175 lb	1,110 lb
Space heater heat control	Manually operated thermostat	Manually operated thermostat	Automatic external thermostat

CHAPTER 2
OPERATING INSTRUCTIONS

Section I. CONTROLS AND INSTRUMENTS

19. General

This section covers controls and instruments used by the operator that are not covered in other manuals; controls and instruments used by maintenance personnel are covered in instructions for the appropriate maintenance echelon. Refer to the applicable technical manuals listed in appendix I for the controls of the various components that make up the RTT set.

20. Interconnecting Box J–668/GR Controls (fig. 3)

Control or indicator	Function
Function selector switch.	Two position toggle switch. Selects circuit connected to DC MILLIAMPERES meter. *Position* — *Action* BIAS 30MA — Permits measurement of bias current of the keying relay. BIAS 60MA — Permits measurement of page printer signal line current.
MAIN POWER circuit breakers.	OFF-ON breakers. Open and close main power circuit.
Power switches..	Four two-position (ON-OFF) toggle switches: Control power to equipment as indicated: LIGHTS, BLOWER, TTY, CRYPT.
DC VOLTS meter.	Indicates the input supply voltage, 0 to 50 dc.
DC MILLIAMPERES meter.	Indicates the current in the bias circuit, or in the page printer line circuit as selected by the function selector switch, 0 to 100 ma dc.

21. SEND-REC-MARK HOLD Switch (fig. 10)

The SEND-REC-MARK HOLD switch, located on the center front of the teletypewriter shelf (fig. 1), is used to control the send, receive, and mark-hold functions of the equipment.

a. In the SEND position, the equipment is connected for teletypewriter or simultaneous voice and teletypewriter transmission. The transmitter is energized and teletypewriter signals will be fed to the modulator.

b. In REC position, the equipment is connected for teletypewriter or simultaneous voice and teletypewriter reception. The output of the frequency-shift converter is connected to the page printer loop.

c. In the MARK HOLD position, the RTT set is connected for standby operation; the receiver is operational and must be monitored. The page printer and reperforator-transmitter are in the mark condition. The page printer will not print even if a message is being received. Reception of voice and cw is possible in this position.

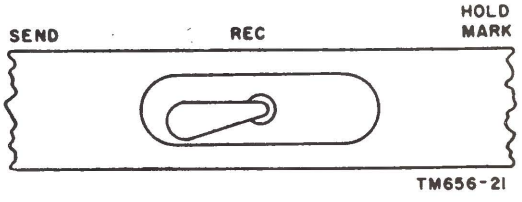


Figure 10. SEND-REC-MARK HOLD switch.

22. Blackout Switch (fig. 11)

The blackout switch is at the top of the shelter door. Whenever the door is opened, the ceiling lights go off. The switch lever may be pulled down manually to the detent stop to keep the lights on when the door is open. The switch automatically trips to the OFF position when the door is closed to prevent the light from going on when the door is opened again.

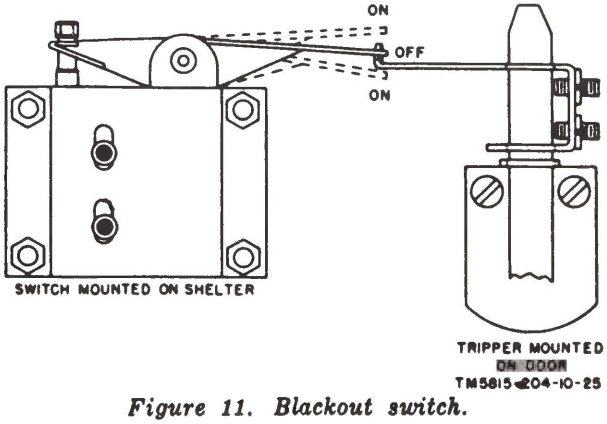


Figure 11. Blackout switch.

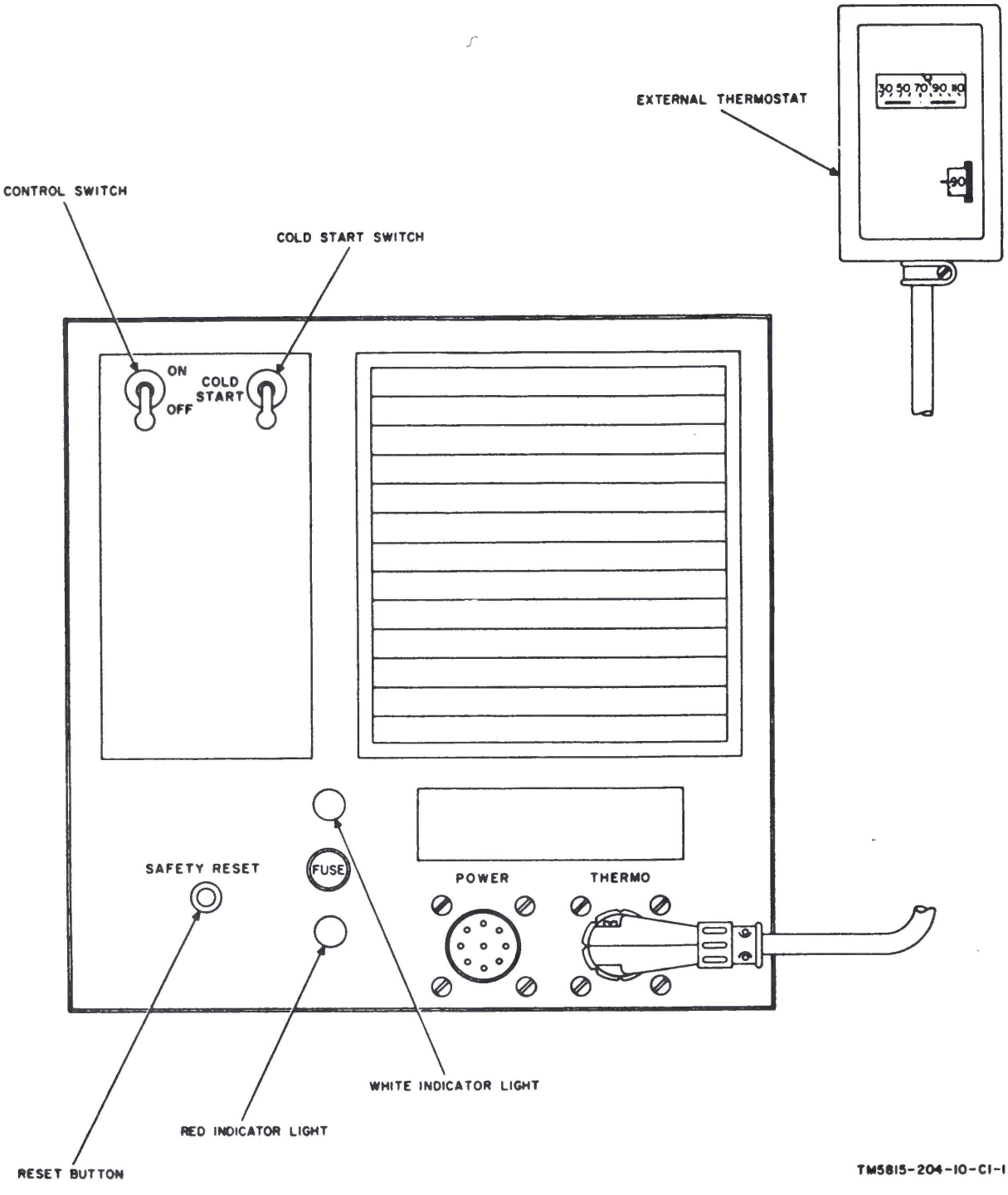


Figure 12. Heater controls, AN/GRC-46B.

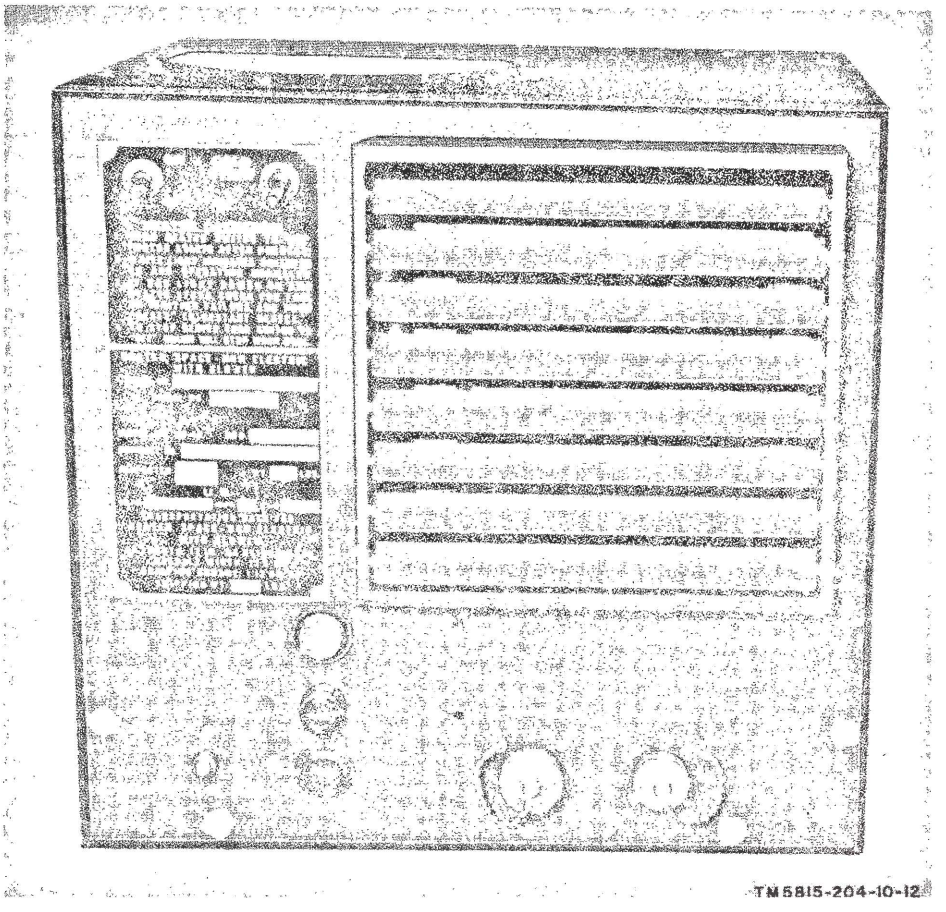


Figure 13. Heater, AN/GRC–46B.

