DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST RECEIVING SET, RADAR DATA AN/TKQ-2

This copy is a reprint which includes current pages from Changes I through 7. Title was changed by Change 7.

HEADQUARTERS, DEPARTMENT OF THE ARMY
SEPTEMBER 1966

WARNING

Operator and maintenance personnel should be familiar with the requirements of TB SIG 291 before attempting installation or operation of the equipment covered in this manual. Failure to follow requirements of TB SIG 291 could result in injury or death"

WARNING

Be careful when working on the 120-volt ac line connections to Generator Set, Gasoline Engine PU-107A/U. Serious injury or death may result from contact with these terminals.

DON'T TAKE CHANCES!

EXTREMELY DANGEROUS VOLTAGES EXIST IN THE FOLLOWING

UNITS OF RECEIVING SET, RADAR DATA AN/TKQ2

Power Supply PP-4338/TKQ-2	600 volts
Indicator, Radar Target IP-795/TKQ-2	2,300 and10,000 volts
Decoder, Video KY-564/TKQ-2	600 volts
Power Supply PP-4339/TKQ-2	10,000 volts

CAUTION

Do not attempt to use the tiedown eyes in the corners of the shelter top to lift the shelter from the truck. The shelter must be lifted by means of slings passed beneath the shelter floor.

TECHNICAL MANUAL
NO. 11-5840-294-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *21 September 1966*

Operator and Organizational Maintenance Manual Including Repair Parts and Special Tool Lists RECEIVING SET, RADAR DATA ANITKQ-2 (NSN 5840-00-1681568) AND AN/TKQ-2A (NSN 5840-01-012-8623) AND TEST FACILITIES KIT MK-1148/TKQ-2 (NSN 6625.00-113-9764)

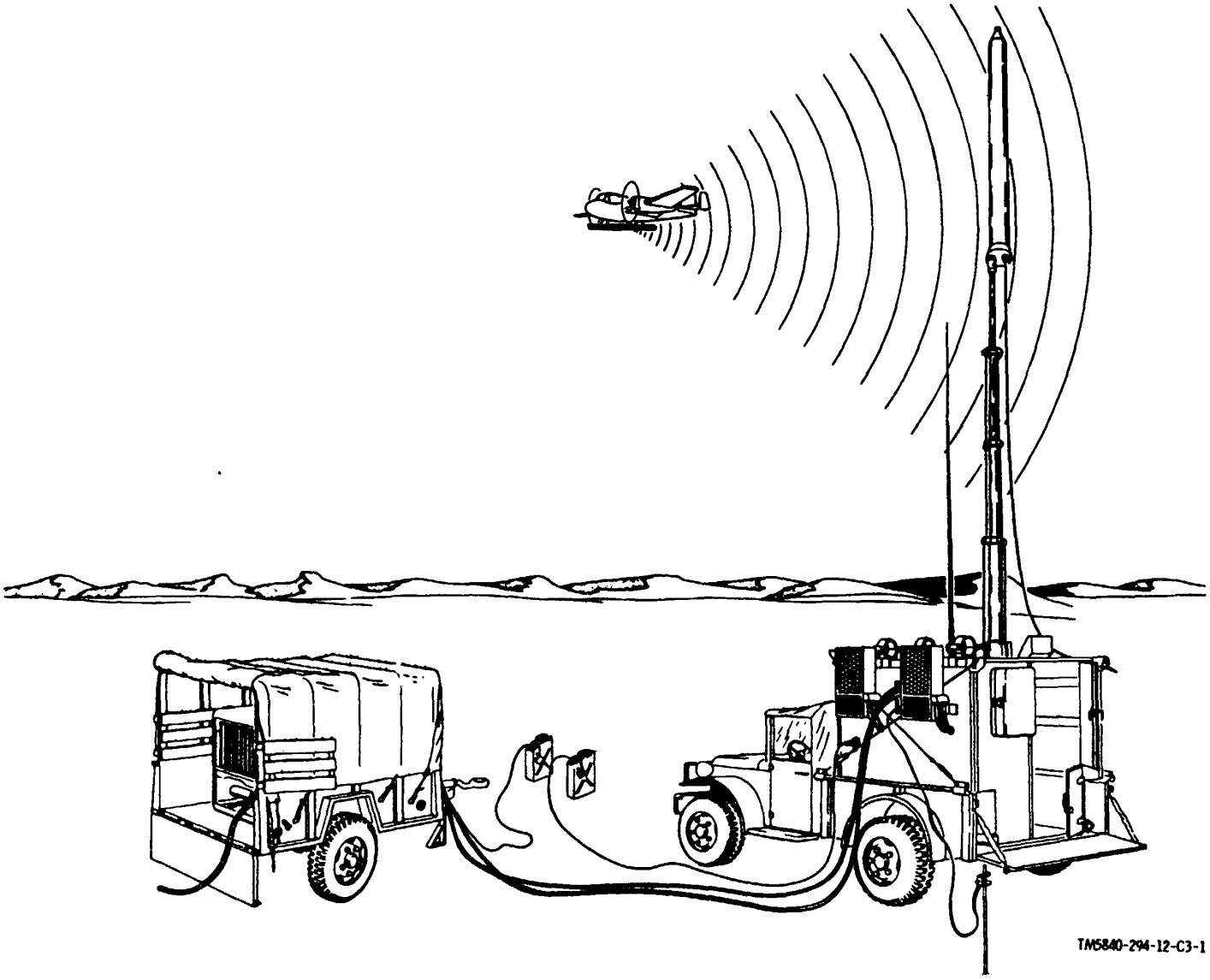


Figure 1-1. Typical Receiving Set, Radar Data AN/TKQ-2 installation with data antenna extended.

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1-1. Scope

This manual describes Receiving Set, Radar Data AN/TKQ-2 and covers its operation and operator and organizational maintenance. It includes operation under usual and unusual conditions, cleaning and inspection of the equipment, and replacement of parts available to operator and organizational maintenance personnel. The maintenance allocation chart (MAC) appears in appendix C. and the basic issue item list appears in appendix B.

1-2. 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.

1-3. 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 (Packaging Improvement Report) as prescribed in AR 700-58/ NAVSUPINST 4030.29/AFR 71-13/MCO P4030.29A, and DSAR 4145.8.

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/NAVSUPINST 4610.33A/AFR 75-18/MCO P4610.19B and DSAR 4500.15.

1-3.1. 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 Blank Forms, and forwarded direct to Commander, US Army Electronics Command, ATTN: DRSEL-MA-Q, Fort Monmouth, NJ 07703.

1-3.2. Reporting Equipment Improvement Recommendations (EIR)

EIR's will be prepared using DA Form 2407 (Maintenance Request). Instructions for preparing EIR's are provided in TM 38-750, The Army Maintenance Management System. EIR's should be mailed direct to Commander, US Army Electronics Command, ATTN: DRSEL-MA-Q, Fort Monmouth, New Jersey 07703. A reply will be furnished direct to you.

Section II. DESCRIPTION AND DATA

1-4. Purpose and Use

a. Receiving Set, Radar Data ANTKQ-2 is the ground-based portion of the data transfer system of Radar Surveillance System AN/UPD-2(V) (airborne radar mapping and data transfer system). From data received from the airborne portion of the data transfer system (Transmitting Set, Radar Data AN/AKT-18), the AN/TKQ-2 produces photo-radar maps in the form of photographic filmstrips. The filmstrips show fixed and moving targets in the ground area under observation by the airborne radar set.

b. The airborne portion of the AN/UPD-2(V) includes Radar Surveillance Set AN/APS-94C and Transmitting Set, Radar Data AN/AKT- 18. During a mission, the AN/APS-94C, a side-looking airborne radar (SLAR), scans a wide area beneath and to one side or both sides of the aircraft flightpath. As it scans the area under observation, the AN/APS-94C develops one set of video signals for fixed targets (ft) and another set of video signals for moving targets (mt). The video signals, a synchronizing signal, and various map orientation data are fed to the AN/AK'T-18, which compresses and encodes the information and transmits it as a frequency-modulated (FM) encoded converted video signal to the ground-based AN/TKQ-Z For details on the AN/APS94C, refer to TM 11-5895-284-12. For details on the AN/AKT-18,refer to TM 11-5841-25512.

c. The ANJ/TKQ2 is sited within ultra-high frequency (uhf) radio receiving range of the airborne AN/AK'T-18. Voice radio communication between the operator of the AN/TKQ-2 and the operator of the AN/AKT-18 is provided by Receiver-Transmitter, Radio RT-524/VRC (part of the AN/TKQ-2) and a radio receiver-transmitter in the aircraft.

d. Upon receiving the encoded converted video signal from the AN/AKT-18, and the AN/TKQ2 decodes the signal into its components and records the map information and present position display (ppd) data on photographic filmstrips. It is possible to simulataneously record the same information on

similar filmstrips in the aircraft. In addition to the fixed- and moving-target maps with ppd data, the filmstrip shows aircraft groundspeed, drift angle and heading information, time of flight, and any other information, such as date and mission data, that may be written on a data card (part of Recorder-Processor-Viewer, Radar Mapping RO-166B/UP).These data may be recorded on the film by pressing the MANUAL DATA EXPOSE button on the RO-166B/UP control panel.

e. During operation of the AN/TKQ-2, the moving filmstrip is continuously exposed and developed, and then is routed through a film illumination assembly where it can be viewed and analyzed within minutes after the airborne radar passes over the area under observation. The developed film can be handled under normal lighting conditions for several days without deterioration. If the film is to be retained as a permanent record, it can be further processed in accordance with TM 11-5820480-12.

f. Signal flow through components of the AN/KQ-2 is shown in figure 1-2.

1-5. Technical Characteristics

a. General

Total power required:

With air conditioners . Approximately 6,000 watts maximum.

Without air conditioners and heaters (receiver and processing equipment only) …… Approximately 1,100 watts maximum.

Range. ……	Nominally line-of-site transmission (depending on interfering terrain, atmospheric conditions, and altitude transmitting, and aircraft).
Azimuth and elevation coverage ……	Omnidirectional.
Display range……	25 or 50 kilometers on each side of aircraft flightpath.
Range delay……	0, 20, or 40 km, depending on setting of airborne AN/AKT-18 controls Antijamming provision Change transmission frequency.
Installation time……	Approximately 30 minutes to prepare for field operation
Transportability……	Shelter, Electrical Equipment S-33lTKQ2 in Truck ¾4-ton, 4 x 4, Cargo M37,which tows Generator Set, Mounted PU-3Engine, PU-375A/C PU-376B/G (not part of AN/TKQ-2).

b. Radar Data Receiving System.

Type of antenna……	Antenna-Radome AS-1097A/GR (fur-element stacked array).
Antenna pattern……	Omnidirectional in horizontal plane
Data Receiver	Receiver, Radio R-1336/G or R-1335A/G
Data signal reception mode……	Frequency modulation.
Frequency range……	225 to 399.95 me.
Type of tuning ……	Digitally tuned in 50-kc steps throughout range (3,500 channels).

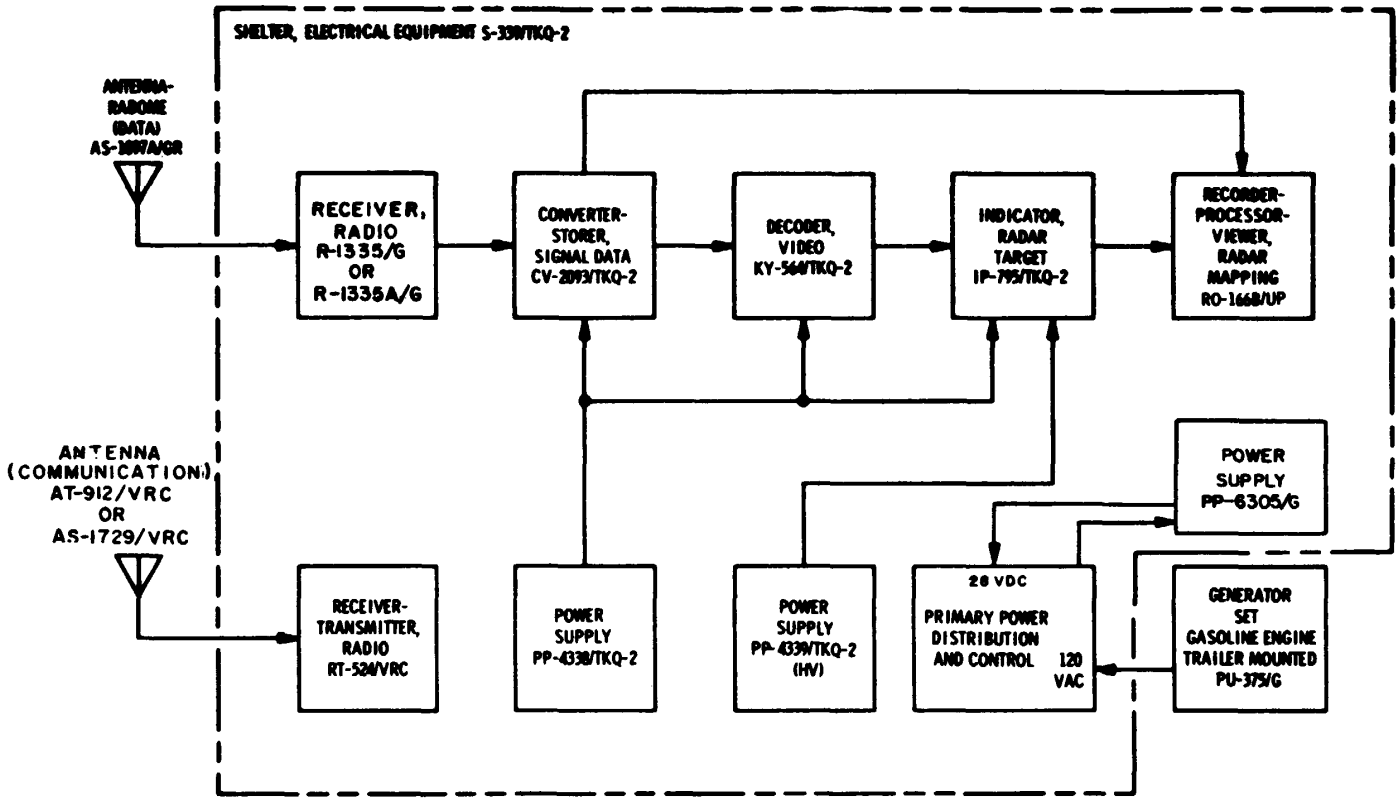


Figure 1-2. Receiving Set, Radar Data AN/TKQ-2, block diagram

Auxiliary reception mode - Amplitude modulation; not used for data reception.
Data signal characteristics
Modulation type ..... FM.
Signal information - Moving-target video, fixed-target video, drift-angle data; ground-speed data, aircraft identification, and ppd data.
FM video bandwidth ..... Direct current to 15 kilocycles.
Effective preselection bandwidth ..... 4 mc at half power (3 db) points.
Receiving range (line-of-sight) for mapping Aircraft. 30 miles at 399.95 mc and 50 miles at 225 mc.

c. Communications Radio System.

Type of antenna ..... Antenna AT-912/VRC or AS-1729/VRC (base-fed whip type).
Communications receiver-transmitter. Receiver-Transmitter, Radio RT-524/VRC.
Type of signal reception - FM.
Frequency range ..... 30.0 to 75.95 mc.
Type of tuning ..... Digitally tuned in 50-kc steps throughout range (920 channels).
Receiving-transmission range. 50 to 75 miles, depending on aircraft altitude and terrain.

Note. Refer to TM 11-5820-401-10 for additional technical characteristics of Receiver-Transmitter, Radio RT-524/VRC.

d. Indicating System.

Type of indicating system ..... Recorder-Processor-Viewer, Radar Mapping RO 166B/UP attached to Indicator, Radar Target IP-795/TKQ-2
Type of presentation ..... Illuminated Continuous photoradar maps (ft and mt) recorded on a single strip film with pp data appearing between the maps.
Data chamber:
Type ..... Special, removable.
Data recorded ..... Aircraft groundspeed, heading, and drift angle; time of day; and handwritten mission data.
Film size ..... 9 1/2 inches wide (81/2 inch map), 50-foot filmstrip (per cassette).
Presentation and recording duration. Approximately 25 hours per cassette, depending on film-transport speed. Continuous operation is limited to a 3-hour capacity of developer fluid.
Power source ..... Decoder. Video KY-664/TKQ-2
Temperature range limits:
Operating ..... 41° to +137° F (+5° to +58.3° C).
Storage ..... 80° to +160 F (-62.2° to +71° C).

Note. Film processing fluid freezes at +.32°F and film deteriorates at +137° F. Refer to TM 11-5820-680-12 for additional indicating system technical characteristics.

e. Power Supply System.

Generator set ..... One of three may be used in the AN/TKQ-2. Generator Set, Gasoline Engine, Trailer-Mounted PU-375/G or PU4-75A/G has28-volt dc capability; the two generator sets consist of Trailer Cargo, ¾ Ton 2 W-M101 and Generator Set, Gasoline Engine PU-107A/U. Generator Set, Gasoline Engine, Trailer-Mounted PU-375B/G does not have 28-volt dc capability and consists of Trailer Cargo, 3/4 Ton 2W-M101 and Generator Set, Gasoline Engine HF-10.0-MD. The generator set is used with but is not part of the AN/TKQ-2.

Note. Refer to TM 5-5264 for additional technical characteristics of Generator Set, Gasoline Engine PU- 107A/U; refer to TM 9-874A for technical characteristics of Trailer, Cargo, 3/4 Ton 2W-M101; refer to TM 5-6115-450-15 for technical characteristics of Generator Set, Gasoline Engine HF-10.0-MD.

Radar data receiving system power supply:
- Type: Power Supply PP-4338/TK2-2
- Inputs: 120 vac, 400 cps, single phase at 7 amperes and 28vdc at 9.3 amperes.
- Outputs: 300 vdc at 394 milliamperes -10 vdc at 1.335 amperes. +2 vdc at 9.2 amperes +150 vdc at 310 ms; +250 vdc at 1.2 ms; +300 vdc at 23.1 ma.

Indicator high voltage power supply:
- Type: Power Supply PP-4339/TKQ-2
- Input: 120 vac, 400 cps, single phase.
- Outputs: 10,000 vdc and 2,200 vdc

Communications radio system power supply: Self-contained within the RT-524/vrc

28-volt dc power supply:
- Type: Power Supply PP-6305/G
- Input: 120 volts (nominal), 400-Cps, three-phase ac.
- Output: 28 volts dc.

f. Shelter

- Type: Shelter, Electrical Equipment S-339/TKQ-2 (truck-mounted).
- Heating: Gasoline heater and heating elements in each of two air conditioners.

Heater:
- Type: Hunter Model UH-48, Type II.
- Fuel: Gasoline
- Fuel consumption: Approximately 0.2 gallon per hour.
- Ignition: Continous spark, radio noise suppressed, and a hot wire glow plug.
- Combustion system: Heat exchanger with blower.
- Heat control: Remote adjustable thermostat.
- Operating Voltage: 120 vac, 400 cps, single phase (2.57 amperes, start; 1.15 amperes, operate).
- Cold - start temperature: 65^0F.
- Heat capacity: 15,000 British thermal units (btu) per hour at sea level; 13,000 btu per hour at 10,000-foot altitude.
- Air delivery: 110 to 125 cubic feet per minute at sea level.

Note. The air conditioners listed below are designed provide heating or cooling as required.

Cooling: Two air conditioners

Air conditioner(s):
- Type: Therm-Air Model CE-6A-400.
- Cooling control: Adjustable themostat.
- Heating control: Adjustable thermostat.
- Operating voltage: 120 vac, three phase, 400 cps, 11 amperes.
- Cooling capacity: 6,000 btu per hour.
- Heating capacity: 4,275 btu per hour.
- Air delivery: 200 cubic feet per minute.

Ventilation: Three shelter ventilation ports.

Lighting: One 120-vac, 60-watt desk light light and one 28-vdc blackout-type extension spotlight

Fire extinguisher: Standard carbon dioxide Type.

1-6. Components of Receiving Set, Radar Data AN/TKQ-2

Note. This listing is based on the original shipment by the contractor on Orders No. 00613-PM-62 and FR 28-043-M5-05-00982(E). For the current and complete official listing of components of individual models, refer to the basic issue items list (app. B). Weights and dimensions of major components of the of the AN/TKQ-2 are listed in a below and running Spares in b below.

a. Weights and Dimensions of Major Components.

Quantity	Fig. No.	Item	Dimensions (in). Height	Depth	Width	Unit weight (lb)
1	1-15,	Power Supply P-4338/TKQ-2	12.5	21.0	17.25	47.0
1	1-12	Indicator, Radar Target IP-795/ TKQ-2.	10.0	19.25	12.5	42.0
1	1-7,	Decoder. Video KY-564/TKQ-2	13.5	20.75	17.25	45.0
1	1-11.1					
1	1-14	Recorder-Processor-Viewer, Radar Mapping RO-166B/UP.	17.6	10.2	12.5	49.0
1	1-9	Receiver, Radio R-1335/G or	12.2	21.8	20.0	10.0
1	1-9.1	Receiver, Radio R-1335A/G	7.5	23.0	22.0	61.0
1	1-10	Receiver-Transmitter, Radio RT-524/VRC.	6.75	13.5	15.25	55.00
1	1-13	Converter-Storer, Signal CV-2093/TKQ-2.	9.27	9.57	13.9	15.5
1	1-14.1	Power Supply PP-6305/G	4.37	7.25	5.62	6.0
1	1-16	Power Supply PP-4339/TKQ-2	5.5	12.0	6.25	33.0
1	1-17	Antenna-Radome AS-1097A/GR	17.0	7.0 (dia)		41.0
1	1-8	Mast AB-924/TKIQ-2	242.1,1 (EXTENDED-ED	10.0 (dia)	59.0	350.0 (empty
1	1-3	Shelter, Electrical Equipment S339/TKQ-2.	87.5	125.0		1726.0 (with all equipment 1496.0 (with all equipment except 2 storage cases)
1	1-8	Heater, Hunter Model UH-48, Type II.	12.0	13.0	17.5	37.5
2	1-8	Air Conditioner, Therm Air Model CE-A-400.				
		Evaporator	18.875	8.75	17.75	85.0
		Condenser	26.25	1125	12.0	32.0
1	1-21	Generator Set, Gasoline Engine, Trailer-Mounted PU-375/G or PU-375A/G consisting of: Note. The PU-375B/G is used with but is not part of the AN/TKQ-2.				
1	1-21	Trailer, Cargo, 3/4 Ton 2W-M101.	82 82	147	73.5	1,340 (empty)
1	1-21	Generator Set, Gasoline Engine PU-107A/U.	37	48	28	1,250
		or				
1	1-21	Generator Set, Gasoline Engine Trailer-Mounted PU-375B/G, consisting of:				

Quantity	Fig. No	Item	Dimensions (in). Height	Depth	Width	Unit weight (lb)
		Note. The PU475/G or PU376A/G is used with but is not part of the AN/TKQ 2.				
1	1-21	Trailer, Cargo, ¾ Ton 2W-M101	82	147	72.5	1,340 (empty)
1	1-21	Generator Set, Gasoline Engine, HF-10.0-MD.	27	51	30	621
1		Test Facilities Kit MK-1148/TKQ-2.				

b. Running Spares. The following running spares are normally stored in Case, Storage CY-4657/TKQ2.

Qty	Item	Qty	Item
2	Electron tubes : 4		Lamps, incandescent:
4	6021	1	MS-25237-328
2	6082WB	1	MS-25237-327
1	6528	1	MS-15571-2
1	5654/6AK5W	1	65-15054A12
2	5670	1	SM-B-497597
1	5725/6AS6W		Lamp, glow:
4	5751	1	SM-B-497418
1	6005/6AQ5W		Crystal:
2	12AT7WA	1	CR-37A/U,128-kc

Qty	Item	Qty	Item
2	5687WA		Fuses, cartridge
1	5744WB	3	F03B32V5A, 5-ampere
2	5814A	3	F03A250VA, 8-ampere
1	6829	10	F03A250V3A,
1	5636		3-ampere
2	7486	6	F02B250V1A,
3	F03A250V10A,		1-ampere
	10-ampere	5	F02A250V1A,
3	F03A250V5A,		1-ampere
	5-ampere	5	F02A250V3A,3-
6	F03A250V1A,		ampere
	1-ampere		
1	7586		

1-6.1. Items Comprising an Operable Equipment

FSN	QTY	Nomenclature, part No., and mfr code	Fig. No.
		NOTE	
		The part numer 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.	
5840-788-5218		Receiver Set, Radar Data AN/TKQ-2, consisting of:	1-1
	1	Accessory Kit, Electronic Equipment: SM-D-497709; 80063 or 201- 45472; 94990 consisting of:	1-22
5935-636-9117	1	Adapter, Connector UG-999A/U	1-17
2910-305-2881	1	Adapter, Fuel Can to Hose: SCC99551;80058 (Heater Supply Hose Adapter)	1-22
8125-926-9116	1	Bottle, Screw Cap: (2-gallon); N1-35; 81349 (Distrilled Water Container	1-22
5995-985-8251	1	Cable Assembly, Power, Electrical CX-11080/U (50 ft power cable) (W2/3)	1-3
5995-985-8252	2	Cable Assembly, Power, Electrical CX-11081/U (50 ft (W2/3)	1-3
5995-985-8253	1	Cable Assembly, Power, Electrical CX-11082/U (6 ft) (W4/W5)	1-22
5995-905-2443	1	Cable Assembly, Radio Frequency CG-1889A/U (20ft) (W6)	1-22
7125-788-5299	1	Case , Storage CY-4657/TKQ-2	1-22
5840-956-8769	1	Extender, Module MX-7543/U	1-22
5120-243-1693	1	Extension, Socket: GGGW641 type 3 class 2 3/8; 81348	1-22
5120-963-6570	1	Extractor, Intergrated Circuit: SM-C-567919;80063 or 5522499G01; 94990	1-22
5120-240-5364	1	Handle, Socket: GGGW641 type 3 class 2 3/8; 81348	1-22
5965-825-4871	1	Headset-Microphone H-161/GR	1-22
4720-091-8813	1	Hose Assembly: AN6270-4-72; 88044 (Heater Supply Hose)	1-22
5965-875-1313	1	Microphone M-80/GR	1-22
5120-239-0017	1	Wrench, Socket: GGGW641, type 2, class 2, style A9-16, 3-8; 81348	1-22
5995-985-8254	2	Wiring Harness CX-11083/TKQ-2	1-22
5995-985-8255	1	Wiring Harness CX-11084/TKQ-2	1-22
5120-288-8710	1	Wrench, Open End: GGW636, type 17, class 3, 1 3/16; 81348	1-22
5120-224-3162	1	Wrench, Open End: GGW636, type 14, 1, 3-16;81348	1-22

FSN	QTY	Nomenclature, part No., and mfr code	Fig. No.
5985-985-9024	1	Antenna AS-1729/VRC	1-3
		consisting ofd:	
5985-985-9002	1	Antenna Element AS-1730/VRC	1-18.1
5820-856-2728	1	Antenna Element AT-1095/VRC	1-18.1
5820-906-1115	1	Matching Unit-Base, Antenna MX-6707/VRC	1-18.1
5820-897-6357	1	Antenna AT-912/VRC	1-18
		consisting of:	
5820-856-2728	1	Antenna Element AT-1096/VRC	1-18
5820-856-2730	1	Antenna Element AT-1096/VRC	1-18
5820-897-6356	1	Antenna Matching Unit MX-2799/VRC	1-18
5820-856-2729	1	Base, Antenna Support AB-719/VRC	1-5
5820-985-8925		Receiver, Radio R-1335/G	13
		consisting of:	
5935-666-1649	2	Adapter, Connector UG-306/U	
5935-681-5013	1	Adapter, Connector UG-491B/U	
5820-892-9707	1	Cabinet, Electrical Equipment CY-4656/G	1-9
5820-788-4659	1	Receiver-Subassembly MX-6833/G: (Lower)	1-9
5820-788-4669	1	Receiver-Subassembly MX-6838/G: (Upper)	1-9
5410-965-0478		Shelter, Electrical Equipment S339/TKQ2	1-3
		consisting of:	
5985-923-0549	1	Adapter, Antenna to Antenna Base: SM-D-497600; 80063 or 258-45262;94990	1-4
4130-732-1048	2	Air Conditioner. Thermo Air Model CEA-400 (Note: 2 each required for use with, but not part of line item number 3218839 (AN/TKQ-2)	1-3
5995-9453844	1	Cable Assembly, Special Purpose, Electrical, Branched: SM-D-496961; 80063 or 230-44612; 94990 (5W1)	1-22
5995-943-7366	1	Cable Assembly, Special Purpose, Electrical: SM-D-496952; 80063 or 230-44613; 94990 (5W2)	1-22
5995-922-7822	1	Cable Assembly, Special Purpose, Electrical: SM-D-496953; 80063 or 230-44614; 94990 (5W3)	1-22
5995-922-7818	1	Cable Assembly, Special Purpose, Electrical: SM-D-497476; 80063 or 230 45138; 94990 (5W4)	1-22
5995-999-7356	1	Cable Assembly, Special Purpose, Electrical: SM-D-497480; 80063 or 230-45142; 94990 (5W5)	1-22
5995-280-3919	2	Cable Assembly, Radio Frequency CG-30A/U (10 ft) (5W6, 5W22)	1-22
5995-945-1923	1	Cable Assembly, Power, Electrical, Branched: SM-D-497482; 80063; or 230-45144; 94990 (5W7)	1-22
5995-944-5273	1	Cable Assembly, Special Purpose, Electrical, Branched: SM-D-497485;80063 or 230-45147; 94990 (5W8)	1-22
5995-905-2442	1	Cable Assembly, Radio Frequency CG-2768A/U (4 ft 10 in.) (5W9)	1-22
5995-935-2547	1	Cable Assembly, Power, Electrical, Branched: SM-D-497968; 80063 or 230-45133; 94990 (5W10)	1-22
5995-823-2988	1	Cable Assembly, Radio Frequency CG-1773A/U (5 ft) (5W11)	1-22
5995-823-2822	1	Cable Assembly, Special Purpose, Electrical CX-4722/VRC (5 ft) (5W12)	1-22
5995-823-2828	1	Cable Assembly, Special Purpose, Electrical CX4720/VRC (5 ft) (5W13)	1-22
6150-922-8619	1	Cable Assembly, High Voltage: SM-D-497755; 80063 or 201-45515; 94990 (Note: Includes cable assemblies 5W14, 5W15, and 5W16.)	1-22
5995-933-7756	3	Cable Assembly, Radio Frequency: SM-D-497657; 80063 or 230-45423-1, 2, 94990 (Note: P/o cable assembly, high voltage SM-D-497755.) (5W14, SW16, 5W16)	1-22
5995-922-7817	1	Cable Assembly, Special Purpose, Electrical: SM-D-497658; 80063 or 230-45424; 94990 (5W17)	
5995-945-3845	1	Cable Assembly, Special Purpose, Electrical, Branched: SM-D-497501; 80063 or 230-45163; 94990 (5W18)	1-22
5995-945-3846	1	Cable Assembly, Special Purpose, Electrical, Branched: SM-D-497704; 80063 or 230-45470; 94990 (5W19)	1-22
5995-944-5314	1	Cable Assembly, Special Purpose, Electrical, Branched: SM-D-497705; 80063 or 230(45471; 94990 (5W20)	1-22
5995-933-7759	1	Cable Assembly: SM-D-497795; 80063 or 230-45611; 94990 (5W21)	1-22
5995-933-7757	1	Cable Assembly: SM-D-497794; 80063 or 230-45610; 94990 (5W23)	1-22

FSN	QTY	Nomenclature, part No., and mfr code	Fig. No.
4520-709-9225	1	Heater, Vehicular Compartment: Hunter Model UH-48 (Note: 1 each required for use with, but no part of line item number 3218839 (AN/rKQ-2).)	1-3
6230-926-1348	1	Light, Desk: Fed spec WL311, type 2, class 1; 81348	1-8
5965-243-6420	1	Loudspeaker LS-166/U	1-3
5985-880-5786	1	Mast AB-924/TKQ2	1-4
5340-999-9090	1	Handcrank: (P/o AB-924/TKQ-2); Geroh part No. KMPHK160-00	
5985-874-2162	1	Antenna. Radome AS-1097A/GR	1-17
5820-492-9709	1	Base, Shock Mount, Electrical Equipment MT3461/TKQ-2; (Used with the R-1335/G and R-1335A/G)	1-7
5840-892-9710	1	Base, Shock Mount Electrical Equipment MT3462/TKQ-2; (Used with KY-564/TKQ-2)	1-7
5840-892-9711	1	Base, Shock Mount, Electrical Equipment MT3463/TKQ-2; (Used with PP-4338/TKQ-2)	1-7
5840-892-9712	1	Base, Shock Mount, Electrical Equipment MT3464FTKQ2; (Used with IP-795/TKQ-2)	1-7
5840-892-9708	1	Base, Shock Mount, Electrical Equipment MT3471/TKQ2; (Used with PP-4339/TKQ-2)	1-8
5840-939-7148	1	Base, Shock Mount, Electrical Equipment MT3616/TKQ-2; (Used with CV-2093/TKQ-2)	1-7
5841-940-8146	1	Converter-Storer, Signal Data CY-2093/TKQ2 1-7	
5995-813-6397	1	Crystal CR37A/U (128 kc)	
5840-788-4725	1	Decoder, Video KY-564/TKQ2	1-7
6115-753-2231	1	Generator Set PU475A/G; (Note: 1 each required for use with, but not part of line item number 3218839 (AN/TKQ-2).)	1-3
5840-788-4710	1	Indicator, Radar Target IP-795]TKQ2	1-12
5820-893-1323	1	Mount, Receiver MT-1029/VRC; (Used with RT-524/VRC)	1-7
840-985-8244	1	Power Supply PP-4338frKQ-2	1-7
5840-9858245	1	Power Supply PP-4339/TKQ-2; (High voltage)	1-8
	1	Receiver, Radio R-1335A/G	1-.1
5820-892-0622	1	Receiver-Transmitter, Radio RT4-24/VRC	1-10
5841-856-2299	1	Recorder-Processor-Viewer, Radar Mapping R0-166B/UP	1-3
		Accessories, Tools, and Test Equipment consisting of:	
6625-926-4393	1	Test Set, Receiving Set, Radar Data AN/GKM-2A	
		Test Facilities Kit MK-1148/TKQ-2	
5625-710-2748	1	Adapter, Test MX-6696ITP-87	
6625-707-3385	1	Cable Assembly, Special Purpose, Electrical CX-10077/U	
6625-707-3390	1	Cable Assembly, Special Purpose, Electrical CX-10086/U	
6625-707-3399	1	Cable Assembly, Special Purpose, Electrical CX-10076/U	
6625-707-3403	1	Cable Assembly, Special Purpose, Electrical CX-10075/U	
6625-724-4091	1	Cable Assembly, Special Purpose, Electrical CX-10085/U	
6625-710-2745	1	Cable Assembly, Radio Frequency CG-3106/U	
6625-724-4130	1	Cable Assembly, Special Purpose, Electrical CX-10081/U1	
6625-707-3472	1	Cable Assembly, Special Purpose, Electrical CX-10079/U	
	1	Cable Assembly, Special Purpose, Electrical CX-11124/U	
	1	Cable Assembly, Special Purpose, Electrical CX-11927/U	

1-7. Common Names

A list of the nomenclature assignments for the components of Receiving Set Radar, Data AN/TKQ-2 is given below. A common name is indicated after each item.

Nomenclature	Common Name
Receiver-Transmitter Radio RT-24-/VRC.	Communications receiver-transmitter.
Receiver, Radio R-1335/G. or Receiver, Radio R-1335A/G.	Data receiver.
Receiving Set, Radar AN/ TKQ2.	Data receiving set.
Decoder, Video KY-564/ TKQO	Video decoder.
Recorder Processor-Viewer, Radar Mapping RO-166B/UP.	Processor-viewer.
Shelter, Electrical Equip-ment S339/TKQ2.	Shelter.
Converter-Storer, Signal Data CV4o9BKXI2.	D/a converter.
Indicator, Radar Target IP-796WrTKQ2.	Target indicator.
Power Supply PP-4338/ TKQl	Power supply.
Truck, S-Ton, 4 x 4 Cargo M7.	Truck
Generator Set, Gasoline Engine, Trailer-Mounted PU-76/G.	Trailer-mounted generator set.
Generator Set, Gasoline Engine PU-107AIU, or Generator Set, Gasoline Engine HF-10.0-MD.	Generator set.
Power Supply PP-4339/ TKQ-.	Hv power supply.
Antenna-Radome AS-1097A/ OR.	Data antenna.
Antenna AT-912/VRC, or Antenna AS-1729/VRC.	Communications antenna.
Case, Storage CY-4667/ TKQ-.	Storage case.
Heater, Hunter Model UH-48, Type II.	Heater.
Mast AB-924/TKQ-2 --------	Data antenna mast.
Power Supply PP6306/G----	28volt dc power supply.

1-8. Description of Receiving Set, Radar Data AN/TKQ-2

a. The data receiving set consists of a shelter and its equipment and a trailer-mounted generator set. During use, the shelter is mounted on a truck (not supplied) which also may be used for towing the trailer-mounted generator set during over-the-road travel. An additional truck is required for cross-country towing (para 5-1). When prepared for use, the data receiving set appears as shown in figure 1-1.

b. The shelter is a thermally insulated aluminum enclosure which, although designed to fit the bed on a ¾4-ton cargo truck, can be transported by helicopter. When transportation by helicopter is desired, use the slings beneath the shelter for support. The tiedown eyes (one at each corner of the shelter top) are for attaching the tiedown ca- bles that secure the shelter to the truck, not for lifting purposes.

c. The major operating components in the shelter (fig. 1-3) are the power supply, target indicator, high voltage (hv) power supply, 28-volt de power supply, video decoder, processor-viewer, data receiver, data annota- tion (d/a) converter, and communications receiver-transmitter. The data receiver and the communications receiver-transmitter are mounted on an equipment rack that fits against the shelter front wall. The video de- coder, power supply, and target indicator are installed on individual mounting frames be- neath the radio equipment. The d/a converter and the hv power supply are installed on mounting frames on the floor to the left of the equipment rack. During operation, the processor-viewer is attached to the target indicator front panel, and is removed and stored in the processor-viewer transit case when not in use. The data antenna is connected to the data receiver by a coaxial cable attached to a feed-through connector in the shelter wall next to he door. The communications antenna is connected to the communications receiver-transmitter through an antenna matching unit (part of communications antenna) inside the shelter.

d. Other major components of the shelter include a heat and two air conditioners. The air conditioners can be used for either cooling or heating. A junction box on the left shelter wall is the distribution point for primary power for all shelter components. Cables from the junction box connect primary power to the shelter lights, light switches, convenience outlets, heater, and an interconnection box

on the shelter front wall Cables conduct power from the interconnection box to the data receiver, power supply, and Mounting MT-1029/VRC

e. All power required to operate the data receiving set is supplied by the generator set. The output of the generator set is connected to the junction box on the left shelter wall through three S-foot cables (fig. 1-3). The three cables are stored in the storage case when the data receiving set is shipped.