23. Heater Controls

a. The following table lists the controls of the heater (fig. 12) in the AN/GRC–46B and indicates their function:

Control	Function
CONTROL switch	In ON position, starts the heater; in OFF position, stops the heater.
COLD START switch ..	Manually operates the glow plug to preheat the burner head for extreme cold weather starting. This switch must be held in the ON position.
EXTERNAL THERMOSTAT.	Controls the heater to maintain a desired temperature.
RESET BUTTON	Manually closes the points of the thermal relay for purposes of checking the heater for momentary failure.
WHITE INDICATOR light.	Indicates heater is ON and operating normally.
RED INDICATOR light.	Indicates a malfunction has occurred and heater is OFF.
FUSE HOLDER	Contains a slow-blow, 5-ampere fuse which is connected between the power receptacle and CONTROL switch for protection of the heater.

b. The following table lists the controls of the heater (fig. 14) in the AN/GRC–46, and AN/GRC–46A and indicates their function:

Control	Function	
	Sw Pos	*Function*
ON-OFF-PRIME switch	ON	Starts the heater
	OFF	Stops the heater
	PRIME	Primes the heater
HEAT CONTROL thermostat.	Controls output of the heater. Pull out for maximum heat.	

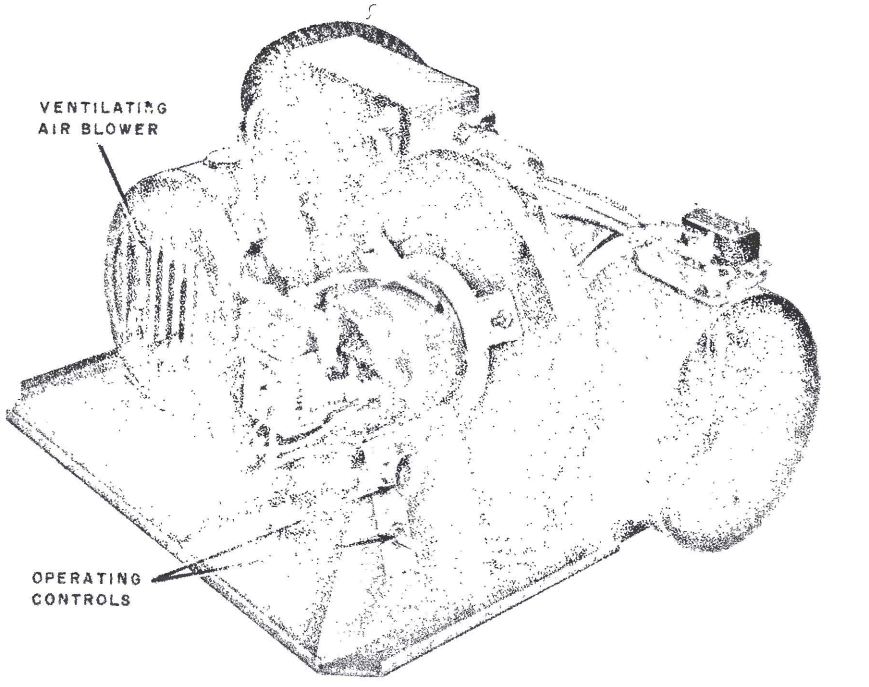


Figure 14. Heater controls, AN/GRC–46, and AN/GRC–46A.

Section II. OPERATION

24. Types of Operation

The AN/GRC–46(*) (AN/VRC–29) may be operated on either a one-way reversible basis or on a full duplex basis. Full duplex requires an additional antenna. The two modes of operation are described in *a* and *b below*. Operating procedures are covered in paragraphs 25 through 29.

a. One-Way Reversible. The RTT set is used with one whip antenna mounted on the vehicle. The transmitter and receiver do not operate at the same time. When the transmitter is on the air, the receiver is disabled: when the receiver is on the air, the transmitter is disabled. Transmission and reception may be done either on a single frequency or on two different frequencies. In this type of operation, a message typed on the page printer will be printed and perforated at the reperforator-transmitter and transmitted to a distant station via the transmitter; or, conversely, a message transmitted by a distant station may be received locally on the page printer and the reperforator-transmitter. A tape message, previously prepared on the reperforator-transmitter, may be used to transmit a message in place of the page printer.

Note. The black plug of reperforator-transmitter is not connected; therefore, its keyboard cannot be used for direct transmission.

b. Duplex Operation. With the use of two antennas (one for receiving and one for transmitting), the RTT set can be used for sending and receiving fsk transmission at the same time. The transmitter and receiver must be tuned at least 1 megacycle apart, and the antennas must be separated at least 50 feet to avoid blocking of the receiver when transmitting. For voice and cw operation, cabling changes which require higher echelon personnel are necessary. *In mobile use, duplex operation is not recommended.*

25. Preparation for Operation

Before the AN/GRC–46(*) is used for operation, preliminary adjustments on each component of the RTT set must be performed. Whenever the assigned operating frequency is changed from one of the transmitter preset channels, the transmitter calibrating and presetting procedures must be repeated; also, whenever the transmitter operating frequency is changed, the modulator BAND SELECTOR switch may have to be changed to correspond to the new frequency. The receiver must be tuned manually whenever the operating frequency is changed. For preliminary adjustments and testing procedures, and for the function of controls for the operating components of the RTT set, refer to the applicable technical manuals (appx I).

26. Preliminary Starting Procedure

Perform the preliminary operations listed below before starting the equipment (para 27).

Caution: **Do not operate the transmitter unless it is connected to the antenna or to a dummy antenna. Be sure that the air intake and air exhaust vents on the transmitter are open and free from obstructions.**

a. Preliminary Procedures.

(1) Start the vehicle engine; run it at a fast idle.

(2) Release the tiedown Rope RP–5 from the antenna. For best results, operate the antenna in a vertical position.

(3) Check to see that the braided ground strap, located on the outside rear bottom of the shelter, is connected to the vehicle frame.

(4) Set the junction box LIGHTS switch at ON. In the AN/GRC–46(*), the junction box LIGHTS switch is in series with the blackout switch (fig. 11). When the shelter door is open, the blackout switch must be in its lowest position for the lights to go on.

(5) Set the junction box BLOWER switch at ON. The blower motor will start, and the damper flap on the shelter will swing open freely.

b. Preliminary Setting of Controls. For all types of operation, set the front panel controls as indicated below.

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

Component	Control	Position
Radio Transmitter T–195(*)/GRC–19.	SERVICE SELECTOR switch	OFF.
	DIAL DIM switch	DIM or FULL, as desired.
	RELAY-NORMAL-DUPLEX switch	NORMAL.
	TEST METER	PA CATHODE.
	LINE LEVEL	+12.
	PRESET CHANNELS switch	Desired channel.
Radio Receiver R–392/URR	Function switch	OFF.
	BFO switch	OFF.
	BFO PITCH	0.
	AGC switch	ON.
	ANT TRIM	0.
	AF GAIN control	Center range.
	BAND WIDTH switch	4KC.
	DIAL DIM switch	DIM or ON, as desired.
	RF GAIN SQUELCH THRESH control	Extreme clockwise.
	DIAL LOCK	Unlocked.

Component	Control	Position
Modulator, Radio Transmitter MD-203/GR.	POWER switch	OFF.
Converter, Frequency Shift CV-278/GR.	POWER switch	OFF.
	SERVICE switch	MARK HOLD.
Interconnecting Box J-668/GR	MAIN POWER circuit breaker	OFF.
	TTY power switch	OFF.
	CRYPT switch	OFF.
	Function selector switch	BIAS 30MA.
Teletypewriter Set AN/UGC-4	POWER switch (located inside cover, right side rear).	OFF.
	MOTOR switch	OFF.
	LIGHT switch	OFF.
	SEND-LOCK switch	SEND.
Reperforator-Transmitter Teletypewriter TT-76(*)/GGC.	Distributer level	FEED-RETRACK.
	SELECTOR switch	3.
	POWER switch	OFF.
	LIGHT switch	OFF.
	MOTOR switch	OFF.
Teletypewriter shelf (fig. 1)	SEND-REC-MARK HOLD switch	MARK HOLD.

27. Starting Procedure

For all types of operation, start the equipment as follows:

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

28. Voice or Cw Operation

a. Refer to paragraph 26 of TM 11-5820-295-10 for voice operation instructions.

b. Refer to paragraph 27 of TM 11-5820-295-10 for cw operation instructions.

29. Frequency-Shift Keying (Radio Teletypewriter) Operation

Calibrate the receiver as indicated in TM 11–5820–334–10 and the transmitter as indicated in TM 11–806.