1-9. Description of Shelter Extemal Configurtion

(fig. 1-4 and 1-5)

a. The shelter entrance door in the rear wall is divided into two sections. The upper door section may be opened without opening the lower door section, making it possible to enter the shelter without lowering the truck tailgate. A door latch (fig. 1-6) on the inside of the upper door section is operated by a handle (not shown) on the outside. This door may be held open by a spring-loaded harness snap that is attached to a harness snap storage catch when not in use. The door can be locked shut with a padlock (not shown). An EMERGENCY ESCAPE screw (fig. 1-6) permits the upper door section to be opened from inside if it is inadvertently padlocked on the outside. The lower door section has a latch operated by a handle (fig. 1-6) on the inside. This door can be opened only when the upper door section is open and the truck tailgate is down. The drain hole (fig. 1-4(1)) drains the data antenna mast base. The drain hold cap is used only when fording.

a. Three ventilation ports, two air conditioner air intake ports, and a heater air intake port are built into the shelter. Two of the ventilation ports and the heater air intake port are in the shelter front wall. The third ventilation port is in the shelter upper door section. The two air-conditioner air intake ports are in

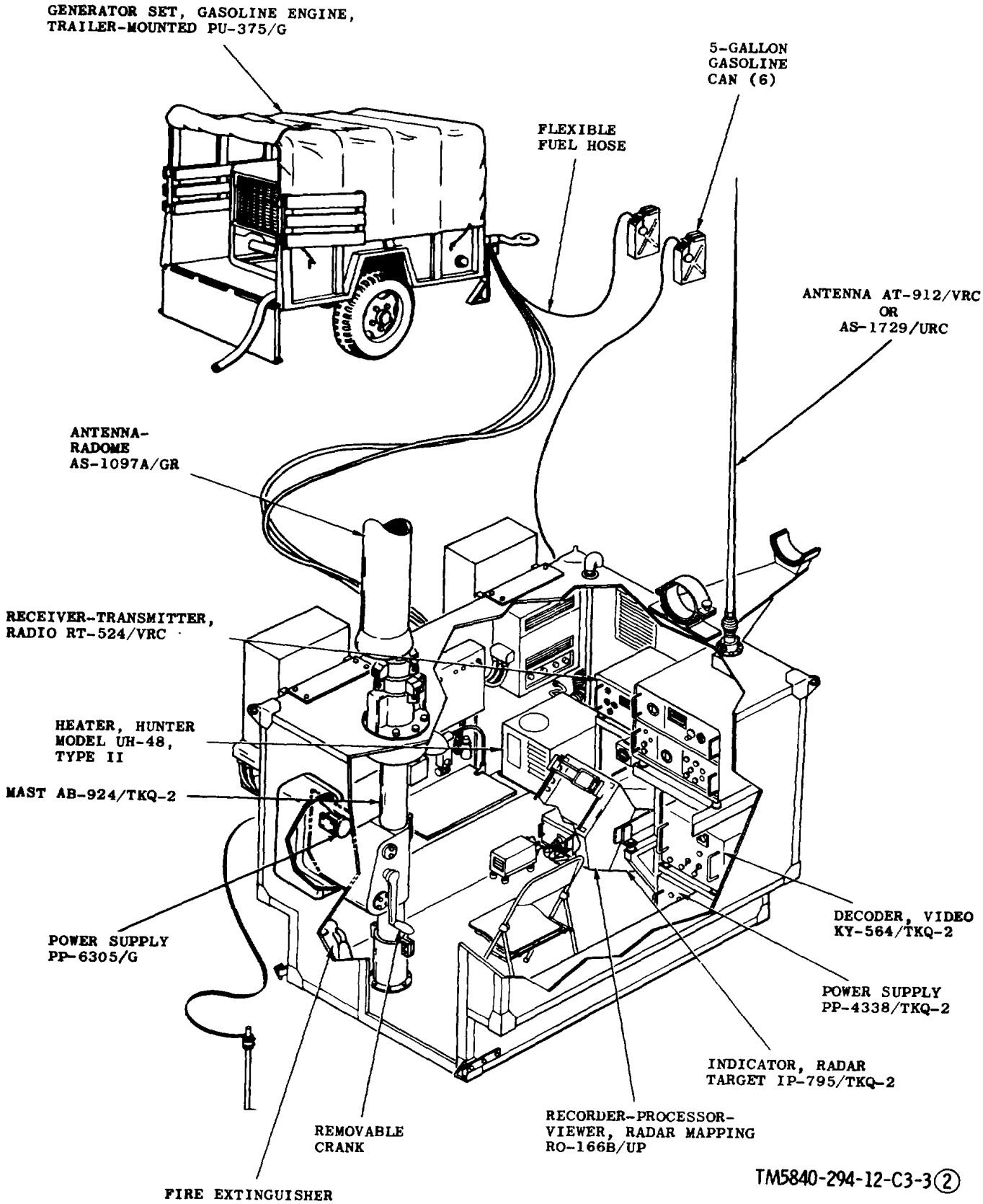


Figure 1-3. (1). Receiving Set, Radar Data AN/TKQ-2, components (sheet 1 of 2).

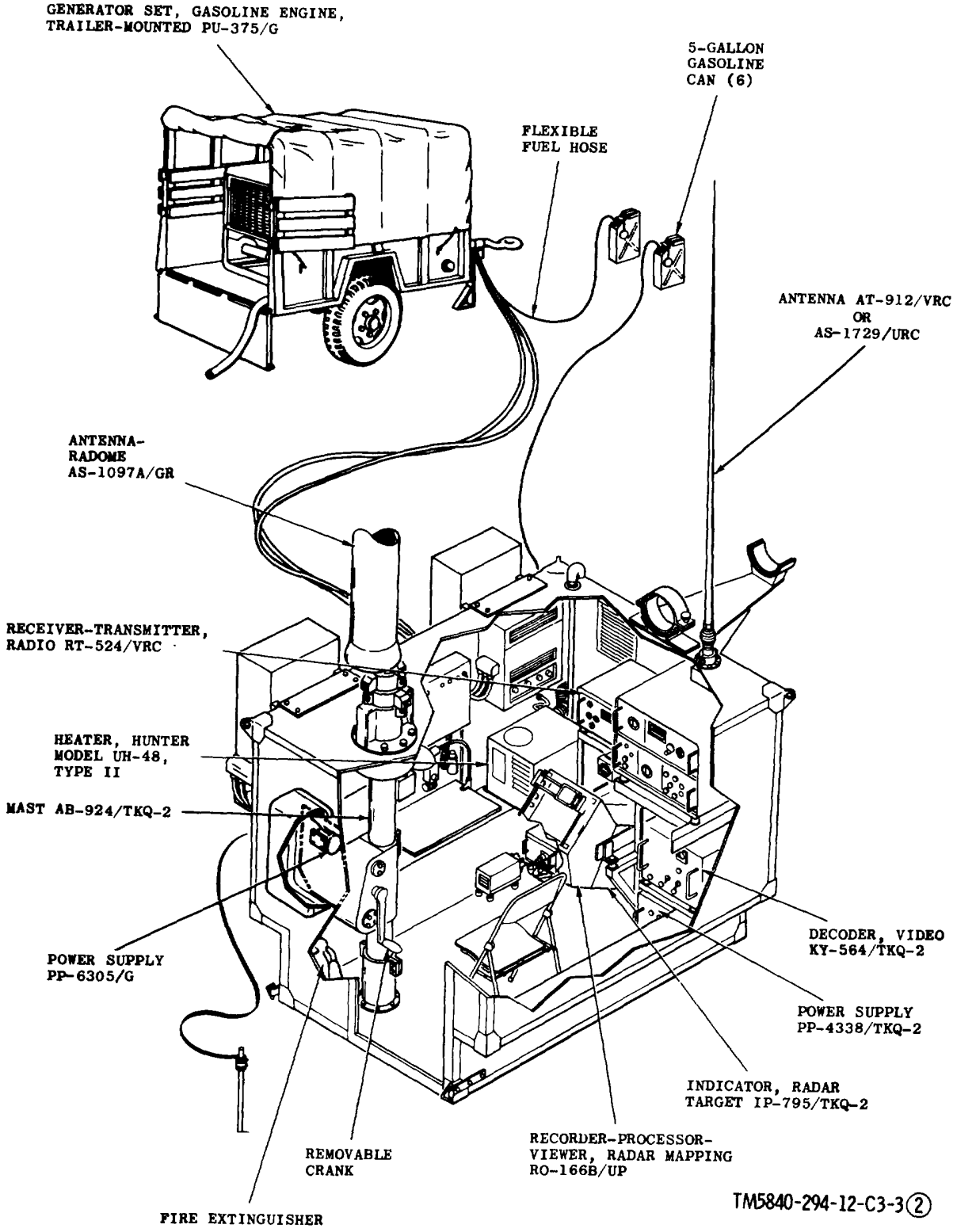


Figure 1-3 (2). Receiving Set, Radar Data AN/TKQ-2 components (Sheet 2 of 2). (sheet 1 of 2)

the shelter left wall. All the ventilation and air intake ports, except the heater air intake port, are equipped with removable covers. Each cover for the two ventilation ports on the shelter front wall and the two air conditioner air intake ports has four captive screws that are used to fasten the covers in the front of the ports or in storage positions below the ports. The ventilation port in the shelter upper door section is fastened with a captive screw when closed. It is also equipped with a re- placeable air filter (fig. 1-6) that is held in place by retaining bars. The ventilation ports should be open when the shelter is in use (except when the air conditioners are set to COOL). At least one ventilation port should be opened when the shelter is to be transported by helicopter or airlift.

c. Eight condenser mounting blocks attached to the shelter left wall are used for mounting the air conditioner condenser section when the shelter is in use. An air-conditioner interconnection poll is located below each set of condenser mounting blocks. These ports provide for installation of the air-conditioner in- terconnection assemblies that connect the con- denser and evaporator sections when the air conditioners are in use. Each assembly consists of an interconnection electrical cable (W7 or W8), two refrigerant lines, and an evaporator condensation tube. Protective caps chained to the shelter wall (inside) are used to. seal the air conditioner interconnection ports when the air conditioners are not in use. Fuel for the heater is supplied through a heater supply hose and a fuel supply line fitting on the shelter left wall (fig. 1-4). Fumes from the heater are exhausted through a heater exhaust outlet that projects through the shelter roof.

Note. The air-conditioner condenser sections and in- terconnection assemblies are part of the shelter external configuration when the shelter is in use. When the shelter is in transit, these components are stored inside the shelter.

d. A junction panel, recessed in the left shelter wall, contains primary power input connectors 5J2 and 5J3, output connectors 5J4 and 5J5, an auxiliary output connector, and ground terminal El. Connector 5J11 on the shelter rear wall is the data antenna input connector. There are two step rings on the shelter right wall. A spring-loaded handhold is mounted on the right side of the shelter roof above the step rings. Three clamps, a backplate, and a yoke, attached to the shelter roof and front wall, are used for storing the data antenna during transit

e. A processor case, mounted on the shelter rear wall, is used to store nitric acid solutions (para 1-60) which are used for cleaning the processor-viewer rollers (para 4-14).

1-10. Description of Shelter Internal Configuration

(fig. 1-7 and 1-8)

a Installations inside the shelter include an equipment rack that fits against the front wall. The communications receiver-transmitter and the data receiver are mounted on stationary racks secured to the top shelf of the equipment rack. Two sliding racks, attached to the lower portion of the equipment rack, con- tain the target indicator (fig. 1-8) and the video decoder. When the data receiving set is in use, the processor-viewer is mounted on the front of the target indicator. The power sup- ply is mounted On a sliding rack secured to the shelter floor beneath the equipment rack. Two stationary racks, secured to the shelter floor to the left of the equipment rack, contain the hv power supply (fig. 1-) and the d/a converter. Primary power for the operating components discussed above is connected through an interconnection box on the shelter front wall. This power is applied to Mounting MT-1029/VRC, the data receiver, and the power supply when the data receiver (R1885/ G) is used. Antenna Matching Unit MX- 2799/VRC and Base, Antenna Support AB- 719/VRC (part of the communications antenna), which provide for interconnection of the communications receiver-transmitter and the communications antenna, are mounted on the shelter roof (MX-2799/VRC inside, AB-719/VRC outside) above the data receiver. When the data receiver (R-1335A/G) is used, Matching Unit-Base, Antenna MX-6707/

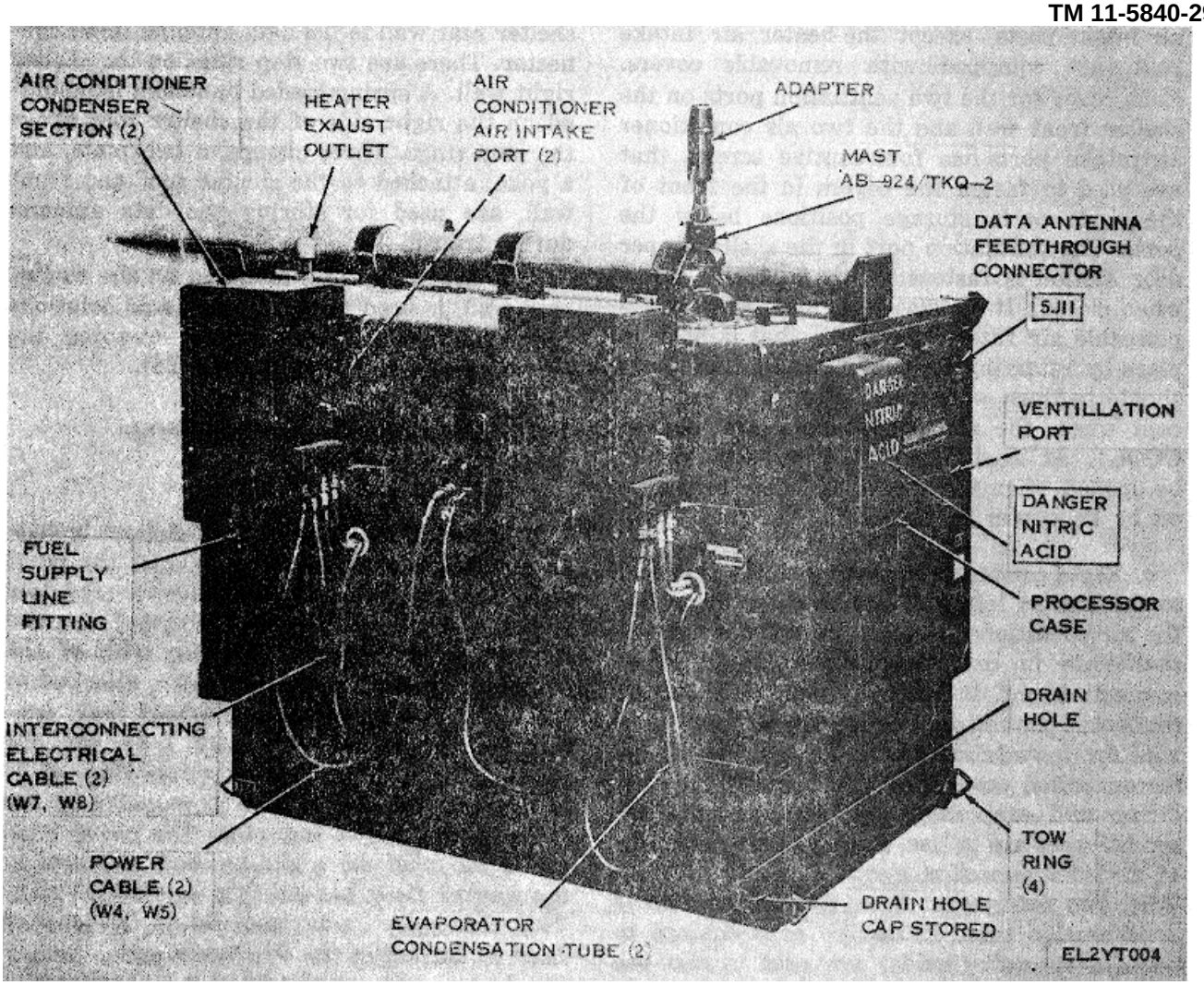


Figure 1-4.(1). Shelter Equipment S-339/TKQ-2, outside rear view (sheet 2 of 2).

VRC (part of the communications antenna), which provides for interconnection of the communications receiver-transmitter and Antenna Element AS-1730/VRC, is mounted through the shelter roof above the data receiver. Power Supply PP-6305/G, the primary source of 28 volts direct current (dc) within the shelter, is mounted on the shelter inside rear wall (fig. 1-8).

b. The junction box (fig. 1-8) on0 the shelter left wall incorporates the junction panel (fig. 1-4) on the outside of the wall. This junction box is the primary power distribution point for all shelter components. Primary power from the generator set is supplied through two 50-foot cables. Alternating current (ac) power (120-volts, 400-cycle-perc-second (cps), three-phase) is connected through junction panel input connectors 5J2 and 5J3. The junction box front panel contains circuit breakers for the primary power circuits, the air conditioners, the 28-volt dc power supply, and an OVHD LT switch. Four convenience outlets, a heater thermostat, an extension spot-

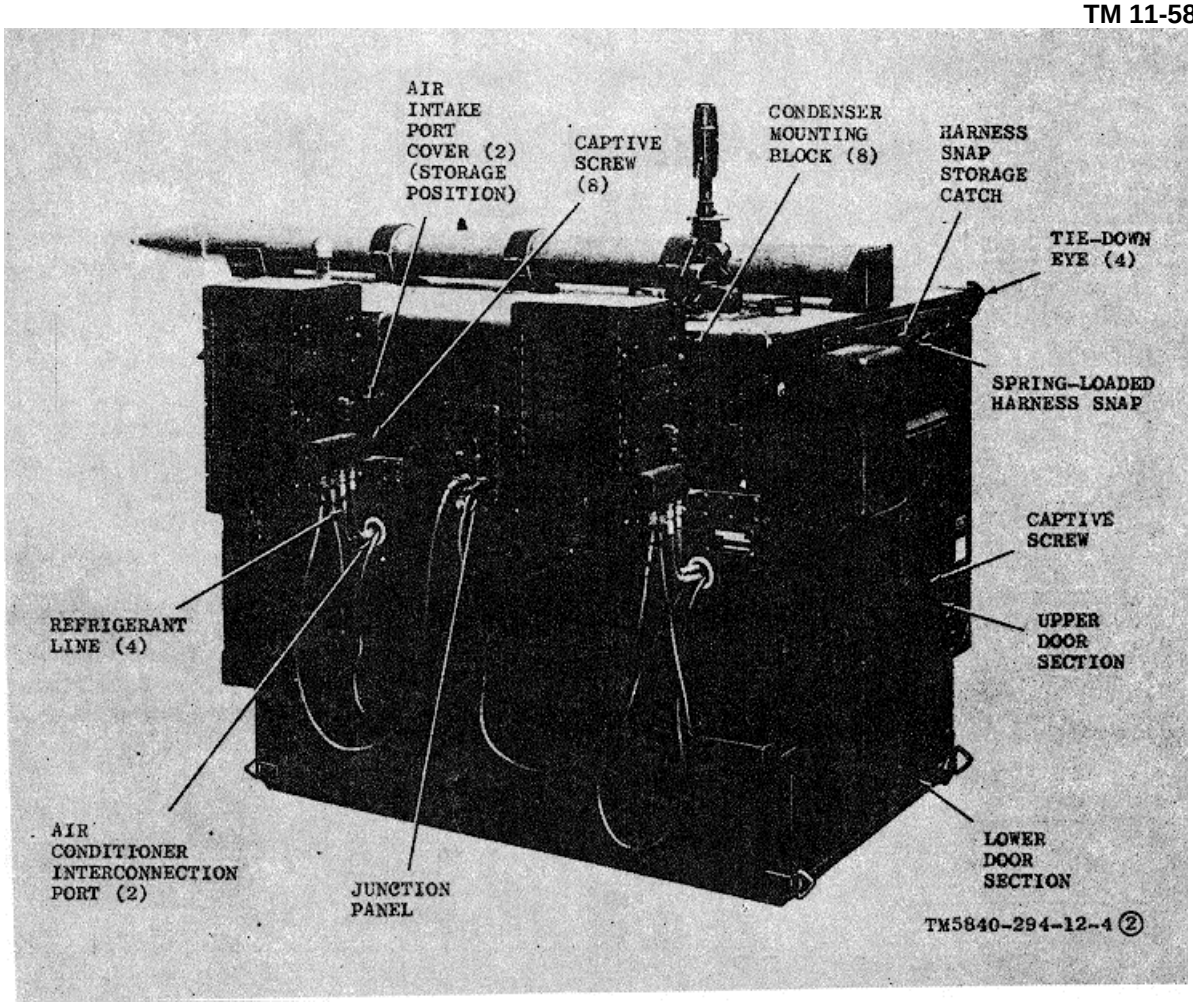


Figure 1-4 (2). Shelter, Electrical Equipment S-339/TKQ-2, outside rear view (sheet 2 of 2).

light, and a worktable equipped with a shelf and a desk lamp, are mounted on the shelter wall below the junction box. The heater is in- stalled in the left front corner of the shelter.

c. The OVHD LT switch on the junction box front panel controls operation of the shelter lights. When the OVHD LT switch is set to BLACKOUT, the interlock blackout switch (fig. 1-6) above the entrance turns the shelter lights off when the door is opened. When the OVHD LT switch is set to ON, the interlock blackout switch is bypassed, allowing the shelter lights to remain on when the door is open. The extension spotlight is equipped with an on-off switch and a control that provides red filtering to permit its use during blackout operations.

d. The base of the data antenna mast is attached to the floor near the left rear corner of

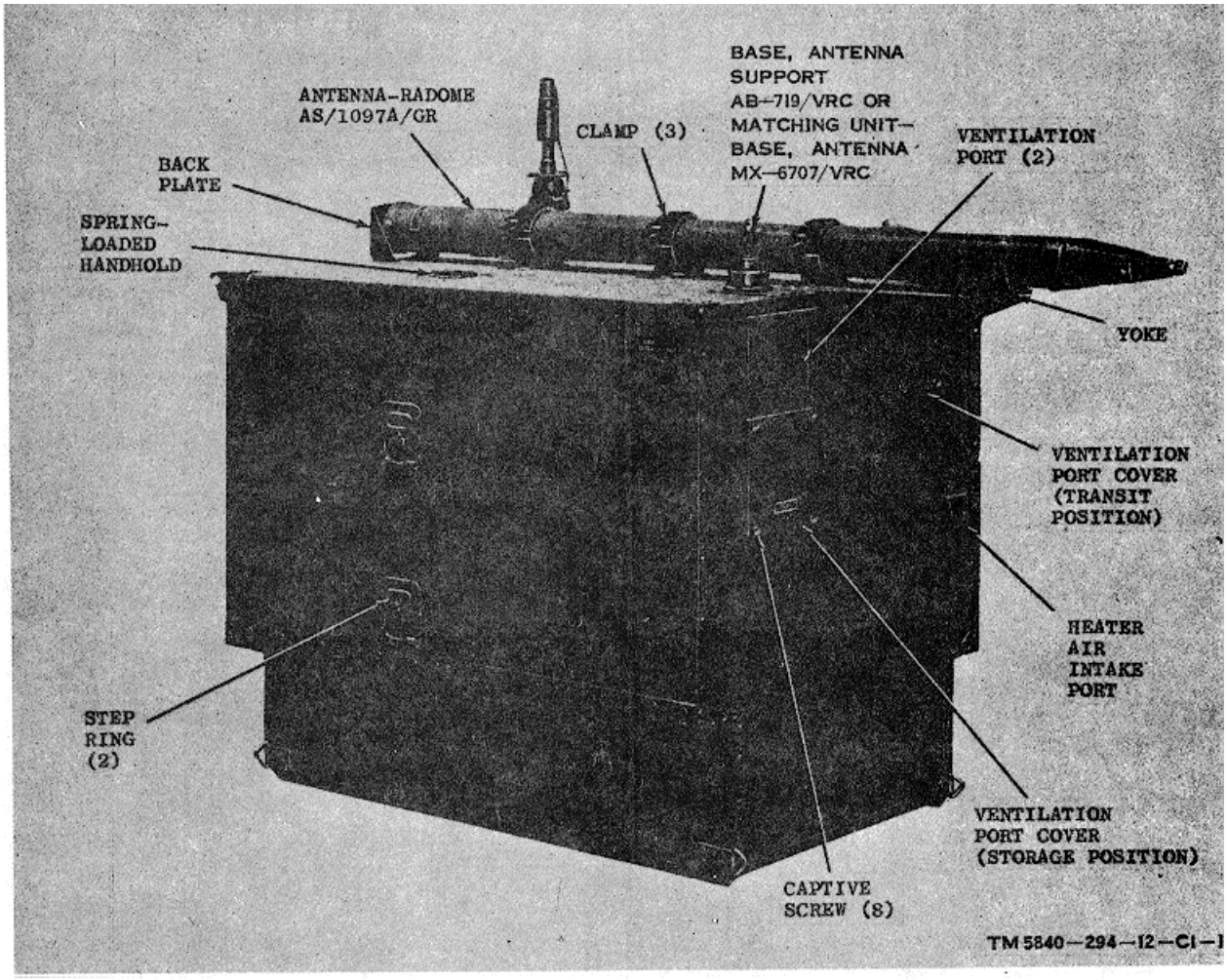


Figure 1-5. Shelter, Electrical Equipment S-339/TKQ-2, outside front view.

the shelter. The telescoping mast extends through the shelter roof. A removable crank (fig. 1-3) is used to extend or retract the antenna mast. When not in use, the crank is stored on the shelter rear wall behind the data antenna mast. A fire extinguisher (fig. 1-3), also stored behind the antenna mast, is mounted in a bracket attached near the shelter floor.

e. Two air conditioner evaporator sections are permanently mounted on the 'shelter left wall. When the air conditioners are in use, the evaporator sections and the condenser sections on the outside wall (fig. 1-4) are interconnected as described in paragraph 2-8. When the air conditioners are not in use, the air-conditioner interconnection assemblies (cables and refrigerant lines) are stored in the storage case. A condenser storage mounting bracket with top and bottom sections is attached to the shelter right wall. When the data receiving set is not in use, the condenser sections are mounted on the condenser storage mounting brackets (fig. 1-7). Four bosses and two tiedown loops (fig. 1-3) attached to the shelter floor are used for positioning the processor-viewer transit case and the storage case, and securing them during transit. As shown in figure 1-3, Antenna Elements AT-1095/VRC and AT-1096/VRC (AT- 912/VRC) or Antenna Elements AT-1095/VRC and AS-1730/VRC (AS-1729/VRC) and the

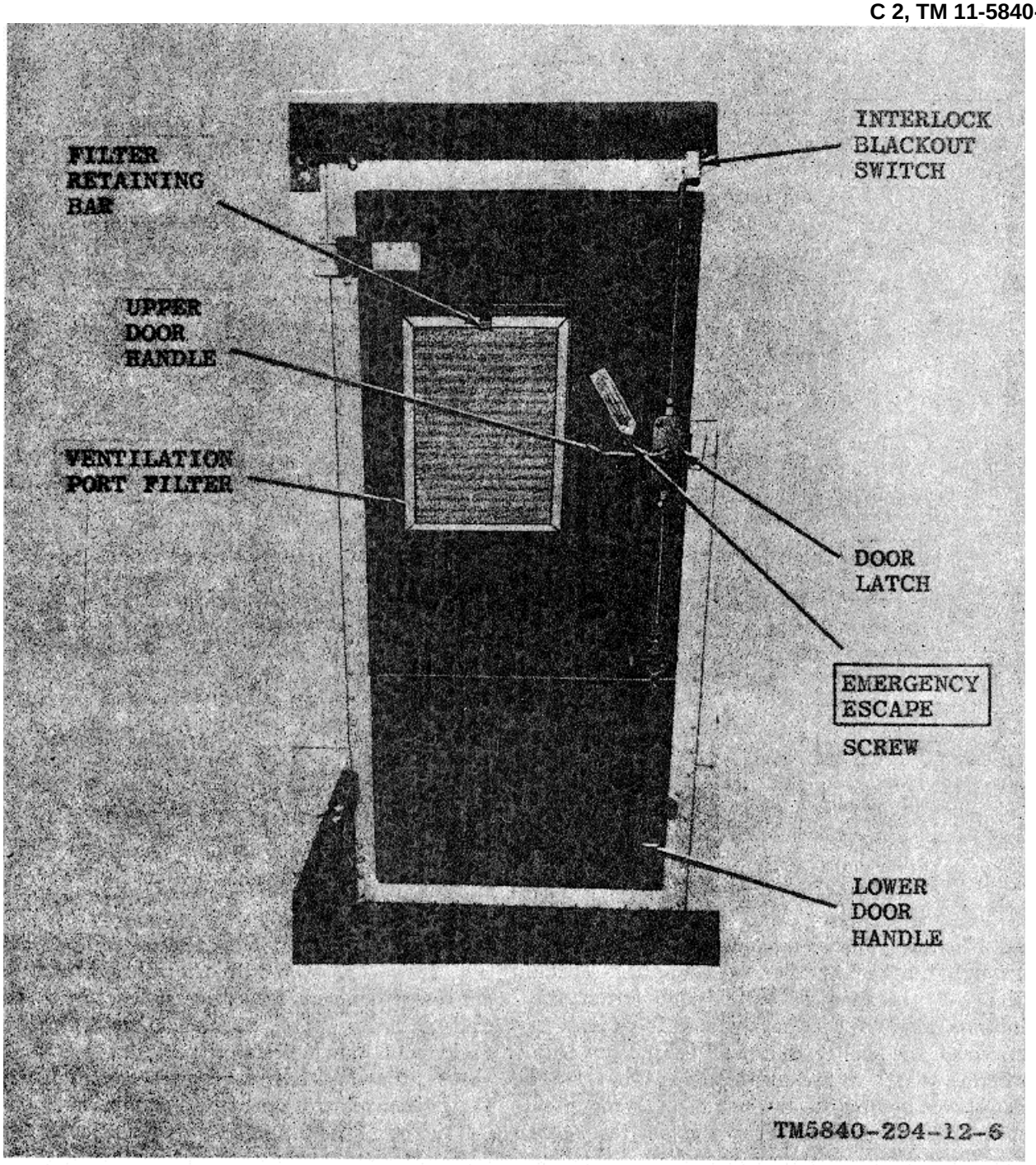


Figure 1-6. Shelter, Electrical Equipment S-339/TKQ-2, entrance, inside view.

ground rod are stored on the shelf formed by the shelter right wall. Test Facilities Kit MK-1148/TKQ-2 is stored in the shelter and used for maintenance.

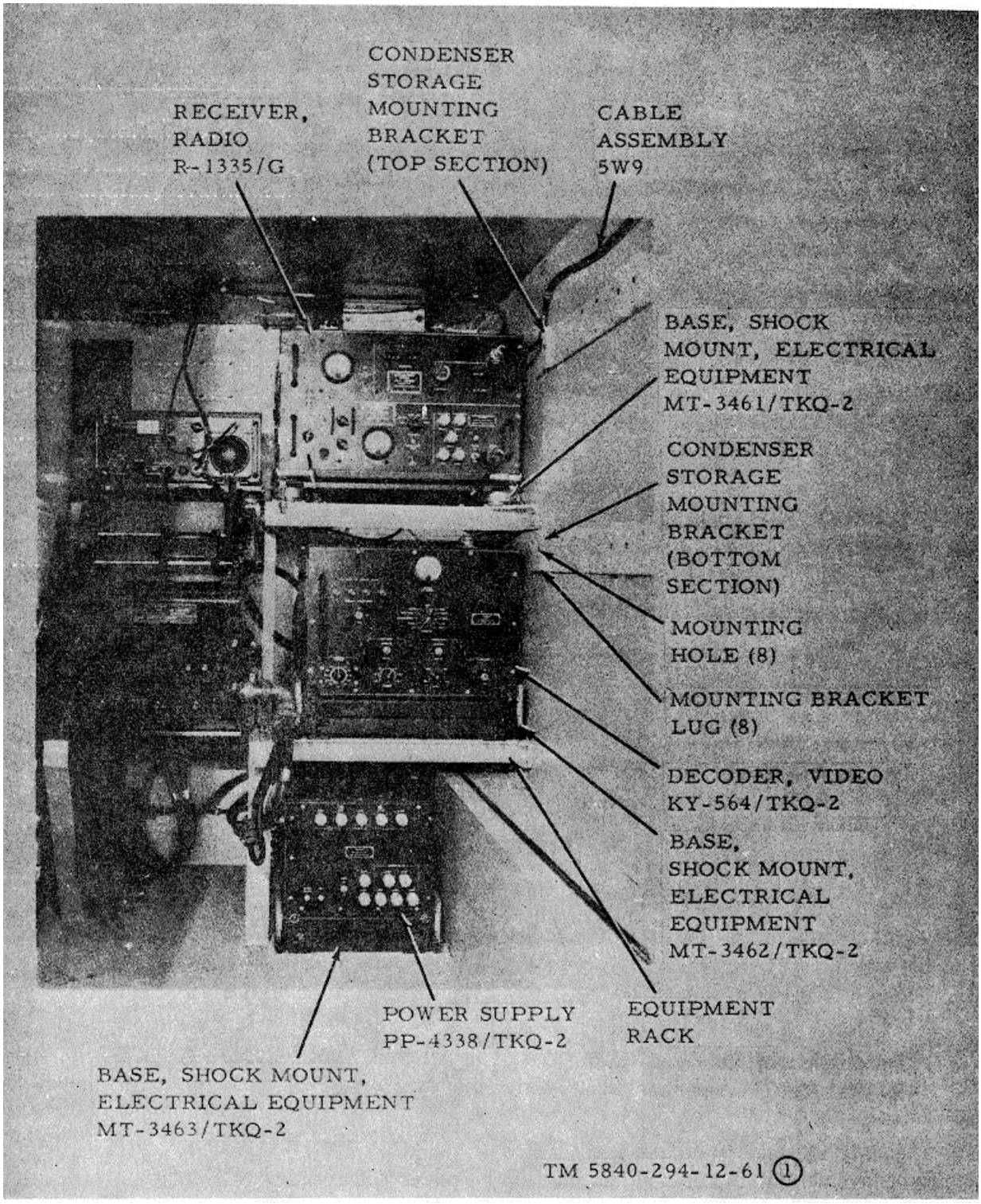


Figure 1-7. Shelter, Electrical Equipment S-339/TKQ-2, front wall, interior view.

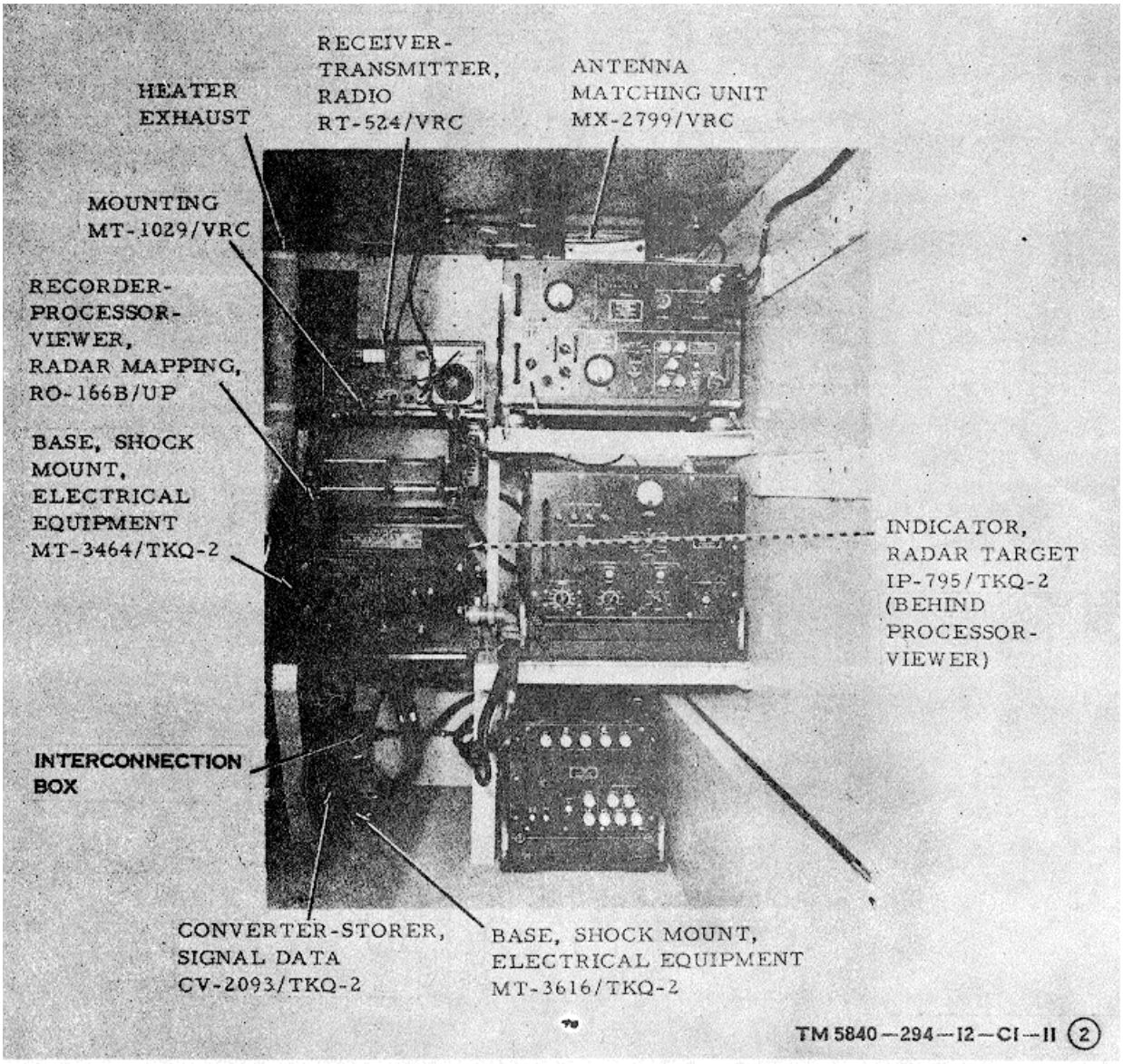


Figure 1-7--Continued

1-11. Description of Receiver, Radio R-1 335/G

(fig. 1-9)

a. The data receiver is designed to receive amplitude-modulation (am.) and fm signals within the frequency range of' 225 to 399.95 megacycles (mc). It has two operating modes: fm video and audio, and am. audio.

b. The data receiver is physically divided into two 19-inch wide by 5-inch high drawer sections. The upper drawer section is nomenclature Receiver-Subassembly MX-6838/G, and the lower drawer section is nomenclatured Receiver-Subassembly MX-6833/G. Both drawer sections mount in a common cabinet, nomenclatured Cabinet, Electrical CY-4656,G. Electrical (intermediate frequency (IF) output)

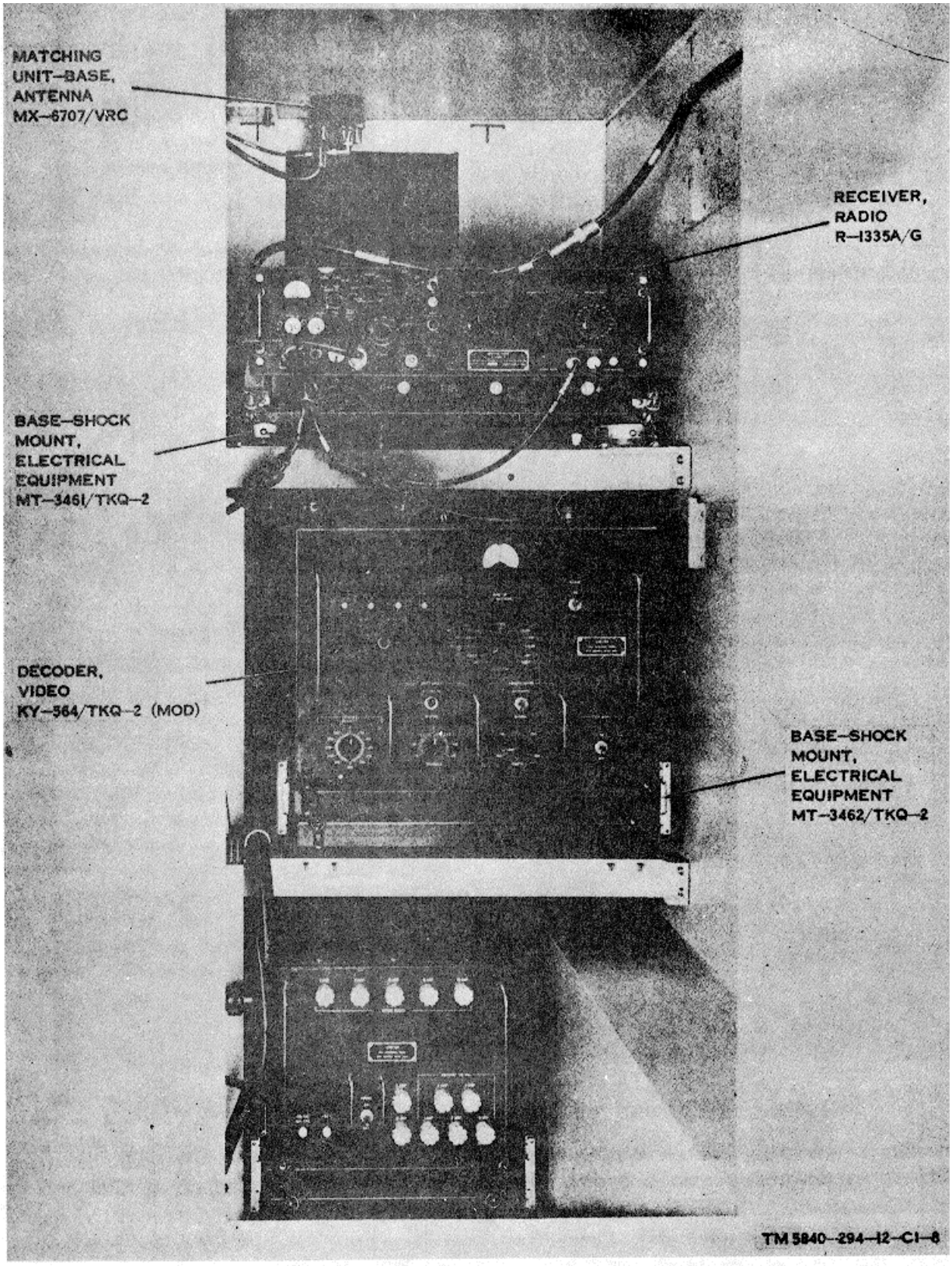


Figure 1- 7. 1. Receiver, Radio R-1335A/G and video decoder mounted in Shelter, Electrical Equipment S-339/TKQ-2.