Note. Before calibrating the transmitter, set the modulator BAND SELECTOR switch to correspond to the operating frequency of the transmitter.

a. Reception.

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

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

b. Transmission.

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

c. Page Printer and Reperforator-Transmitter Operation. When the RTT set has been set up as described in *a* and *b* above, operate the page printer and reperforator-transmitter as follows:

(1) *Transmission on Teletypewriter Set AN/UGC–4.*

Unit	Control	Action
Teletypewriter shelf	SEND-REC-MARK HOLD switch	Place at SEND. The page printer is now ready to transmit radioteletype messages.

(2) *Punching tape using Teletypewriter Set AN/UGC–4 (no transmission).*

Unit	Control	Action
T–195(*)/GRC–19	SERVICE SELECTOR switch	Turn to STAND BY.
TT–76(*)/GGC	MOTOR switch	Place at ON.
	LIGHT switch	Place at ON.
	POWER switch	Place at ON.
	SEND-LOCK switch	Place at SEND.
	SELECTOR switch	Turn to position 1.
Typewriter shelf.	SEND-REC-MARK-HOLD switch	Place at SEND.
Transmitter-distributor	START-STOP lever	Place at STOP. The AN/UGC–4 is now ready for operation. The reperforator-transmitter will automatically punch the tape, which will feed out of the left-hand side of the machine.

(3) *Punching tape using reperforator-transmitter keyboard (no transmission).*

Unit	Control	Action
TT–76(*)/GGC	MOTOR switch	Place at ON.
	LIGHT switch	Place at ON.
	POWER switch	Place at ON.
	SEND-LOCK switch	Place at SEND.
	SELECTOR switch	Turn to position 3.
Typewriter shelf	SEND-REC-MARK HOLD switch	Place at MARK HOLD. The reperforator-transmitter is now ready for the operator to punch a new tape. *Note.* The END OF LINE INDICATOR will light after 65 characters have been typed on each line. This is a warning signal to press the CAR RET. LINE FEED and LTRS keys and continue typing.

(4) *Transmitting messages by tape.*

Unit	Control	Action
T–195(*)/GRC–19	SERVICE SELECTOR switch	TURN to VOICE/FSK
TT–76(*)/GGC	MOTOR switch	Place at ON.
	LIGHT switch	Place at ON.
	POWER switch	Place at ON.
	SEND-LOCK switch	Place at SEND.
	SELECTOR switch	Turn to position 2.
Teletypewriter shelf	SEND-REC-MARK HOLD switch	Place at SEND. Open the tape cover and insert the tape in the tape guide. Typed messages on the tape must be face up. The perforated holes in the tape must fit the cogs in the feed guide. The tape is now ready for transmission.
Transmitter-distributor	START-STOP lever	Place at START.

(5) *Transmitting from either page printer or reperforator-transmitter.* Place the SEND-REC-MARK HOLD switch (fig. 1) at SEND. The page printer and the reperforator-transmitter may be operated to transmit from either page printer keyboard or the reperforator transmitter-distributor (tape). The teletypewriter receiver will print copies of the message being transmitted. Voice transmission is also available.

(6) *Reception with either page printer or reperforator-transmitter.* Place the SEND-REC-MARK HOLD switch at REC. The page printer and reperforator-transmitter are able to receive teletypewriter messages and will make page and tape copies of the messages. Voice reception is also available (para 28).

Note. For normal operation (starting, testing, and stopping procedures) of the page printer and reperforator-transmitter, refer to TM 11-2225.

30. Antijamming

When it is known that the receiver is being jammed, the operator will notify the immediate superior officer immediately and continue to operate the equipment. To provide maximum intelligibility of jammed signals, follow the operational procedure described in TM 11-5820-334-10.

31. Stopping Procedure

In an emergency, the entire RTT set may be shut down by placing the junction box MAIN POWER switch in the OFF position. To shut down the RTT set under normal conditions, proceed as follows:

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

CHAPTER 3

MAINTENANCE INSTRUCTIONS

32. Scope of Operator's Maintenance

a. The maintenance duties normally performed by the operator of the RTT set are listed in *b* below. These procedures do not require special tools or test equipment.

b. Operator's maintenance for the RTT set consists of the following:

(1) Preventive maintenance (para 33).
(2) Replacement of the paper and ribbons in the teletypewriter. (Refer to TM 11–2225).
(3) Checking condition of power cords and seating of connectors (para 34).
(4) Emptying chad container. (See TM 11–2225).
(5) Operational checklist (para 35*c*).

c. Operator's maintenance (including preventive maintenance) for the page printer, reperforator-transmitter, receiver, and transmitter is prescribed in the applicable technical manual (app I).

33. Preventive Maintenance

a. DA Form 11–238. DA Form 11–238 (fig. 15) is a preventive maintenance checklist to be used by the operator. Items not applicable to the RTT set are lined out in the figure. Reference in the ITEM block in the figure are to paragraphs that contain additional information pertinent to the particular item.

b. Items. The information contained in the chart below is supplementary to DA Form 11–238. The item numbers correspond to the ITEM numbers on the form.

Item	Procedures
2	If necessary, wet a cloth with Cleaning Compound (Federal stock No. 7930–395–9542) and then wipe the parts with a dry clean cloth.
3	All control knobs should work smoothly, be tight on the shaft, and should not bind.
7	Inspect the signal lines and power cords; eliminate any sharp bends or severe twists; examine the insulation for dry rot, cuts, breaks, or fraying.
11	Check the air filter to be sure that it is clean and that air is moving through it.

Warning: **Cleaning compound is flammable and its fumes are toxic. Do not use near a flame; provide adequate ventilation.**

34. Visual Inspection

a. When the equipment fails to perform properly, place the junction box MAIN POWER switch in the OFF position and check the items listed below.

(1) Improper setting of switches and controls.
(2) Power cable connectors worn, broken, or loose. Headset or loudspeaker cord, telegraph key, or antenna lead-in wire improperly connected or seated. Hand-tighten all connectors.
(3) Grounded or broken antenna.

b. Turn the MAIN POWER switch to ON and check the input voltage. The DC VOLTS meter, located on the junction box, should indicate between 27.5 and 28 volts.

35. Operational Checklist

a. General. The operational checklist will help the operator locate trouble quickly. The corrective measures are to be used to repair this trouble. If the corrective measures suggested do not restore normal equipment performance, troubleshooting at a higher echelon is necessary. Note on the repair tag what corrective measures were taken and how the equipment performed at the time of failure.

Note. Complete operational checklists for the page printer and reperforator-transmitter are given in their respective manuals (TM 11–2225 and TM 11–5815–200–10).

b. Procedure. Operate the controls of the RTT set to the preliminary starting positions (para 26). Perform the steps shown in *c* below, in the order given. Observe the equipment operation and perform any corrective measures necessary. After starting a unit, allow it to warm up for 5 minutes before observing the equipment operation. If the corrective measures given does not correct the fault, higher echelon maintenance is required. If the procedure calls for the replacement of a fuse and the replacement fuse blows out, higher echelon maintenance is required.

Caution: **Do not replace any fuses with other than the required rating. Damage to the equipment may result.**

LEGEND for marking conditions:
Satisfactory, ✓.
Adjustment, Repair or Replacement required, X.
Defect corrected, (X).

DAILY CONDITION FOR MONTH OF AUGUST 1960

NO.	DAILY ITEM	1 TC 17	2 TC 18	3 TC 19	4 TC 20	5 TC 21	6 TC 22	7 TC 23	8 24	9 25	10 26	11 27	12 28	13 29	14 30	15 31	16	2D 3D ECHELON
1.	COMPLETENESS AND GENERAL CONDITION OF EQUIPMENT. ~~(Transmitter, receiver, carrying cases,~~ wire, cables, microphones, tubes, spare parts, technical manuals).	✓	✓	✓	✓	✓	✓	✓										
2.	CLEAN DIRT AND MOISTURE FROM ANTENNA, MICROPHONES, HEADSETS, KEYS, JACKS, PLUGS, COMPONENT PANELS. PARA 33b(2)	✓	✓	✓	✓	✓	✓	✓										
3	INSPECT CONTROLS FOR NORMAL OPERATION. TAP CONTROLS LIGHTLY FOR EVIDENCE OF CUT-OUT FROM LOOSE CONTACTS. PARA 33b(3)	✓	(X)	✓	✓	✓	✓	✓										
4.	CHECK FOR NORMAL OPERATION OF EQUIPMENT. BE ALERT FOR UNUSUAL OPERATION OR CONDITION.	✓	✓	✓	(X)	✓	✓	✓										

WEEKLY	CONDITION EACH WEEK 1ST	2D	3D	4TH	5TH	2D 3D ECH
5. CLEAN AND TIGHTEN EXTERIORS OF CASES, RACKS, MOUNTS, TRANSMISSION LINES.	✓					
6. INSPECT CASES, MOUNTS, ANTENNA ~~TOWERS~~ AND EXPOSED METAL SURFACES FOR RUST, CORROSION.	✓					
7. INSPECT CORDS, CABLE, WIRE, SHOCK MOUNTS FOR CUTS, KINKS, BREAKS, FRAYING, UNDUE STRAIN. PARA 33b(7)	✓					
8. CHECK ANTENNA ~~GUY WIRES~~ FOR ~~PROPER TENSION OR~~ DAMAGE.	✓					
9. ~~INSPECT CANVAS AND LEATHER ITEMS FOR MILDEW, TEARS, FRAYING.~~						
10. INSPECT ACCESSIBLE ITEMS FOR LOOSENESS: SWITCHES, KNOBS, JACKS, CONNECTORS, ~~RELAYS, TRANSFORMERS~~, MOTORS, PILOT LIGHTS, BLOWERS, ETC.	(X)					
11. CLEAN AND/OR INSPECT AIR FILTERS, BRASS NAME PLATES, DIAL AND METER WINDOWS. PARA 33b(11)	✓					
12. ~~INSPECT STORAGE BATTERIES FOR DIRT, LOOSE TERMINALS, SPECIFIC GRAVITY, DAMAGED CASES. INSPECT DRY BATTERIES FOR LEAKAGE.~~						