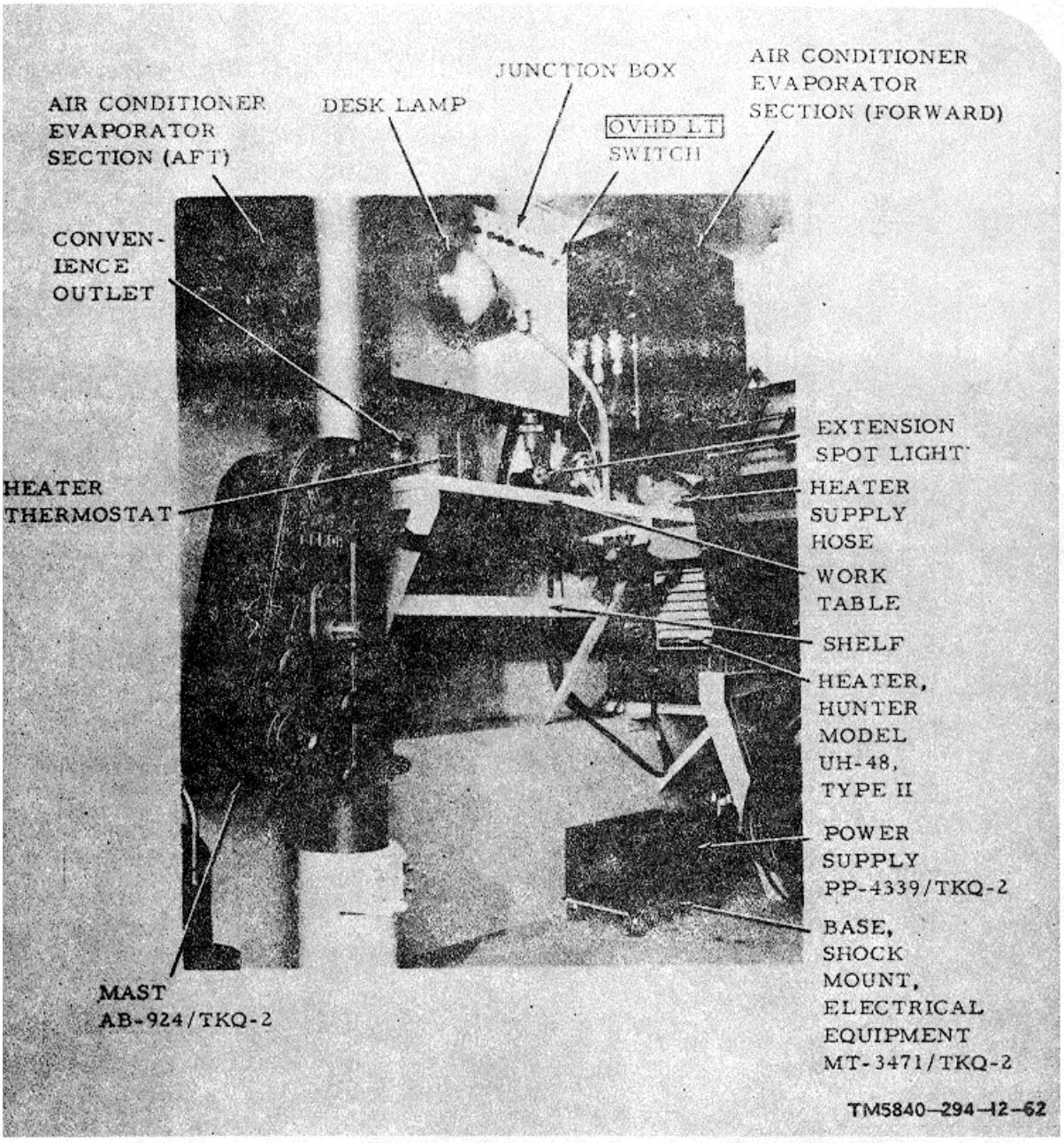


Figure 1-8. Shelter, Electrical Equipment S-339/TKQ-2, left wall, interior view.

Connection between the two sections is made through two right-angle coaxial adapters (adapter, Connector UG306/U), and one straight coaxial adapter (Adapter, Connector UG-491B/U) (not shown in figure 1-9).

c. The unit is cooled by a blower that draws air through four filtered air intakes and exhausts it through a filtered vent at the rear of the case. Base, Shock Mount, Electrical Equipment MT-3461/TKQ-2 (para 1-53) supports

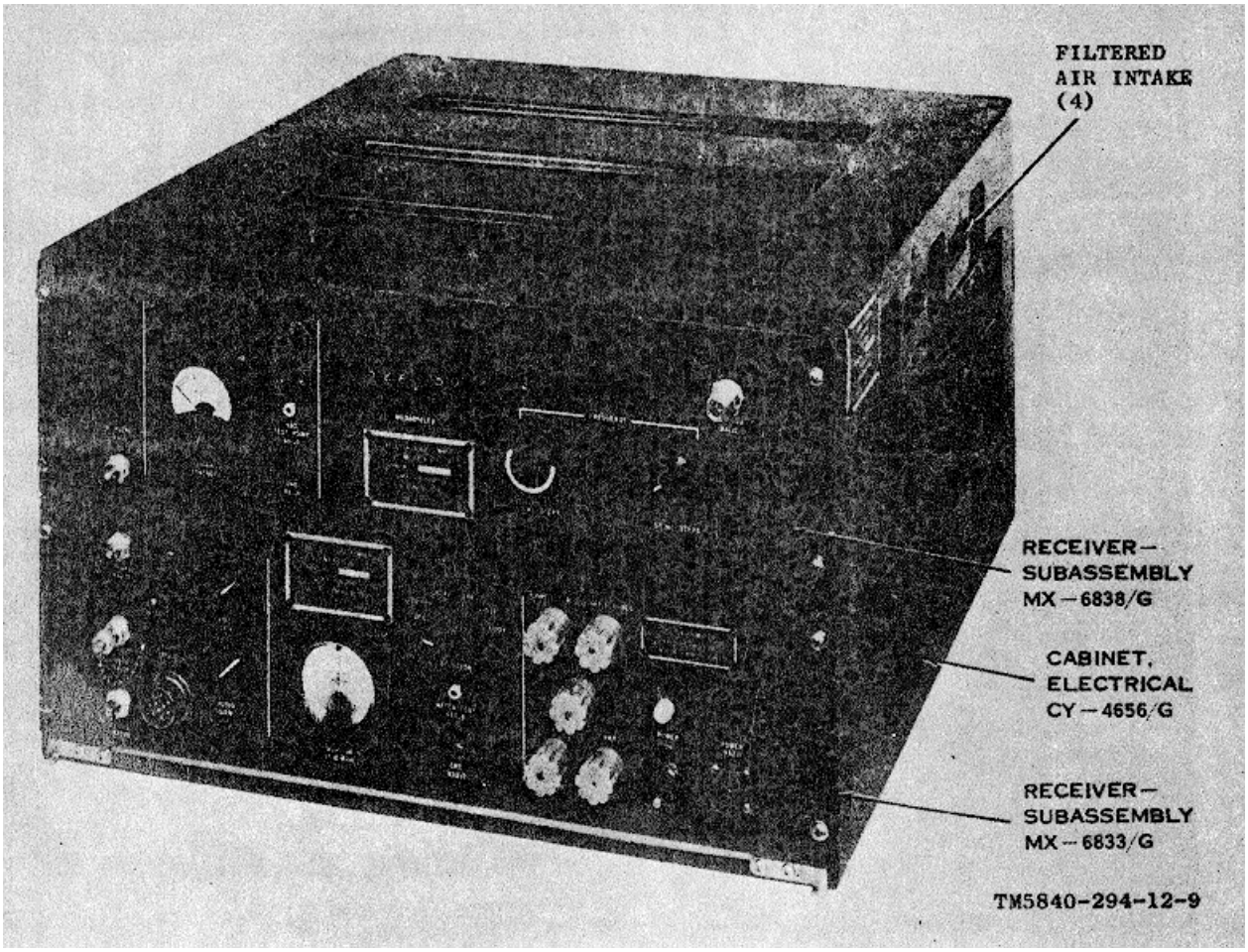


Figure 1-9. Receiver, Radio R-1335A/G

the data receiver in its operating position on the equipment rack (fig. 1-7). All operating controls and indicators are on the front panels.

d. An integral power supply provides the voltages listed below for operation of the data receiver.

(1) +24 volts dc, regulated.
(2) -24 volts de regulated
(3) +120 volts dc.
(4) $+_{100}$ volts de.
(5) 6.3 volts ac.
(6) + 150 volts d.
(7) +26 volts dc.
(8) +70 volts de.

e Loudspeaker, Dynamic *1,S-G*66/U (fig. 1-3 remains connected to the data receiver at all times. It is used to monitor audibly the fm. and am. output modes of the data receiver.

1-11.1 Description of Receiver, Radio R-1 335A/G

(fig. 1-9.1)

a. The data receiver is designed to receive amplitude-modulation (am.) and frequency modulation (fm) signals -within the frequency range of 22) to 399.95 megacycles (mc). It has two operating modes: fm video and audio, and am. audio.

b. The data receiver is physically contained in single drawer 7.50 inches high, 22 inches wide, and 23 inches deep. Shock mount adapters, used to install the data receiver in

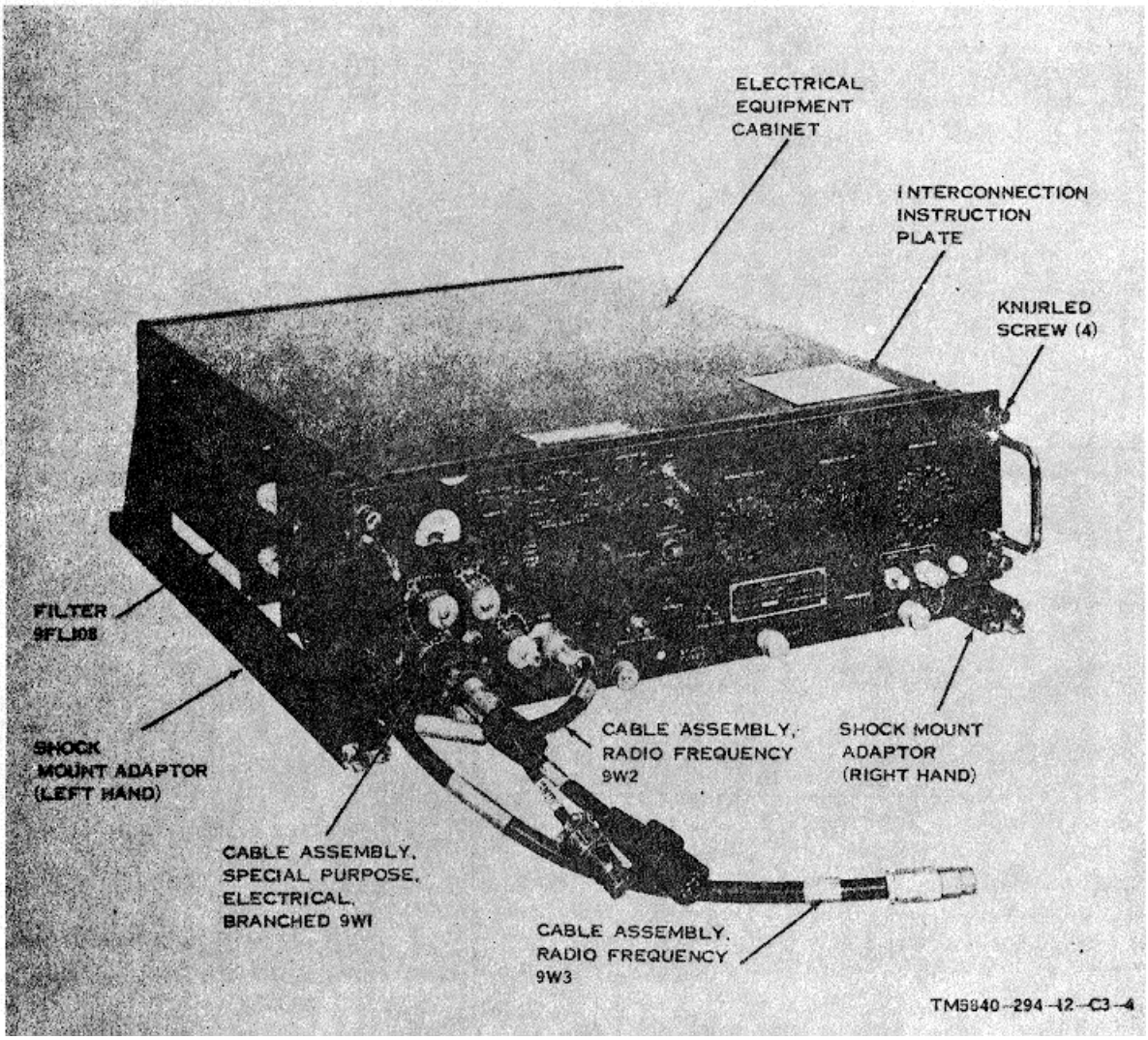


Figure 1-9.1. Receiver, Radio R-1335A/G

shelter, are part of the receiver case (fig.
1-9.1) Base, Shock Mount, Electrical Equip- ment MT3461/TKQ-2 (fig. 1-23) supports the data receiver in position on the equipment rack. All operating controls and indicators are on the front panel. Filter 9FL108 is mounted on the outside of the data receiver case (fig. 1-9.1).

c. Voltages listed below are supplied by three integral power sources: the receiver power supply (9A7), a -24-volt dc power supply (9A12), and a +18-volt dc regulator (9All). The primary power input to the receiver is 120 volts ac, 400 cps, single-phase.

(1) - 24 volts dc.
(2) +18 volts de.
(3) +28 volts de.
(4) +32 volts dc.

d. Loudspeaker, Dynamic LS- 66/U (fig. 1- 3) remains connected to the data receiver at all times. It is used to monitor, audibly, the fm and am. output modes of the data receiver.

1-12. Description of Receiver-Transmitter, Radio RT-524/VRC

(fig. 1-10)

The communications receiver-transmitter receives and transmits fm voice signals in the range of 30.0 to 75.95 me. Structurally, it is a rugged, lightweight, compact receiver-transmitter housed in a watertight case. All operating controls are on the front panel. The connector at the rear (not shown) mates with a connector on the front of the junction box on Mount- ing MT-1029/VRC (para 1-59). Two guide pinholes at the rear of the unit mate guide pins on the MT-1029/VRC. A blower inside the case helps dissipate heat. The top and bottom covers are held in place by captive screws. The loudspeaker for the communications receiver-transmitter is self-contained. For a complete description of the communications receiver-transmitter, refer to TM 114820- 401-10.

1-13. Description of Decoder, Video KY-564/TK-2

(fig. 1-11)

a. The video decoder decodes the information elements of the encoded converted video signal the data receiver acquires from the air- borne AN/AKT-18. Except for the main POWER switch on the power supply and local control switches on the processor-viewer, all controls for the data receiving set are on the video decoder front panel. Input power for the video decoder is controlled by the power supply POWER switch (para 1-17).

b. Structurally, the video decoder is a panel chassis-type assembly enclosed in a metal case with removable top and bottom covers. The

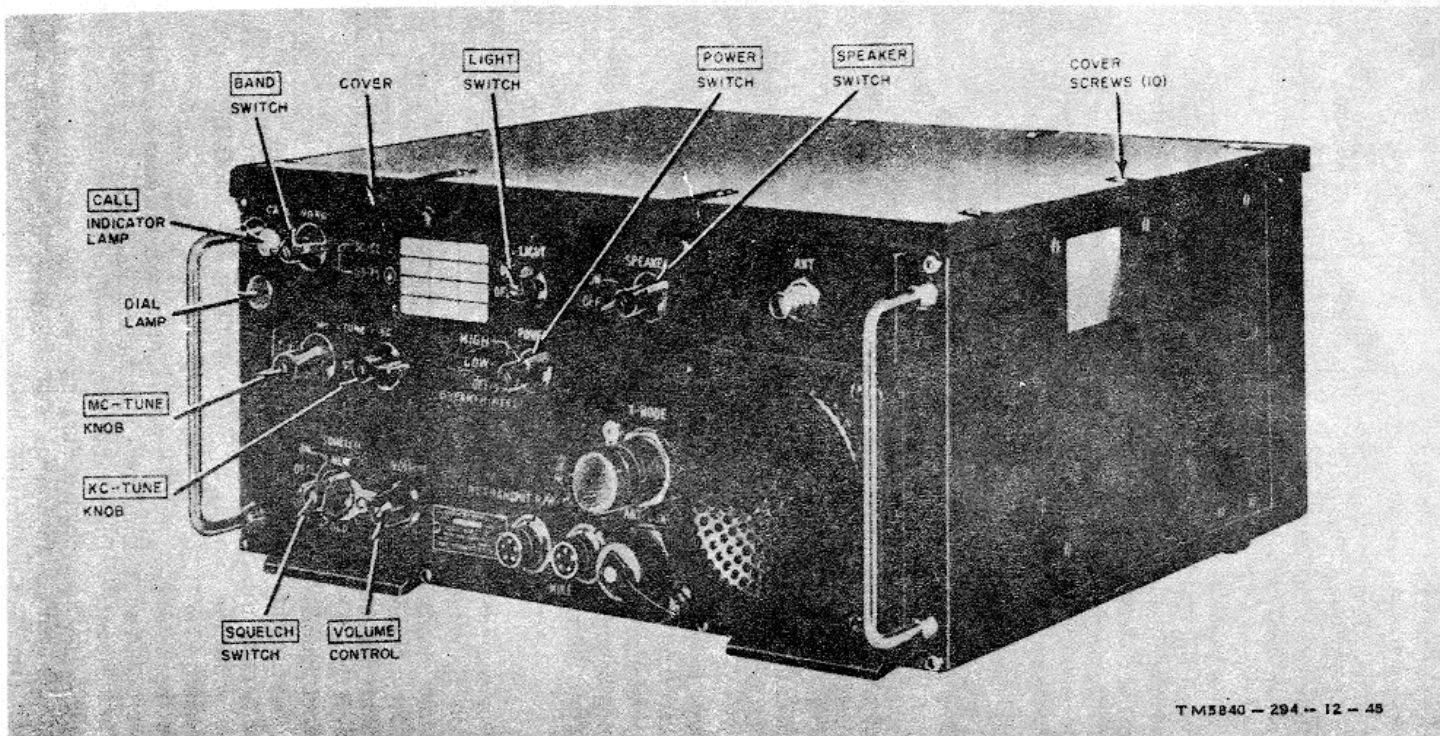


Figure 1-10. Receiver-Transmitter, Radio RT-524/VRC.

video decoder is cooled by an internal blower that draws air into an air intake port in the bottom cover and exhausts it through louver sin the top portion of the rear panel. Rear panel connectors 3J1, 3J2, 3J3, and 3J4 provide for power and signal interconnections between the video decoder and other components of the data receiving set. Access to ft video bias adjustment R9 and ft video bias adjustment R29 is obtained by removing the protective cap installed on the top cover. Base, Shock Mount, Electrical Equipment MT-3462/ TKQ-2 (para 1-54) supports the video decoder in its operating position on the equipment rack (fig. 1-7).

1-14. Description of Indicator, Radar Target IP-795/TKQ-2
(fig. 1-12)

a. The target indicator contains two 5-inch cathode-ray tubes. The screen of each cathode- ray tube (crt) is positioned so that it is visible through an opening in the target indicator front panel. Radar target information (ft and mt) decoded by the video decoder is displayed on the crt screens. The left crt displays ft information; the right crt displays mt information; When the processor-viewer is not installed on the target indicator, a plastic cover is mounted by four captive thumbscrews in front of the crt screens to protect them.

b. Structurally, the target indicator is a panel-chassis-type assembly enclosed in a metal case with removable top and bottom covers. The target indicator is cooled by an internal blower that draws air through an air intake port in the bottom cover and exhausts it through louvers in the rear panel. Rear panel connector 2J1 provides for the connection of input power from the power supply. Rear panel connectors 2J2 and 2J3 provide for the connection of video signals from the video decoder. Connectors 2J15 through 2J18 on the top cover provide for the connection of power to and from the hv power supply. Base, Shock Mount, Electrical Equipment MT-3464/TKQ-2 (para 1-56) supports the target indicator in its operating position on the equipment rack (fig. 1- 7).

c. When the data receiving set is in use, the processor-viewer is mounted on two mounting brackets on the target indicator front panel (para 2-12). When the processor-viewer is installed, connectors P5 and P6 (fig. 1-14) mate connectors 2J5 and 2J6 on the target indicator front panel.

1-15. Description of Converter-Storer, Signal Data CV-2093/TKQ-2
(fig. 1-13)

a. The d/a converter contains circuitry that detects present position display (ppd.) data included in the encoded converted video signal acquired by the data receiver. It converts the detected ppd. data to segment voltages for lighting the display unit within the processor-viewer.

b. Structurally, the d/a converter is a chassis mounted assembly installed in a metal case. The metal case is equipped with a cover that is secured by four snap latches. Two handles on the front panel faciliate handling when the unit is removed for servicing. The front panel also contains a test switch, two circuit breakers, and four connectors. Operating power from the power supply is connected through power connector J1. The video signal from the data receiver is connected through VIDEO INPUT coaxial connector J2. The video output to the video decoder is connected through VIDEO OUTPUT coaxial connector J3. Multipin connector J4 provides input connections for operating voltages from the d/a converter and the processor-viewer. Base, Shock Mount, Electrical Equipment MT4616/TKQ-2 (para 1-58) supports the d/a converter in its operating position on the floor of the shelter.

1-16. Description of Recorder-Processor-Viewer, Radar Mapping RO-166B/UP
(fig. 1-14)

a. The processor-viewer includes a camera film-drive system, a film-processing system, a film illuminator assembly and observation window, a data chamber for recording flight in- formation, and a system for generating rear command signals and displaying aircraft pre- sent position data (part of the ppd. system).

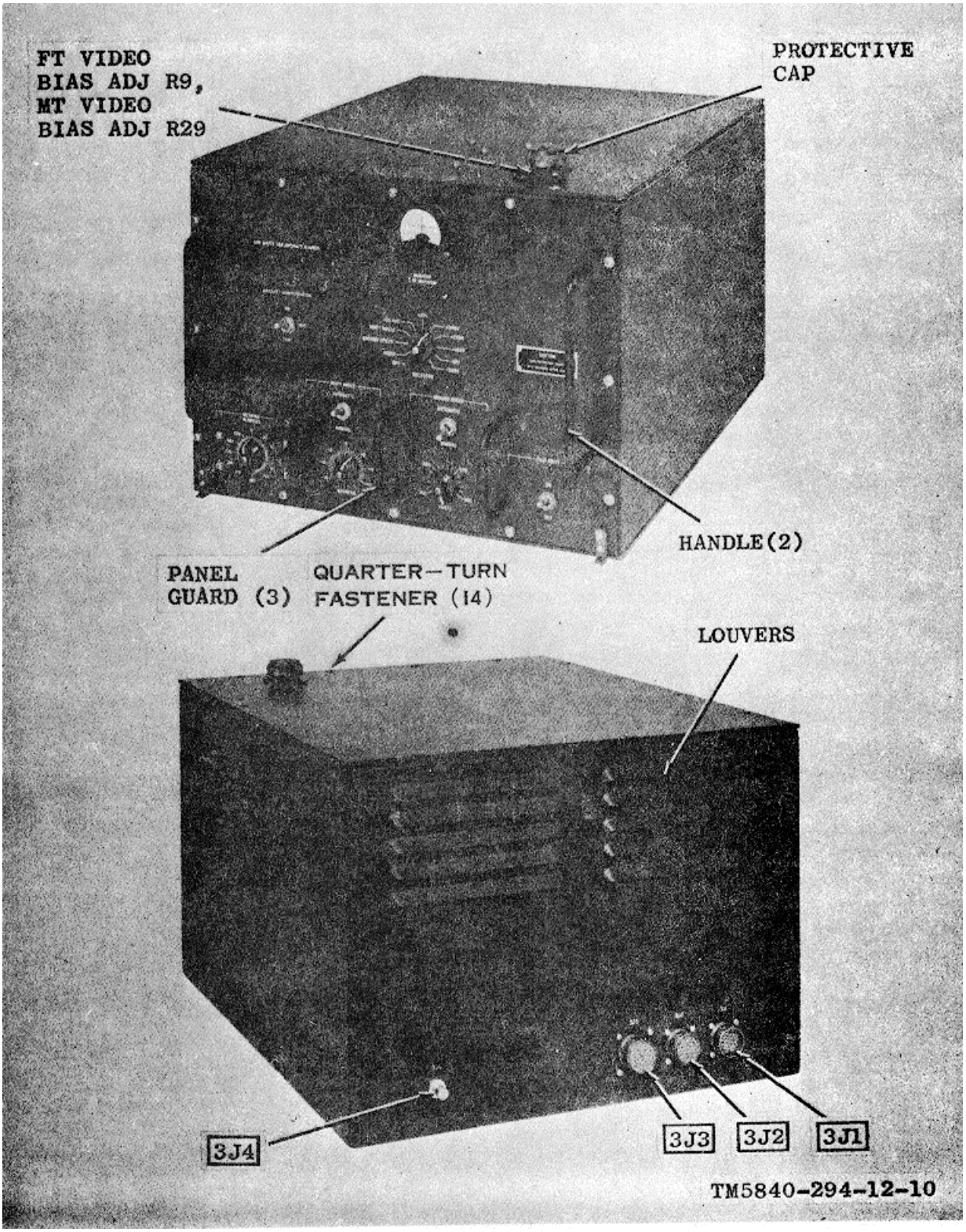


Figure 1-11. Decoder, Video KY-564/TKQ-2.

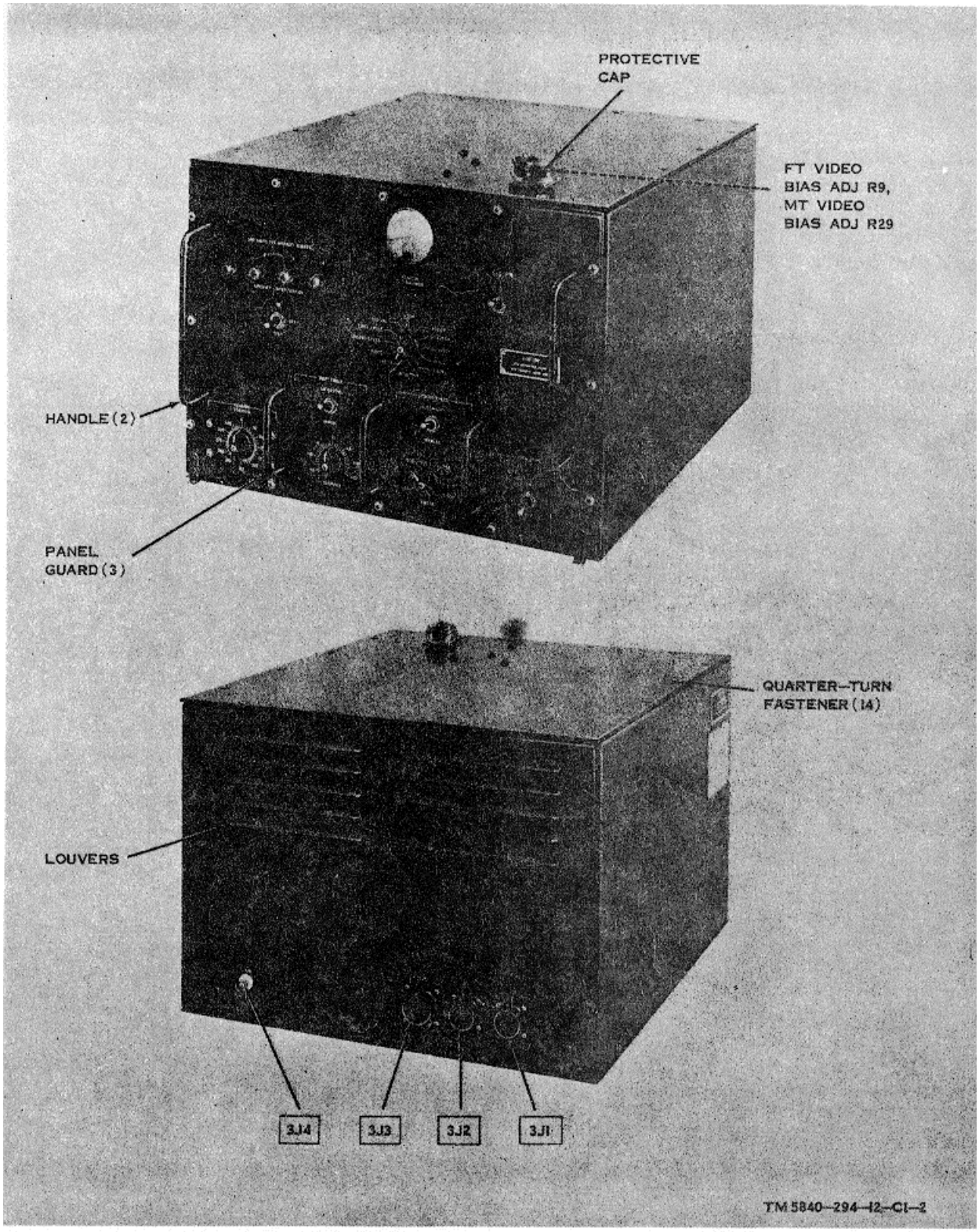


Figure 1-11.1. Decoder, Video KY-564/TKQ-2, order No. FR28-04s-M5-05-00982(E), serial No. 40 through 52, and order No. DAAB07-68-C-0304, serial No. 1 through 26.

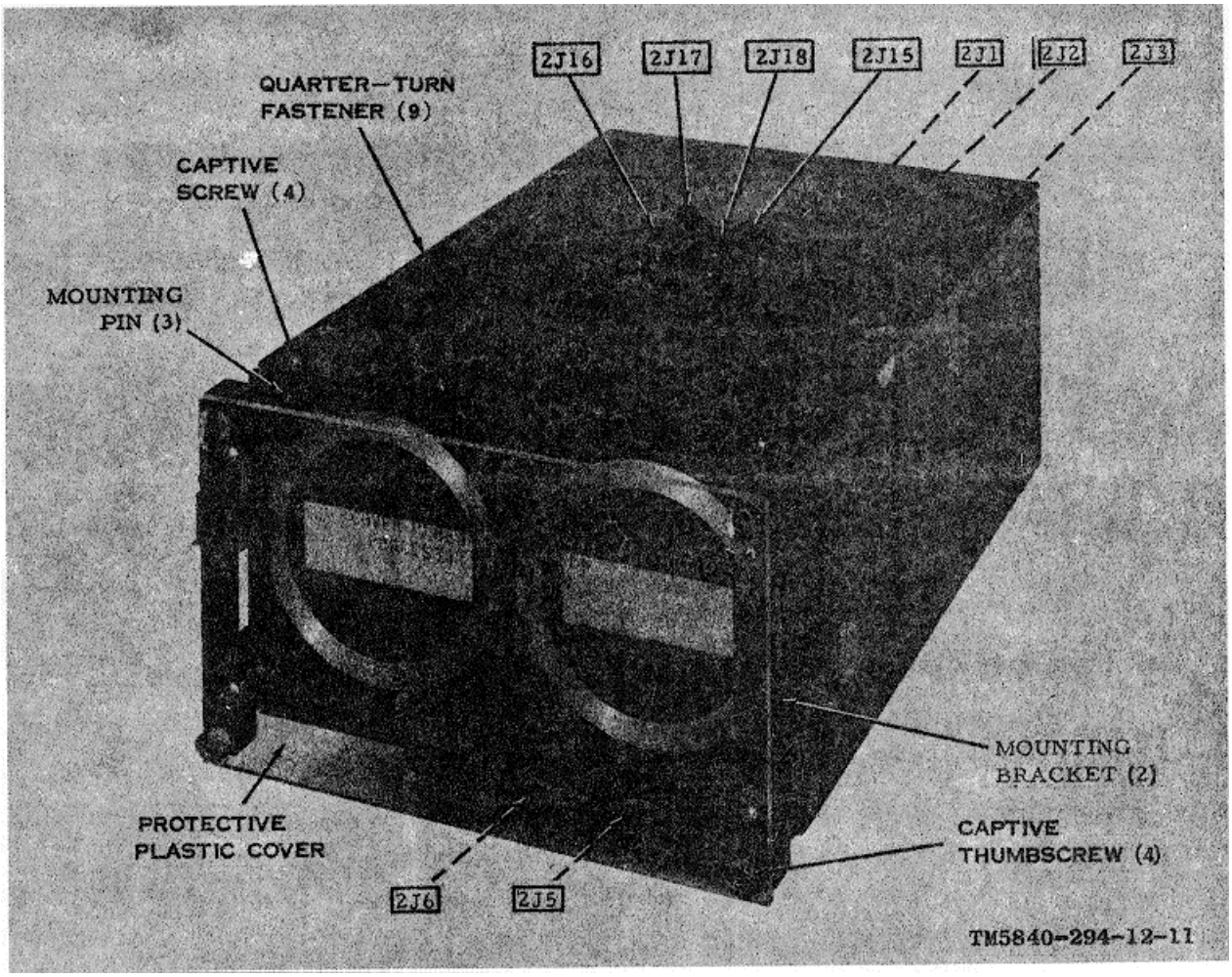


Figure 1-12. Indicator, Radar Target Ip-795/TKQ-2

When prepared for use, the processor-viewer is mounted on the target indicator as described in paragraph 2-12. In the mounted position, three mounting bushings and connectors P5 and P6 at the rear of the processor-viewer mate three mounting pins and connectors 2J5 and 2J6 (fig. 1-12) on the target indicator (para 1-14). The processor-viewer is secured in the mounted position by four mounting screws that mate threaded inserts in the target indicator. The mounting screws are accessible when the upper front cover and the lower front cover are open. When the processor-viewer is not in use, dust covers are installed over the ft and mt apertures, and the unit is stored in a transit case. Handling is simplified by a carrying handle attached to the top of the metal case.

b. The front of the processor-viewer has an upper and a lower cover. The upper front cover contains the observation window under which the processed film passes during operation. A magnifier lens is mounted over the observation window. Two horizontal guide rods and two vertical guide rods allow positioning of the magnifier lens over any section of the observation window to examine the desired target information recorded on the film. Operating controls for the processor-viewer are on the front edges of the case on each side of the upper front cover. The upper front cover, the top of which is hinged to the case, can be

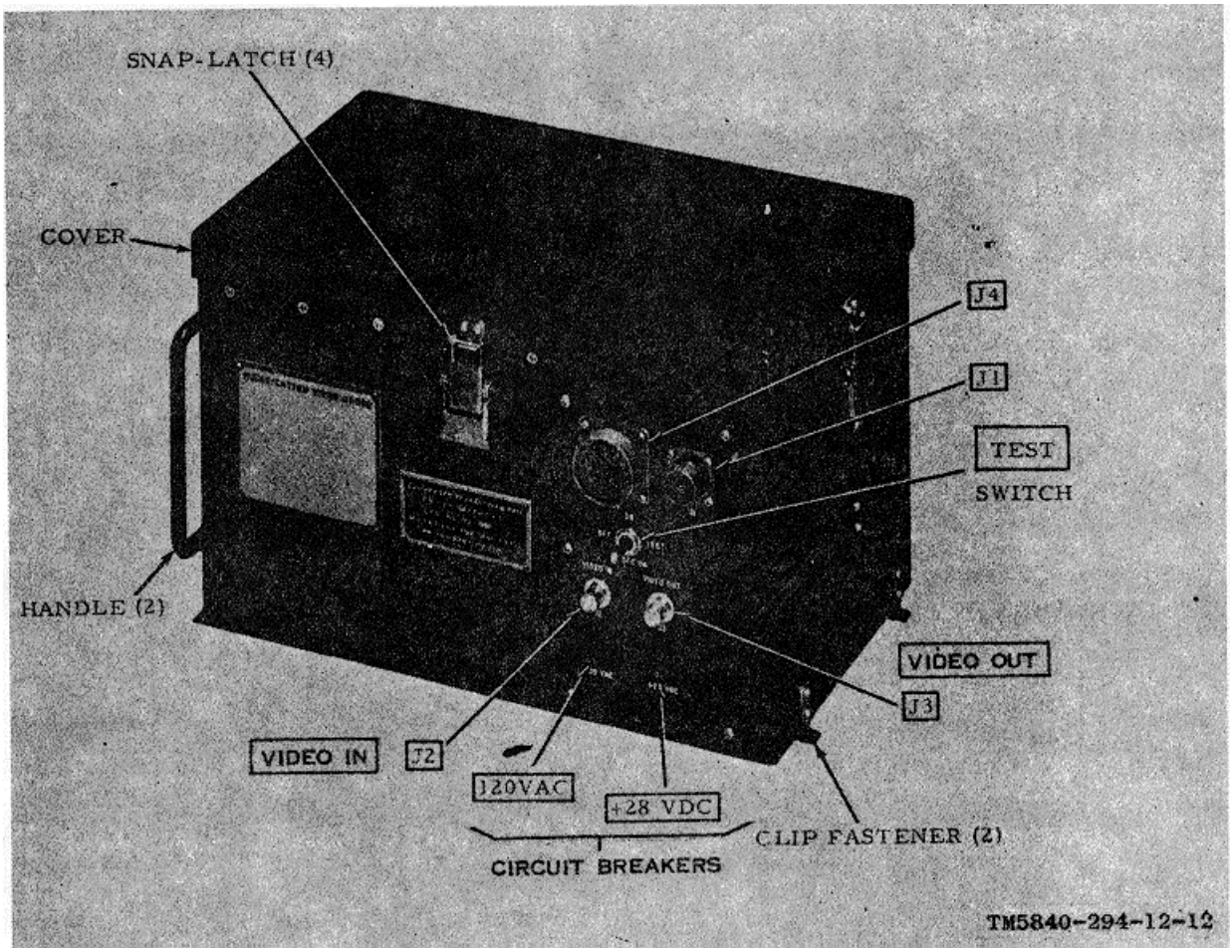


Figure 1-13. Converter-Storer, Signal Data CV-2093/TKQ-2

opened by releasing two upper front cover fasteners. Access to the film-drive system, the film illuminator assembly, and components of the read command signal generating circuitry is gained by raising the upper front cover.

c. The film-processing system, data chamber, ppd system display unit, and display unit optical system are accessible when the seven lower front cover fasteners are released and the lower front cover is removed: The data chamber contains a handwound 24-hour chronometer and indicators that show ground-speed, heading, and drift-angle information transmitted by the airborne AN/AKT-18. When in use, the data chamber will also contain a data card upon which the operator records essential mission data provided verbally by the operator of the airborne AN/AKT-18. - These data, and data from the ppd system display unit, are recorded on the film along with the photoradar map (fig. 1-32). The data card holder cover permits removal of the data card without removing the lower front cover. This is accomplished by releasing the data card holder fastener and removing the data card holder cover.

d. An internal heater, a processing fluid pump, takeup motor, and film brightness illuminator assembly are controlled by the operation of switches on the processor-viewer control panel. The film-drive system is controlled by the operation of a switch on

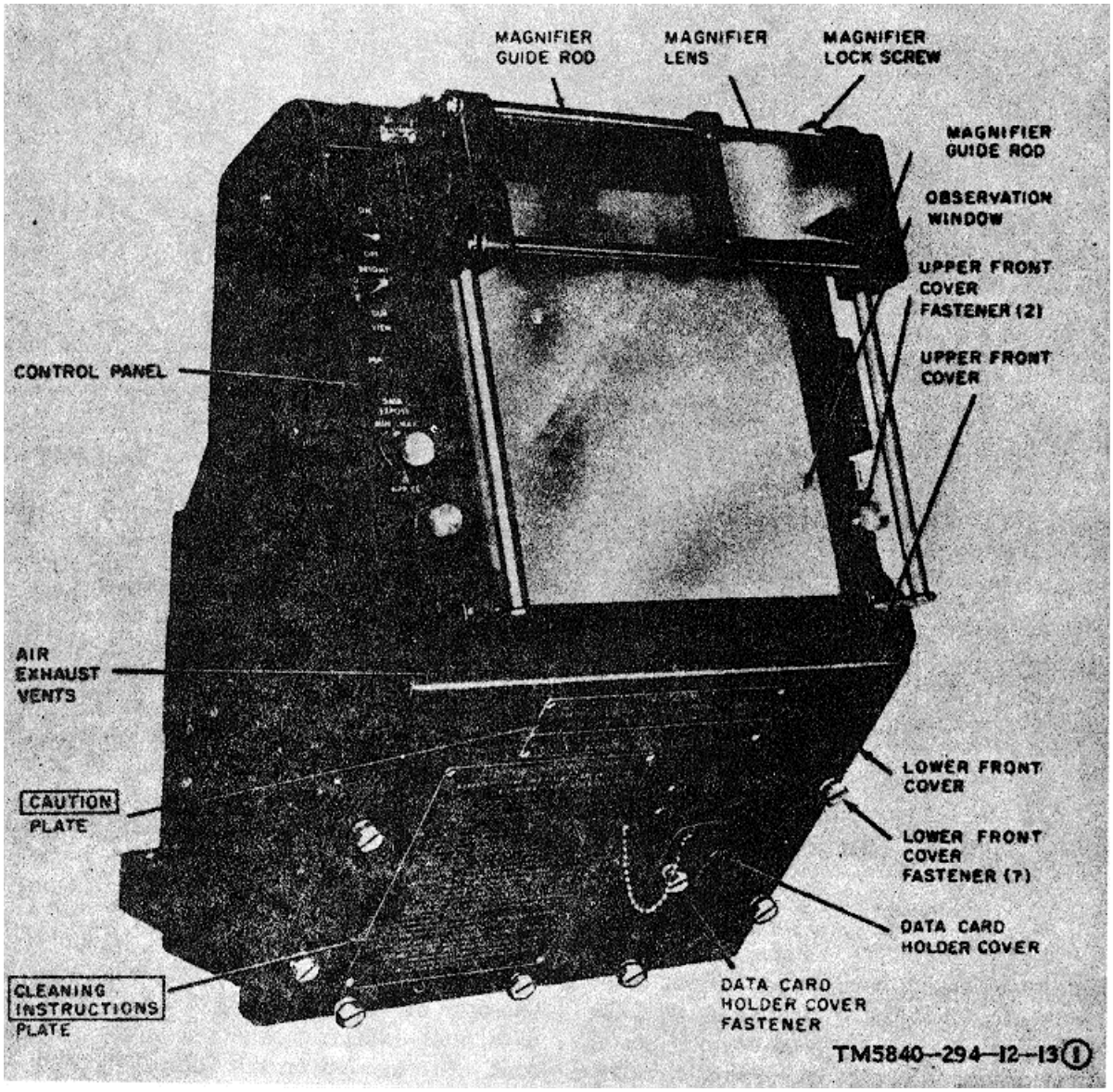


Figure 1-14 (1). Recorder-Processor- Viewer, Radar Mapping RO-166B/UP

the video decoder and a switch on the processor-viewer. Power for the internal blower that provides cooling and primary power for the film illuminator assembly are controlled by the operation of the power supply POWER switch (para 1-17).