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
13 ~~INSPECT SHELTERS AND COVERS FOR ADEQUACY OF WEATHER PROOFING, TEARS, FRAYING.~~	
14. ~~CHECK TERMINAL BOX COVERS FOR CRACKS, DIRT, LEAKS, DAMAGED GASKETS, GREASE.~~	

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
15. ~~INSPECT SEATING OF READILY ACCESSIBLE PLUG-OUT ITEMS: TUBES, LAMPS, FUSES, CRYSTALS, CONNECTORS, VIBRATORS, PLUG-IN COILS.~~	
16. ~~INSPECT RELAYS AND CIRCUIT BREAKERS FOR LOOSE MOUNTINGS, BAD CONTACTS, MIS-ALINEMENT OF CONTACTS AND SPRINGS, PROPER SPRING TENSION.~~	
17. ~~INSPECT VARIABLE CAPACITORS FOR DIRT, MIS-ALINEMENT OF PLATES, LOOSE MOUNTINGS, MOISTURE.~~	
18. ~~INSPECT RESISTORS, BUSHINGS AND INSULATORS FOR CRACKS, CHIPPING, BLISTERING, MOISTURE, DISCOLORATION.~~	
19. ~~CLEAN AND TIGHTEN SWITCHES, TERMINAL BLOCKS, BLOWERS, RELAY CASES AND INTERIORS OF CHASSIS AND CABINETS NOT READILY ACCESSIBLE.~~	
20. ~~INSPECT TERMINAL BLOCKS FOR LOOSE CONNECTIONS, CRACKS AND BREAKS.~~	
21. ~~INSPECT TERMINALS OF LARGE FIXED CAPACITORS AND RESISTORS FOR DIRT, CORROSION, LOOSE CONTACTS.~~	
22. ~~INSPECT TRANSFORMERS, CHOKES, POTENTIOMETERS AND RHEOSTATS FOR OVERHEATING AND OIL LEAKAGE.~~	
23. ~~INSPECT GENERATORS, AMPLIDYNES, DYNAMOTORS FOR BRUSH WEAR, SPRING TENSION, ARCING AND FITTING OF COMMUTATOR.~~	
24. ~~INSPECT CATHODE RAY TUBES FOR BURNT SCREEN SPOTS.~~	
25. ~~INSPECT WATERPROOF GASKETS FOR LEAKS, WORN OR LOOSE PARTS.~~	

CONTINUED ON PAGE 4

2 3

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Figure 15. DA Form 11-238.

c. Operational Checklist.

Action	Normal indication	Corrective measure
1. Set *junction box* LIGHTS switch at ON.	Lights go on	Be sure shelter door is closed or blackout switch is at ON (para 22). Check junction box 10 AMP fuse and lamps by substitution. Check seating of plug in junction box LIGHTS receptacle and condition of associated cabling.
2. Set *junction box* BLOWER switch at ON.	Blower starts	If lights do not go on or are not used, check junction box fuse F1 (10 AMP). If lights are on, check seating of plug in junction box BLOWER receptacle. If turning BLOWER switch to ON burns out 10 AMP fuse, higher echelon repair is required. *Note.* In an emergency, the equipment may be operated with the BLOWER switch at OFF. Be sure to leave shelter doors and windows open for adequate ventilation.
3. Set *junction box* MAIN POWER circuit breakers at ON. *Note.* Prior to this step, be sure vehicle engine is running at a fast idle.	DC VOLTS meter indicates 27.5 volts.	Check plug in POWER INPUT 27.5V connector and ground terminal for proper seating. If circuit breaker will not remain at ON, higher echelon repair is required.
4. Turn *transmitter* SERVICE SELECTOR switch to CALIB and TEST METER switch to BATT.	Transmitter test meter indicates at midpoint of BATTERY scale.	Higher echelon repair required.
	Dynamotor starts within 40 seconds on unlettered model. *Note.* Refer to step 10 to check lettered models of transmitter.	Check dynamotor fuse on front panel of transmitter. Higher echelon repair required.
5. Turn *receiver* function switch to STAND BY.	Dial lamps light	Check the seating of cables on receiver front panel. Check LINE 5 AMP fuse on receiver front panel.
6. Turn *modulator* POWER switch to ON.	Indicator lamp lights	Check the seating of 27.5 VOLTS DC connector on modulator front panel and MD–203 connector on junction box.
7. Turn *modulator* BAND SELECTOR switch to correspond to the *transmitter* operating frequency.		
8. Turn *frequency-shift converter* POWER switch to ON and SERVICE switch to MARK HOLD.	Power indicator lamp lights	Check frequency-shift converter 3 AMP fuse. Check the seating of frequency-shift converter 27.5 VOLTS DC connector and junction box connector CV–278/GR.
9. Turn *transmitter* TEST METER switch to PA GRID.		

Action	Normal indication	Corrective measure
10. Turn *transmitter* PRESET CHANNELS switch to 1 through 7, then to desired channel number. For each position, momentarily hold the *transmitter* TEST KEY in the ON position.	Test meter indicates within the shaded area marked PA GRID.	Check modulator MO INPUT and FSK OUTPUT and transmitter FSK IN and MO OUT connectors for proper seating. Higher echelon repair required.
11. Turn *transmitter* SERVICE SELECTOR switch to CW. Turn *transmitter* TEST METER switch to PA CATH.	Dynamotor starts within 10 seconds. Test meter indicates in the shaded area marked PA CATHODE.	Higher echelon repair required.
12. Hold *transmitter* TEST KEY at ON.	TUNING INDICATOR stays lit after a slight delay of not longer than 30 seconds.	Check antenna and ground connections.
	Test meter indicates in the shaded area marked PA CATHODE.	Higher echelon repair required.
	400-cycle sidetone signal can be heard in headset.	Check headset and cord, or loudspeaker and cord, whichever is used.
13. Release *transmitter* TEST KEY from the ON position.	TUNING INDICATOR is not lit. Test meter reads zero. The 400-cycle sidetone signal is not heard in headset.	Higher echelon repair required.
14. If cw transmission is desired, remove microphone and cable from the AUDIO receptacle. Connect telegraph key and cable to the AUDIO receptacle. Hold telegraph key closed. If cw transmission is not desired, omit steps 14, 15, and 16.	Test meter indicates within the shaded area marked PA CATHODE. TUNING INDICATOR stays lit. The 400-cycle sidetone signal is heard in the headset.	Higher echelon repair required.
15. Release the telegraph key.		
16. Turn the *transmitter* SERVICE SELECTOR switch to STAND BY.	The dynamotors stop. The TUNING INDICATOR is not lit. Nothing is heard in the headset. The dial lamps are lit.	Higher echelon repair required.
17. Turn the *transmitter* SERVICE SELECTOR switch to VOICE/FSK.	The dynamotor does not start (unlettered model). The TUNING INDICATOR is not lit. The test meter reads zero.	Higher echelon repair required.
18. If telegraph key is connected to AUDIO connector, replace it with the microphone and cable. Press microphone switch and talk into the microphone. Speak normally and hold microphone about 2 inches from the lips.	The dynamotor starts when the microphone button is depressed. The TUNING INDICATOR stays lit. The test meter indicates in the shaded area marked PA CATHODE, and the pointer moves slightly while the operator is talking. The audio level meter on the transmitter indicates about 100 (on the peaks). Voice sidetone signal is heard in the headset or loudspeaker.	Check transmitter AUDIO cable connector for proper seating. Check the microphone and cord.

Action	Normal indication	Corrective measure
19. Release microphone button. Turn *transmitter* SERVICE SELECTOR switch to STAND BY.	The dynamotor stops. The dial lamps stay lit.	Higher echelon repair required.
20. Turn *transmitter* DIAL DIM switch to OFF.	The dial lamps are not lit	Higher echelon repair required.
21. Turn *transmitter* DIAL DIM switch to DIM.	The dial lamps light dimly	Higher echelon repair required.
22. Turn *transmitter* DIAL DIM switch to FULL.	The dial lamps light fully	Higher echelon repair required.
23. Turn *receiver* function switch to NORMAL. Tune the *receiver* MEGACYCLES and KILOCYCLES controls to receive a voice signal.	A signal or a rushing noise is heard in the headset or loudspeaker, until a signal is heard. The CARRIER LEVEL meter may show the strength of the received signal or noise.	If the signal cannot be received, check the transmitter and antenna connections. Check the seating of the cable connectors between the receiver and transmitter. If the CARRIER LEVEL meter does deflect, check the headset or loudspeaker and its connections.
24. Turn the AF GAIN control of the *receiver* through the entire range.	The signal heard in the headset or loudspeaker becomes louder as the control is turned clockwise.	Higher echelon repair required.
25. Turn the *receiver* ANT TRIM control through the entire range.	If a carrier of sufficient strength is being received, the CARRIER LEVEL meter shows increasing and decreasing signal strength.	Higher echelon repair required.
26. Adjust ANT TRIM control for maximum signal strength.	CARRIER LEVEL meter indicates maximum signal strength.	Higher echelon repair required.
27. Turn the *receiver* BAND WIDTH switch from 8KC to 4KC to 2KC.	The selectivity becomes sharper; this is indicated by less background noise in 4KC position and the least background noise in 2KC position.	Higher echelon repair required.
28. Turn the *receiver* function switch to LIMITER.	If noise or static is being received, the noise peaks are reduced in strength.	Higher echelon repair required.
29. Hold the *transmitter* TEST KEY at ON.	The receiver is silenced; nothing is heard in headset.	Higher echelon repair required.
30. Release *transmitter* TEST KEY from ON.	The signal is heard in headset or loudspeaker.	Higher echelon repair required.
31. Turn *receiver* function switch to SQ, adjust KILOCYCLES control so that only noise (without a signal) is heard. Adjust RF GAIN control slowly counterclockwise until the background noise stops. Turn KILOCYCLES control through the entire range.	There is no noise as receiver is tuned between stations. When listening to voice-operated stations, receiver is quieted between transmissions.	Check the setting of RF GAIN control.
32. Turn *receiver* function switch to NORMAL.		