1-17. Description of Power Supply PP-4338/TK-2

(fig. 1-15)

a. The power supply receives 120vokt ac, 400-cps primary power from the generator set and 28-volts dc from the 28-volt de power

supply. These inputs are connected through circuit breakers in the junction box on the shelter left wall. The power supply transforms, rectifies, and regulates primary power inputs to provide the output voltages required for operation of the video decoder, the target indicator, and the processor-viewer. Outputs of the power supply are: +300, +250, +150, -10, and-,300 volts dc.

b. Structurally, the power supply is a panel-chassis assembly enclosed in a metal case with

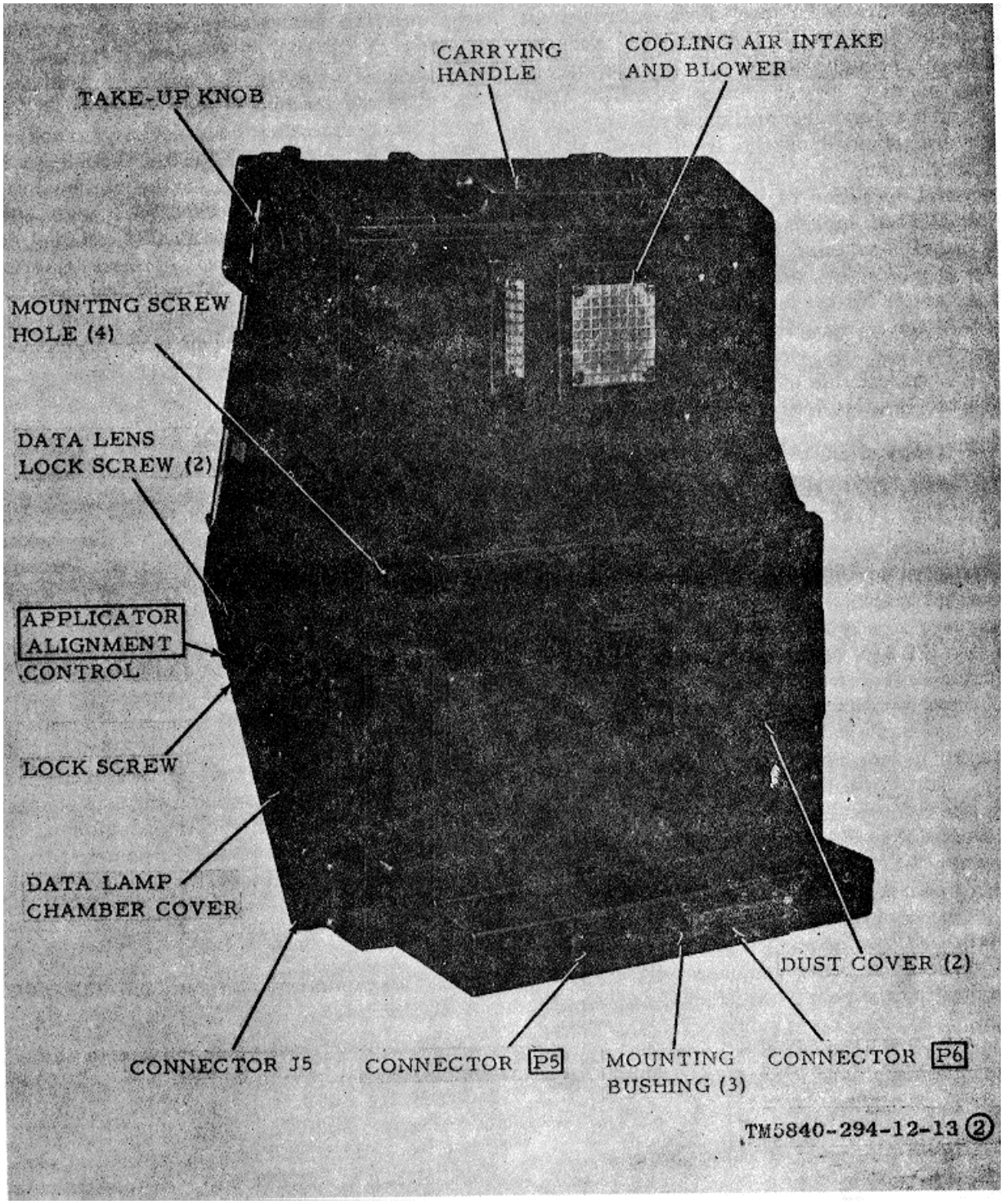


Figure 1-14.---Continued.

removable top and bottom covers. Base, Shock Mount, Electrical Equipment MT-3463/TKQ-2 (para 1-55) supports the power supply in its operating position on the shelter floor (fig.

1-7). Cooling is provided by an internal blower that draws air into the case through an air intake port in the bottom cover and exhausts it through louvers in the rear panel. Seven primary power fuses, POWER ON-OFF switch, two indicator lamps, and five spare fuses are mounted on the front panel, which has handles and two switch guards to prevent accidental operation of the POWER ON-OFF switch. Three connectors are located on the rear panel. Connector iJ1 is the primary power input connector. Connector 1J2 is the output connector for the target indicator and processor-viewer. Connector 1JS is the output connector for the video decoder. Connector 1J4, on the left side of the case**,** is the output connector for the d/a converter.

1-18. Description of Power Supply PP-4339/TKQ-2

(fig. 1-16)

a. Primary power (120 volts ac at 400 cps) is connected to the hv power supply through the target indicator. Outputs of the hv power supply are a +10-kilovolt (kv) anode voltage and two +2.2-kv focus voltages for the target indicator cathode ray tubes.

b. The hv power supply is housed in a metal case equipped with a cover that can be removed by loosening eight quarter-turn fasteners. An interlock switch disconnects power from the hv power supply when the cover is removed. Voltages between the hv power supply and the target indicator are coupled through connectors 10J1 through 10J4 on one end of the case. Three of the connectors (high voltage) are mechanically interlocked to prevent them from being removed without first disconnecting the power connector. Base, Shock Mount, Electrical Equipment MT-3471/TKQ- 2 (para 1-57) supports the hv power supply in its operating position on the shelter floor (fig. 1-3).

1-19. Description of Antenna-Radome AS-1097A/GR

(fig. 1-17)

The data antenna consists of Antenna-Radome AS-1097A/GR and Adapter, Connector UG-999A/U which is stored in the storage case when the data receiving set is shipped. The AS-1097A/GR is a four-element stacked array enclosed in a 7-inch diameter, cylindrical, fiberglass radome that is approximately 10 feet long. It operates in the frequency range of 225 to 400 mc. The UG-999A/U adapter is connected to the bottom of the antenna to permit the connection of cable W6 (para 1-30). When in use, the data antenna is mounted on the data antenna mast (fig. 1-4) and extended as shown in figure 1-1. When not in use, the data antenna is removed from the mast and secured to the top of the shelter by a backplate, three clamps, and a yoke (fig. 1-5).

1-20. Description of Mast AB-924/TKQ2

(figs. 1-3 and 1-8)

The data antenna mast is a telescoping mast assembly. It is mounted on the shelter floor near the rear wall and extends through the roof. The data antenna mast can be extended to a maximum height of approximately 19 feet above the shelter floor by a removable crank It can be retracted to a minimum height of approximately 20 inches above the shelter roof. When not in use, the removable crank is stored on the shelter rear wall behind the data antenna mast. An adapter (fig. 1-4) attached to the top of the data antenna mast is shaped to accept the base of the data antenna. If necessary, the adapter can be removed to reduce the overall height of the shelter during shipment (para 5-3).

1-21. Description of Antenna AT-912/VRC

(fig. 1-18)

The communications antenna consists of Antenna Elements AT-1095/VRC and AT-1096 /VRC, Base, Antenna Support AT-719/VRC, and Antenna Matching Unit MX-2799/VRC. It is a base-fed whip-type antenna. Base, Antenna Support AT-719/VRC is mounted on the right front corner of the shelter roof. The antenna lead is connected to Antenna Matching Unit MX-2799/VRC, which is mounted on the shelter ceiling below the AT-719/VRC.

1-21.1 Description of Antenna AS-1729/VRC

(fig. 1-18.1)

The communications antenna, consisting of Antenna Elements AT-1095/VRC and AS1730/VRC, and Matching Unit-Base, Antenna MX-6707/VRC, is a base-fed, whip-type antenna. Matching Unit-Base, Antenna MX- 6707/VRC is mounted through the shelter roof above the data receiver and is connected to the antenna lead and the antenna control cable. A manual frequency band selection switch is part of Matching Unit-Base, Antenna MX-6707/VRC (fig. 3-13.1).

1-21.2 Description of Power Supply PP6305/G

(fig. 1-14.1)

a. The 28-volt dc power supply receives 120 volts (nominal), 400-cps, three-phase power from three 4-ampere circuit breakers on the front panel of the junction box (fig. 1-8). The 28-volt dc power supply transforms and rectifies the primary power inputs to provide 28 volts dc *re*quired for operation of Power Supply PP-4338/TKQ-2, the communications receiver-transmitter, and the extension spotlight (fig. 1-8). The 28-volt dc power supply is capable of supplying 50 amperes, continuously.

b. The 28-volt dc power supply is constructed cylindrically and is covered by a two-piece housing. The unit is mounted on a base which is installed on a mounting plate. A cooling fan, at the terminal end, draws air through the cover grille and exhausts it through the cover grille in the opposite end. Primary ac power is applied to input connector 5A4J1. The dc output voltage is taken from the two terminal studs of terminal board 5A4TB1. Polarity markings are stamped on the end of each terminal stud.

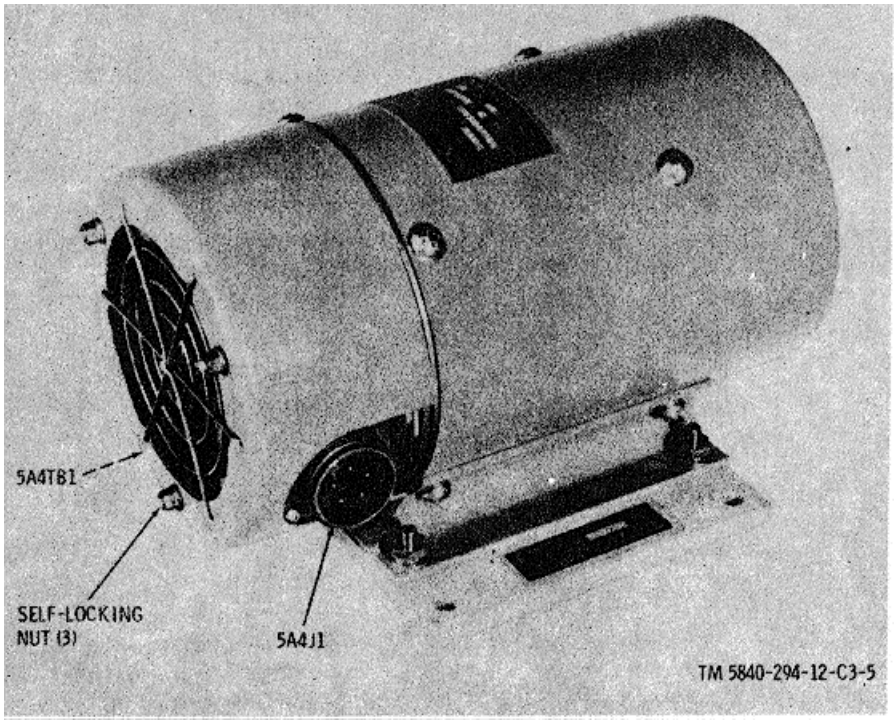


Figure 1-14.1. Power Supply PP-6305/G

1-22. Description of Heater, Hunter Model UH48, Type 11

Note. Two configurations of heaters are supplied with the AN/TKQ-2. An arbitrary reference of heater A and heater B is assigned in this manual to distinguish between the two heaters. Heater A is supplied with AN/TKT-2's bearing serial numbers I through 6 and is described in a below. Heater B is supplied with AN/TKQ-2's bearing serial numbers 6 and up and is described in b below.

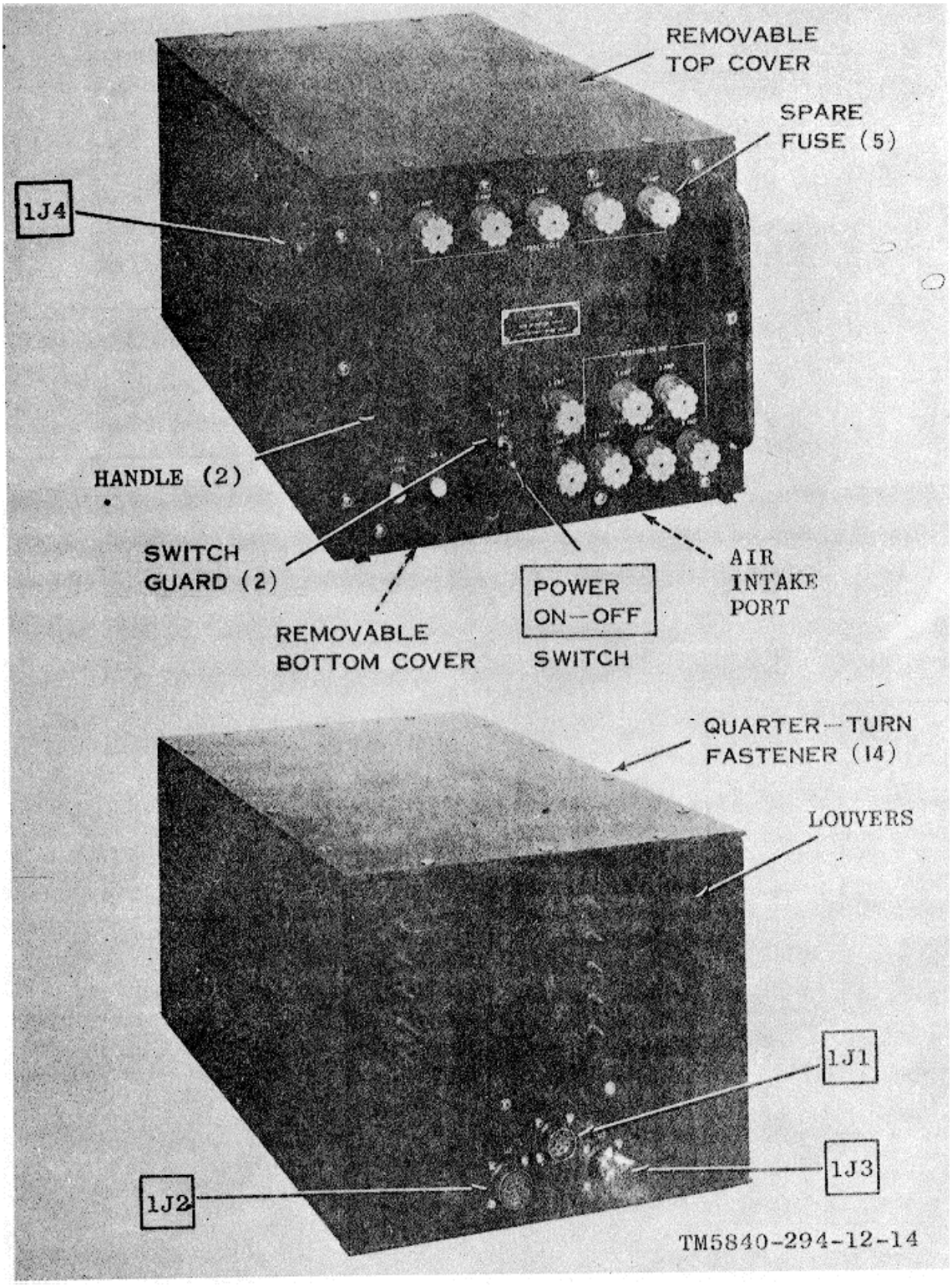


Figure 1-15. Power Supply PP-4338/TKQ-2.

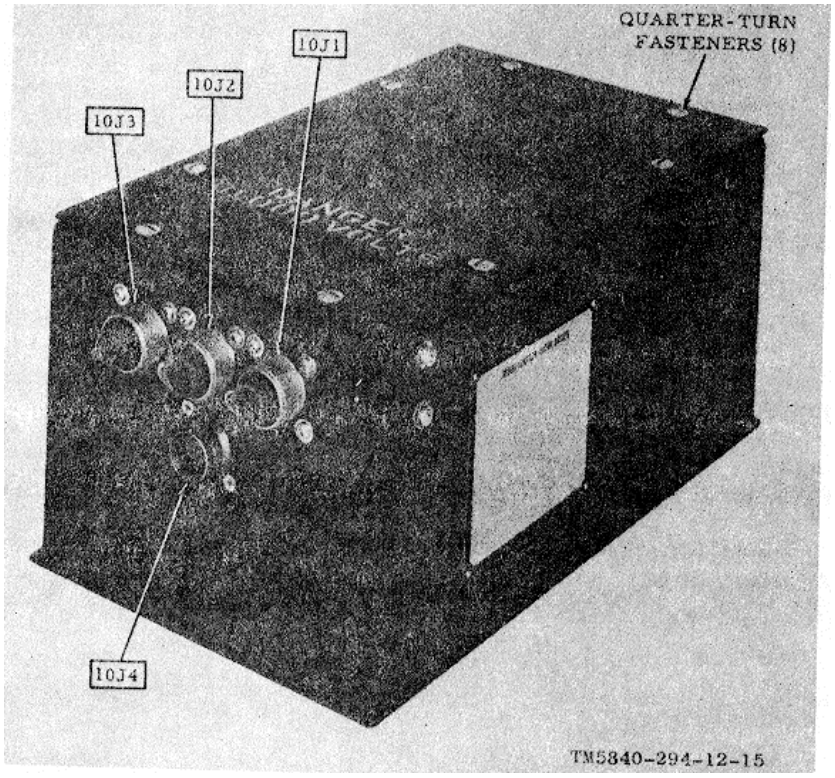


Figure 1-16. Power Supply PP-4339/TKQ-2.

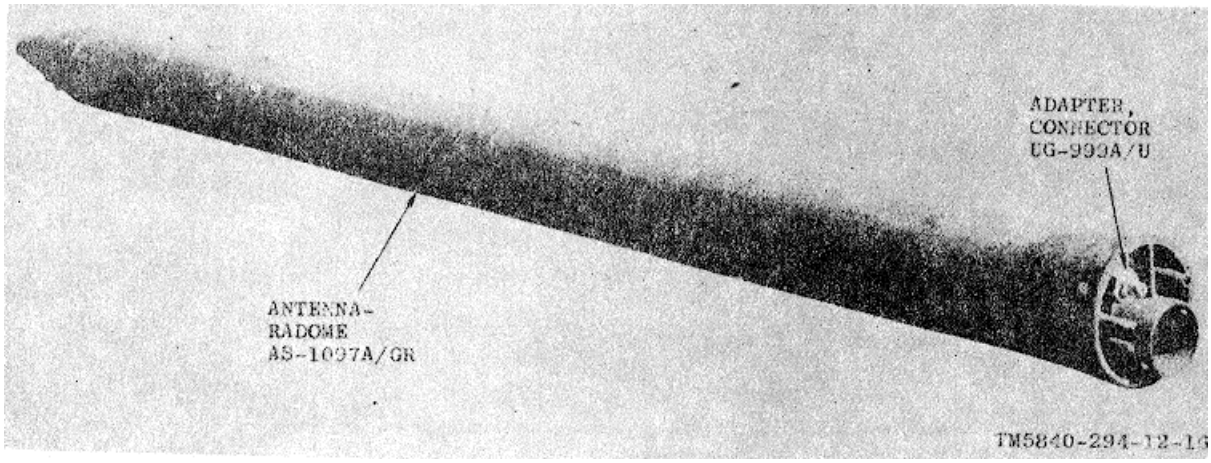
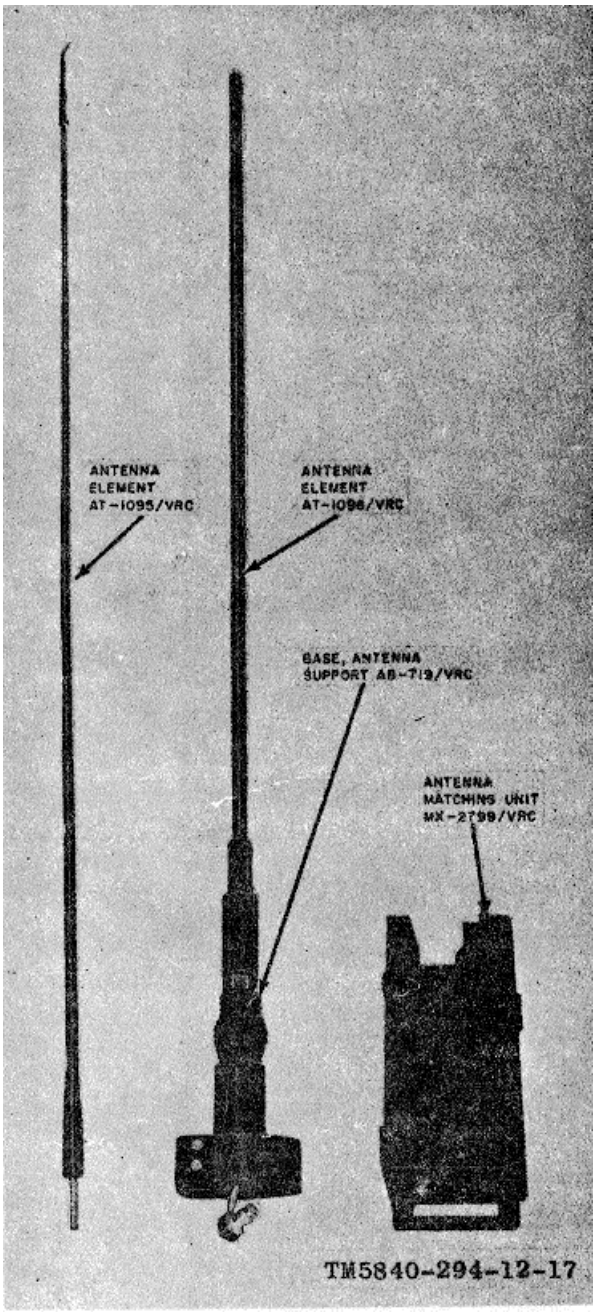


Figure 1-17. Data antenna.



a. Heater A (fig. 1-19). Heater A is a multifuel-burning, forced hot air-type heater with an output capacity of 15, 000 btu per hour. It operates on any grade of gasoline and requires 123-volt ac, 400-cps electrical power.

(1) The heater metal case includes two removable panels (A, fig. 1-19), one at the top and one at the left side. The left side panel contains an air inlet screen to receive circulating air. The heater front panel includes an air discharge louver, a fuse, controls, indicators, and electrical connectors. The air discharge louver can be pulled out and repositioned to direct the heated air in a vertical or horizontal direction. Electrical power is applied to the POWER connector. An external heater thermostat (fig. 1-8) connects to THERMO connector 5A1J2.

(2) Fuel is supplied to the heater through the fuel inlet fitting at the rear of the heater (B, fig. 1-19). Heater fumes are discharged through the exhaust outlet fitting. A fresh air inlet is also located at the rear of the heater. Mounting facilities for the heater include four receptacles at the bottom corners of the heater.

b. Heater B (fig. 1-20). Heater B is similar to heater A (*a* above). Differences in heater B are described below.

(1) The air inlet screen for receiving circulating air is in the top panel. The front panel includes an air discharge louver and a controls and electrical connectors panel. Located on the controls and electrical connectors panel are a fuse, a spare fuse, two controls, and two electrical connectors. Electrical power is applied to the POWER 120 VAC connector, and the external heater thermostat (fig. 1-8) is connected to THERMO connector 5A1J2.

(2) The fuel inlet and exhaust outlet fittings are at the rear of the heater. A fresh air inlet, hidden by a cover, is also at the rear of the heater. When the heater is installed, the cover is removed and a flexible hose with adapter plate is installed in its place.

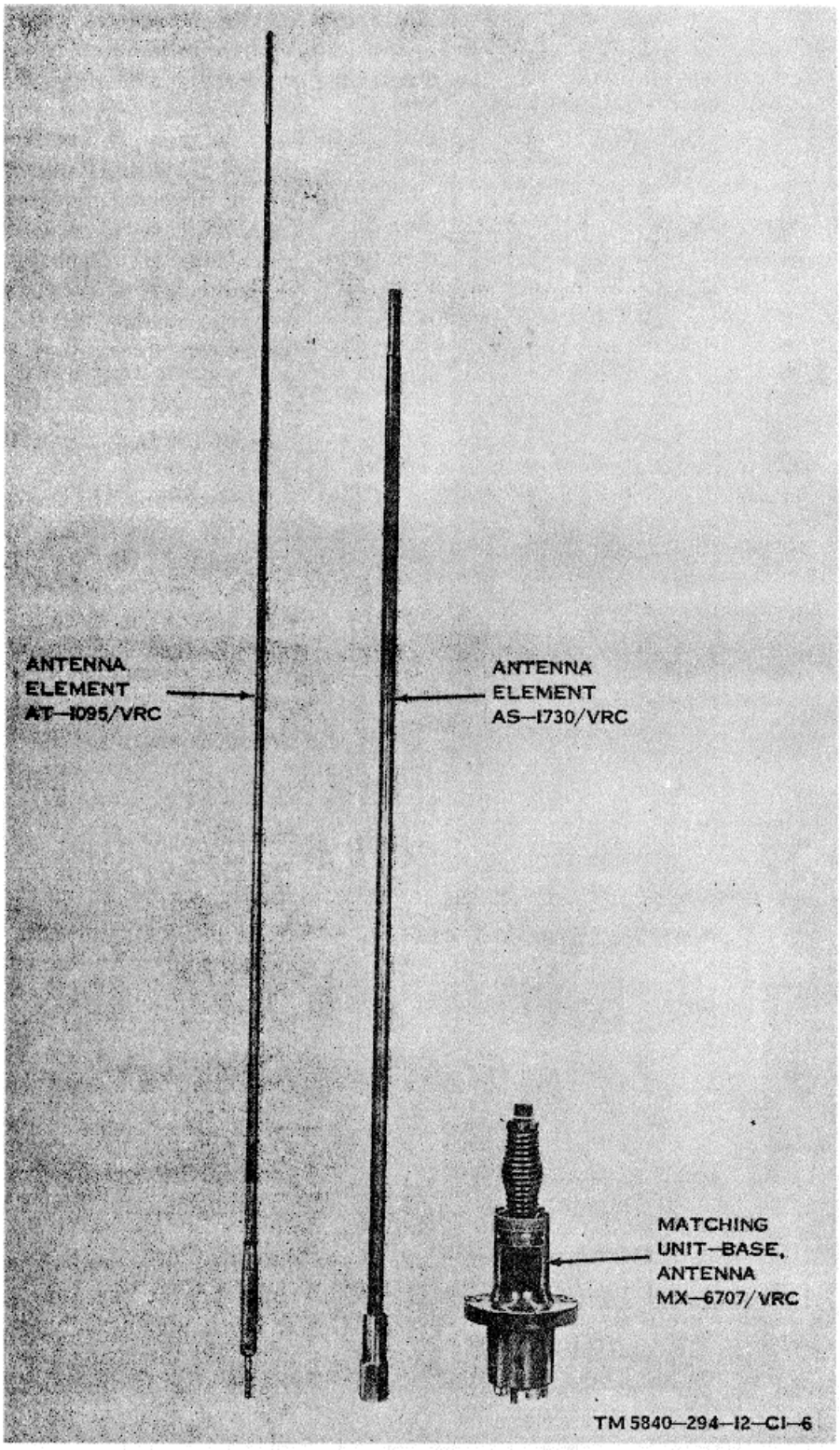


Figure 1-18.1. Antenna AS-1729/VRC.

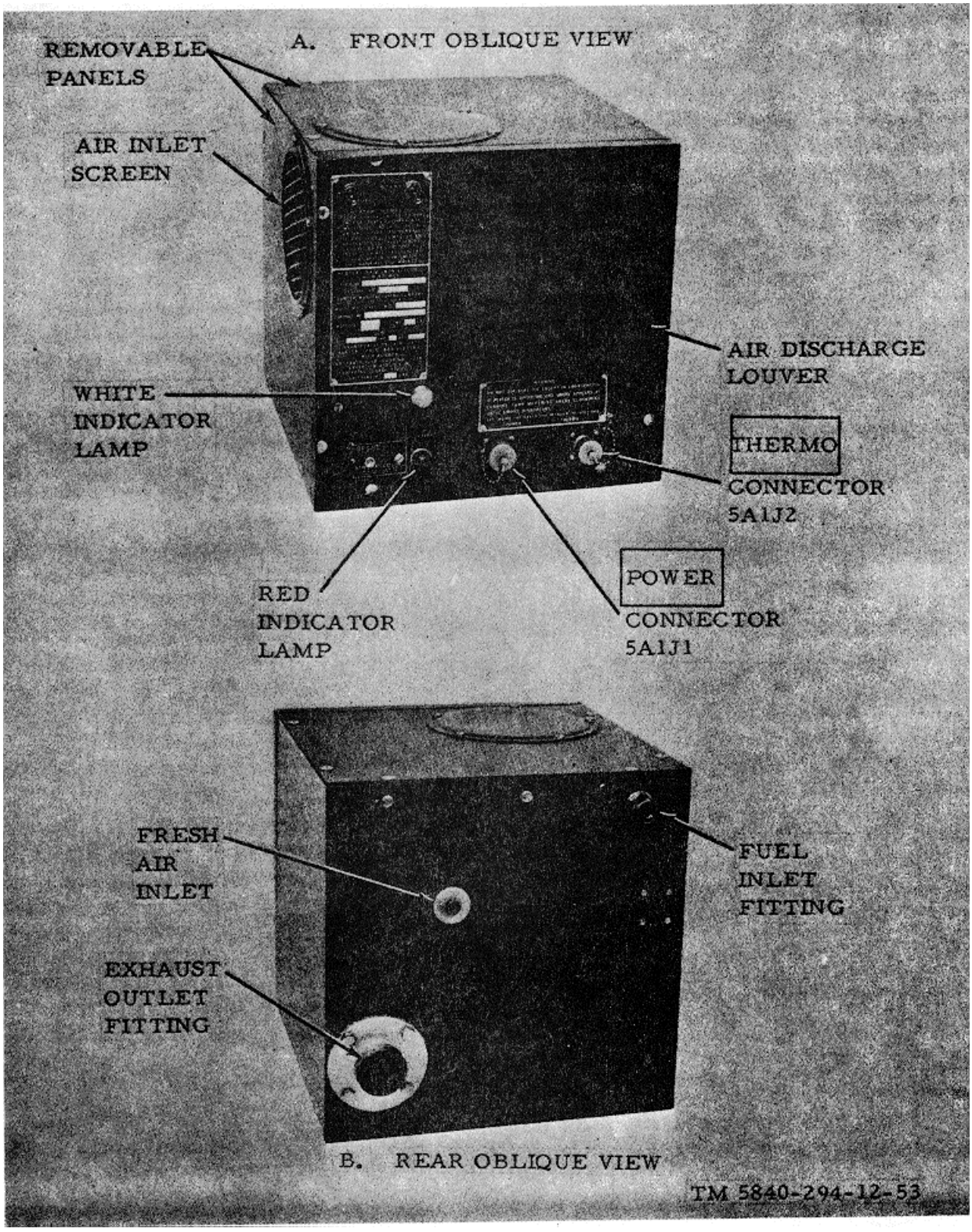


Figure 1-19. Heater, Hunter model UH-48, type II (heater A).

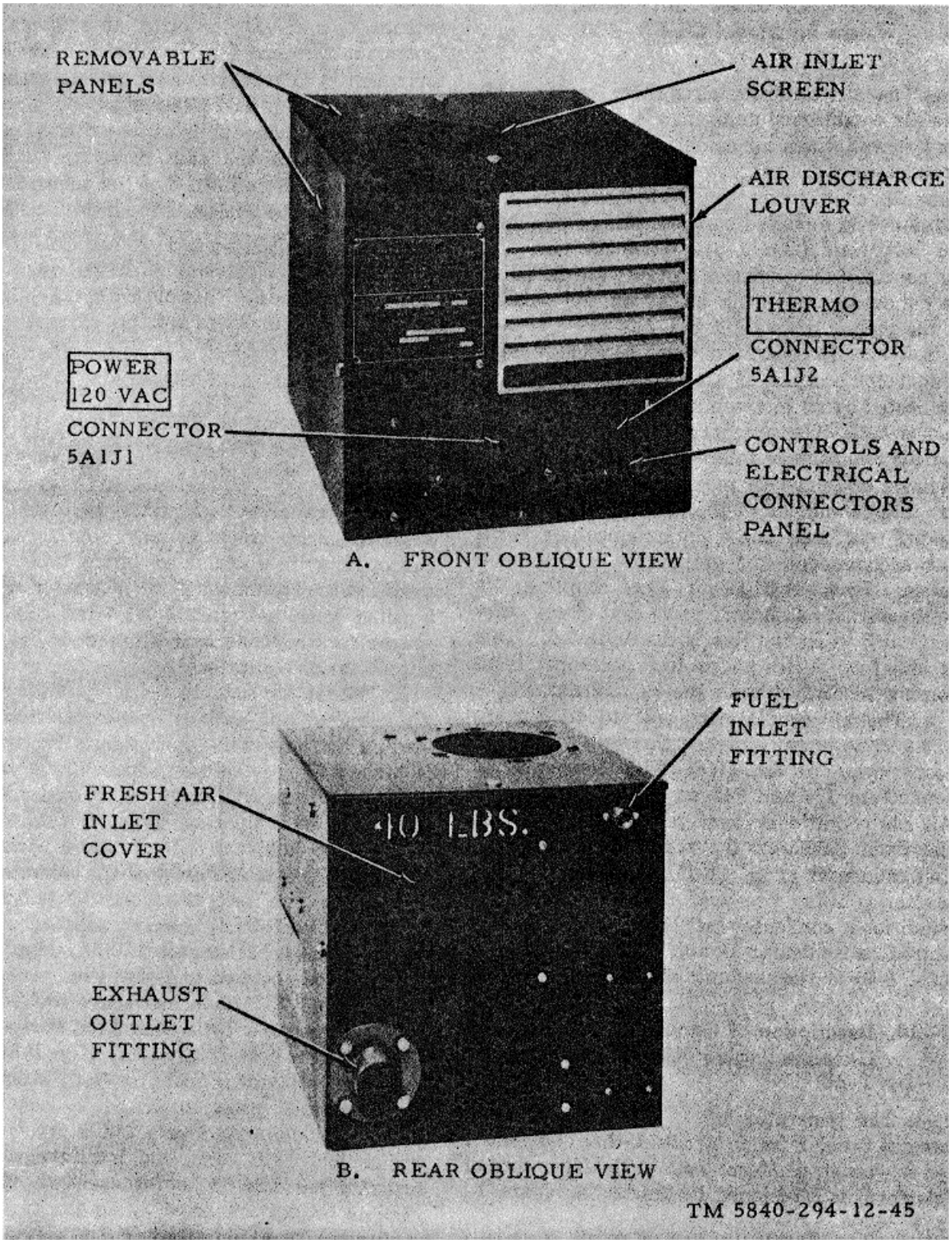


Figure 1-20. Heater, Hunter Model UH-48, type II (heater B).

1-23. Description of Air Conditioner, Therm-Air Model CE-6A-4

(fig. 1-4)

a. The air conditioning system consists of two air conditioner units installed on the shelter left wall. Each air conditioner unit includes a condenser section and two evaporator sections. The air conditioner evaporator sections are permanently mounted on the inside of the shelter left wall (fig. 18). When in use, the air conditioner condenser sections are installed on condenser mounting blocks on the outside of the shelter left wall (fig. 1--4).

b. When in operation, the condenser and evaporator sections of each air conditioner are connected by an interconnecting electrical cable and two flexible, pre charged refrigerant lines. An air conditioner interconnection port below each set of condenser mounting blocks provides for interconnection of the condenser and evaporator sections. These interconnection ports also accommodate the evaporator condensation tubes Each refrigerant line coupling is equipped with a shutoff valve that closes automatically when the line is disconnected. This is a safety device to protect personnel from coming in contact with the refrigerant.

c. The air conditioners operate on Sphase 12O-volt ac power supplied through two 6 1/2- foot power cables (W4, W5) connected to connectors 5J4 and 5J5 on the junction panel All air conditioner operating controls are on the front panels of the evaporator (fig. 3-10 and condenser (fig. 3-11) sections. When the shelter is being prepared for transit, the air conditioner condenser sections are removed and stored on condenser storage mounting brackets (fig. 1-7) on the shelter right wall.

1-24. Description of Generator Set, Gasoline Engine PU-107A/U

(fig. 1-21)

a. The generator set is installed within a welded tubular frame structure that is mounted on a wooden platform with skids. The wooden platform is positioned in the trailer (para 1- 25).

b. The generator set is a single-bearing, permanent-magnet-type alternator direct-coupled to the flywheel of a four-cylinder, four-cycle gasoline engine. It also includes two dc generators, two 12-volt batteries, all controls and instruments required for regulation, and a winterization system to make the engine easier to start in extremely cold weather. c. The generator set provides primary power for operation of the data receiving set. The 120-vit ac, 400cps output of the generator set is supplied to the shelter through two cable assemblies (W2/3, para 1-28). Cable W2/3 is stored in the storage case when not in use. Refer to TM 5-5264 for a complete description of the generator set.

1-25. Description of Trailer, Cargo, 3/4-Ton 2W-M101

(fig. 1-21)

a. The -trailer is designed to be towed by a 3/4Jton cargo truck or any similar vehicle equipped with a standard pintle hook. It is modified to accommodate the generator set, six 5-gallon gasoline cans, tool kits and running spares for the generator set and trailer, and miscellaneous equipment.

b. The trailer endgate assembly is hinged at the corners, and can be opened to facilitate loading and unloading operations. The tailgate is hinged to provide easy access to the trailer interior. When equipment is to be loaded or unloaded, two tailgate support chains can be used to hold the tailgate in a horizontal position. Pins at the ends of the tailgate support chains are used to secure the tailgate in the closed position. A wood and steel removable rack assembly extends 15 3/4 inches above the sides of the trailer body. Five removable bows extend 15 1/2 inches above the top rail of the removable rack assembly. The removable bows support a tarpaulin (fig. 1-3) that is lashed to tiedown hooks on the trailer body during normal operation.

c. Two handbrake levers at the front of the trailer body are connected by linkages to a separate parking brake for each wheel. The parking brakes are used when the trailer is parked and disconnected from the towing vehicle, or when the trailer and the towing vehicle are connected and parked.

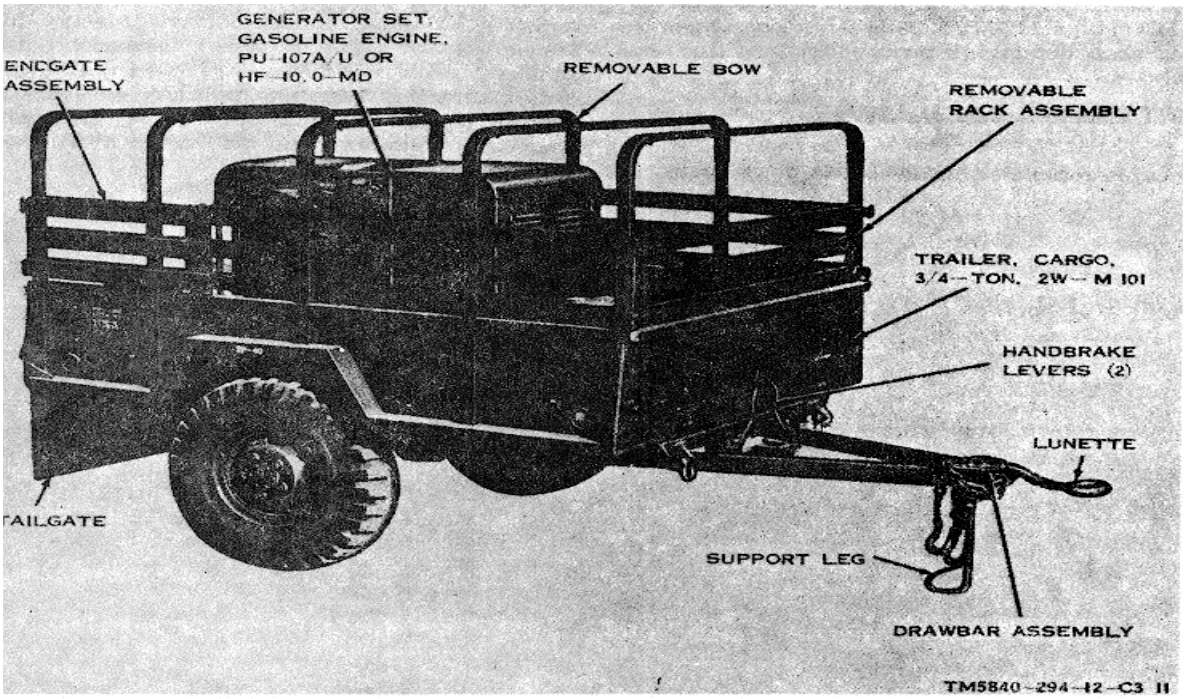


Figure 1-21. Generator Set, Gasoline Engine, Trailer Mounted PU-375/G, PU-375A/G, or PU-375B/G

d. A drawbar assembly is attached to the front of the trailer chassis. The towing end of the drawbar assembly is equipped with a lunette to mate the pintle hook of the towing vehicle. A support leg attached to the drawbar assembly supports the front of the trailer when the towing vehicle is disconnected. The support leg can be locked in the raised or I lowered position by a spring-loaded plunger. A support is also provided for the rear of the trailer. This support (not shown) is mounted beneath the trailer bed.

1-26. Description of Minor Components

Minor components (cables and shock mounts) or the data receiving set are shown in figures 1-22 through 1-30 and are described in paragraphs 1-27 through 1-59. Miscellaneous minor components (other than cables and shock mounts) are described in paragraph 1-60.

1-27. Cable Assembly 5W24

(fig. 1-22 (1))

This cable connects the 115-volt ac output terminals of the junction box (fig. 1-8) to the 115-volt ac input, connector 5A4J1 (type MS-3102E16S-8P), of 28-volt dc power supply 5A4 (fig. 1-14.1). The cable is a 6-foot, 4inch rubber-covered, heavy-duty, four-conductor

(No. 16 wire) assembly. The four conductors are soldered to pins 1, 2, 3, and 4 .of connector 5W24P1 (type MS3108E16S-8S). The opposite end of each conductor terminates in a lug terminal.

1-27.1. Cable Assembly 5W25

(fig. 1-22(1))

This cable connects the 28-volt dc power supply output terminal studs (fig. 1-14.1) -to the junction box dc input terminals. The cable is a 6-foot, 2-inch, rubber-covered, heavy-duty, two-conductor (No. 8 wire) assembly. Both ends of each conductor are terminated in a single terminal lug. The polarity of each conductor (black (-), white (+)) is stamped on marking sleeving near the ends of the conductors

1-28. Cable Assembly, Power, Electrical CX-1 1081/U (W2/3)
(fig. 1-2)

Two W2/3 cable assemblies are used to connect the generator set 120-volt ac output terminals to input connectors 5J2 and 5J3 of the junction panel (fig. 1-4) on the shelter left wall. Cable W2/3 is a 50-foot, rubber, covered, heavy-duty, four-conductor (No. 12 wire) assembly. The four conductors are soldered to contacts 1, 3, 5, and 7 of connector W2P1 (type MS3137E19-7S). The other end of each conductor terminates in a lug terminal. The * two W2/3 cable assemblies are stored in the storage case when not in use.

1-29. Cable Assembly, Power, ElectricalCX-1 1082/U (W4, W5)
(fig. 14-2)

Cables W4 and W5 are 6-foot 6-inch rubber-covered, four-conductor (No. 16 wire) assemblies with a male connector (P1) (type MS-SlTE-19-112P) on one end and a female connector (P2) (type MS3106A-18-4S) on the other end. These cables are used to convey 120-volt ac power from connectors 5J4 and 5J5 on the junction panel (fig. 1-4) to the air conditioner condenser sections. Cables W4 and W5 are stored in the storage case when not in use.

1-30. Cable Assembly, RF (W6)
(fig. 1-22)

Cable W6 is a 20-foot cable assembly that connects Adapter, Connector UG-999A/U on the data antenna to feedthrough connector 5Jll in the shelter rear wall. It is a single-conductor, type CG-1889/U radiofrequency (rf) coaxial cable. Both W6P1 and W6P2 are type UG-21F/U connectors. Cable W6 is stored in the storage case when not in use.

1-31. Air Conditioner Interconnecting Electrical Cables (W7, W8)
(fig. 1-22)

Note. Each of the cables described below is part of one of the air conditioner interconnection assembles. The air conditioner interconnection assemblies are stored in the storage case when not in use
Cables W7 and W8 are used to connect the air conditioner condenser and evaporator sections. These cables are 4-foot, 14-conductor, plastic-covered assemblies. One end of each assembly is equipped with a female connector and the other end is equipped with a male connector. The female connectors of cables W7 and W8 are connected to the air conditioner evaporator sections. The male connectors of cables W7 and W8 are connected to the air conditioner condenser sections (when the condensers are installed for operation).

1-32. Cable Assembly SW1
(fig. 1-2)

Cable 5W1 is a 4-foot 7-inch cable assembly that connects terminals in the interconnection box (fig. 1-7) on the shelter front wall to power supply input connector 1J1. It is a rubber-covered, seven-conductor (No. 16 wire) assembly. The seven conductors are soldered to the seven contacts of plug connector 5W1P1. The other ends of the conductors terminate in lugs that are attached to terminals in the interconnection box.

1-33. Cable Assembly 5W2
(fig. 1-22)

Cable 5W2 is a 6-foot 6-inch cable assembly that connects power supply output connector 1J2 to target indicator input connector 2J1. It is a 27-conductor (No. 20 wire) assembly with connector 5W2P1 on one end and connector 5W2P2 on the other end.

1-34. Cable Assembly 5W3
(fig. 1-22)

Cable 5W3 is a 9-foot 6-inch cable assembly that connects power supply output connector 1J3 to video decoder input connector 3J1. It is a rubber-covered, 27-conductor (No. 20 wire) assembly with connector 5WSP1 on one end and connector 5W3P2 on the other end.

1-35. Cable Assembly 5W4
(fig. 1-22)

Cable 5W4 is a 7-foot l-inch cable assembly that connects video output connector 3J2 to target indicator input connector 2J2. It is a rubber-covered assembly consisting of 24

20 strand, type B-20-U insulated conductors; two 22-strand, No. 22 shielded electrical conductors; three special-purpose electrical cable assemblies, each consisting of a jacketed and shielded pair of 22-strand, insulated conductors; and ten 5-inch lengths of insulated conductor, fourteen MS25311-90 ferrules, and two MS25311-130 ferrules used as shield terminations. Each end of each of the 32 conductors and 5 shields terminates in a 37-contact plug connector.

1-36. Cable Assembly SW5
(fig. 1-22)

Cable 5W6 is a 7-foot 3-inch cable assembly that connects video decoder output connector 3J3 to target indicator input connector 2J3. It is a rubber-covered assembly consisting of five 20-strand, type B-20-U insulated conductors; sixteen 22-strand, No. 22 shielded conductors; and thirty-two 5-inch lengths of insulated conductor and thirty-two MS25311-90 ferrules used as shield terminations. Each end of each of the 21 conductors and 16 shields terminates in a 37-contact plug connector.

1-37. Cable Assembly, RF CG-530A/U (5W6)
(fig. 1-22)

Cable 5W6 is a 10-foot cable assembly that connects data receiver VIDEO connector 9A2J3 to d/a converter VIDEO IN connector 11J2. It is a plastic covered, single-conductor, type RG-62A/U RF coaxial cable with a type UG-260/U straight plug connector (5W6P1) on one end and an elbow plug connector (5W6P2) on the other end. Connector 5W6P1 connects to the d/a converter. Connector 5W6P2 connects to the data receiver.

1-38. Cable Assembly 5W7
(fig. 1-22)

Cable 5W7 is an 8-foot 5-inch cable assembly that connects power input terminals in the interconnection box (fig. 1-7) on the shelter front wall to data receiver POWER connector 9A2J1. It is a rubber-covered, two-conductor (No. 16 wire) assembly. One end terminates in plug connector 5W7P1 (type MS3137E-7S). The other end of each conductor terminates in a terminal lug (type MS25036-53).

1-39. Cable Assembly 5W8
(fig. 1-22)

Cable 5W8 is a 5-foot cable assembly that connects power input terminals in the junction box (fig. 1-8) on the shelter left wall to heater input connector SAIJ1. It is a rubber-covered, three-conductor (No. 16 wire) assembly with connector 5A8P1 (type MS3018B-145-7S) on one end. The other end of each conductor terminates in a terminal lug (type MS25036-53).

1-40. Cable Assembly, RF CG-2768A/U (5W9)
(fig. 1-22)

Cable 5W9 is a 4-foot 10-inch cable assembly that connects data receiver ANTENNA connector 9A1J2 to feedthrough connector 5J11 in the shelter rear wall. It is a plastic-covered, single-conductor, RF coaxial cable with a type UG-21F/U male connector on one end and a type UG-22F/U female connector on the other end.

1-41. Cable Assembly SW10
(fig. 1-22)
Note. Two configurations of cable assembly 6W10 are applicable to the AN/TKQ-2. An arbitrary ref- erence of cable 5W10 (heater A) and cable 5W10 (heater B) is assigned in this manual to distinguish between the two cable assemblies. Cable 5W10 (heater A) is used with heater A (para 1-22a). Cable 5W10 (heater B) is used with heater B (para 1-22b).

a. Cable 5W10 (heater A) is a 5-foot cable assembly that connects the heater A thermostat to heater A connector 5A1J2. It consists of a rubber-covered, two-conductor (No. 16 wire) cable with a two-pin connector 5W1OP1 (type MS3108B-12S-3P) on one end. The other end of each conductor terminates in a terminal lug (type MS25036-6).

b. Cable 5W10 (heater B) is a 5-foot cable assembly that connects the heater B thermostat to heater B connector 5A1J2. This cable is similar to cable 5W10 (heater A) (above) except that connector 5WlOPl is a three-pin connector (type MS3108R14S-7 PX).

1-42. Cable Assembly, RF CG-1773A/U (SWl1)
(fig. 1-22)

Cable 5Wll is a 5-foot cable assembly that connects connector J552 on Antenna Matching Unit MX-2799/VRC (fig. 1-7) or Matching Unit-Base, Antenna MX-6707/VRC (fig. 1- 7.1) to the communications receiver-transmitter ANT. connector. It is a plastic-covered, single-conductor, type RG-58C/U RF coaxial cable with a type UG-88E/U male connector (5W11P1) on one end and a type UG-913A/ U male connector (5W11P2) on the other end.

1-43. Cable Assembly, Special Purpose, Electrical CX-4722/VRC (5W12)
(fig. 1-22)

Cable 5W12 is a 5-foot cable assembly that connects connector J551 on Antenna Matching Unit MX-2799/VRC or Matching Unit-Base, Antenna MX-6707/VRC (fig. 1-7.1) to the communications receiver-transmitter ANT. CONT. connector. It is a 12-conductor (No. 22 wire) cable with male connector 5W12P1 (Amphenal 67-06J14-12P) on one end and female connector 5W12P2 (Amphenol 67-06J14-12S) on the other end.

1-44. Cable Assembly, Special Purpose, Electrical CX-4720/VRC (SW13)
(fig. 1-22)

Cable 5W13 is a 5-foot cable assembly that connects power input terminals in the interconnection box (fig. 1-7) on the shelter front wall to connector J21 on Mounting MT-1029/ VRC. It is a rubber-covered, four-conductor (No. 14 wire) cable with connector 5W18P1 (Amphenol 164-230-4S). The other ends of two of the four conductors (red and white wires) terminate in a single terminal lug (type MS20659-40). The other ends of the green and black wires also terminate in a single terminal lug (type MS20659-40).

1-45. Cable Assemblies 5W14, 5W15, and 5W16
(fig. 1-22)

Cables 5W14, 5W15, and 5W16 are identical 5-foot cable assemblies that connect hv power supply connectors 10J, 10J2, and 1053 to target indicator connectors 2J16, 2J18, and 23W17, respectively. Each assembly consists of a type RG-214 coaxial cable with a type MS-27191 connector at each end. The three cable assemblies are held together at each end by a metal plate designed to prevent removal of the high voltage cables without first removing power input cable 5W17 (para 1-46).

1-46. Cable Assembly 5W17
(fig. 1-22)

Cable 5W17 is a 5-foot cable assembly that connects hv power supply connector 10J4 to target indicator connector 2J15. This assembly includes three No. 20 wire conductors, two shielded conductors (No. 22 wire), and one shielded pair of conductors (No. 22 wire). Each end of the cable is equipped with a connector: 5W17P1 is a type MS3137E-12SW connector. 5W17P2 is a type MS3137E-12PW connector.

1-47. Cable Assembly SW18
(fig. 1-22)

Cable 5W18 is an 8-foot 6-inch cable that conveys primary power from the junction box (fig. 1-8) on the shelter left wall to the interconnection box (fig. 1-7) on the front wall. It is a nine-conductor (No. 12 wire) cable. The conductors are attached to terminals in the junction box and the interconnection box.

1-48 Cable Assembly 5W19
(fig. 1-22)
Cable 6W19 is a 1-foot 6-inch cable that connects the four convenience outlets (fig. 1-8) on the shelter left wall to the junction box. It is a three conductor (No. 16 wire) cable. The conductors are attached to terminals of the convenience outlets and the junction box.

1-49. Cable Assembly SW20
(fig. 1-22)

Cable 5W20 is a 6-foot 8-inch cable that connects the interlock switch (fig. 1-6) on the shelter rear wall to the junction box (fig. 1-8) on the right wall. It is a two-conductor cable (No. 20 wire). The conductors are attached to terminals of the interlock blackout switch and the junction box.

1-50. Cable Assembly 5W21
(fig. 1-22)

Cable 5W21 is a 9-foot cable assembly that connects D/a converter power input connector llJl to power supply output connector I1J4. It is a seven-conductor cable with a type MSS3137E-12SY female connector (5W211P1) on one end and a type MSS13rE-12P male connector (5W21P2) on the other end.

1-51. Cable Assembly, RF CG-530A/U (5W22)
(fig. 1-22)

Cable 5W22 is a 10-foot cable assembly that connects d/a converter VIDEO OUT connector 11J3 to video decoder input connector 3J4. It is a coaxial cable with a type MS35168--88E connector on each end.

1-52. Cable Assembly 5W23
(fig. 1-2)

Cable 5W23 is an 8-foot 4-inch cable assembly that connects d/a converter output connector 11J4 to processor-viewer input connector 4J4. It is a 56-conductor cable with a type MS3116E22-55S connector on each end.

1-52.1 Cable Assembly, Special Purpose, Electrical, Branched (9W1)
(fig. 1-9.1)

Cable 9W1 is an 11-inch long, special purpose branched cable that connects the data receiver to a source of 120-volt, 400-cps power and also to the loudspeaker. Connector 9W1Pl (type MS3137E27-5SY) attaches to the data receiver; connector 9WlJl (type UG-78/U) attaches -to the loudspeaker; connector 9WlJ2 (motorola type 28-9370L011) attaches to cable 5W7 from the interconnection box.

1-52.2 Cable Assembly, Radio Frequency (9W2)
(fig. 1-9.1)

Gable 9W2 is a 16.5-inch long coaxial cable. Connector 9W2Pt (Motorla type 28-2971L-01) attaches to bandpass filter 9FL-1lV; connector 9W2LP2 (Motorola type 28 {PA2LOI1) attaches to the data receiver.

1-52.3 Cable Assembly, Radio Frequency (9W3)
(fig. 1-9.1)

Cable 9W3 is a 24-inch long coaxial cable. Connector 9W3P1 (type MS91236-21G) attaches to bandpass filter 9FL108; connector 9W3J1 (type MS91327-23F) attaches to cable 5W9 from the shelter.

1-53. Base, Shock Mount, Electrical Equipment MT-3461 /TKQ-2
(fig. 1-28)

The MT3461/TKQ-2 is a mounting for the data receiver. Four shock isolators, joined to the base by four screws, act as shock absorbers. Four ground straps connect the base, shock isolators, and the mounting surface to insure a good ground connection. Two wingnut and bushing retainers at the front of the base lock the data receiver to the mounting. Two guide pins at the rear of the base mate with rear pan mounting bushings on the data receiver ,to aid in aligning and holding the data receiver to the MT-3461/TKQ-2.

1-54. Base, Shock Mount, Electrical Equipment MT-3462/TKQ-2
(fig. 1-24)

The MT3462/TKQ-2 is a mounting for the video decoder. This mounting is a sliding-drawer-type base designed and constructed to permit a mounted video decoder to slide forward for easy removal and replacement. Two guide pins at the rear of the sliding rack mate with rear panel mounting bushings on the video decoder to aid in aligning and holding the video decoder to the MT3462/TKQ-2. The front of the video decoder is secured to the sliding rack by two wingnut and bushing retainers. Two additional wingnut and bushing retainers (not shown) at the front of the fixed rack fasten to two cleats to lock the sliding rack to the fixed rack. In the forward, position, the sliding rack locks in place and will not slide back to the normal (operating) position until a locking bar (not shown) on each side of the sliding rack is depressed.

1-55. Base, Shock Mount, Electrical Equipment MT-3463/TKQ-2
(fig. 1-2)

The MT-463/TKQ2 is a mounting for the power supply. huis mounting is a sliding-drawer4ype base designed and constructed to permit a mounted power supply to slide forward for easy removal and replacement. Two guide pins at the rear of the sliding rack mate with rear panel mounting bushings on the power supply to aid in aligning and holding the power supply to the MT-3463/TKQ-2. The front of the power supply is secured to the sliding rack by two wingnut and bushing retainers. Two additional wingnut and bushing retainers (not shown) at the front of the fixed rack fasten to two cleats to lock the sliding rack to the fixed rack. In the forward position the sliding rack locks in place and will not slide back to the normal (operating) position until a locking bar (not shown) on each side of the sliding rack is depressed.

1-56. Base, Shock Mount, Electrical Equipment MT 3464/TK-2
(fig. 1-26)

The MT3464/TKQ-2 is a mounting for the target indicator. This mounting is a sliding-drawer-type base designed and constructed to permit a mounted target indicator to slide forward for easy removal and replacement. Two guide pins at the rear of the sliding rack mate

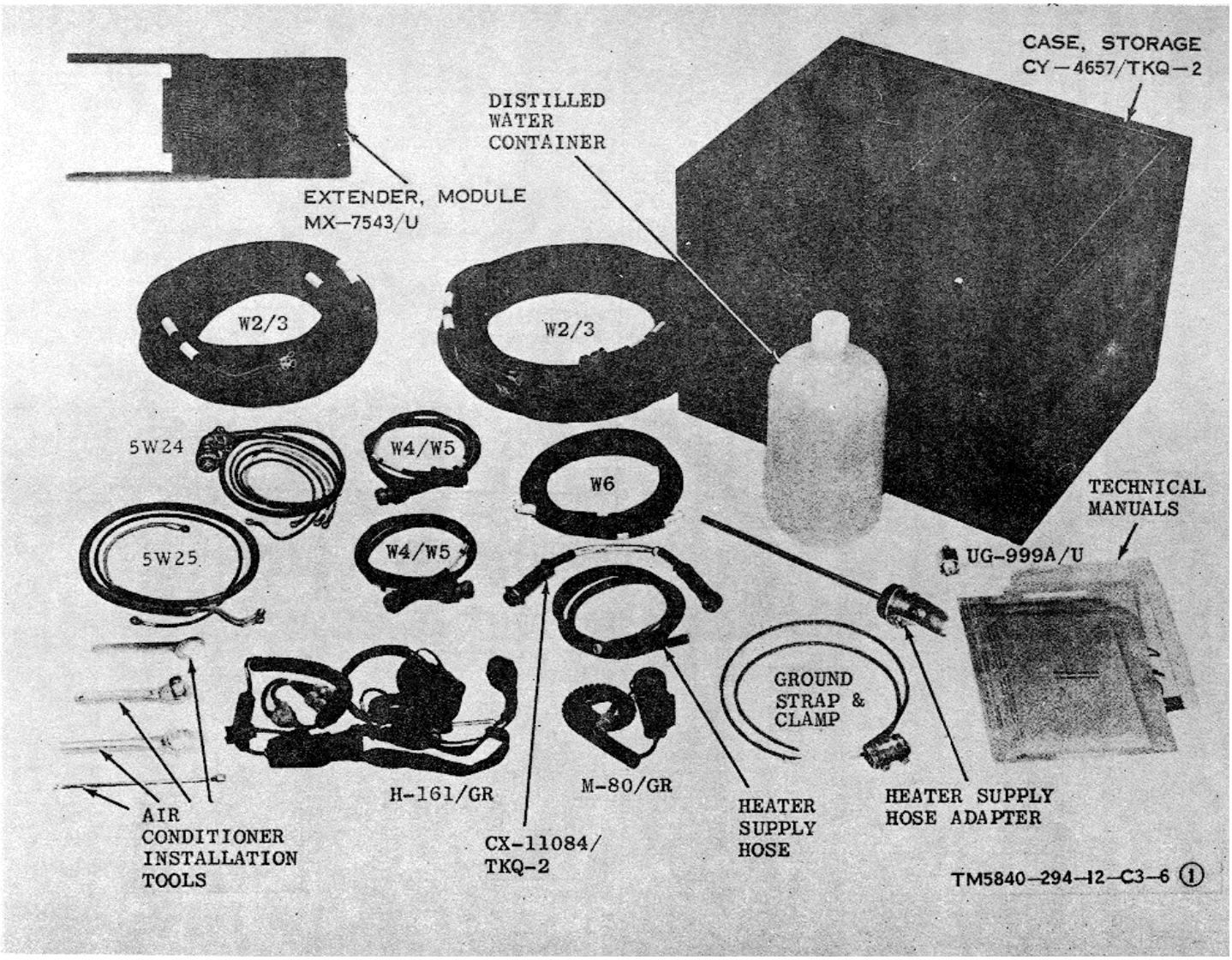


Figure 1-22. (1). Cables and miscellaneous minor components (sheet 1 of 4).

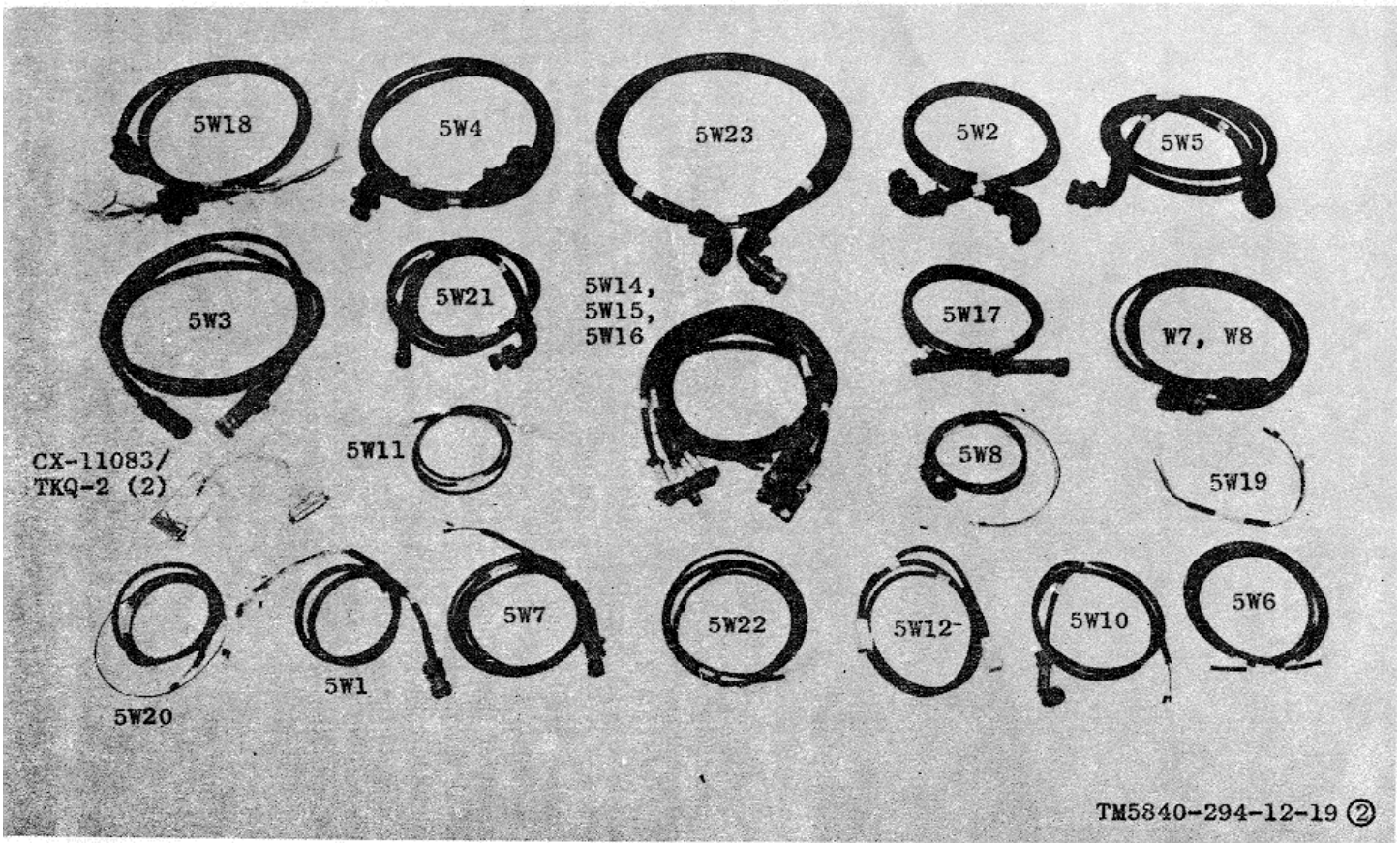
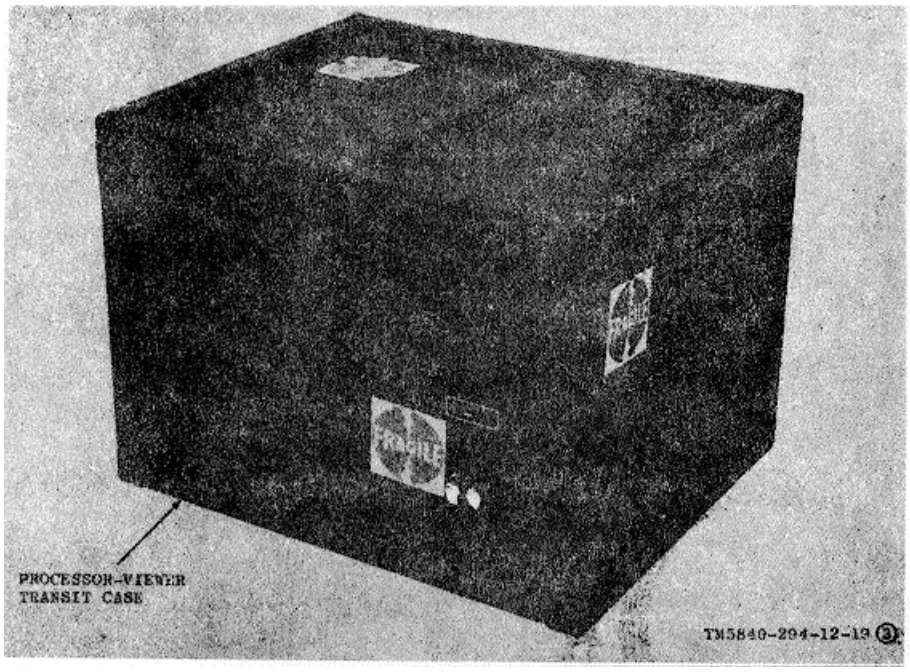


Figure 1-22. Continued



with rear panel mounting bushings on the target indicator to aid in aligning and holding the target indicator to the MT3464/TKQ-2. The front of the target indicator is secured to the sliding rack by two wingnut and bushing retainers. Two additional wingnut and bushing retainers on the front of the fixed rack fasten to two cleats on the front of the sliding rack to lock the sliding rack to the fixed rack. In the forward position, the sliding rack locks in place, and will not slide back to the normal (operating) position until a locking bar (not shown) on each side of the sliding rack is depressed.

1-57. Base, Shock Mount, Electrical Equipment MT-3471 /TK-2
(fig. 1-27)

The MT3471/TKQ-2 is a mounting for the hv power supply. Lips on the base and a clamp on the front of the base hold the mounted hv power supply to the MT3471/TKQ-2.

1-58. Base, Shock Mount, Electrical Equipment MT-3616/TKQ-2
(fig. 1-28)
The MT3616/TKQ-2 is a mounting for the d/a converter. Lips on the base and two wingnut and bushing fasteners on the front of the base hold the d/a converter to the MT3616/TKQ-2.

1-59. Mounting MT-1 029/VRC
(fig. 1-29)

a. The MT-1029/VRC is a mounting for the communications receiver-transmitter. Five stainless-steel, mesh shock isolators act as shock absorbers. Five screws inserted through the shock isolators hold the top tray to the mounting plate (lower portion). Two copper bonding straps connected between the top tray and the mounting plate insure a good ground connection. Two clamps lock the communications receiver-transmitter to the top tray. Two guide pins aid in holding the communications receiver transmitter to the MT-1029/VRC.

b. The MT-1029/VRC contains a gasket-sealed junction box which distributes power.

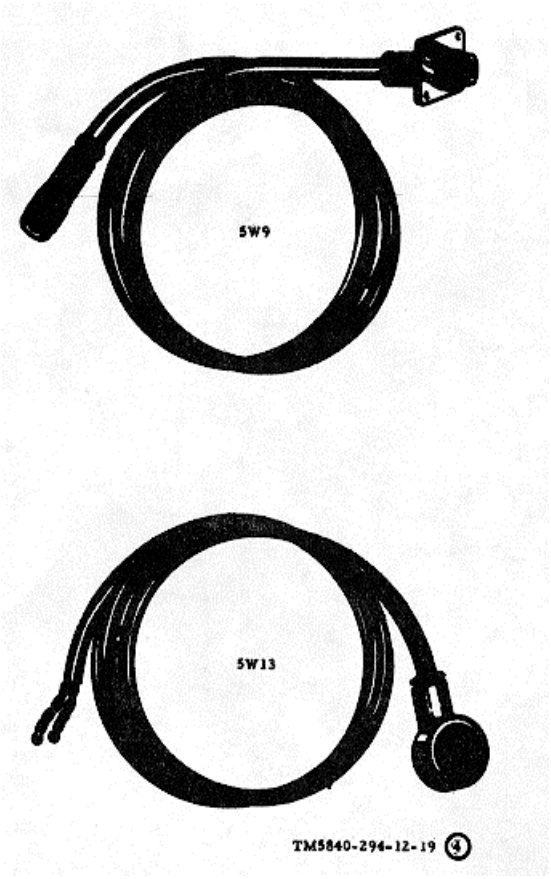


Figure 1-22 - Continued.

Control, and signal voltages between the communications receiver-transmitter and the interconnecting box. The connector on the front of the junction box mates with a connector at the rear of the communication receiver-transmitter. There are three additional connectors (not shown) on the bottom of the junction box. Only one of these three connectors (J21) is used to connect system power to the communications receiver-transmitter.

1-60. Miscellaneous Minor Components

The use and features of miscellaneous minor components are described in *a* through *h* below.

Note. The processor-viewer transmit case and the storage case are prepared for transmit as described in *a* and *b* below for road travel only. When the data receiving set is to be transported cross-country, both cases must be removed from the shelter and conveyed in a separate vehicle.

a. Processor-Viewer Transmit Case. The processor-viewer transit case (fig. 1-22) is used for storing the processor-viewer during transit. When prepared for transit, the processor-viewer transit case (and the storage case, *b* below) are clamped to the shelter floor as shown in figure 2-2.

b. *Case, Storage CY-4557-TKQ-2.* The storage case (fig. 1-22) is a heavy metal case that is 26 1/2 inches wide by 19 3/4 inches high by 21 1/2 inches deep. During transit, it is used to store miscellaneous tools and equipment and cables that are not permanently attached to the shelter. When prepared for transit, the storage case may be placed on top of the processor-viewer transit case and clamped to the shelter floor as shown in figure 2-2.

c. Ground Rod and Ground Strap. The ground rod is ε. 60-inch length of 1/2-inch copper-clad steel. It is sharp at one end and the other end is equipped with a strap clamp. The ground strap (fig. 1-22) is a length of heavy, flexible braid. When the data receiving set is installed for operation, the ground rod is driven into the ground (fig. 1-3), and the ground strap is attached to terminal E1 on the junction panel (fig. 1-4) on the shelter left wall. When not in use, the ground strap is stored in the storage case and the ground rod is placed in its storage position (fig. 1-3) on the shelf formed by the shelter right wall.

d. Wiring Harness CX-11083/TKQ-2. Wiring Harness CX-11083/TKQ-2 (fig. 1-22) is designed for use during higher-category video decoder maintenance and troubleshooting procedures. When installed between a plug-in module connector and the mating chassis connector, this harness permits the module to be checked while outside the component case. The CX-11083/TKQ-2 consists of 37 conductors with a 37-pin male connector at the other end and a 37-pin female connector at the other end. Connecting and disconnecting the male connector is facilitated by an adapter handle. The male connector is equipped with guide pins to assure proper mating. The female connector is equipped with guide pins bushings. When not in use, the CX-11083/TKQ-2 is stored in the storage case. Two module holder brackets (not illustrated), used in conjunction with the CX-11083/TKQ-2, are mounted on the inside of the video decoder cover

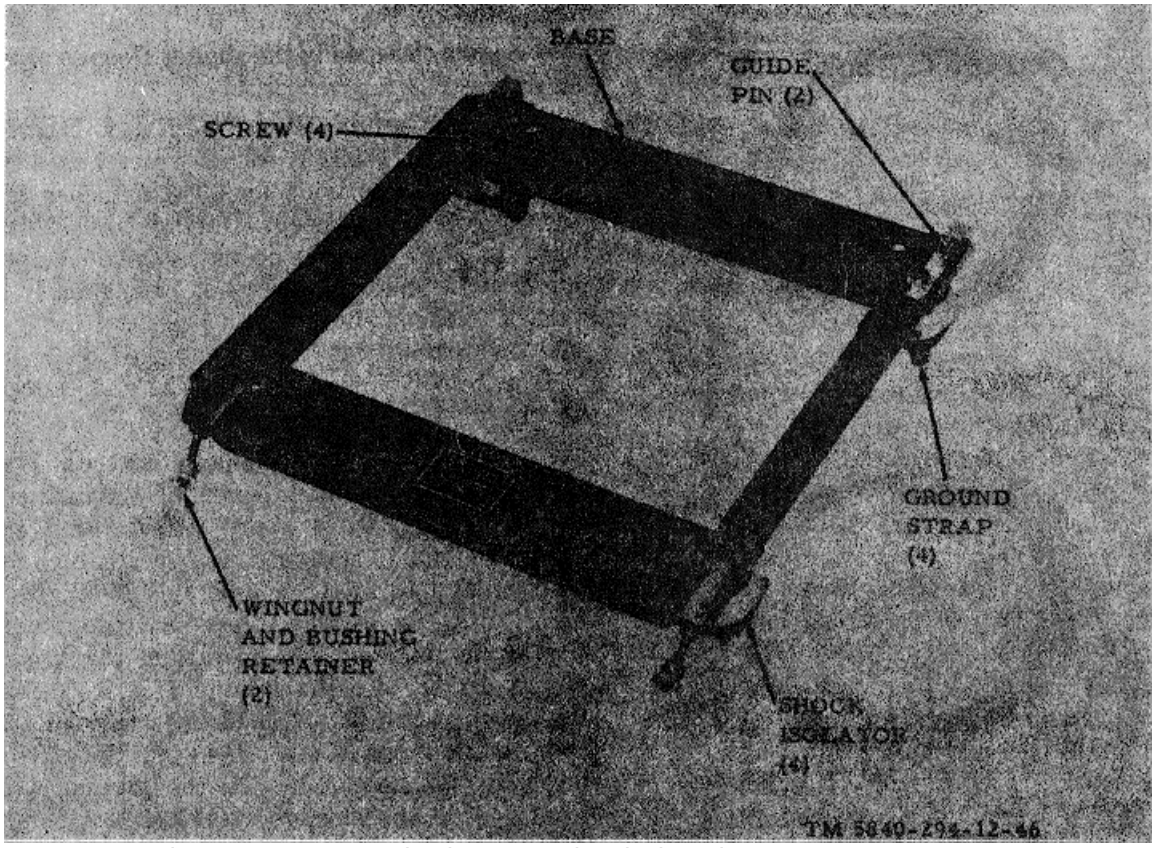


Figure 1-23. Base, Shock Mount, Electrical Equipment MT-3461?TKQ-2.

e. Wiring Harness CX-11084/TKQ-2. Wiring Harness CX-11084/TKQ-2 (fig. 1-22) is provided for use during higher category maintenance and troubleshooting of the target indicator dc amplifier. It serves as an extender, permitting the dc amplifier to be removed from the target indicator chassis when being serviced. The CX-11084/TKQ-2 is a cable assembly with a type MX3137E-27 female connector at one end and a type MS3130E-27P male connector at the other end.

f. Extender, Module MX-7543/U. The MX-7543/U module extender (fig. 1-22) is a plug-in device consisting of a 29-pin female connector interconnected with a section of printed circuit board. It is used to extend the d/a converter modules from their connectors to permit access to module circuitry during higher category maintenance.

g. Tools for Mounting Air Conditioner Condenser Sections. Tools for mounting the air conditioner condenser sections (fig. 1-22) include a 12-point socket wrench, an extension bar, a ratchet handle, an open-end wrench, and a flare nut wrench. When not in use, the tools are stored in the storage case.

h. Distilled Water Container. The distilled water container (fig. 1-22) is a 2-gallon plastic jug with a screw cap. The distilled water is required for operation of the processor-viewer. When not in use, the distilled water container is stored in the storage case.

i. Nitric Acid Containers (fig 1-30). Two nitric acid solution containers are stored in the processor case at the rear of the shelter (fig. 1-4). The 10-percent solution container, a cylindrical, nonmetallic container with cap and a

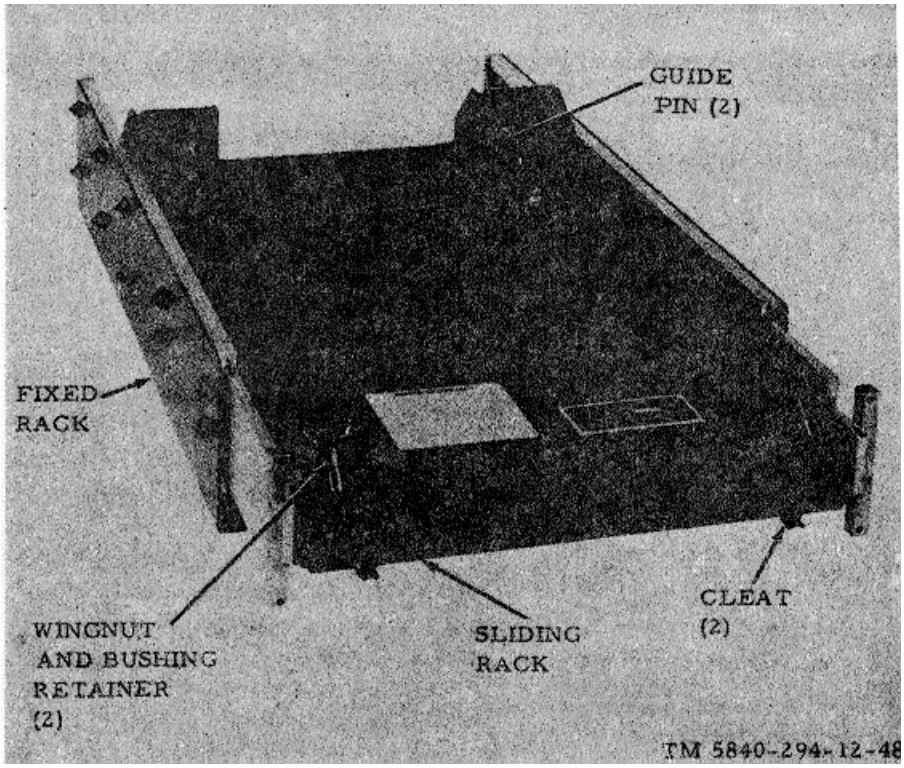


Figure 1-24. Base, Shock Mount, Electrical Equipment MT-3462/TKQ-2.