Action	Normal indication	Corrective measure
33. Turn *receiver* BFO switch to ON and adjust KILOCYCLES control until a cw signal is heard in headset.	Clear, sharp cw signals are heard in headset.	Higher echelon repair required.
34. Turn *receiver* BFO PITCH control through the entire range.	The tone of the cw signal changes.	Higher echelon repair required.
35. Turn *receiver* AGC switch to CAL and turn KILOCYCLES control through the entire range.	A beat note is heard in headset, and CARRIER LEVEL meter pointer moves at every 100-kc point on the frequency indicator.	If beat note is heard but not the 100-kc points, recalibrate receiver (TM 11–5820–334–10). If beat note is not heard at any point, higher echelon repair is required.
36. Turn *receiver* DIAL DIM switch to OFF.	Dial lamps are not lit	Higher echelon repair required.
37. Turn *receiver* DIAL DIM switch to midposition.	Dial lamps light dimly	Higher echelon repair required.
38. Turn *receiver* DIAL DIM switch to ON.	Dial lamps light fully	Higher echelon repair required.
39. Turn *receiver* function switch to STAND BY.	The receiver is silenced. Dial lamps stay lit.	Higher echelon repair required.
40. Turn *receiver* function switch to NORMAL.		
41. Tune *receiver* to a fsk transmission.	Frequency-shift converter SIGNAL INPUT meter indicates at least 5.	Check setting of RF GAIN control; if no indication, check receiver IF OUT cable connectors for proper seating.
42. Tune *receiver* KILOCYCLES control until *frequency-shift converter* DISCRIMINATOR meter oscillates around zero on the scale.	Associated page printer does not print. Discriminator needle oscillates around zero.	Higher echelon repair required.
43. Set *junction box* TTY switch at ON.	Rotary converter starts	Remove junction box (fig. 5) protective cover marked FUSES, ROTARY CONVERTER and check fuse (30 AMP) beneath TTY switch. Check seating of cable connector in the ROTARY CONVERTER POWER INPUT TTY receptacle on junction box; check condition of associated cabling.
44. Set *page printer* POWER switch at ON.		
45. Set *page printer* LIGHTS switch at ON.	Lamp lights	Check lamp (under the dust cover of page printer).
46. Set *page printer* MOTOR switch at ON.	Motor starts	Check seating of cable in 120 VAC receptacle of rotary converter.
47. Set *page printer* SEND-LOCK switch at SEND.		Higher echelon repair required.
48. Set *reperforator-transmitter* POWER switch at ON.		

Action	Normal indication	Corrective measure
49. Set *reperforator-transmitter* LIGHT switch at ON.	Copylight lights	Check lamp (under the dust cover of the reperforator-transmitter).
50. Set *reperforator-transmitter* MOTOR switch at ON.	Motor starts	Check seating of 120 VAC receptacle of rotary converter.
51. Turn *frequency-shift converter* SERVICE switch to NOR.	Discriminator needle oscillates around 0.	Higher echelon repair required.
52. Turn *remote* SEND-REC-MARK HOLD switch to REC.	Page printer prints accurate copy in either the NOR or REV position of the frequency-shift converter service switch. Page printer prints garbled copy in other position.	Check seating of cable connector in frequency-shift converter PRINTER receptacle and junction box cable connector in TTY SIGNAL LINES, located on right side of junction box.
	Note. Not all fsk transmissions are 60 WPM and plain text. If they are not, the page printer will print garbled copy.	Higher echelon repair required.
53. Turn *frequency-shift converter* SERVICE switch to NOR. Have operator of distant station transmit a steady mark signal to your equipment.	DISCRIMINATOR needle holds at right-hand four-division mark.	Higher echelon repair required.
54. Turn *frequency-shift converter* SERVICE switch to REV.	DISCRIMINATOR needle holds at left-hand four-division mark.	Higher echelon repair required.
55. Turn *frequency-shift converter* SERVICE switch to NOR. Have operator at distant station transmit a steady space signal to your equipment.	DISCRIMINATOR needle holds at left-hand four-division mark.	Higher echelon repair required.
56. Turn *frequency-shift converter* SERVICE switch to REV.	DISCRIMINATOR needle holds at right-hand four-division mark.	Higher echelon repair required.
57. Turn *frequency-shift converter* SERVICE switch to NOR.		
58. Turn SEND-REC-MARK HOLD (fig. 1) switch to SEND.	High-voltage dynamotor in unlettered models of the transmitter starts.	
59. Type at least five consecutive copies of a test message on page printer.	Page printer runs closed (quiet) on a steady marking when not sending or receiving. Distant station receives good copy.	Check line cords and plugs.
60. Turn *reperforator-transmitter* SELECTOR switch to position 2. Place prepared tape in transmitter-distributor and place START-STOP lever at START.	Equipment transmits from prepared tape. When page printer is on, home copy of transmitted tape message is made.	Higher echelon repair required.
61. Turn *reperforator-transmitter* SELECTOR switch to position 1.	A duplicate tape is punched when transmitting from a prepared tape. A home copy of transmitted message is made.	Higher echelon repair required.
62. Press *reperforator-transmitter* BREAK switch.	The reperforator-transmitter runs open. Paper tape feeds.	Higher echelon repair required.

Action	Normal indication	Corrective measure
63. Have distant operator send a test message. Place SEND-REC-MARK HOLD (fig. 1) switch at REC.	Page printer prints legible copy. Inking ribbon feeds as every character is typed.	Higher echelon repair required.
64. Set SEND-REC-MARK HOLD switch at SEND. Send continuous R's and Y's with *reperforator-transmitter* keyboard.	Code is punched correctly	Higher echelon repair required.
65. Turn SELECTOR switch to position 3.		
66. Move *reperforator-transmitter* manual feedout lever to left.	Paper tape feeds out. BLANK symbol prints on paper tape.	Higher echelon repair required.
67. Press *reperforator-transmitter* keyboard S key with unit shifted to figures position.	Signal bell rings	Higher echelon repair required.
68. Operate *reperforator-transmitter* backspace lever.	Paper tape back spaces one space for each operation.	Higher echelon repair required.
69. Turn SELECTOR switch to position 1.		
70. Set *reperforator-transmitter* SEND-LOCK switch at LOCK.	No transmission possible from transmitter keyboard.	Higher echelon repair required.
71. Place a test paper tape in transmitter-distributer of the *reperforator-transmitter*. Set START-STOP lever at START.	Transmitter-distributor transmits from tape.	Higher echelon repair required.
72. Set SEND-REC-MARK HOLD (fig. 1) switch at MARK HOLD.		
73. Shut down equipment as outlined in paragraph 31.		

CHAPTER 4

MATERIAL USED IN CONJUNCTION WITH RTT SET

36. Purpose of Auxiliary Equipment

a. General. Although it is possible to operate Radio Teletypewriter Sets AN/GRC–46(*) and AN/VRC–29 locally, tactical considerations often make it necessary to install the RTT set in one location and to control part of the operation from a more protected and remote location. The remote control equipment which may be used with the AN/GRC–46(*) and AN/VRC–29 installations is described in *b* below. (For detailed instructions concerning the auxiliary equipment necessary to operate Radio Set AN/GRC–19 remotely, refer to TM 11–5820–295–10).

b. Auxiliary Equipment Needed. The following additional items are required when it is desired to operate a remote page printer in conjunction with the RTT set.

Number required	Item
1	Teletypewriter Set AN/UGC–4
1	Four-conductor telephone cable, maximum length 5,280 feet, color-coded leads, if possible.
1	Double-pole, three-position switch (SEND-REC-MARK HOLD switch or equivalent).

37. Operation of Teletypewriter Set AN/UGC–4 From Remote Site

a. General. In addition to the page printer already installed in the RTT set (local site), a page printer can be operated from any remote control point (remote site) up to 1 mile from the RTT set. Although the remote cable adds resistance to the page printer line circuit, the remote function is the same as the normal circuit function for the page printer at the local site, except that the remote site is an extension of the junction box wiring and SEND-REC-MARK HOLD switch. The installation is done by higher echelon personnel.

b. Preparation for Operation. Preoperational setup is as follows:

Site	Unit	Control	Action
Local	J–668/GR	LINE 60 MA control	Turn fully counterclockwise.
Remote	AN/UGC–4	DC POWER switch	Place at OFF.
		LINE SELECTOR switch	Turn to 60.
		LINE CURRENT control	Turn fully clockwise.
		MOTOR switch	Place at OFF.
		LIGHT switch	Place at OFF.
		SEND-LOCK switch	Place at SEND.
		POWER switch	Place at OFF.
	Teletypewriter shelf	SEND-REC-MARK HOLD switch ..	Place at REC.

c. Operational Procedure. Follow the instructions given in *b* above and paragraph 29. Both page printers and the reperforator-transmitter are now in the same loop, but the page printer at the remote site is not operational.

Site	Unit	Control	Action
Remote	AN/UGC–4	MOTOR switch	Place at ON.
		LIGHT switch	Place at ON.
		POWER switch	Place at ON.
		DC POWER switch	Place at ON.

Site	Unit	Control	Action
Local	J–668/GR	Function selector switch	Place at LINE 60 MA. The DC MILLIAMPERES meter should read 60 ma; if not, proceed as follows:
		LINE 60 MA control	Adjust, so that the reading on the DC MILLIAMPERES meter indicates 60 ma. This will give the local site position over the loop current.
Remote	Teletypewriter shelf	SEND-REC-MARK HOLD switch ..	Place at MARK HOLD.

d. Mode of Operation. When the operational procedures (*c* above) have been completed, the system is now ready for teletypewriter operation from either the local or the remote site; both SEND-REC-MARK HOLD switches must be operated as shown below for the desired mode of operation.

Mode of operation	Position of SEND-REC-MARK HOLD switch	
	At local site	At remote site
Transmission between local and remote site (no on-the-air transmission)	MARK HOLD	MARK HOLD
Teletypewriter transmission from remote site (on-the-air transmission)	SEND	REC
Teletypewriter transmission from remote site (on-the-air transmission)	REC	SEND

e. Stopping Procedure (Remote Page Printer). Stop the remote page printer and close it to traffic by placing the remote page printer MOTOR, LIGHT, and POWER switches at OFF.

CHAPTER 5

SHIPMENT AND LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE

38. Disassembly of Equipment

The following instructions are recommended as a guide for preparing Radio Teletypewriter Sets AN/GRC–46(*) and AN/VRC–29 for shipment and storage:

a. Turn all power switches OFF.

b. Remove the main power cable from the vehicle battery and pull it into the shelter; replace the cap on the opening.

c. Tighten all the shock mounts and equipment mounting bolts.

d. Remove the whip antenna sections, rope, mast base, antenna lead, and mast base bracket, and store them in the shelter.

e. Remove the ground strap and store it in the shelter.

f. Empty the chad cup.

g. Turn the two captive hooks to lock the carriage in Teletypewriter Set AN/UGC–4. Refer to TM 11–5815–200–10.

h. Store the microphone, loudspeaker, and headset in the storage box.

i. Move the ceiling lights away from the equipment.

j. See that the table slides are in and locked.

k. Lift the operator's seats to the locked position.

l. Drain the fuel tank and install it on the inside of the shelter door. Fasten the end of the fuel line on the dummy fitting.

m. Tighten all cable connectors and secure loose cables to prevent vibration.

n. Pack all loose items in the storage box to prevent movement.

o. Close all the windows. Pull the blackout covers over the windows.

p. Remove the holddown bars from the truck and secure them.

q. Close the door and lock it with the padlock.

Note. For Radio Teletypewriter Set AN/VRC–29 perform the instructions in *a.* through *i.* and *k.* through *n.* above.

39. Authority for Demolition

Demolition of the equipment will be accomplished only upon the order of the commander. The destruction procedures outlined in paragraph 40 will be used to prevent further use of the equipment.

40. Methods of Destruction

Use the following methods to destroy the equipment:

a. Smash. Smash the interior units of the RTT set and all controls, tubes, coils, switches, capacitors, transformers, and meters; use sledges, axes, handaxes, pickaxes, and any other heavy tools available to smash the units of the RTT set. Use the heaviest tool on hand to smash the clock, the meters, the knobs, the dials, the loudspeaker, page printer, and reperforator-transmitter.

Note. Heavy tools will effectively damage the external parts mentioned in *a* above, but the remainder of the exposed surfaces of the equipment are constructed of pressed steel. Attempts to damage them by smashing will be useless.

b. Cut. Cut cabling, cording, and wiring; use axes, handaxes, machetes, and similar tools. Use a heavy axe or machete to cut the power cables. Cut all cords and cables in a number of places.

c. Burn. Burn as much of the equipment as is flammable; use gasoline, oil, flamethrowers, and similar tools. Burn the instructional literature first. Pour gasoline on the cut cables and ignite it. Burn spare parts; use a flamethrower or gasoline. Use incendiary grenades to complete the destruction of the unit interiors.

***Warning:* Be extremely careful with explosives and incendiary devices. Use these items only when the need is urgent.**

d. Explode.

(1) Use explosives to complete demolition or to cause maximum damage, before burning, when time does not permit complete demolition by other means. Powder charges, fragmentation grenades, or incendiary grenades may be

used. Incendiary grenades usually are most effective if destruction of small parts and wiring is desired.

(2) For quick destruction of Radio Teletypewriter Set AN/GRC–46(*), place an incendiary or fragmentation grenade in the unit. Get away from the unit after the grenade is placed.

e. Dispose. Bury or scatter destroyed parts or throw them into nearby waterways. This is particularly important if a number of parts have not been completely destroyed.

APPENDIX I

REFERENCES

Following is a list of applicable references that are available to the operator of Radio Teletypewriter Sets AN/GRC–46(*) and AN/VRC–29:

SIG 7 & 8	Microphone M–29/U; M–29A/U.
TM 11–806	Radio Transmitters T–195/GRC–19 and T–195A/GRC–19.
TM 11–2225	Teletypewriter Sets AN/GGC–3 and AN/GGC–3A, and Teletypewriter Reperforator-Transmitters TT–76/GGC, TT–76A/GGC, and TT–76B/GGC.
TM 11–5410–201–12P	Operator and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart: Shelter, Electrical Equipment S–89C/G.
TM 11–5805–210–10	Operator's Manual: Frequency Shift Converter CV–278/GR.
TM 11–5805–295–12P	Operator and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart: Mounting MT–791/U and MT–791A/U.
TM 11–5815–200–10	Operator's Manual: Teletypewriter Sets AN/FGC–20, AN/FGC–20X, AN/FGC–21, AN/UGC–4, and Teleprinter TT–259/AG.
TM 11–5815–200–12P	Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart: Teletypewriter Set AN/FGC–20, AN/FGC–20X, AN/FGC–21, and AN/UGC–4.
TM 11–5815–238–12P	Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Teletypewriter Set AN/GGC–3 and AN/GGC–3A.
TM 11–5820–205–10	Radio Transmitter Modulator MD–203/GR: Operator's Manual.
TM 11–5820–295–10	Radio Set AN/GRC–19.
TM 11–5820–295–10P	Operator Maintenance Repair Parts and Special Tools List: Radio Set AN/GRC–19.
TM 11–5820–334–10	Radio Receiver R–392/URR.
TM 11–5820–334–10P	Operator's Maintenance Repair Parts and Special Tools List: Receiver, Radio R–392/URR.
TM 11–5965–222–15P	Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Dynamic Loudspeaker LS–166/U.

APPENDIX II

BASIC ISSUE ITEMS LIST
RADIO TELETYPEWRITER SETS AN/GRC–46, AN/GRC–46A, AND AN/VRC–29

Section I. INTRODUCTION

1. Scope

a. This appendix lists items supplied for initial operation and for running spares. The list includes tools, accessories, parts, and material issued as part of the major end item. The list includes all items authorized for basic operator maintenance of the equipment. End items of equipment are issued on the basis of allowances prescribed in equipment authorization tables and other documents that are a basis for requisitioning.

b. The columns are as follows:

(1) *Source, maintenance, and recoverability code.* Not used.

(2) *Federal stock number.* This column lists the 11-digit Federal stock number.

(3) *Designation by model.* Not used.

(4) *Description.* Nomenclature or the standard item name and brief identifying data for each item are listed in this column. When requisitioning, enter the nomenclature and description on the requisition.

(5) *Unit of issue.* The unit of issue is the supply term by which the individual item is counted for procurement, storage, requisitioning, allowances, and issue purposes.

(6) *Expendability.* Expendable items are indicated by the letter X; nonexpendable items are indicated by NX.

(7) *Quantity authorized.* Under "Items Comprising an Operable Equipment," the column lists the quantity of items supplied for the initial operation of the equipment. Under "Running Spares and Accessory Items," the quantities listed are those issued initially with the equipment as spare parts. The quantities are authorized to be kept on hand by the operator for maintenance of the equipment.

(8) *Illustration.* The "Item No." column lists the figure number and the reference designations that appear on the part in the equipment. These same designations are also used on any illustrations of the equipment.

2. Critical Items

A zero slash (ϕ) in the "Description" column indicates items that are expected to fail during the first year; also items that will make the equipment inoperative if they fail.