Special internal roller-holding device, is approximately 12 inches long by 1 1/2 inches inside diameter. It is used to clean processor rollers used in the processor-viewer (para 4-14). The 70-percent solution container, a non-metallic bottle with a screw cap, is used for storage of 70 percent nitric acid solution, which is used to prepare the 10 percent nitric acid cleaning solution.

1-61. Additional Equipment Required

The equipment described below is required for use with but is not applied as part of the date receiving set.

a. Radar Surveillance Set AN/APS-94C. The airborne AN/APS-94C generates the video signals transmitted from the aircraft by Transmitting Set, Radar Data AN/AKT-18 (*b* below) to the data receiving set.

b. Transmitting Set, Radar Data AN/AKT-18. The airborne AN/AKT-18 receives video signals and aircraft flight data from the AN/APS-94C and transmits the encoded converted data to the data receiving set.

c. Truck, Cargo, 3/4-Ton, 4 X 4 M-37. This truck, or an equivalent type, is used to transport the shelter to a favorable operating location within line-of sight range of the radar mapping aircraft.

*d. Test Set, Receiving Set, Radar Data AN/*GKM-2A. The AN/GM-2A is used for testing, aligning, and adjusting the data receiving set. Refer to TM 11-6625-827-12 for additional information.

e. Maintenance Kit, Recorder-Processor-Viewer (FSN 5841-064-5364). This kit contains supplies and tools required for operation and maintenance of the processor-viewer. Refer to Tm 11-5841-237-10 and TM 11-5841-237-20 for additional information.

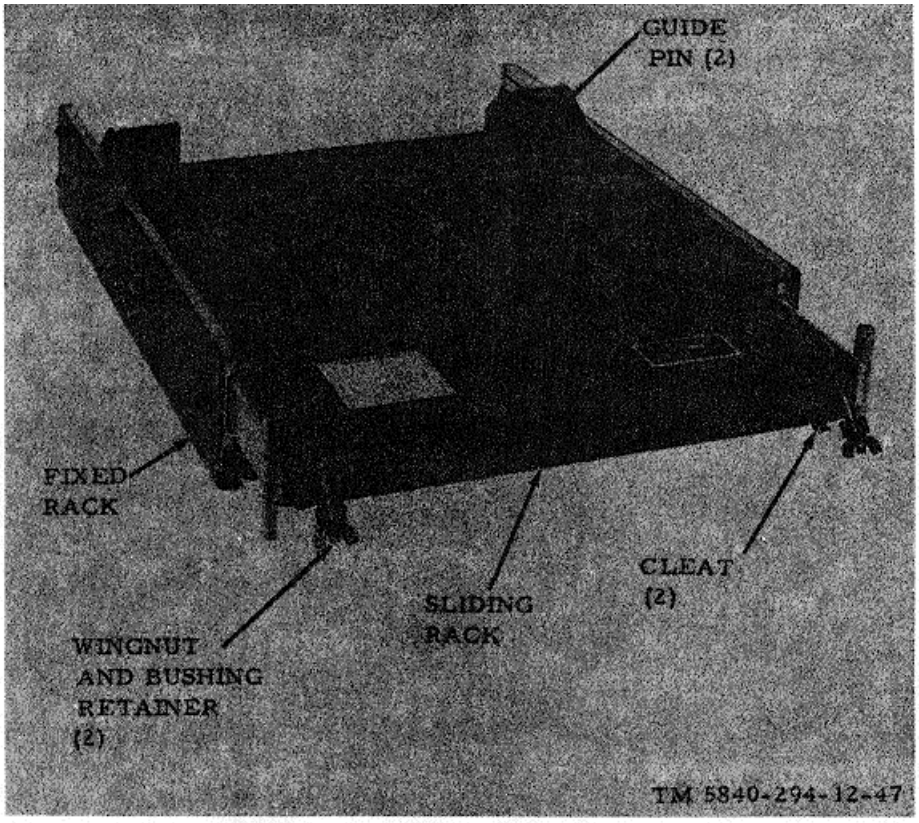


Figure 1-25. Base, Shock Mount, Electrical Equipment MT446$/TKQ-.

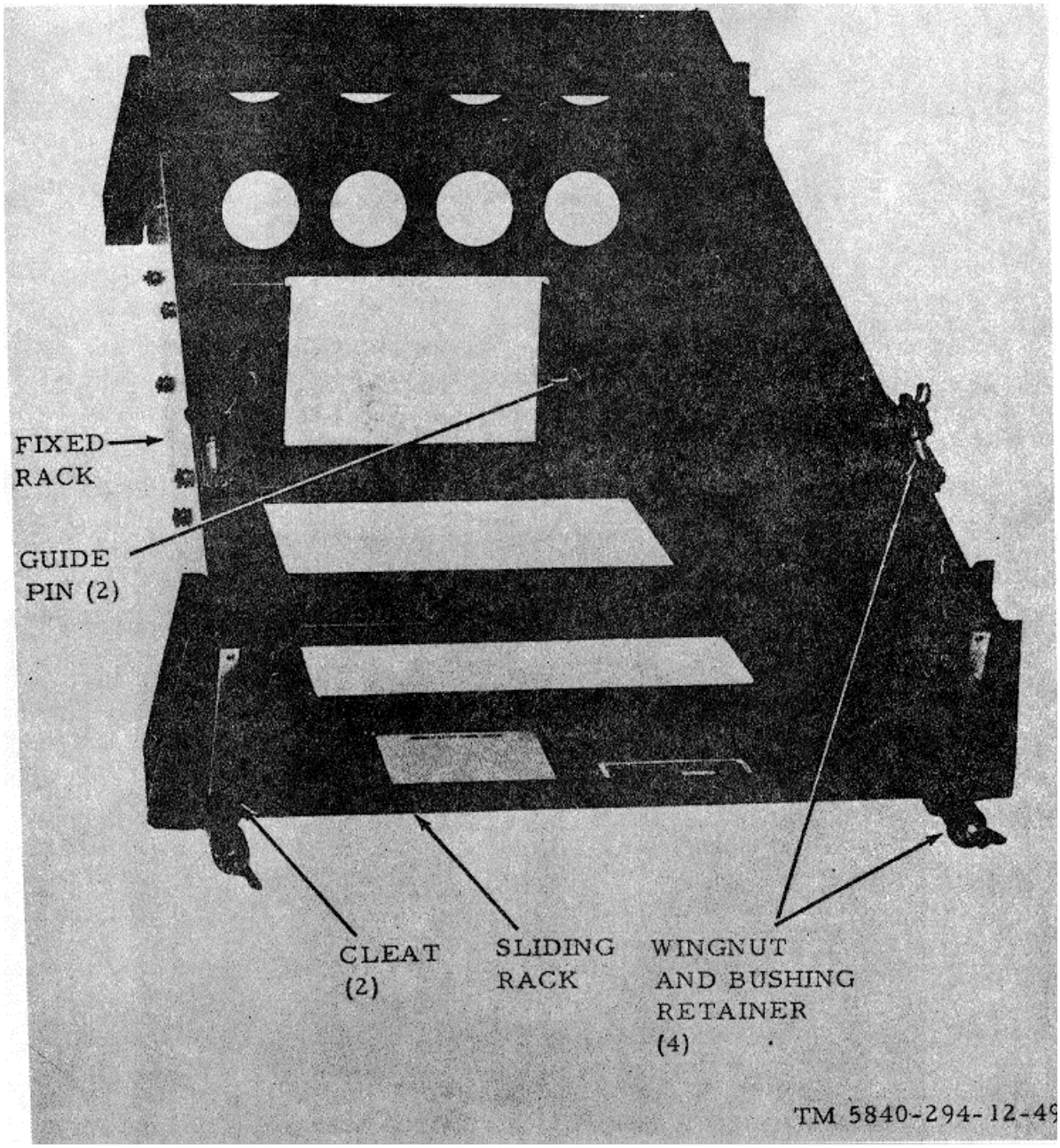


Figure 1-26. *Base, Shock Mount, Electrical Equipment MT-3464/TKQ-2.*

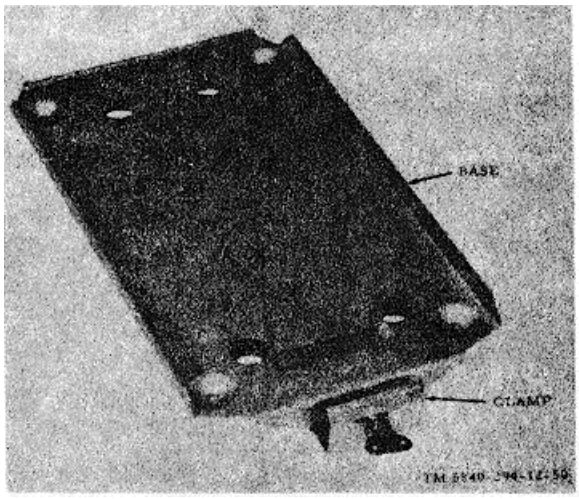


Figure 1-27. Base, Shock Mount, Electrical Equipment MT-3471/TKQ-2.

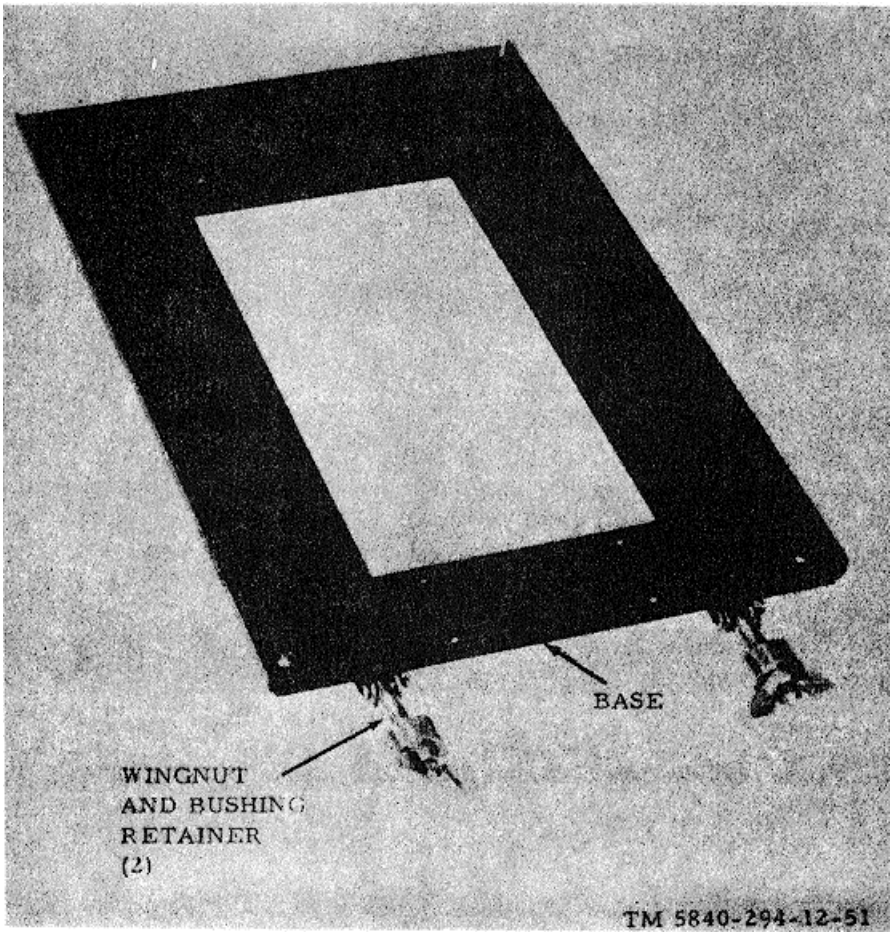


Figure 1-28. Base, Shock Mount, *Electrical Equipment MT-3616/TKQ-2*

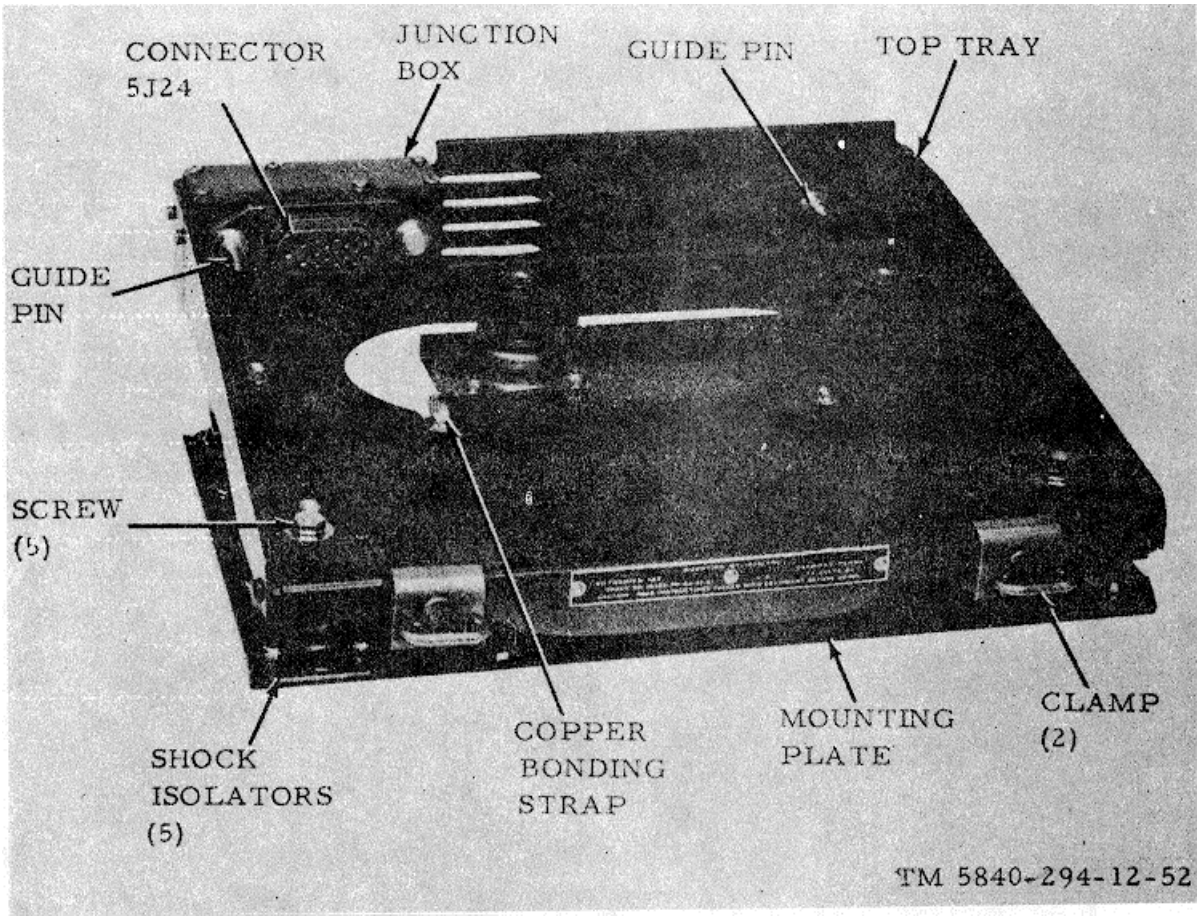


Figure 1-29. Mounting MT-1029/VRC.

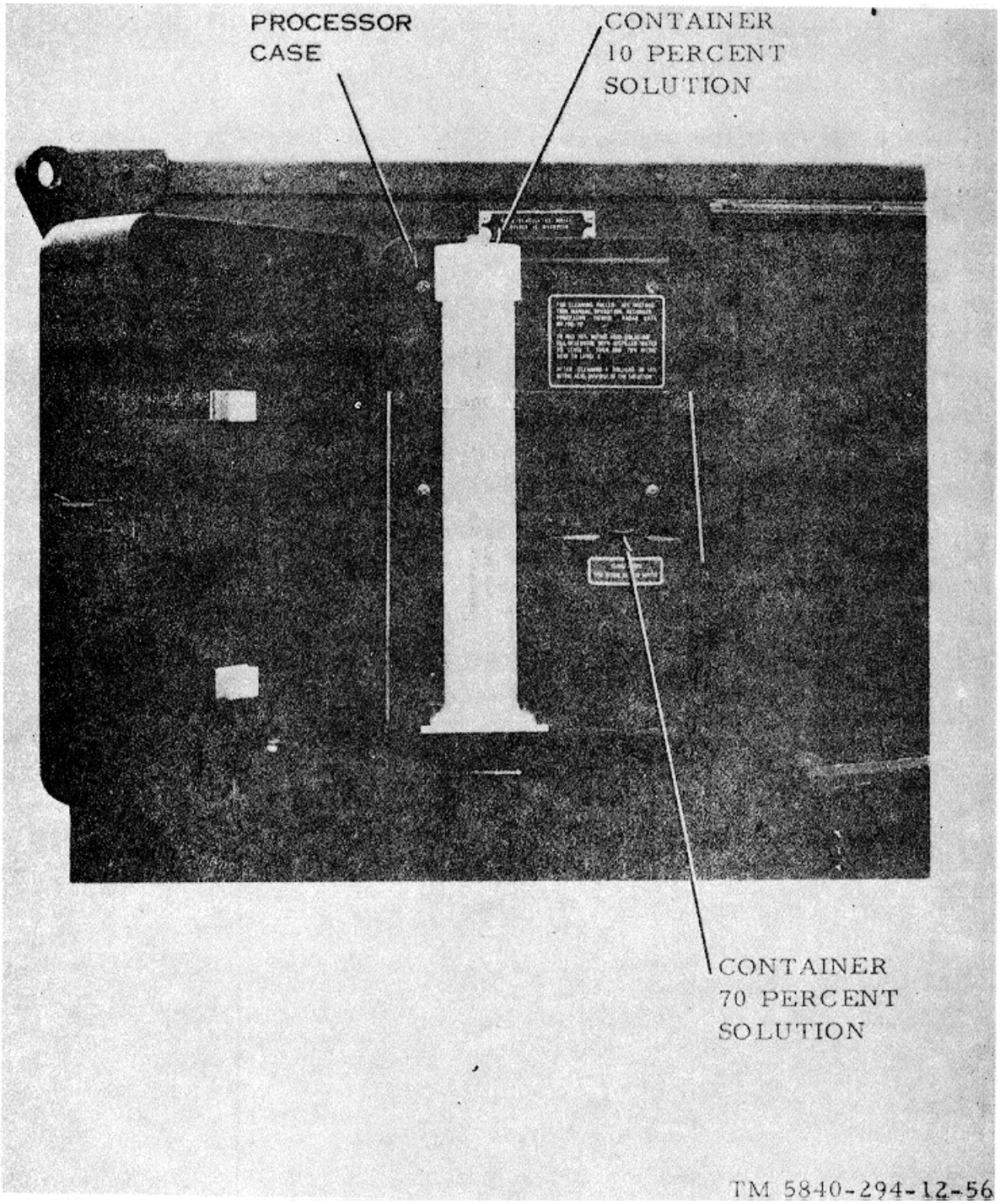


Figure 1-30. Nitric acid solution containers.

Section III. EQUIPMENT APPLICATION

1-62. General

(fig. 5-3)

a. As a functional element of the AN/UPD-2(V) radar surveillance system, the AN TKQ-2 data receiving set serves as the ground- based receiver for radar mapping data acquired by the radar surveillance aircraft (para 1-4). When used together, the data receiving set and the AN/AKT-18 data transmitting set in the aircraft are referred to as the data *transfer system.*

b. Figure 5-3 is a simplified block diagram showing the flow of information through the data transfer system. The AN/APS-94C sends out radar signals that are reflected back by the terrain and other targets on either or both sides of the aircraft flightpath. The intensity of the reflected signals varies with the reflective properties of the targets. The varying reflected signals (ft and mt) are fed to the AN/AKT-18 along with map orientation information consisting of timing signals (system trigger), groundspeed data, drift- angle data, and left and right antenna gates. Rangemarks, ppd data, and an aircraft identification signal are intermixed with the video signals in the AN/AKT-18. Range delay (portion of the radar range not to be displayed), frequency control, and aircraft identification information are manually set into the AN/AKT-18. The AN/AKT-18 encodes and combines all these signals to one encoded converted video signal. This signal is then transmitted by FM radio to the ground-based AN/TKQ-2. The functions of the AN/TKQ-2 include reception and demodulation of the transmitted fm radio signal, decoding the encoded converted video signal into its component signals, converting the signals into visible form, presenting a continuous photographic film record of the visible information in the form of maps showing the terrain surveyed and ppd data, and lighting appropriate lamps that identify the mapping aircraft. These functions are described in paragraphs 1-63 through 1-68.

1-63. Data Signal Reception.

The FM radio signal from the AN/AKT-18 is received and demodulated by the data receiver. The demodulated encoded converter to the d/a converter.

1-64. Ppd Data Detection

The demodulated encoded converter video signal from the data receiver passes through the d/a converter and is applied to the video decoder. The d/a converter detects the super-imposed ppd data and converts the ppd data to segment voltages that are applied to the processor-viewer.

1-65. Decoding and Converting Signals to Visible Form

The demodulated encoded converted video signal received by the video decoder from the d/a converter consists of target video, map orientation information, and an aircraft identification signal. These information elements are separated by the video decoder, and then supplied to video decoder front panel indicator lamps, the target indicator, and the processor-viewer.

a. Aircraft Identification Signal. The aircraft identification signal is applied to four AIRCRAFT IDENTIFICATION indicator lamps on the video decoder front panel (fig.3-3).

b. Target Video. The ft and mt signals are amplified in the video decoder, and then applied to the two cathode-ray tubes (range indicators) in the target indicator.

c. Map Orientation Information. In addition to actual map information, the encoded converted video signal includes map orientation information consisting of sweep synchronizing data, aircraft drift-angle data (vertical sweep signals), aircraft groundspeed data, and radar range and range delay data.

(*1 Right and left horizontal sweep data* These signals, derived from the sweep synchronizing data, are fed to the target indicator by the video decoder where they synchronize right and left sweeps of the electron beams in the cathode-ray tubes. The luminous traces of the electron beams originate

the center of each tube screen and are directed to the left and right from near the center.

(*2*) *Aircraft drift-angle data.* When the surveillance aircraft is to follow a prescribed course in a crosswind, the airplace heading must be altered to counteract the crosswind effect and keep the aircraft on course. It then advances in a crablike matter, and the radar beam is radiated at some angle to the course other than the preferred approximate right angle. To prevent distortions of the photoradar map that would be caused by this crab angle, or drift angle, encoded drift angle data are transmitted as part of the encoded converted video signal. These drift-angle signals are separate from the encoded converted video signal by the video decoder and are supplied to the target indicator as vertical sweep signals. They displace the centers of the crt traces and tilt the traces to compensate for drift angle. The drift-angle signals also are fed to a DRIFT indicator in the processor-viewer data chamber. Drift-angle in- formation also can be communicated by voice radio and the drift angle can be set into the video decoder by means of a manual control, creating the same effects on the crt traces and the DRIFT indicator as do the normal automatic signals.

(*3*) *Aircraft groundspeed data.* To preserve map linearity, the recording film in the processor-viewer must move past the lens apertures at a speed proportional to the groundspeed of the aircraft. To accomplish this, the speed of the film-drive motor is regulated by groundspeed signal voltages separated from the encoded converted video signal by the video decoder. The groundspeed signals are also applied to a GRD SPEED indicator in the processor-viewer data chamber. Groundspeed information can be communicated by voice radio and the groundspeed can be set into the video decoder by means of a manual control, creating the same effects on the film-drive motor and the GRD SPEED indicator as do the normal automatic signals.

(*4*) *Radar range and range delay data.* Rangemarks, representing 20, 40, 60, and 80 kilometers (km) range on each side of the aircraft flight path, are included in the signals supplied by the airborne AN/APS-94C to the airborne AN/AKT-18. One of three possible ranges to be transmitted, re-ceived, and recorded is set into the airborne transmitter. The ranges are: 0 to 50 km on each side of the flight- path (zero range delay); 20 to 70 km on each side of the flightpath (20-km range delay); and 40 to 90km on each side of the flightpath (40-km range delay). The appropriate rangemarks included in the target information appear on the target indicator crt screen as slightly brighter spots in the traces to identify the range being displayed. With zero range delay, no rangemark is observed at the beginning of each trace (center of the crt screen), a single (20-km) rangemark appears part way out on each trace, and double (40- and 41-km) rangemarks (the 41-km rangemark is produced by the AN/AKT-18) appear farther out on each trace. With 20-km range delay, a single (20-km) rangemark may or may not appear at the beginning of each trace, the double (40- and 41-km) rangemarks appear part way out on each trace, and a single (60-km) rangemark appears farther out on each trace. With 40-km range delay, the 41-km rangemark appears at the beginning of each trace (the 40-km rangemark may or may not appear), a single (60-km rangemark appears part way out on each trace, and another single (80-km) rangemark appears farther out on each trace.

1-66. Target Indicator Visible Display

Video, unblanking, horizontal sweep, and vertical sweep signals from the video decoder

are applied to the two cathode-ray tubes in the target indicator, causing intensity-modulated electron beam traces to be swept to the left and right from the center of each tube. Fixed-target information appears as light traces of varying intensity on crt No. 1 (left tube). Moving-target information appears as light traces of varying intensity on crt No. 2 (right tube). On each tube, target information to the left of the aircraft flightpath appears on the left side of center, and target information to the right side of the flightpath appears on the right side of center. The appropriate rangemarks appear as slightly brighter spots to identify the range delay being used and to indicate the distance of target details from the flightpath.

1-67. Presentation and Photographic Recording of Target Information

The processor-viewer mounted on the target indicator photographically records on 9 ½ inch-wide moving film the successive traces on the cathode-ray tubes, producing continuous, daul (fixed- and moving target) maps on the film. The film is immediately and automatically developed and passed over a film illuminator assembly as a presentation of the information obtained by the airborne radar set. The map occupies 4 inches on the left side of .he film, the mt map occupies 4 inches near the right side, and 1 inch on the right side is reserved for periodic photographs of the data chamber showing written information, time of day, aircraft drift angle, and aircraft heading. Heading information is transmitted by voice radio to the AN/TKQ-2 and is manually set into the video decoder, which delivers voltages to control the HDG indicator in the processor-viewer data chamber. Each 4-inch map (ft and mt) is divided into left and right segments representing the left side and right side of the aircraft flightpath. Target video from the right side of the aircraft flightpath appears to the left of the map center, and target video from the left side of the flight path appears to the right of the center, as if the aircraft were flying from the top of the map toward the bottom. The exposed film is in negative form; that is, strong targets such as hills and buildings appear dark on the ft map and moving objects appear as strings of dark dots on the mt map. The rangemarks appear as vertical dark lines on the maps.

1-68. Presentation and Photographic Recording of Ppd Data

(figs. 1-31 and 1-2).

a. Numeric Printout. The ppd presentation appears as two numeric printouts, one above the other, as shown in figure 1-31**.** They are photographically recorded on the same film that presents the photoradar map information. The uppermost printout is a three-digit number indicating the aircraft position in kilometers north or south of a preselected reference point. The lower printout is a three-digit number indicating the aircraft position in kilometers east or west of the same reference point. A minus sign preceding the upper print-out indicates a position south of the reference point, and the absence of a minus sign indicates a position north of the reference point. A minus sign preceding the lower printout indicates west and the absence of a minus sign indicates east. The numeric printout shown in figure 1-2 would have been printed on the film at the time when the aircraft was located 25 kilometers north and 150 kilometers west of the reference point. The ppd system is capable of displaying the aircraft present position from 0 to 999 kilometers north or south, and 0 to 999 kilometers east or west of the reference point.

*b. Fiducial Mar*ks. Fiducial marks (fig. 1-32) are reference marks that are recorded close to the centerline of the photoradar map. They extend outward a distance representing approximately 2 kilometers from the center of the map. The fiducial marks are recorded on the film at the same time the ppd printout is recorded, thus showing the aircraft position on the map centerline that corresponds to the numeric printout. Fiducial marks are recorded on both the ft map and the mt map.

c. Code Spacing. The fiducial marks and ppd printouts are recorded in group sequences separated by slightly wider spacings. Ten printouts occur for approximately every 3 inches

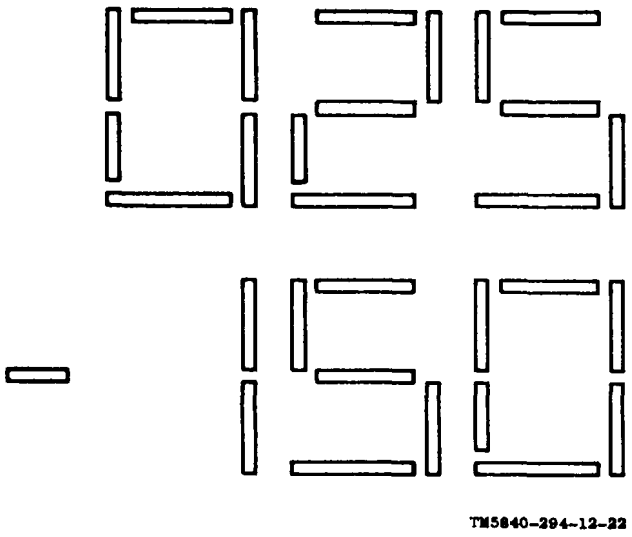


Figure 1-31. Present position display numeric printout.

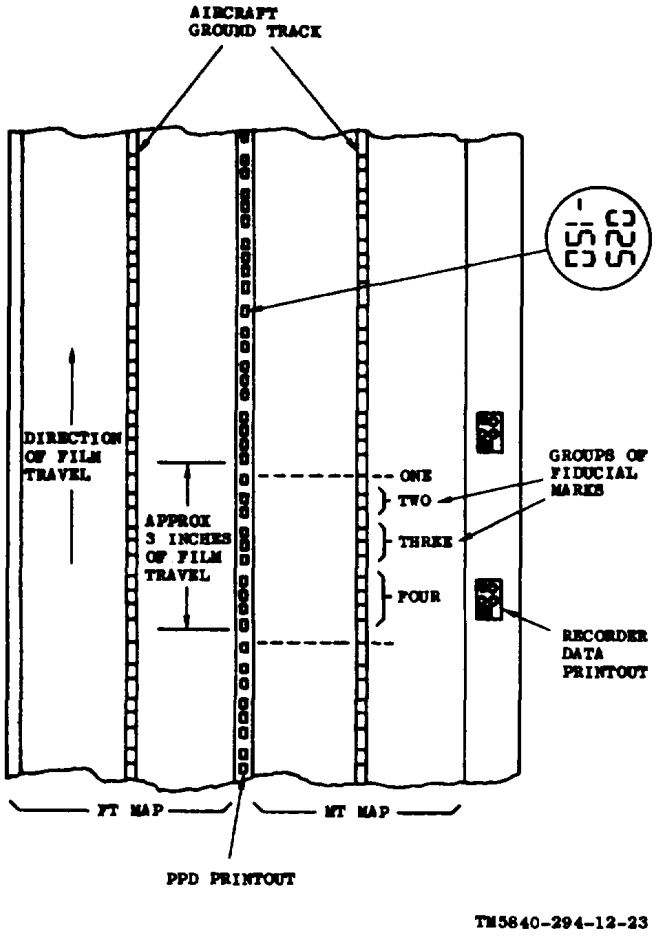


Figure 1-32. Present position display printout on ft and mt maps

of film travel (amount of film travel is based on aircraft groundspeed), as shown in figure 1-32. The ppd displays appear in a recurring sequence of one printout followed by groups of two, three, and four printouts. This code spacing corresponds to a similar code spacing of the fiducial marks, thus correlating each ppd printout with the fiducial mark recorded at the same time. Correlation of ppd printouts with corresponding fiducial marks is shown in figure 1-2. The coding provides for correlation of ppd printouts with corresponding fiducial marks despite the presence of drift-angle correction (fig. 1-33), thereby permitting the exact location of features viewed on the map to be determined.

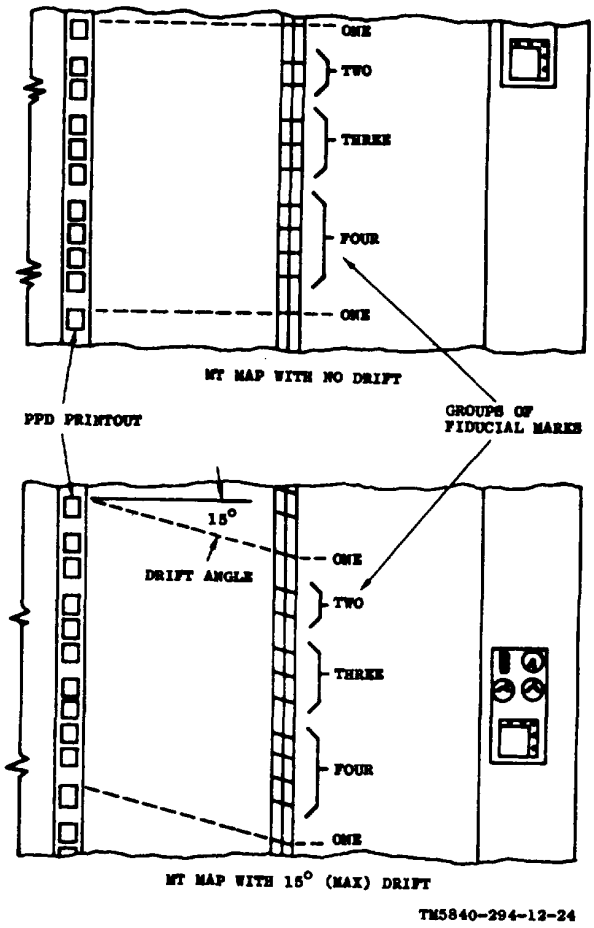


Figure 1-33. Present position display printout on mt map with drift-angle correction.

CHAPTER 2

INSTALLATION

Warning: **During installation of this equipment, conform to all safety requirements set forth in TB SIG 291. Injury or DEATH could result from failure to comply with safe practices.**

2-1. Siting

Figure 2-1 illustrates good and bad siting. When locating the data receiving set, consider the following:

a. The communications frequencies used by the data receiving set are in the very high-frequency (vhf) range and the data receiving frequencies used are in the uhf range. Radio waves at these frequencies tend to travel in straight lines. Therefore, line-of-sight transmission paths are desirable because signal strength attenuates rapidly over paths having obstructions between the transmitting and receiving antennas. A line-of-sight transmission path exists when the data receiving set antennas are within theoretical optical sight of the airborne transmitting set.

b. Intervening hills, building, or densely wooded areas in the transmission path will cause radio waves to bend slightly as they pass over or around the obstructions. Bending will result in loss of signal strength. Weak or otherwise undesirable signals may be expected also if the data receiving set is operated near steel structures or power lines. Best reception will be obtained if the data receiving set is located on a hilltop with the antennas in the clear.

Caution: **Take precautions to protect the data antenna and data antenna mast in high winds. If winds in excess of 87 knots (100 miles per hour (mph)) are anticipated, retract the data antenna mast and remove the data antenna. Store the data antenna in the clamps provided on the shelter roof. If possible, move the data receiving set to a sheltered area.**

2-2. Unpacking

Major components of the data receiving set, except the items listed in a through d below, are shipped installed in their normal operating positions. All items listed, except the data antenna are stored inside the shelter during transit or storage of the data receiving set. Instructions for removing these items are included in the installation procedures described in paragraphs 2-6 through 2-13.

a. Processor-viewer; stored in processor-viewer transit case secured to shelter floor.

b. Data antenna; stored in clamps and yoke on shelter roof.

c. Communications antenna; stored in clamps on the shelf formed by the shelter right wall.

d. Air conditioner condenser sections; stored on condenser storage mounting brackets attached to the shelter right wall.

2-3. Checking Unpacked Equipment

During the installation procedures (paras 2-6-2-13), inspect the equipment as follows:

a. Check for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6 (para 1-3.

b. See that the equipment is complete ask listed on the packing slip. Report all discrepancies in accordance with TM 38-750. Storage of a minor assembly or part that does not affect proper functioning of the equipment should not prevent use of the equipment.

c. If the equipment has been used or reconditioned, check to see whether it has been changed by a modification work order (MWO). If the equipment has been modified, the MWO number will appear on the front panel near the nomenclature plate. Check to see whether

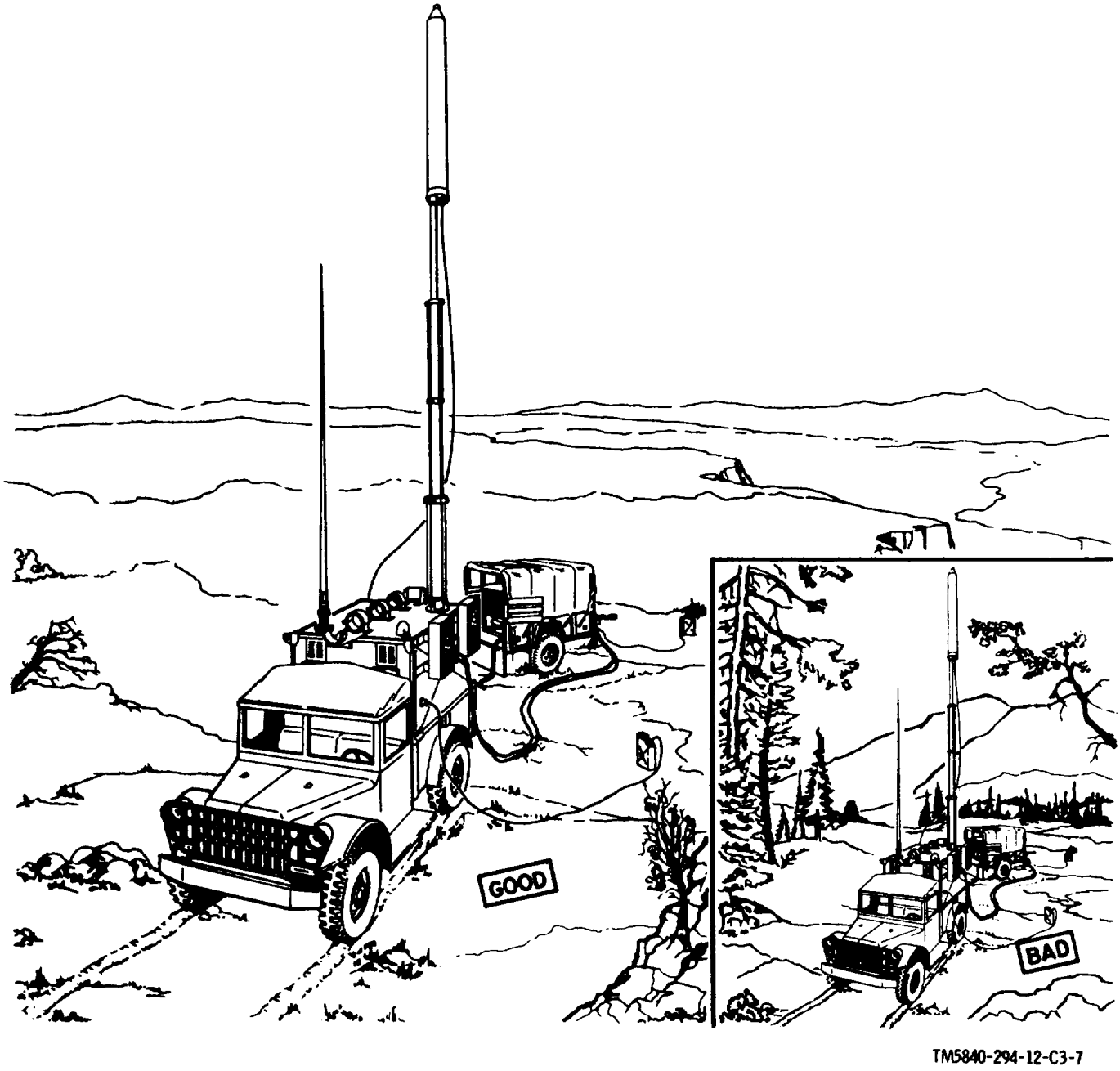


Figure 2-1. Siting Receiving Set, Radar Data AN/TKQ-2

the MWO number (if any) and appropriate notations concerning the modification have been entered in the manual.

Note. Current MWO's applicable to the equipment are listed DA Pam 310-7.

2-4. Tools and Test Equipment Required for Installation

Tools and test equipment required for installing the data receiving set are listed below. The use of each item is also listed.

a. Tools. One each of the following tools is required:

(1) Sledge hammer (not supplied); used for driving ground rod **(**fig**.** 1-3) into ground.

(2) Screwdriver (not supplied); used for installing processor viewer.

(3) Flarenut wrench (stored in storage case); used for connecting refrigerant line couplings to refrigerant line condenser fittings.

(4) 1-inch open-end wrench (stored in storage case); used for connecting refrigerant line couplings to refrigerant line condenser fittings.

(5) 13/16-inch flarenut wrench (stored in storage case); used for connecting refrigerant line couplings to refrigerant line condenser fittings.

(6) 9/16-inch 12-point socket wrench with extension bar and rachet handle (stored in storage case); used for removing and installing air conditioner condenser sections.

(7) 1/4-inch open-end wrench (not supplied); used for opening and closing air conditioner condenser receiver valve.

(8) 3/16-inch open-end wrench (not supplied) used for opening and closing air conditioner condenser receiver valve.

(9) 11/16-inch open-end wrench (not supplied); used for removing and installing protective cap on shelter fuel supply line fitting.

(10) 3/4-inch open-end wrench (not supplied) used for connecting heater supply hose.

(11) Level (not supplied); used for leveling shelter to assure proper operation of processor-viewer.

b. Test Equipment. Test Set, Receiving Set, Radar Data AN/GKM-2A; used for testing and aligning the data receiving set.

2-5. Installation of Equipment

Two men are required for installing the data receiving set. An experienced crew can complete the installation in approximately 30 minutes. Installation procedures are described in paragraphs 2-6 through 2-13.

2-6. Installing Trailer

Drive the truck towing the trailer to to the desired trailer location and perform the steps listed in a through h below. To reduce annoyance from the noise of the generator set, uncouple the trailer as far from the shelter site as the 50-foot power cables will permit without placing a strain on the shelter power input connectors.

a. Apply the trailer parking brakes (fig. 1-21).

b. Lower the support leg and make sure it is locked in the down position.

c. Unhook the safety chains from the towing vehicle.

d. Remove the intervehicular cable from the towing vehicle receptacle.

e. Open the towing vehicle pintle hook, grasp the drawbar assembly, and lift out the lunette.

f. Lower the drawbar assembly until the support leg rests on the ground.

g. Lower the rear support located beneath the trailer bed.

h. Install the gasoline engine fuel supply system and the exhaust pipe as described in TM 5-5264.

2-7. Installing Shelter

After installing the trailer, drive the truck carrying the shelter to the desired site. Position the truck so that the shelter is level from side to side (it does not have to be level lengthwise), and then perform the steps listed in a through k below. To complete the shelter installation, install individual operating components as described in paragraphs 2-8 through 2-11

a. Set the truck parking brakes.

b. Lower the truck tailgate.

c. Unlock and open the shelter door.

d. Loosen the turnbuckles that secure the processor-viewer transit case and storage case in the transit position (fig. 2-2).

e. Remove the processor-viewer transit case and storage case from the shelter.

f. Unstrap the chair and remove it from the shelter.

g. Remove the ground rod from its storage position (fig. 1-3) on the shelf that is formed by the shelter right wall.

h. Remove the ground strap and clamp from the storage case.

i. Use the sledge hammer to drive the ground rod into the ground (at least 3 1/2 feet) near the left rear corner of the shelter.

j. Connect the ground strap clamp to the ground rod.

k. Attach the other end of the ground strap to terminal E1 (fig. 2-3) on the junction panel on the shelter left wall.

2-8. Installing Air Conditioner Condenser Sections

In transit, the air conditioner condenser sections and interconnecting components are stored

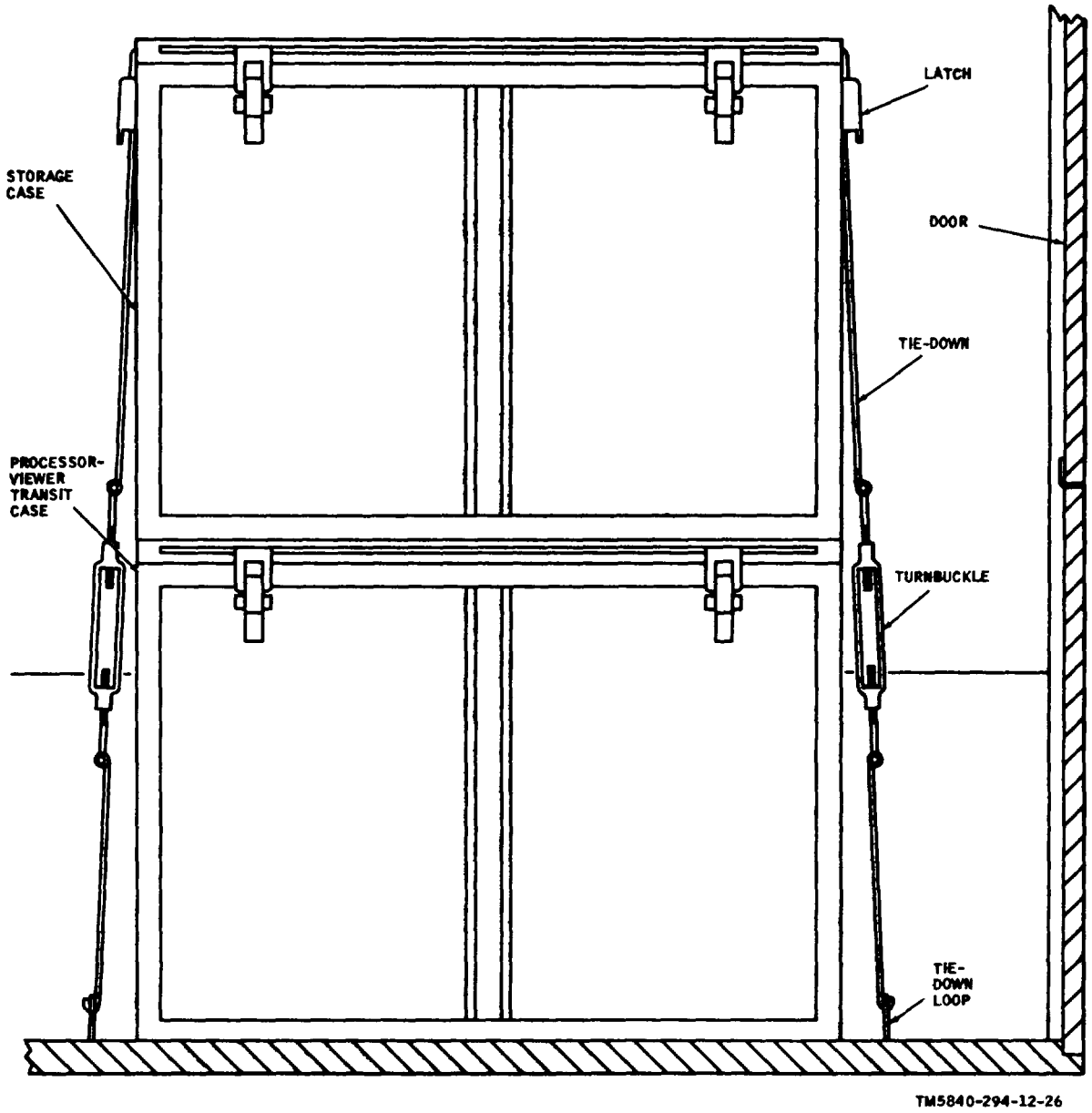


Figure 2-2. Processor-viewer transit case and storage case, secured for transit.

inside the shelter. The air conditioner condenser sections are stored on condenser storage mounting brackets (fig. 1-7) attached to the shelter right wall. The interconnecting refrigerant lines and electrical cables (W7, W8) may remain attached to the air conditioner evaporator sections or may be removed and stored in the storage case. Covers for the air conditioner air intake ports are in use during transit and are stared as shown in figure 2-3 when the air conditioners are in use. Two men are required for installing the air conditioner condenser sections. Installation consists of removing components from their storage positions and installing them, as described in a through e below.

a. Removing Air Conditioner Air Intake Port Cover(s) (fig. 2-3)

(1) Loosen the four captive screws that secure the air conditioner air intake port cover in the transit position.

(2) Remove the air conditioner air intake port cover from in front of the air conditioner air intake port.

b. Installing Air Conditioner Air Intake Port Cover(s) in Storage Position (fig. 2-3).

(1) Place the air conditioner air intake port cover in its storage position below the air conditioner air intake port.

(2) Align the four captive screws with the mounting holes.

(3) Tighten the four captive screws.

c. Removing Air Conditioner Condenser Section(s) from Condenser Storage Mounting Brackets.

(1) Loosen the four captive studs that secure the air conditioner condenser section to the condenser storage mounting brackets (fig. 1-7). Lips on the upper condenser mounting frame flanges (fig. 2-3) prevent the units from falling when the studs are loosened.

(2) Lift the air conditioner condenser section enough to free the lips on the upper condenser mounting frame flanges from the condenser storage mounting brackets, and then remove the unit from the shelter.

d. Mounting Air Conditioner Condenser Section(s) On Condenser Mounting Blocks (fig.23).

(1) Lift the air conditioner condenser section to a point where the upper condenser mounting frame flanges will slide onto the two upper condenser mounting blocks. Make sure the lips on the condenser mounting frame flanges fit into the mating grooves.

(2) Adjust the position of the air conditioner condenser section until the four captive studs in the condenser mounting frame rate with the four mounting holes in the condenser mounting blocks.

(3) Tighten the four captive studs in the condenser mounting frame until the lockwashers beneath the man are compressed.

d. Connecting Refrigerant Lines and Interconnecting Electrical Cable(s) (fig. 28).

(1) Remove the air conditioner interconnection assembly (cables and refrigerant lines) from the storage case.

(2) Remove the protective cap from the inside outlet of the air conditioner interconnection port.

(3) Connect the female connector of the interconnecting electrical cable (W7 or W8) to air conditioner evaporator connector L.

(4) Remove the dust cap from the hexagonal fitting on the evaporator end of each refrigerant line. Store the dust caps in the storage case.

Note. When performing (5) and (6) below, use two wrenches (par 2-4). Use the 1-inch open-end wrench to hold the air conditioner evaporator fitting stationary while tightening the refrigerant line coupling with the 1 8/16-inch flarenut wrench.

Caution: Do not allow the air conditioner evaporator fitting to turn.

(5) Connect the larger refrigerant line (stamped "S" on flats of hexagonal fitting) to air conditioner evaporator fitting S.

(6) Connect the smaller refrigerant line (stamped "D" on flats of hexagonal

fitting) to air conditioner evaporator fitting D.

(7) Screw the coupling on the evaporator condensation tube onto the fitting that projects from the bottom of the air conditioner evaporator section.

(8) Insert the free end of the refrigerant lines, interconnecting electrical cable, and evaporator condensation tube into the air conditioner interconnection port,

(9) Push the refrigerant lines, interconnecting electrical cable, and evaporator condensation tube through the air conditioner interconnection port as far as the four-hole rubber grommet will permit.

(10) Check the refrigerant lines and interconnecting electrical cable to see if they will reach air conditioner condenser fittings P-L-S-D.

(11) If the refrigerant lines and interconnecting electrical cable will reach air conditioner condenser fittings P-L-S-D-, proceed to (13) below. If the refrigerant lines and interconnecting electrical cable will not reach the fittings, perform the procedure given (12) below.

(12) Slide the four-hole rubber grommet toward the air conditioner evaporator connections far enough to make up the shortage, and then proceed with (13) below.

(13) Push the four-hole rubber grommet into the air conditioner interconnection port to seal it,

(14) Remove the dust cap from the hexagonal fitting on the end of each refrigerant line. Store the dust caps in the storage case.

Note. When performing (15) and (16) below, use two wrenches (para 2-4). Use the 1-inch open-end wrench to hold the air conditioner condenser fitting stationary while tightening the refrigerant line coupling with the 1 8/16-inch flarenut wrench.

Caution: Do not allow the air conditioner condenser fitting to turn. Do not kink or twist the refrigerant lines.

(15) Connect the larger refrigerant line (stamped "S" on flats of hexagonal fitting) , to air conditioner condenser fitting S.

(16) Connect the smaller refrigerant line (stamped "D" on flats of hexagonal fitting) to air conditioner condenser fitting D.

(17) Plug the male connector of the interconnecting electrical cable into air conditioner condenser receptacle L.

(18) Verify that the refrigerant lines and the interconnecting electrical cable drape below the air conditioner interconnection port If the refrigerant lines and interconnecting electrical cable extend directly upward from the port, they provide a means by which rainwater may enter the shelter.

(19) Remove power cables W4 and W5 from the storage case.

(20) When the forward air conditioner condenser section is being installed, connect male connector P1 of one power cable to connector 5J5 on the junction panel. Connect female connector P2 of this cable to air conditioner condenser connector P.

(21) When the rear air conditioner condenser section is being installed, connect male connector P1 of the power cable to connector 5J4 on the junction panel. Connect female connector P2 of the power cable to air conditioner condenser connector P.

2-9. Installing Antenna-Radome AS-1 097A/GR

a. Release the three clamps (fig. 1-5) that secure the data antenna in its storage position on the shelter roof.

b. Remove the quick-release pin (fig. 2-4) from the antenna mast adapter.

c. Being careful to support its center section, lift the data antenna from the clamps.

d. Raise the data antenna to a vertical position with its base above and close to the adapter on the retracted data antenna mast.

e. Lower the data antenna, fitting the tapered hole in its base over the tapered adapter, as shown in figure 2-5.

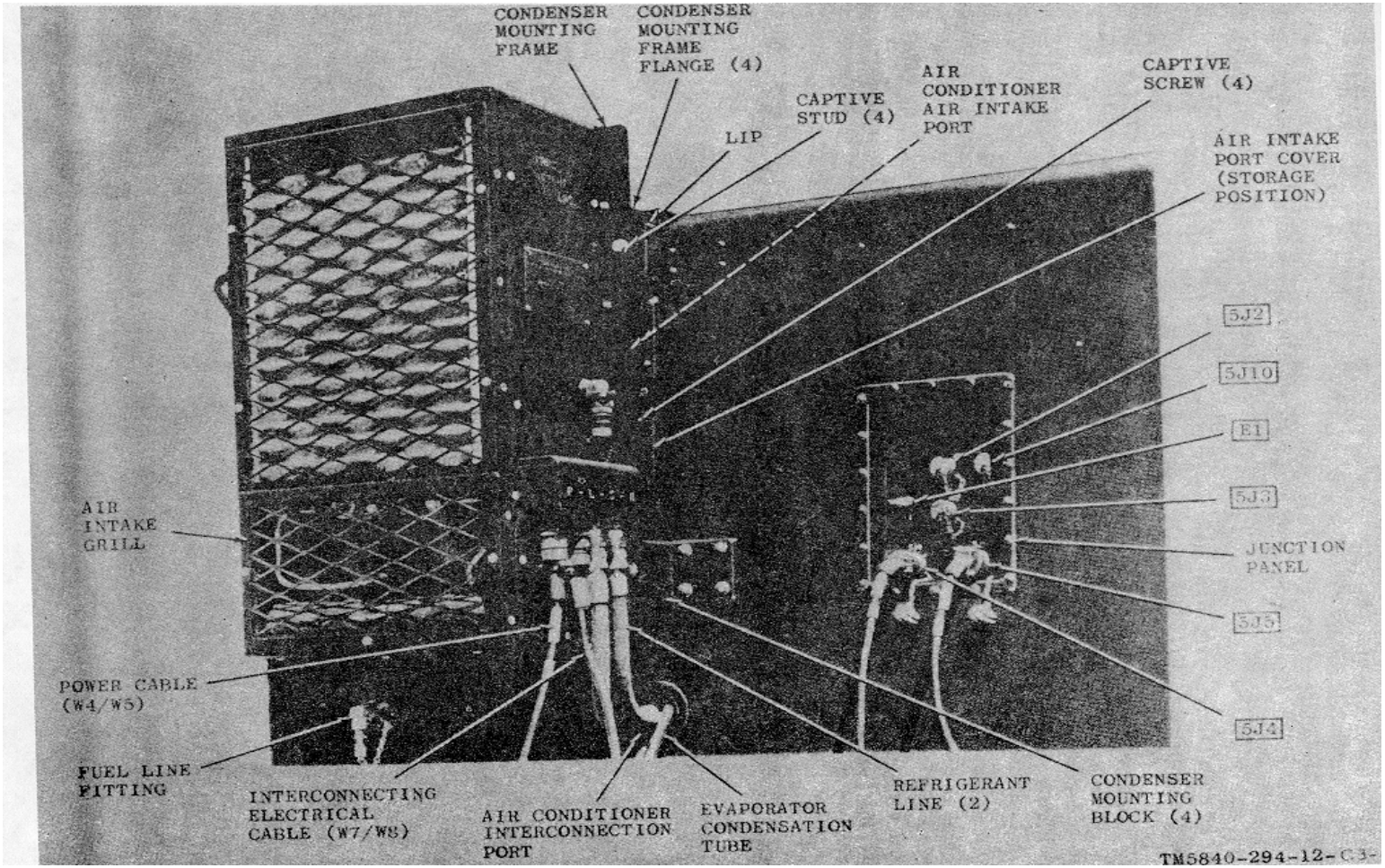


Figure 2-3. Shelter left wall, showing air conditioner condenser section interconnections

f. Align the hole through the data antenna base with the hole through the adapter.
g. Install the quick-release pin to secure the data antenna to the adapter.
h. Remove cable W6 from the storage case.

NOTE

When the data receiving set is shipped, Adapter, Connector UG-999A/U is stored in the storage case. If the UG- 999A/U has not been left on the AS- 1097A/GR from a previous installation, install it before proceeding with next step. Figure 1-17 shows the UG- 999A/U installed.

i. Connect connector P1 of cable W6 to Adapter, Connector UG-999A/U (fig. 1-7) on the data antenna base.
j. Connect connector P2 of cable W6 to connector 5Jll (fig. 1-4) on the shelter rear wall.
k. Lift the two latches to release the two data antenna mast tiedown assemblies (fig. 5-1) to permit erection of the data antenna.

2-10. Installing Antenna AT-912/VRC

a. Obtain Antenna Elements AT-1095/VRC and AT-1096/VRC from their storage positions (fig. 1-3) on the shelf formed by the shelter right wall.
b. Screw Antenna Element AT-1096/VRC onto Base, Antenna Support AB-719/VRC (fig. 1-5).
c. Screw Antenna Element AT-1095/VRC onto Antenna Element AT-1096/VRC.

2-10.1 Installing Antenna AS-1729/VRC

(fig. 1-18.1)

a. Obtain Antenna Elements AT-1095/VRC and AS-1730/VRC form their storage position (fig. 1-3) on the shelf formed by the shelter right wall.

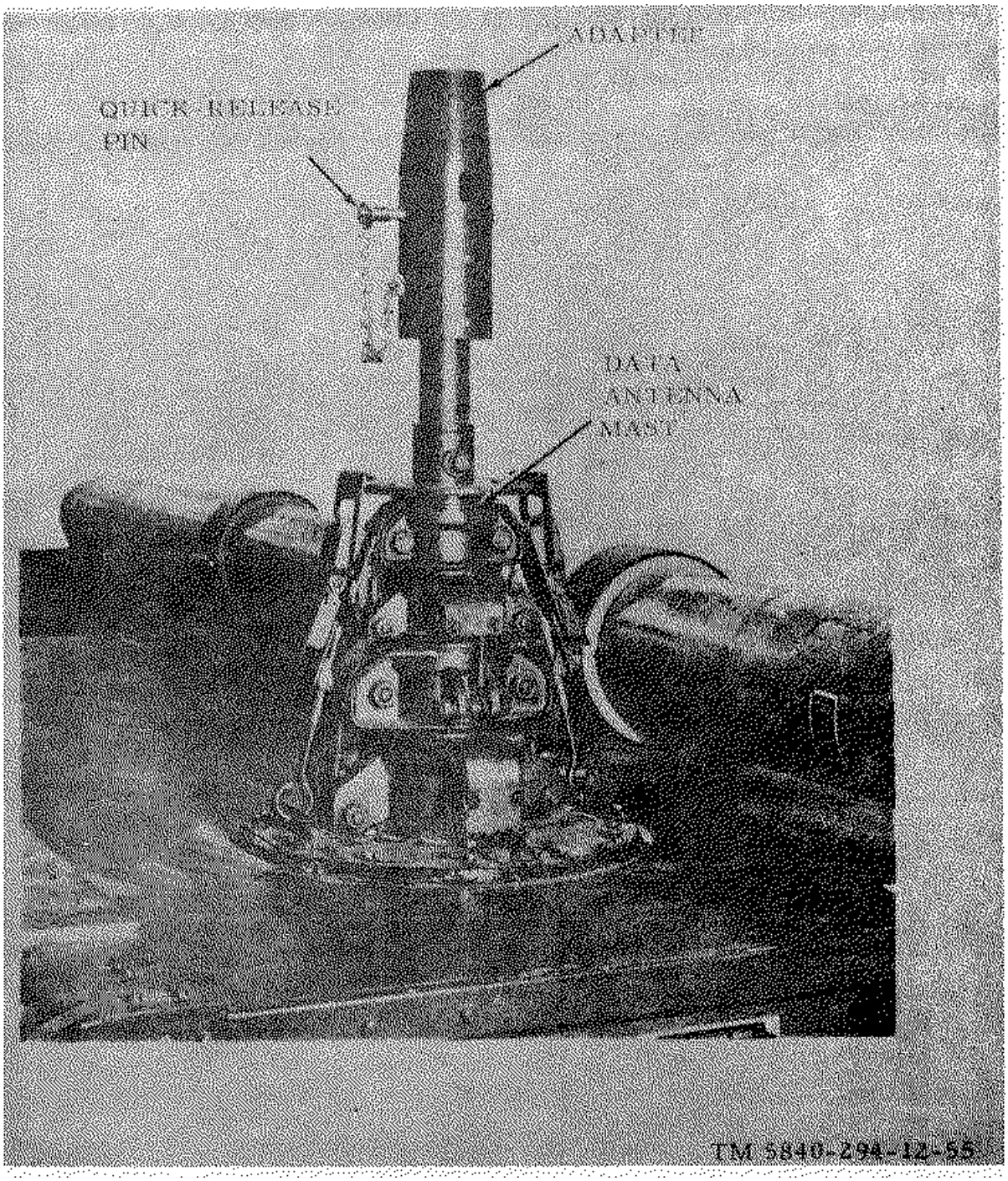


Figure 2-4. Data antenna mast and adapter.

b. Screw Antenna Element AT-1095/VRC onto Antenna Element AS-1730/VRC.

c. Screw the assembled antenna elements (*b* above) onto Matching Unit-Base, Antenna MX-6707,/VRC (fig. 1-5).

2-11. Connecting Heater Fuel Supply

a. Obtain a 5-gallon can of gasoline from the trailer.

b. Remove the heater supply hose and the heater supply hose adapter from the storage case.

c. Check the upper end of the heater supply hose adapter to determine whether it is equipped with a size-reducing bushing and nipple. If the bushing and nipple are installed,

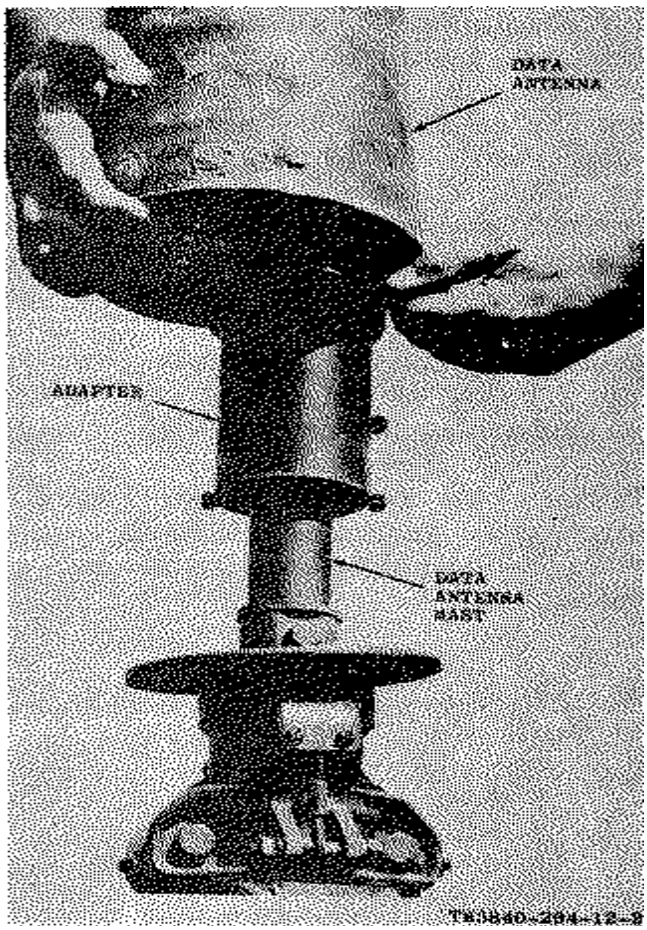


Figure 2-5. Installing data antenna.

proceed with *g* below. If the bushing and nipple are not installed, perform the procedure given in *d*, *e,* and *f* below.

d. Obtain the bushing and nipple from the storage case.

e. Screw the bushing into the heater supply hose adapter outlet.

f. Screw the nipple into the bushing.

g. Remove the protective cap from the fuel line fitting (fig. 2-3) on the shelter left wall.

h. Install the heater supply hose adapter in the 5-gallon can of gasoline.

i. Connect the heater supply hose between the nipple in the heater supply hose adapter outlet and the fuel line fitting on the shelter.

2-12. Installing Recorder-Processor-Viewer, Radar Mapping RO-166B/UP

a. Removing Processor-Viewer from Processor-Viewer Transit Case. For instructions on removing the processor-viewer from the processor-viewer transit case, refer to TM 11-5841 237-10.

b. Mounting Processor-Viewer on Target Indicator.

(1) Remove the plastic cover from the front of target indicator and place it in the storage case.

(2) Turn the two upper front cover fasteners (fig. 1-14) one-quarter turn counterclockwise to permit lifting the upper front cover ((7) below).

(3) Use a screwdriver to turn the seven lower front cover fasteners (fig. 1-14) counterclockwise. Remove the lower front cover.

(4) Remove the two dust covers (fig. 1-14) by grasping the knobs and pulling.

Caution: When performing (5), (6), and (7), below, do not grasp any internal parts of the processor-viewer.

(5) Hold the processor-viewer by its carrying handle and align the three mounting bushings (fig. 1-14) with the three mounting pins (fig. 1-12) on the target indicator front panel.

(6) Carefully press the processor-viewer to the target indicator. If any resistance is felt, make sure the two sets of connectors are mated properly before proceeding with the installation.

(7) While supporting the processor- viewer, lift the upper front cover and screws (fig. 2-6) with a screwdriver.

(8) Use a screwdriver to tighten the two lower mounting screws (fig. 2-6).

(9) Replace the lower front cover and tighten the seven lower front cover fasteners by turning them clockwise with a screwdriver.

(10) Fasten the upper front cover by turning the two upper front cover fasteners one-quarter turn clockwise.

Caution

Be sure the upper and lower front covers are fastened securely. Improperly fastened covers will admit light to the interior of the processor-viewer, and may cause film to fog.

(11) Connect cable 5W23 between d/a converter output connector llJ4 (fig. 1-13) and processor-viewer input connector 4J5 (fig. 1-14), as shown in figure 2-7.

2-13. Installing Cables

(fig. 2-7)

Twenty-four of the 32 cables supplied with the data receiving set are installed by the manufacturer and remain connected. The permanently installed cables are 5W1 through 5W22 (para 1-32 through 1-51), 5W24 (para 1-27), and 5W25 (para 1-27.1). Installation of cables W4 and W5 (para 1-29), and W7 and W8 (para 131) is described in the procedures for installing the air conditioner condenser sections. Installation of cables W6 and 5W23 is described in the procedures for in- stalling the data antenna (para 2-9) and the processor-viewer (para 2-12), respectively. Cables W2/3 (para 1-28) convey primary power from the generator set to the shelter. The lugged ends of these cables may be left connected to the generator set output terminals. If the lugged ends of cables W2/3 are not connected, perform the procedure given in a through f below. If the lugged ends are connected, perform *e* and *f* below.

Warning

Perform the following steps before starting the generator set. Dangerous voltages may exist at the terminals involved.

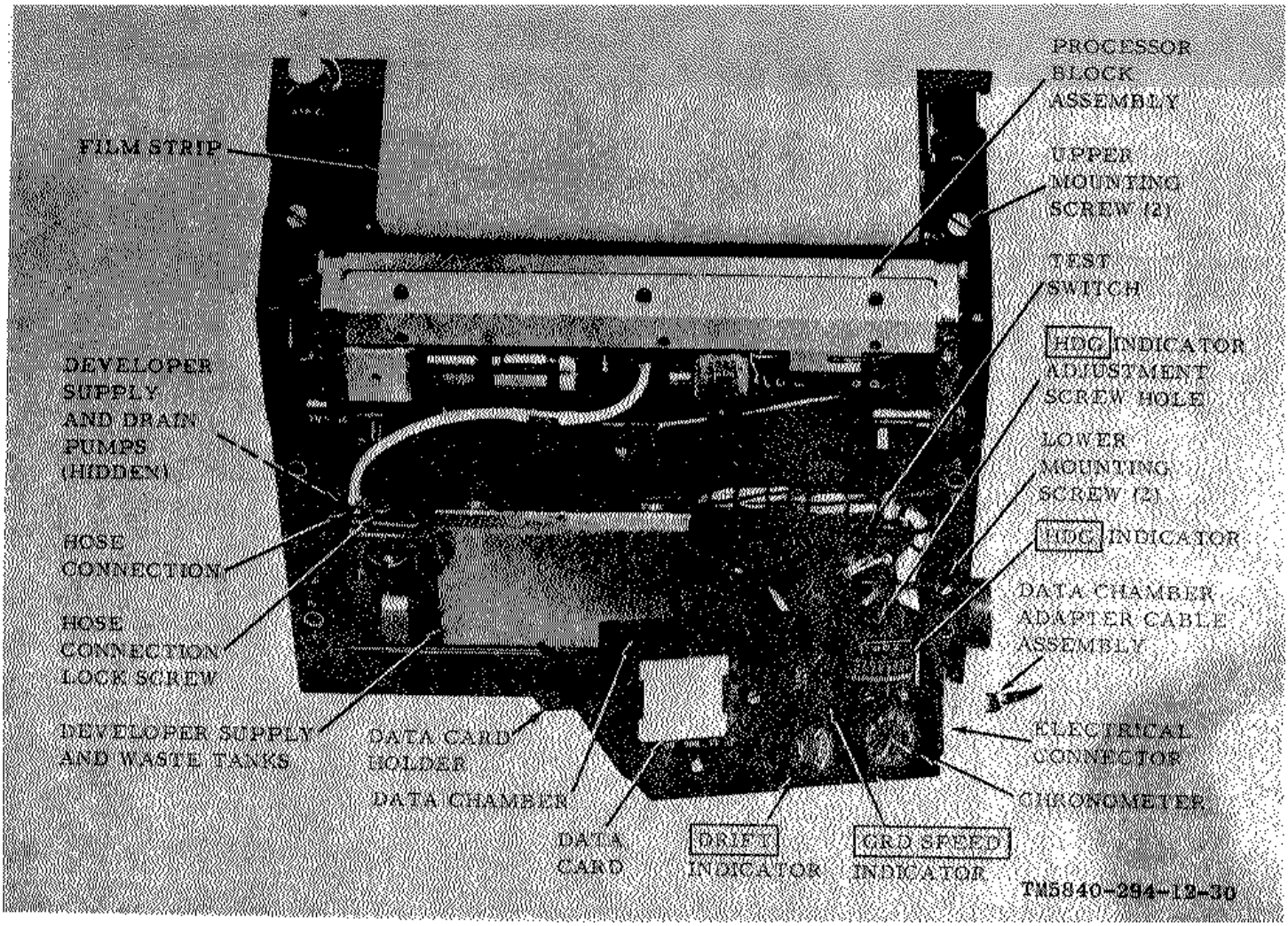


Figure 2-6. Recorder-Processor-Viewer, Radar Mapping RO-166B/UP, upper and lower front covers and data chamber removed.

when the generator set is operating. DON'T TAKE CHANCESI

a. Connect the WHT leads of cables W2/8 to the generator set PHASE A terminal.
b. Connect the RED leads of cables W2/8 to the generator set PHASE B terminal.
c. Connect the GRN leads of cables W2/3 to the generator set PHASE C terminal.
d. Connect the BLK leads of cables W2/3 to the generator set NEUTRAL terminal.

e. Plug connector P1 of one cable W2/S into connector 5J2 (fig. 2-3) on the shelter junction panel.
f. Plug connector P1 of second cable W2/8 into connector 5J3 (fig. 2-3) on the shelter junction panel.

2-14. Cabling Check

After installing the data receiving set, check the cabling as described in a through e below before starting the generator set.

a. Verify that connector P1 of cables W2/3 (2) are firmly mated to shelter connectors 56J2, and 5J3, and that the lugged ends of cables are connected to the proper generator set output terminals (para 2-12).
b. Verify that cables W4, W5, W7, and W8 are connected as' described in paragraph 28, and that the cable connections are tight.
c. Verify that cable W6 is connected between the data antenna and connector 5J11 (para 2-9), and that the cable connections are tight.
d. Verify that cable 5W28 is connected between d/a converter and processor-viewer as described in paragraph 2-12.
e. Verify that all cable connectors inside the shelter are securely connected.
f. Interconnection information for all data receiving set cables is given in the chart below. Cables are listed numerically. Refer to figure 2-7 for additional information.
Note. An cables, except the power cable between the generator set and the shelter (W1, W2/8 (2)), the air conditioner power cables (W4, W6) and interconnecting electrical cables (WI, W8), and the data antenna lead-in (W6), remain installed and connected at all times. Connector P2 of cable 5W28 must be disconnected from connector 4J5 when the processor viewer is stowed for transit.

			Connects to--
Cable	**Connector**	**Connector**	**Component**
		- -	
W2/W3	P1	5J2	Junction box, shelter.
	Lugs	- -	Generator set.
W2/W3	P1	5J3	Junction box, shelter.
	Lugs	- -	Generator set.
W4	P1	5J4	Junction box, shelter.
	P2	- -	Air conditioner condenser 7A1-AFT.
W5	P1	5J5	Junction box, shelter.
	P2	- -	Air conditioner condenser 8A1-FORE.
W6	P1	6CP1	Data antenna.
	P2	5J11	Shelter.
W7	- -	- -	Air conditioner evaporator 7A2-AFT.
W8	- -	- -	Air conditioner evaporator 8A2-FORE.
5W1	P1	1J1	Power supply.
5W2	P1	1J2	Power supply.
	P2	2J1	Target indicator.
5W3	P1	1J3	Power supply.
	P2	3J1	Video decoder.

		Connects to--	
Cable	**Connector**	**Connector**	**Component**
5W4	P1	3J2	Video decoder.
	P2	2J2	Target indicator.
5W5	P1	3J3	Video decoder.
	P2	2J3	Target indicator.
5W6	P1	11J2	D/a converter.
	P2	9A2J3, or 9J114	Data receiver (R-1335/G). Data receiver (R-1335A/G).
5W7	P1	9A2J1, or 9W1J2	Data receiver (R-1335/G).
	P1		Data receiver (R1335A/G).
5W8	P1	5A1J2l	Heater.
5W9	P1	9A1J2, or 9W3J1	Data receiver (R-1335/G). Data receiver (R-1335A/G).
5W10	P1	6A1J2	Heater.
5W11	P1	J552 or J1	Antenna matching unit (R-1335/G). Matching Unit-Base, Antenna (R-1335A/G).
	P2	ANT	Communications transmitter-receiver.
5W12	P1	ANT CONT	Communications transmitter-receiver.
	P2	J551 or J1	Antenna matching unit (R-1335/G). Matching Unit-Base, Antenna (R-1335A/G).
5W13	P1	J21	Mounting MT-1029/VRC.
5W14	P1	10J1	Hv power supply.
	P2	2J16	Target indicator.
5W15	P1	10J2	Hv power supply.
	P2	2J18	Target indicator.
5W16	P1	10J3	Hv power supply.
	P2	2J17	Target indicator.
5W17	P1	10J4	Hv power supply.
	P2	2J15	Target indicator.
5W18	Junction box	Interconnecting box.	Shelter.
5W19	Junction box	5J6 through 5J9.	Shelter outlets.
5W20	Junction box	5S2	Shelter interlock switch.
5W21	P1	11J1	D/a converter.
	P2	1J4	Power supply.
5W22	P1	11J3	D/a converter.
	P2	3J4	Video decoder.
5W23	P1	11J4	D/a converter.
	P2	4J5	Processor-viewer.
5W24	P1	5A4J1	28-volt dc power supply.
5W25	Junction box	Terminal board 5A4TB1	28-volt dc power supply.
9W1	P1	9J101	Data receiver (R-1335A/G).
	J 1	LS-166/U	Loudspeaker.
	J2	5W7P1	Interconnection box.
9W2	P1	9J112	Bandpass filter (9FL108).
	P2	9J102	Data receiver (R-1335A/G).
9W3	P1	9J113	Bandpass filter (9FL108).
	J1	5W9P1	Shelter (5J11).
AUDIO	LS-166/U	9A2J2	Data receiver (R1335/G).
AUDIO	LS-166/U	9W1J1	Data receiver (R1335A/G).