Section II. FUNCTIONAL PARTS LIST

(1) SOURCE MAINTENANCE AND RECOVERABILITY CODE	(2) FEDERAL STOCK NUMBER	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPENDABILITY	(7) QUANTITY AUTHORIZED	(8) ILLUSTRATIONS FIGURE NO.	(9) ILLUSTRATIONS ITEM NO.
			ITEMS COMPRISING AN OPERABLE EQUIPMENT					
			RADIO TELETYPEWRITER SET AN/GRC-46 AN/GRC-46A AND AN/VRC-29					
	5815-543-1760		RADIO TELETYPEWRITER SET AN/GRC-46; AN/GRC-46A:	ea	NX			
	Order thru AGC		TECHNICAL MANUAL TM 11-5815-204-10	ea	X	2		
	5935-500-5967		ADAPTER, CONNECTOR: MIL type UG-306/U	ea	X	3		CP201 thru CP203
	5820-633-0344		ANTENNA MOUNTING ASSEMBLY: mts ant on shelter; includes plate, mtg plate bracket; SWED part 01X202755	ea	X	1		
	5820-678-6202		ANTENNA MOUNTING ASSEMBLY: c/o 4 ea plates; 1 ea bracket and receptacle assy; SWED part 01X204964 (Note: Used in AN/GRC-46 A only)	ea	X	1		
	5306-543-5898		BOLT, HOOK: retains hand microphone; SWED part 55P200400	ea	X	1		MP2
	6645-633-3597		BRACKET: mtg bracket f/clock; SWED part 07P200238	ea	X	1		MP1
	5995-577-8058		CABLE ASSEMBLY, POWER, ELECTRICAL CX-4539/U: 4 ft 9 in lg o/a	ea	X	1		W250
	5995-617-1868		CABLE ASSEMBLY, POWER, ELECTRICAL CX-4540/U: 3 ft 2 in lg o/a	ea	X	1		W209
	5995-617-0312		CABLE ASSEMBLY, POWER, ELECTRICAL CX-4540/U: 4 ft 6-1/4 in lg o/a	ea	X	1		W213
	5995-617-1871		CABLE ASSEMBLY, POWER, ELECTRICAL MX-4541/U: 6 ft 11 in lg o/a	ea	X	2		W221 W223
	5995-617-1869		CABLE ASSEMBLY, POWER, ELECTRICAL CX-4542/U: 8 ft 11 in lg o/a	ea	X	1		W229
	5995-617-0314		CABLE ASSEMBLY, POWER, ELECTRICAL CX-4543/U: 10 ft 3 in lg o/a	ea	X	1		W231
	5995-617-1870		CABLE ASSEMBLY, POWER, ELECTRICAL CX-4544/U: 12 ft 8 in lg o/a	ea	X	1		W233
	5995-617-0313		CABLE ASSEMBLY, POWER, ELECTRICAL CX-4545/U: 6 ft 5 in lg o/a	ea	X	1		W247
	5995-617-0346		CABLE ASSEMBLY, RADIO FREQUENCY: CG-530B/U: 2 ft 11 in lg o/a;	ea	X	2		W203 W205
	5995-617-1877		CABLE ASSEMBLY, RADIO FREQUENCY CG-1127/U: 2 ft 6 in lg o/a	ea	X	1		W211
	5995-617-1880		CABLE ASSEMBLY, RADIO FREQUENCY CG-409 C/U: 4 ft 3 in lg o/a;	ea	X	1		W207
	5995-617-1874		CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-4546/U: 3 ft 9 in lg o/a	ea	X	1		W201
	5995-617-1876		CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-4547/U: 5 ft 6 in lg o/a	ea	X	1		W215
	5995-682-3313		CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-4548/U: 5 ft 11 in lg o/a;	ea	X	2		W217 W227
	5995-617-1875		CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-4549/U: 4 ft 5 in lg o/a	ea	X	1		W219
	5995-617-1432		CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-4550/U: 7 ft 5 in lg o/a	ea	X	2		W225 W235
	5995-617-1434		CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-4551/U: 9 ft 3 in lg o/a;	ea	X	1		W237

(1) SOURCE MAINTENANCE AND RECOVERABILITY CODE	(2) FEDERAL STOCK NUMBER	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPENDABILITY	(7) QUANTITY AUTHORIZED	(8) ILLUSTRATIONS FIGURE NO	(9) ILLUSTRATIONS ITEM NO
			AN/GRC-46, AN/GRC-46A, AN/VRC-29 (continued)					
	5340-619-1353		CLAMP, LOOP: antenna rope clamp; 5/8 in w o/a; SWED part No. 42X200114	ea	X	1		
	6645-633-3824		CLOCK, AIRCRAFT, MECHANICAL: Longines-Wittnauer Watch Co Inc part No. A-11-63R 8-day manual winding type;	ea	NX	1		M1
	5815-543-1728		CONVERTER, FREQUENCY SHIFT CV-278/GR:	ea	NX	1		
	4140-624-4476		FAN, VENTILATING, PROPELLER: c/o 2 circulating fans, 1 dc motor, 1 screen (wire fabric) and housing; SWED part 01X202758	ea	NX	1		
	6210-633-6730		FIXTURE, LIGHTING: 250 v dc, 2.65 amp, 660 w; SWED part 09P202614	ea	X	1		MP15
	6210-633-6731		FIXTURE, LIGHTING: 250 v dc, 2.65 amp, 660 w; SWED part 09P202615	ea	X	1		MP16
	4520-690-2956		HEATER, INSTALLATION: SWED part 01X204966	ea	NX	1		
	5970-240-3845		INSULATOR, BUSHING: Sig Insulator IN-111	ea	X	1		
	5970-405-8971		INSULATOR, SPREADER: MIL type NS485224	ea	X	8		
	5815-615-9854		INTERCONNECTING BOX J-668/GR	ea	NX	1		
	6240-238-8515		LAMP, INCANDESCENT: 30 v, 25 w; GE part No. 25A30	ea	X	2		I1
	5965-243-6420		LOUDSPEAKER LS-166/U	ea	NX	1		
	5820-543-1672		MODULATOR, RADIO TRANSMITTER MD-203/GR	ea	NX	1		
	6125-617-1435		MOTOR-GENERATOR: 27.5 v input; 12-3/8 in lg x 6-1/2 in w x 9-3/8 in h; Wincharger part SS-688	ea	NX	2		
	5805-186-9464		MOUNTING MT-791/U; MT-791A/U:	ea	NX	2		
	5975-615-7302		RACK, ELECTRICAL EQUIPMENT: security equip rack f/AN/GRC-46; SWED part 01X200135	ea	X	1		
	5815-676-3417		RACK, ELECTRICAL EQUIPMENT: security equip rack f/AN/GRC-46A; SWED part 01X204922	ea	X	1		
	5975-615-7301		RACK, ELECTRICAL EQUIPMENT: 54 in lg x 26 in w x 27 in h o/a; SWED part 01X200496 (Note: Used in AN/GRC-46 only)	ea	X	1		
	5815-676-3418		RACK, ELECTRICAL EQUIPMENT: 54-3/8 in lg x 24-1/4 in w x 25-1/4 in h o/a; SWED part 01X204921 (Note: Used in AN/GRC-46A only	ea	X	1		
	5820-030-0155		RADIO SET AN/GRC-19	ea	NX	1		
	5820-030-2969		REEL RL-29	ea	NX	1		
	6210-633-6732		REFLECTOR, LIGHT: 6 in lg x 3-1/2 in w x 1-3/4 in h o/a; Hubbell part No. 5429P	ea	X	2		MP17 MP18
	5815-503-2760		REPERFORATOR-TRANSMITTER TELETYPEWRITER TT-76/GGC:	ea	NX	1		
	5975-615-7310		ROD, GROUND: 46-1/2 in lg x 1/2 in dia o/a; SWED part No. 47X200121	ea	X	1		
	5410-614-4668		SEAT, INDIVIDUAL: right hand seat; SWED part 01X200454-2	ea	NX	1		
	5410-633-3603		SEAT, INDIVIDUAL: rear seat; SWED part 01X200111	ea	NX	1		
	5410-633-3604		SEAT, INDIVIDUAL: left hand seat; SWED part 01X200454-1	ea	NX	1		
	5410-542-5868		SHELTER, ELECTRICAL EQUIPMENT S-89C/G: (Note: Used in AN/GRC-46 only)	ea	NX	1		
	5410-542-2532		SHELTER, ELECTRICAL EQUIPMENT S-144/G: (Modified) SWED part 01P204925 (Note: Used in AN/GRC-46A only)	ea	NX	1		

(1) SOURCE MAINTENANCE AND RECOVERABILITY CODE	(2) FEDERAL STOCK NUMBER	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPENDABILITY	(7) QUANTITY AUTHORIZED	(8) ILLUSTRATIONS FIGURE NO.	(9) ILLUSTRATIONS ITEM NO.
			AN/GRC-46, AN/GRC-46A, AN/VRC-29 (continued)					
	5930-630-0020		Ø SWITCH, LEVER: p/o sw and mtg bracket; irregular shape; SWED part 45P200383	ea	X	1		MP20
	5930-633-0350		SWITCH AND MOUNTING BRACKET: for lighting system interlock; SWED part No. 40X202664	ea	X	1		A2
	5815-557-5970		TELETYPEWRITER, SET AN/UGC-4:	ea	NX	1		
	5410-690-2957		VENTILATOR ASSEMBLY: f/filtered air vent; SWED part 01X204965 (Note: Used in AN/GRC-46A only)	ea	X	3		
	5820-633-3598		VENTILATOR KIT: f/Radio Transmitter T-195/GRC-19; SWED part 01X202756	ea	X	1		
	6145-617-0352		WIRE, ELECTRICAL: bare, 16 AWG; 7 strands, 24 AWG strands; MIL type C, class B (Note: To be requisitioned as required in minimum lengths of 250 ft or multiples thereof	ft	X	250		W1
	5410-542-5887		WIRE ROPE ASSEMBLY, SINGLE LEG: used f/lifting shelter; 10 ft lg SWED part 55X200417	ea	X	4		A7, A21 thru A23
			HEATER, INSTALLATION GROUP AN/GRC-46( ) only					
	4520-670-5659		ELECTRODE IGNITER: ignites fuel f/heater; SW, Southwind Div part 700808	ea	X	1		
	5920-284-6795		FUSE, CARTRIDGE: MIL type F04A10R0B	ea	X	1		
	4720-678-2262		HOSE, ASSEMBLY, METAL: rd; 1-3/8 in ID; Amer Brass part AMH-79701	ea	X	1		
	5430-580-6303		TANK, FUEL, SPACE HEATER: 1-1/2 gal cap; SWED part 01X200275	ea	X	1		MP10
	6130-659-1556		Ø VIBRATOR, INTERRUPTER: 24 v dc pwr output; Oak part 94-H	ea	X	1		G1
			SHELTER, ELECTRICAL EQUIPMENT GROUP AN/GRC-46( ) only					
	4210-223-9912		EXTINGUISHER, FIRE, CARBON DIOXIDE: 5 lb, squeeze grip type	ea	NX	1		
	5340-265-7690		PADLOCK: lock f/shelter door; Fed FF-P-101 Amend 1 type EPA	ea	X	1		
			INTERCONNECTING BOX J-668/GR MOTOR GENERATOR GROUP					
			BARE UNIT: for Interconnecting Box J-668/GRC	ea	NX	1		
	5920-577-6778		CAP, ELECTRICAL: Littlefuse part No. 342012-SA-2	ea	X	2		E11 E12
	5920-543-0425		FUSE, CARTRIDGE: 1/4 amp, 250 v; MIL type F02GR250B	ea	X	1		F2
	5920-284-6795		FUSE, CARTRIDGE: 10 amp, 32 v; MIL type F04A10R0B	ea	X	1		F1
	5920-552-0006		FUSE CARTRIDGE: 30 amp, 32 v; MIL type F05A30R0B	ea	X	2		F3 F4

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							FIGURE NO	ITEM NO
			AN/GRC-46, AN/GRC-46A, AN/VRC-29 (continued)					
	5945-615-1457		RELAY, ARMATURE: 2 wnd, dc, 160 ohm, 27.5 v; 3-1/32 in lg x 1-15/16 in dia o/a; SWED part No. 80P200049	ea	X	1		K1
	5945-615-7182		RELAY, ARMATURE: 1 wnd, dc, 2000 ohm, 27.5 v; 1-21/32 in lg x 1-7/16 in w x 2-23/32 in h; SWED part No. 80P200106	ea	X	1		K2
	5815-543-1758		RADIO TELETYPEWRITER SET AN/VRC-29:	ea	NX			
	Order thru AGC		TECHNICAL MANUAL TM11-5815-204-10	ea	X	2		
	5815-706-3051		BRACKET, ASSEMBLY (LEFT HAND): SWED part 07X202630	ea	X	1		MP16
	5815-706-3052		BRACKET ASSEMBLY (RIGHT HAND): SWED part 07X202629	ea	X	1		MP15
	5815-706-3053		BRACKET: equip stop bracket; SWED part 07P200478	ea	X	2		MP17 MP18
	5995-682-3315		CABLE ASSEMBLY, POWER, ELECTRICAL CX-4541/U: 3 ft 1 in lg o/a	ea	X	2		W221 W223
	5995-681-8589		CABLE ASSEMBLY, POWER, ELECTRICAL CX-4847/U: 1 ft 10 in lg o/a	ea	X	2		W209 W213
	5995-681-8584		CABLE ASSEMBLY, POWER, ELECTRICAL CX-4849/U: 6 ft 3 in lg o/a	ea	X	1		W229
	5995-681-8585		CABLE ASSEMBLY, POWER, ELECTRICAL CX-4850/U: 6 ft 5 in lg o/a	ea	X	1		W247
	5995-682-3319		CABLE ASSEMBLY, RADIO FREQUENCY CG-530B/U: 1 ft 5 in lg o/a	ea	X	2		W203 W205
	5995-682-3312		CABLE ASSEMBLY, RADIO FREQUENCY CG-1127/U: 1 ft 7 in lg o/a	ea	X	1		W211
	5995-681-8590		CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-4848/U: 3 ft 6 in lg o/a	ea	X	1		W215
	5815-707-2321		CABLE AND SWITCH ASSEMBLY SPECIAL PURPOSE: 4 ft 9 in lg o/a; SWED part 30X204981	ea	NX	1		W245
	5340-619-1353		CLAMP, LOOP: ant rope clamp; SWED part 42X200114	ea	X	1		
	5815-543-1728		CONVERTER, FREQUENCY SHIFT CV-278/GR:	ea	NX	1		
	5995-682-3314		CORD CG-409C/U: 3 ft 3 in lg o/a	ea	X	1		W207
	5995-682-3323		CORD ASSEMBLY, ELECTRICAL CX-4546/U: 6 ft 4 in lg o/a	ea	X	1		W201
	5995-682-3313		CORD ASSEMBLY, ELECTRICAL CX-4548/U: 5 ft 11 in lg o/a	ea	X	2		W217 W227
	5995-682-3309		CORD ASSEMBLY, ELECTRICAL CX-4549/U: 3 ft 3 in lg o/a	ea	X	1		W219
	5995-682-3311		CORD ASSEMBLY, ELECTRICAL CX-4551/U: 7 ft 5 in lg o/a	ea	X	1		W235
	5995-682-3316		CORD ASSEMBLY, ELECTRICAL CX-4551/U: 6 ft 4 in lg o/a	ea	X	1		W237
	5995-682-3317		CORD ASSEMBLY, ELECTRICAL CX-4551/U: 3 ft 4 in lg o/a	ea	X	1		W225
	5995-682-3318		CORD ASSEMBLY, ELECTRICAL CX-4854/U: 9 ft 1 in lg o/a	ea	X	1		W253
	5995-682-3310		CORD ASSEMBLY, ELECTRICAL CX-4855/U: 9 ft 1 in lg o/a	ea	X	1		W255
	5815-615-9854		INTERCONNECTING BOX J-668/GRC-46:	ea	NX	1		
	5965-243-6420		LOUDSPEAKER LS-166/U:	ea	NX	1		
	5820-543-1672		MODULATOR, RADIO TRANSMITTER MD-203/GR:	ea	NX	1		
	6125-617-1435		MOTOR-GENERATOR: 27.5 v input; Wincharger part SS-688	ea	NX	2		
	5805-186-9464		MOUNTING MT-791/U; MT-791A/U:	ea	NX	2		

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			AN/GRC-46, AN/GRC-46A, AN/VRC-29 (continued)					
	5815-702-6539		PLATE, INSTRUCTION: cording diagram of AN/VRC-29 17 in x 11 in x 3/64 in thk SWED part No. 63P204968	ea	X	1		MP19
	5820-030-0155		RADIO SET AN/GRC-19	ea	NX	1		
	5815-706-2410		SLIDE AND PIN ASSEMBLY: c/o slide right hand and pin shoulder headed; SWED part 57X202684	ea	X	1		A2
	5815-706-3054		SLIDE AND PIN ASSEMBLY: c/o slide left hand and pins headed SWED part 57X202690	ea	X	1		A1
	5815-503-2760		TELETYPEWRITER TT-76/GGC	ea	NX	1		
	5815-557-5970		TELETYPEWRITER SET AN/UGC-4:	ea	NX	1		
			MOTOR GENERATOR GROUP					
			Maintenance information for Motor Generator is included in Radio Teletypewriter Set AN/GRC-46; AN/GRC-46A					
			RUNNING SPARES AND ACCESSORY ITEMS					
			RADIO TELETYPEWRITER SET AN/GRC-46 AN/GRC-46A AND AN/VRC-29					
	5340-619-1353		CLAMP, LOOP: antenna rope clamp; 5/8 in w x o/a; SWED part No. 42X200114	ea	X	1		

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			AN/GRC-46, AN/GRC-46A, AN/VRC-29 (continued)					
			HEATER INSTALLATION GROUP AN/GRC-46( ) only					
	4520-670-5659		ELECTRODE IGNITER: ignites fuel f/heater; SW, Southwind Div part 700808	ea	X	1		
	5920-284-6795		FUSE, CARTRIDGE: MIL type F04A10R0B	ea	X	2		
	6130-659-1556		Ø VIBRATOR, INTERRUPTER: 24 v dc pwr output; Oak part 94-II	ea	X	1		G1
			INTERCONNECTING BOX J-668/GR					
	5920-543-0425		FUSE, CARTRIDGE: 1/4 amp, 250 v; MIL type F02GR250B	ea	X	2		
	5920-284-6795		FUSE, CARTRIDGE: 10 amp, 32 v; MIL type F04A10R0B	ea	X	2		
	5920-552-0008		FUSE, CARTRIDGE: 30 amp, 32 c; MIL type F05A30R0B	ea	X	4		F3 F4
	5945-615-1457		RELAY, ARMATURE: 2 wnd, dc, 160 ohm, 27.5 v; 3-1/32 in lg x 1-15/16 in dia o/a; SWED part No. 80P200049	ea	X	1		
	5340-619-1353		CLAMP, LOOP: ant rop clamp; SWED part 42X200114	ea	X	1		

By Order of *Wilber M. Brucker*, Secretary of the Army:

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General, United States Army,
Chief of Staff

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9-17
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9-217
9-377
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10–348
10–377
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33–106
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For explanation of abbreviations used, see AR 320–50.

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