2-15. Initial Adjustment

Initial adjustment of the data receiver set is not required; however, certain preliminary preparations are necessary before operation (para 3-14).

CHAPTER 3

OPERATING INSTRUCTIONS

Section I. OPERATING CONTROLS AND INDICATORS

Note. This section covers only controls and indicators used by the operator. Controls and indicators used by maintenance personnel are covered in instructions for the appropriate maintenance category.

3-1. Receiver, Radio R-1335/, Controls and Indicators

(fig. 3-1)

Controls or indicator	Function
MEGACYCLES dial	Shows channel to which data receiver is tuned.
FREQUENCY 1 MC STEPS knob	Tunes data receiver in 1-mc steps as indicated on MEGACYCLES dial.
FREQUENCY .05 MC STEPS knob	Tunes data receiver in 0. 05-mc steps as indicated on MEGACYCLES dial.
SIGNAL STRENGTH meter	When meter pointer is in green area, indicates satisfactory level of signal being received from airborne data transmitting set. When meter pointer is in red area, indicates an unsatisfactory signal strength is being received.
MODE SELECTOR switch (2-position toggle).	In FM position, data receiver operates in fm mode.
	In AM position, data receiver operates in AM mode (not used for video operation).
VIDEO GAIN control	Increases or decreases video signal output level at VIDEO connector 9A2JS.
AUDIO GAIN control	Increases or decreases audio signal output level at AUDIO connector 9A2J2.
SELECTOR switch (6-position rotary).	Selects voltage to be monitored on MONITOR meter.
MONITOR meter	Indicates whether voltage check selected by SELECTOR switch is within acceptable limits.
POWER indicator lamp	Lights when ON-OFF is in ON position.
ON-OFF switch (2-position toggle)	In ON position, connects power to data receiver.
	In OFF position, disconnects power from data receiver.
SQUELCH control (operates only when MODE SELECTOR switch is set to kn).	In OFF position, no squelch is applied to signal.
	Rotating knob clockwise increases signal level required to break squelch.

3-1.1 Receiver, Radio R-135A/G, Controls and Indicators (fig. 3-1.1)

Controls or indicator	Function
Monitor meter	Monitors each position of METER SELECT SW switch.
METER SELECT SW switch (rotary).	Monitors data receiver as indicated by monitor meter; eleven functions are available:
Positions	Action
RF MIX CUR	During maintenance procedures, monitors Rf crystal mixer current.

Controls or indicator	Function
	Position — Action
	1st IF — During maintenance procedures, monitors first IF amplifier.
	AUDIO — During maintenance procedures, monitors second audio power amplifier stage.
	IFO — During preparation for operations procedures, monitors Rf oscillator (green area of monitor meter).
	SW OBC — During preparation for operations procedures, monitors Schmitt trigger stage in 1f sweep oscillator (green area of monitor meter).
	HF OSC — During preparation for operations procedures, monitors hf crystal oscillator stage (green area of monitor meter).
	MF OSC — During preparation for operations procedures, monitors mf crystal oscillator stage (green area of monitor meter).
	LF OSC — During preparation for operations procedures, monitors If crystal oscillator stage (green area of monitor meter).
	28 VDC — During preparation for operations procedures, monitors 28-volt de power supply (green area of monitor meter).
	18 VDC — During preparation for operations procedures, monitors 18-volt dc power supply output (green area of monitor meter).
	AGC — During preparation for operations procedures, monitors first AGC stage of second IF amplifier (green area of monitor meter).
QUIETING DB switch (rotary)	Sets level of audio output signal, as heard through headset (coarse control).
HDSET AUDIO GAIN control	Sets level of audio output signal, as heard through headset (fine control).
AM-FM switch	Selects either am. or fm mode of operation.
PWR ON indicator	When lighted, indicates presence of +28 vdc in data receiver.
FREQ MC control	Tunes data receiver RF section to desired frequency.
AUDIO GAIN control	Sets level of audio output signal, as heard through loudspeaker.
RF CARR indicator	When lighted, indicates presence of desired frequency.
MEGACYCLES X10 switch	Selects frequencies between 220 and 390 mc in 10-mc increments.
MEGACYCLES X1 switch	Selects frequencies between 0 and 9 mc in 1-mc increments.
MEGACYCLES switch	Selects frequencies between 0.00 and 0.95 mc in 50-kc increments.
ON-OFF switch	Applies power (120 volts) to data receiver.
SWITCH TUNING pushbutton switch	When pressed during rf tuning (FREQ MC control), simulates aircraft transmitted signal.
SQUELCH control	Sets level at which data receiver squelch circuitry activates.
XTAL OVEN indicator	When lighted indicates crystal oven heaters are activated (cycles on every 2.5 minutes).
VIDEO GAIN control'	Sets level of video output signal as viewed on video decoder MONITOR ±10 MAXIMUM meter.
VFO HEATERS indicator	When lighted, indicates vfo heaters are activated.

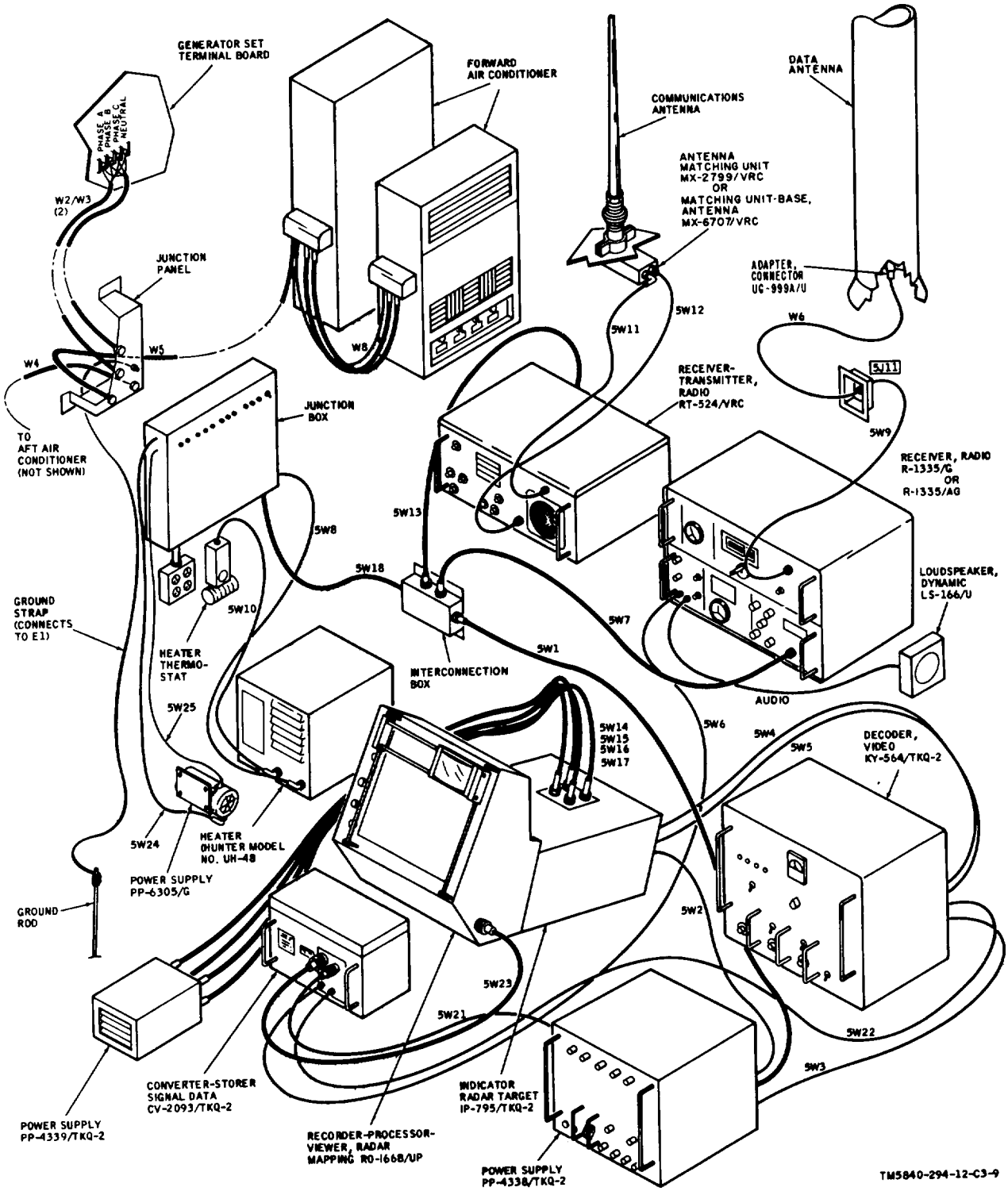


Figure 2-7. Pictorial cabling diagram.

3-2. Receiver-Transmitter, Radio RT-524/VRC, Controls and Indicators (fig. 3-2)

Controls or indicator	Function
CALL indicator	Lights when a signal is received if LIGHT and SQUELCH switches are set to ON.
Band switch (two-position rotary)	Selects frequency band (A or B).
LIGHT switch (two-position rotary).	Controls power to channel dial lamp and CALL indicator.
SPEAKER switch (two-position rotary).	Turns internal loudspeaker on or off.
Channel dial	Shows channel to which RT-524/VRC is tuned.
MC-TUNE knob	Tunes RT-524/VRC in 1-mc steps (indicated on channel dial).
KC-TUNE knob	Tunes RT-524/VRC in 50-kc steps (indicated on channel dial).
POWER switch (three-position rotary).	In OFF BREAKER RESET position, turns power of and resets circuit breaker if tripped. In LOW position, turns power on; transmitter has low-power output. In HIGH position, turns power on; transmitter has high-power output.
SQUELCH switch (four-position rotary).	Position: OLD OFF — Function: Removes squelch. Position: OLD ON — Function: Selects noise-operated squelch. Position: NEW OFF — Function: Removes squelch. Position: NEW ON — Function: Selects squelch operated by tone from distant transmitter.
Volume control	Adjust audio output.

3-3. Decoder Video KY-564/TKQ-2, Controls and Indicators (fig. 43)

Controls or indicator	Function
SELECTOR switch (11-position rotary).	Used with MONITOR +10 MAXIMUM meter to monitor outputs of power supply, data receiver, and automatic aircraft drift-angle and groundspeed data.
OFF	Position: OFF — Function: Disconnects MONITOR ± 10 MAXIMUM meter from video decoder circuit.
VIDEO	Position: VIDEO — Function: Monitors video circuit in receiving system and indicates video amplitude.
GROUND SPEED	Position: GROUND SPEED — Function: Compares manually controlled ground-speed data with automatically controlled groundspeed data.
DRIFT ANGLE	Position: DRIFT ANGLE — Function: Compares manually controlled drift angle data with automatically controlled drift angle data.
120 VAC	Monitors 120-volt ac primary voltage.
+28 V	Monitors + 28-volt dc primary voltage.
+300 V	Monitors power supply + 300-volt dc output.
+250	Monitors power supply + 250-volt dc output.
+ 150 V	Monitors power supply + 1650-volt dc output.
-10 V	Monitors power supply -10-volt dc output.
-300 V	Monitors power supply -800-volt de output.

Controls or indicator	Function
MONITOR ± 10 MAXIMUM meter	Used with SELECTOR- switch to monitor outputs of power supply and aircraft drift angle/groundspeed data. For a given SELECTOR switch position, meter reading denotes satisfactory performance when meter needle is on 0 ±10.
DRIFT ANGLE switch (2-position toggle).	In AUTOMATIC position, provides data receiving set with drift angle data from surveillance aircraft. In MANUAL position, provides data receiving set with simulated drift angle information from DRIFT ANGLE DEGREES control.
GROUNDSPEED switch (2-position toggle).	In AUTOMATIC position, provides data receiving set with groundspeed data from surveillance aircraft In MANUAL position, provides data receiving set with simulated groundspeed information from GROUNDSPEED KNOTS control.
FILM DRIVE switch (2-position toggle).	In ON position, applies voltage for film drive mechanism in processor-viewer. In OFF position, deenergizes film drive mechanism in processor-viewer.
HEADING DEGREES control.	Sets aircraft heading on HDG indicator located in processor-viewer data chamber.
DRIFT ANGLE DEGREES control	Applies simulated drift angle data to circuits of data receiving set (DRIFT ANGLE switch in MANUAL position).
GROUNDSPEED KNOTS control	Applies simulated groundspeed data to circuits of data receiving set (GROUNDSPEED switch in MANUAL position).
AIRCRAFT IDENTIFICATION indicator lamps (clear).	Used with AIRCRAFT IDENTIFICATION switch for identification of surveillance aircraft. Aircraft identification is obtained by adding digits over lighted indicator lamps. Sum of this addition is encoded identification number assigned to transmitting aircraft.
AIRCRAFT IDENTIFICATION switch (3-positlon toggle).	In ON position, activates aircraft identification circuits In OFF position, deactivates aircraft identification circuits. In TEST position, applies power to all for AIRCRAFT IDENTIFICATION indicator lamps to detect burned-out lamps.
RANGE switch (2position toggle)	Selects 2-km or 50-km operating mode. In 25-km mode, AN/TKQ-2 process first 25 km of data; in 50-km mode, all data is processed.

3-4. Converter-Storer, Signal Data CV-2093/TKC2, Control and Indicators (fig. 4)

Controls or indicator	Function
TEST switch (3-position toggle	When held in ON position, illuminates all segments of ppd display unit in processor-viewer continuously. When held in .5 SEC ON position, illuminates all segments of ppd display unit in processor-viewer for period of approximately 0.5 second. In OFF position, removes segment illuminating voltage from processor-viewer
120 VAC circuit breaker	Pops out (trips) when overload exists in 120-volt ac circuits. Reset manually by pressing inward.
+28 VDC circuit breaker	Pops out (trips) when overload exists in 28-volt dc circuits. Reset manually by pressing inward.

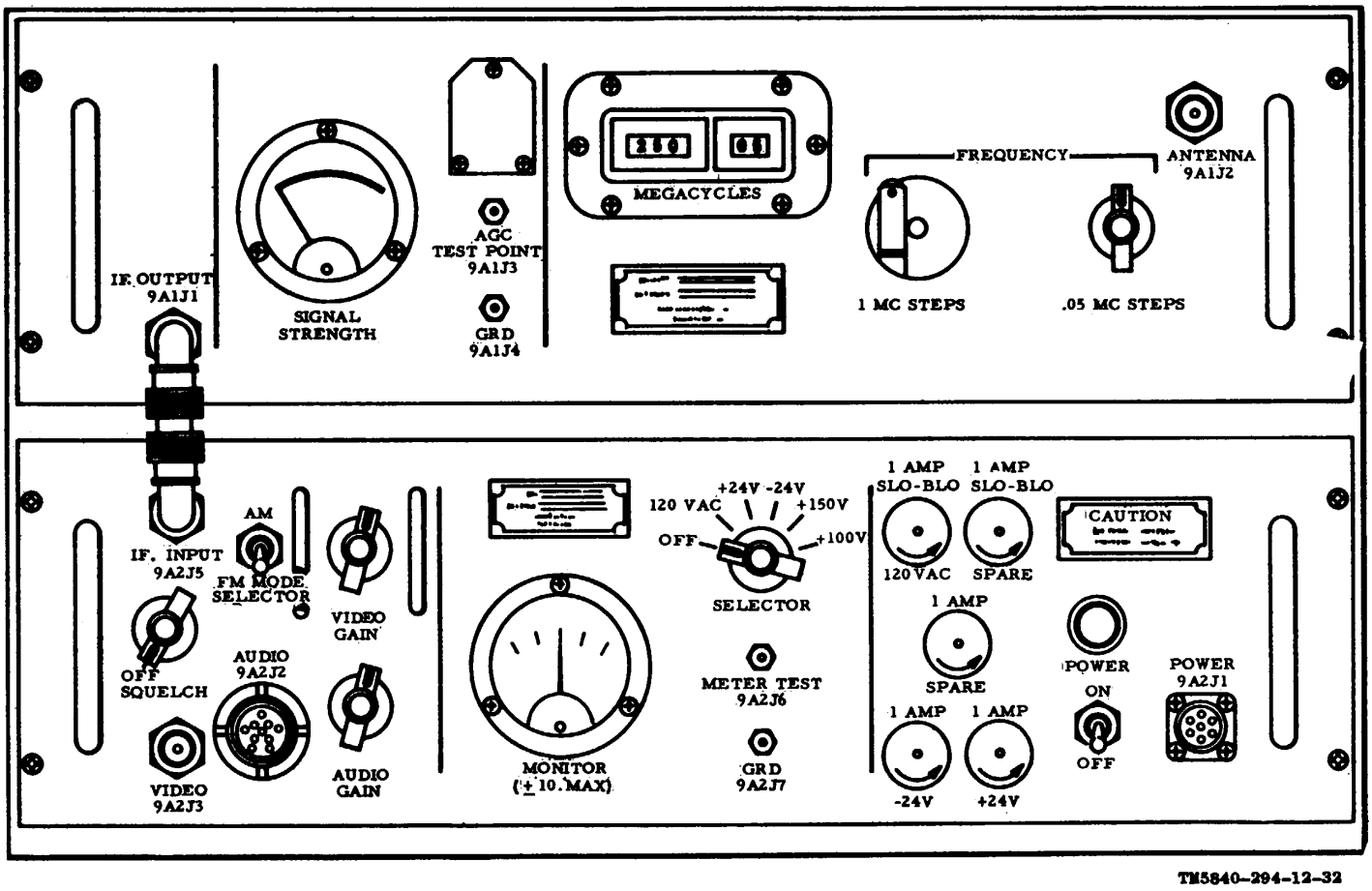


Figure 3-1. Receiver, Radio R-1335/G, controls and indicators.

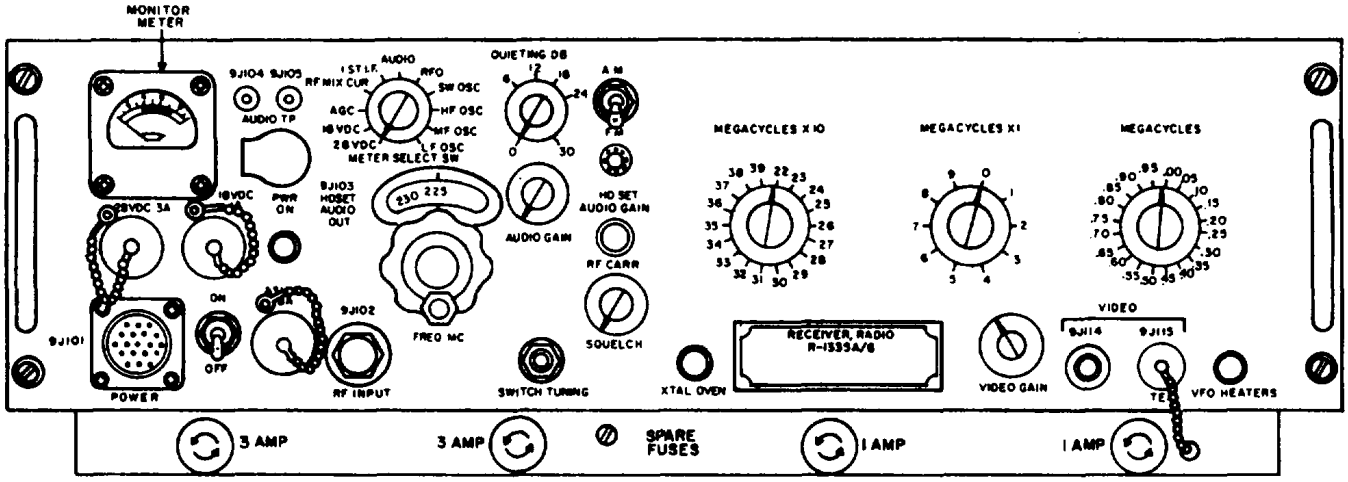


Figure 3-1.1. Receiver, Radio R-1335A/G, controls and indicators.

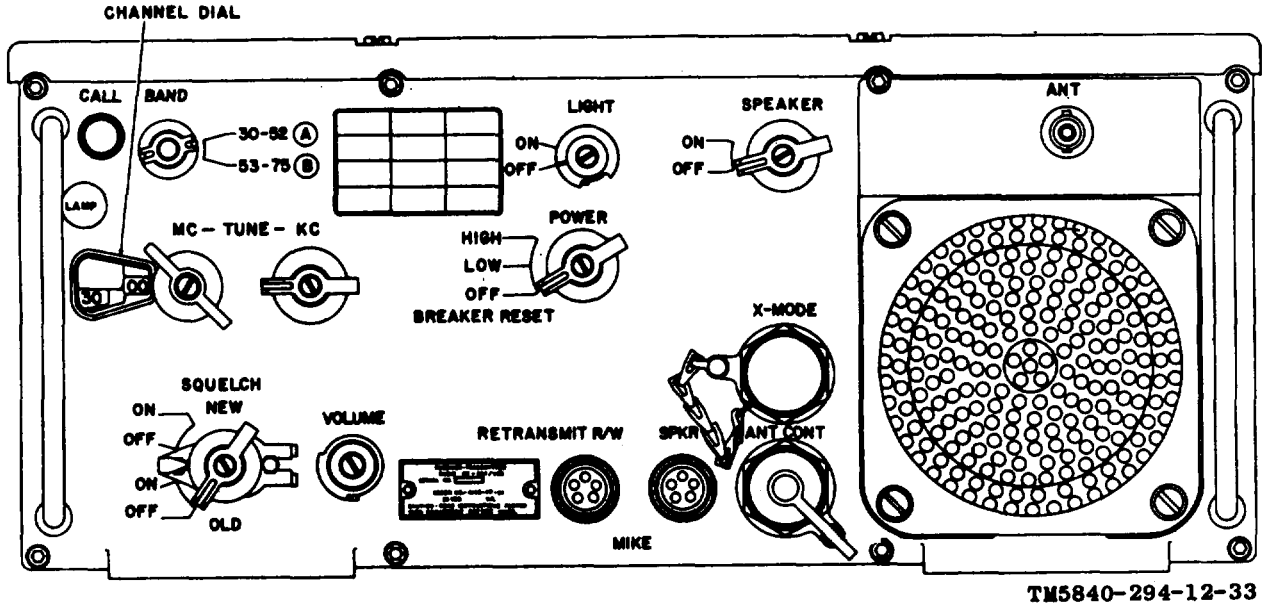


Figure 3-2. Receiver-Transmitter, Radio RT-524/VRC, controls and indicators.

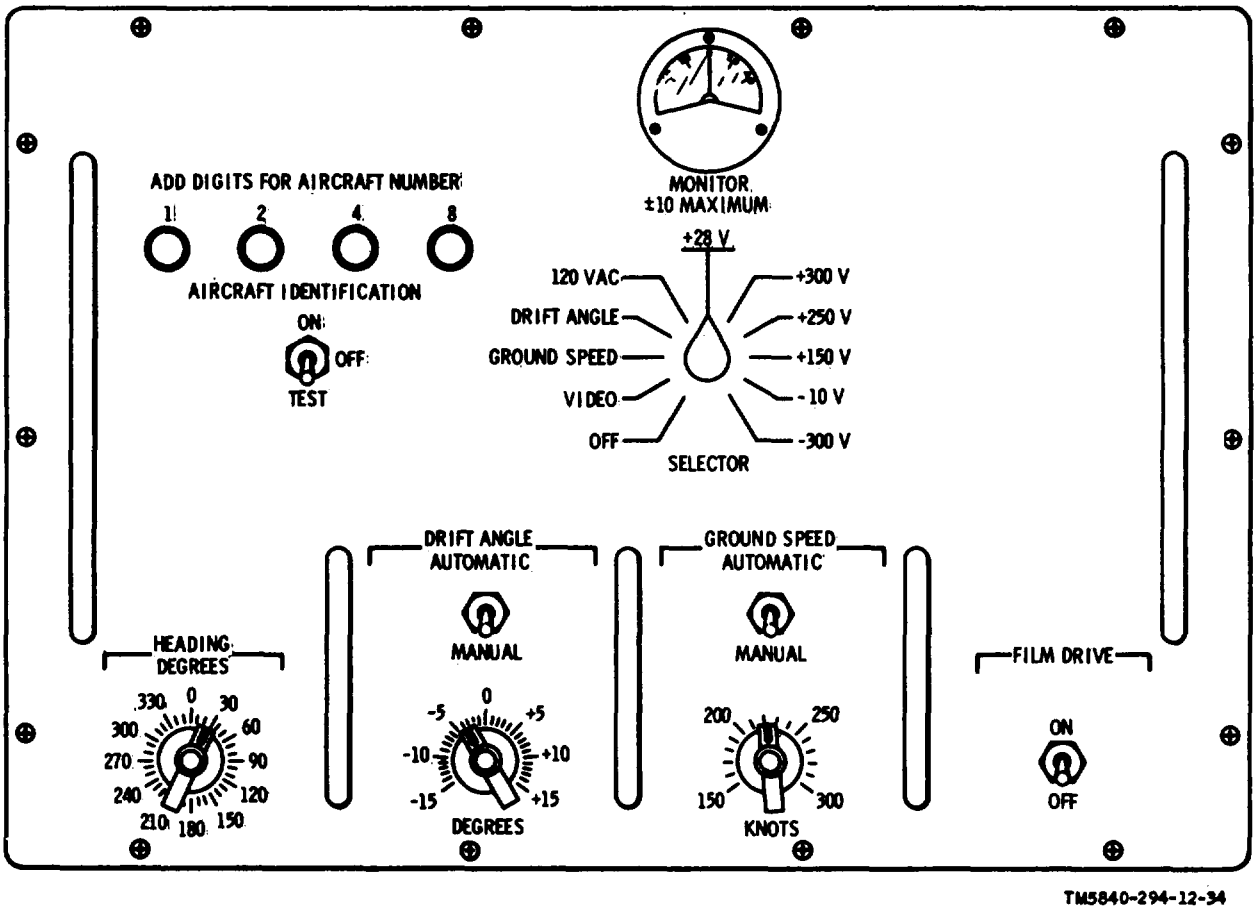


Figure 3-3. Decoder, Video KY-564/TKQ-2, controls and indicators.

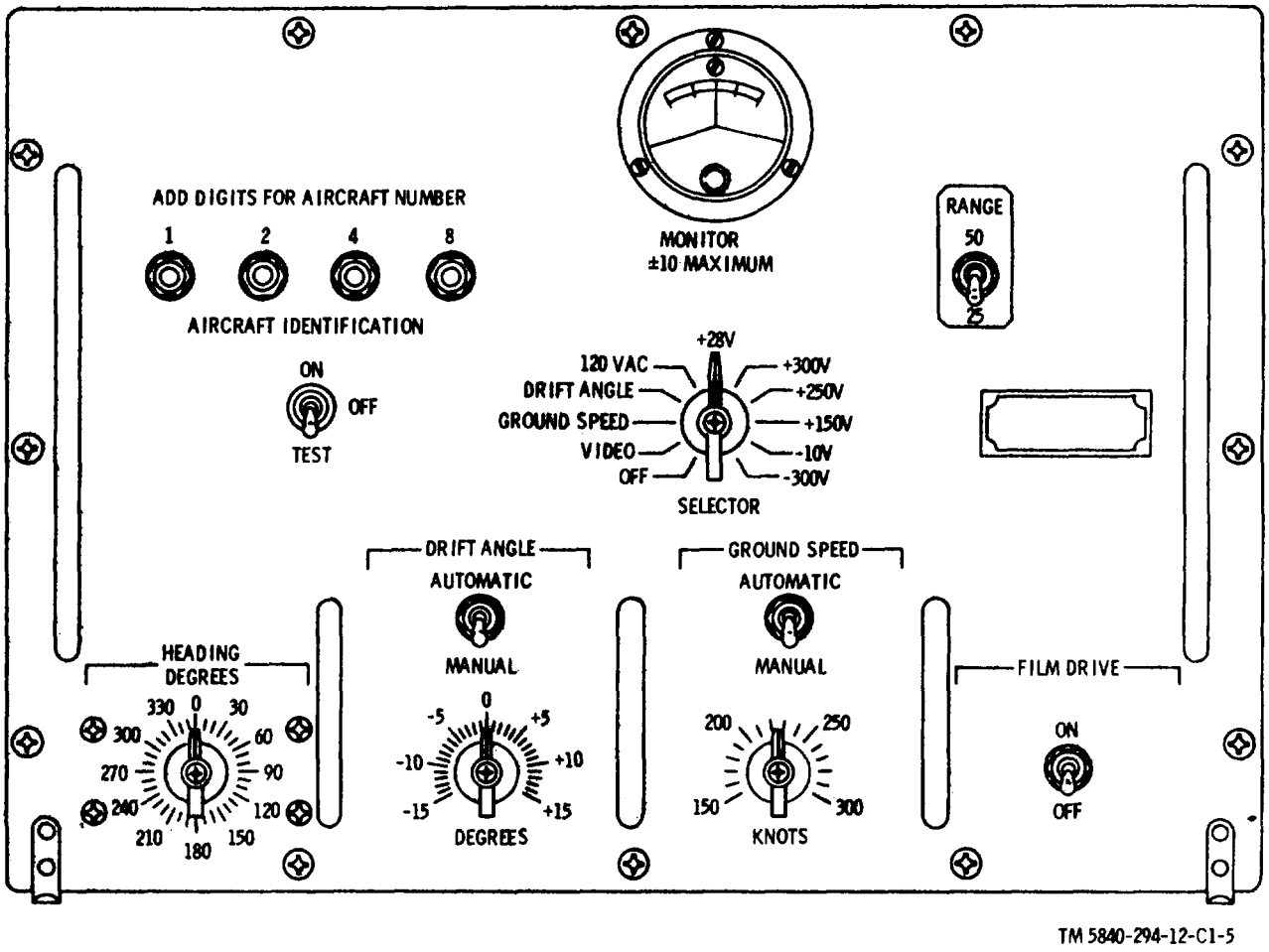


Figure 3-3.1. Decoder, Video KY-564/TKQ-2, controls and indicators order No. FR28-043-M5—00982(E) serial No. 40 through 52; and order No. DAABO7-6B-C-0304, serial Nos 1 through 26.

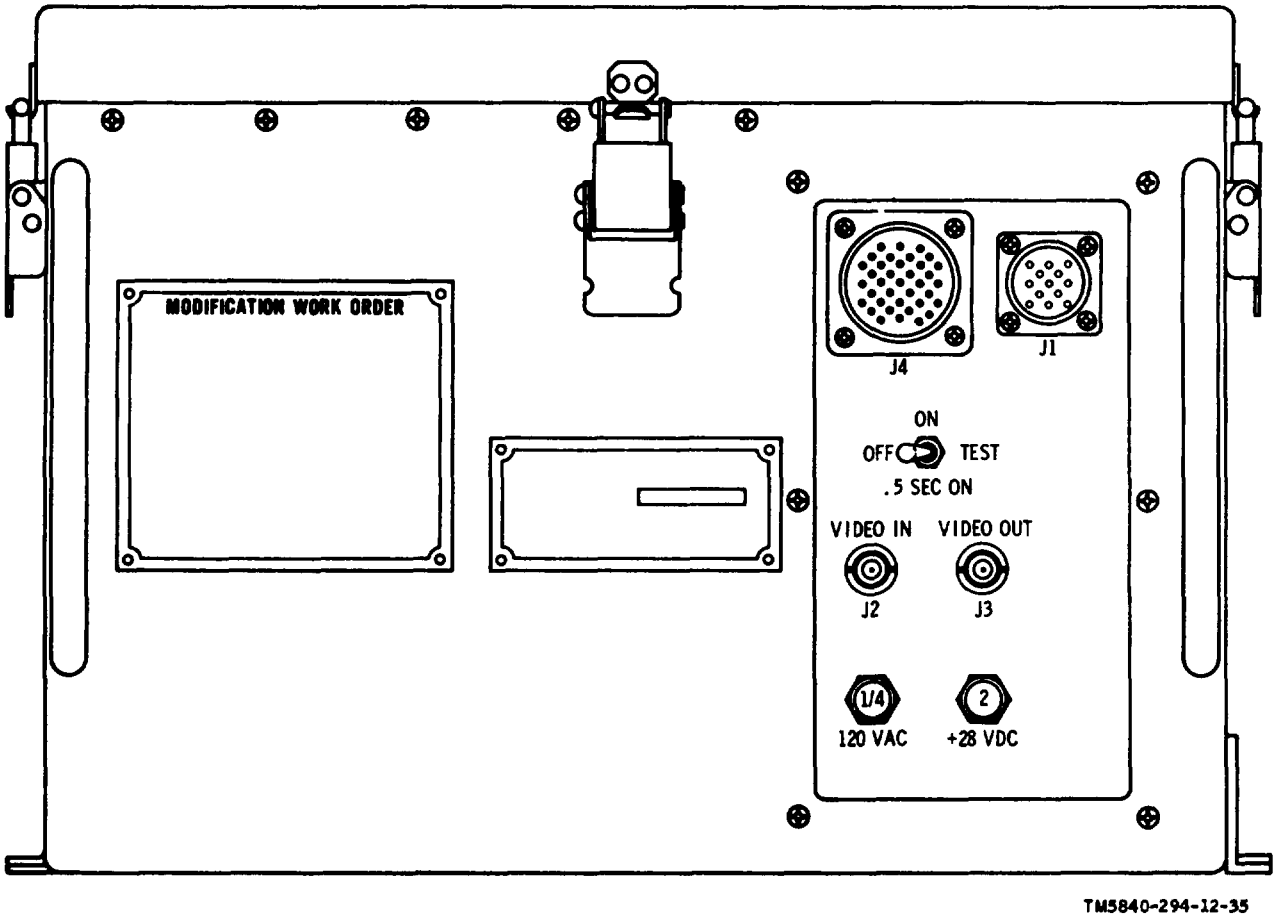


Figure 3-4. Converter-Storer, Signal Data CV-2093/TKQ-2, control and indicators.

3-5. Recorder-Processor-Viewer, Radar Mapping RO-166B/UP, Controls

(figs 3-5 and 3-6)

Processor-viewer controls used by the operator of the data receiving set during normal operation are described below. For a description of controls used in preparing the processor-viewer for use, refer to TM 11-5841-237-10.

Controls or indicator	Function
ON-OFF switch (two-position toggle).	In ON position, applies power to: (1) Film takeup motor. (2) Roller drive motor. (3) Heaters. (4) Film-drive motor. (5) Pump motor. (6) Fast film advance panel illumination circuits. In OFF position disconnects power from processor-viewer subsystems listed in (1) through (6) above
VIEW switch (three-position toggle).	Pos: OFF — Function: Turns off film illuminator lamps. Pos: BRIGHT — Function: Turns film illuminator lamps to full brilliance.

Controls or indicator	Function
	Pos Function DIM Reduces brightness of film illuminator lamps.
MANUAL DATA EXPOSE SWITCH (momentary push-button)	When pressed, turns on data illuminator lamps to record data chamber information on film.
FAST FILM ADV switch (lateral-press-type).	When pushed, advance film rapidly.
Data card	Provides a place for operator to record essential mission data. When data card is inserted into data chamber and MANUAL DATA EXPOSE switch is pressed, mission data is recorded on film along with other data chamber information.
APP.CL control	Controls position of roller with respect to film.

3-6. Power Supply PP-4338/TKQ-2, Controls and Indicators (fig. 3-7)

Controls or indicator	Function
POWER switch (two-position toggle).	In ON position, connects 120-volt ac, single-phase, 400-cp, and +28-volt dc power to d/a converter, video decoder, target indicator, processor-viewer, and hv power supply. In OFF position, disconnects power from units listed above.
120 VAC 400 CPS indicator lamp (white).	Lights when POWER switch is placed in ON position.
+28 V indicator lamp (red).	Lights when POWER switch is placed in ON Position

3-7. Heater, Hunter Model UH-48, Type II, Controls and Indicators

a. Heater ***A*** **(fig. 3-8)**

Controls or indicator	Function
ON-OFF switch	In ON position, connects 120-volt ac power to heater. In OFF position disconnects 120-volt ac power from heater.
COLD START switch (two-position momentary toggle).	When held in UP position, manually operates heater glow plug to preheat heater burner head prior to setting ON-OFF switch to ON position.
RESET button	When depressed, manually closes heater thermal relay and energizes heater electrical circuits.
White indicator lamp	Lights when ON-OFF switch is in ON position to signal that heater is in operation.
Red indicator lamp	Lights to indicate a heater malfunction.

b. Heater **B (fig. 3-9).**

Controls or indicator	Function
ON-OFF switch	In ON position, connects 120-volt ac power to heater. In OFF position, disconnects 120-volt ac power from heater.
RESET --_--_----- ----------_--	When depressed, manually closes eater thermal relay and energizes electrical circuits.

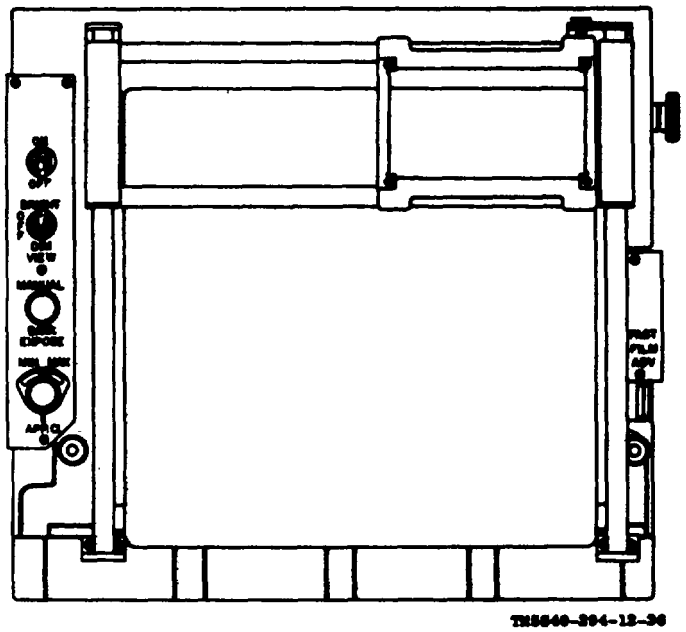


Figure 3-5. Recorder-Processor-Viewer, Radar Mapping RO-166B/UP, controls.

3-8. Air Conditioner, Therm-Air Model CE-6A-400, Controls and Indicators (figs 3-10 and 3-11)

Controls or indicator	Function
ON-OFF switch SW1 (two-position toggle).	In ON position, connects 120-volt ac power to air conditioner. In OFF position disconnects 120-volt ac power from air conditioner.
HEAT-VENT-COOL selector switch SW2 (three-position toggle).	Pos / Function HEAT — Conditions air conditioner for heating operations. VENT — Conditions air conditioner for providing ventilation without heating or cooling. COOL — Condition air conditioner for cooling operations.
FRESH AIR control switch SW3.	Controls mixture of fresh and return air supplied to air conditioner evaporator section
COOLER control switch SW4 (thermostat).	Provides control for both heating and cooling elements.
Receiver valve	Control flow of refrigerant from receiver to rest of system.
Sight glass	Permits viewing of refrigerant to determine moisture content and presence of air bubbles

3-9. Shelter Controls

a. The shelter is equipped with three ventilation ports (figs. 1-4 and 1-6). Two of the ventilation ports are located in the shelter front wall. The third ventilation port is located in the upper door section. Ventilation port covers for the ventilation ports in the shelter front wall are secured in the closed or the storage position with four captive screws. Chains prevent loss of these ventilation port covers when they are not installed on the shelter. When operation with the front ventilation ports open is desired, loosen the captive

screws, remove the ventilation port covers, and install them in their storage positions (fig. 1-5). The ventilation port in the upper door section is equipped with a ventilation port cover that is hinged at the top. A captive screw secures this ventilation port cover in the closed position. A folding bracket on the ventilation port cover holds the ventilation port cover in the open position. The ventilation port in the upper door section (fig. 1-4) is normally equipped with a removable ventilation port filter (fig. 1-6).

b. Other shelter controls consist of the heater thermostat (fig. 1-8) and the OVHD LT switch located on the junction box front panel (fig. 3-12). The OVHD LT switch controls the shelter lights as described in paragraph 1-10c. In addition to the OVHD LT switch, the junction box front panel contains manually reset-table circuit breakers that control the primary power inputs to operating components of the shelter.

3-10. Generator Set, Gasoline Engine PU-107A/U, Controls and Indicators (Used only with Generator Set, Gasoline Engine, Trailer-Mounted PU-375/G or PU-375A/G) (figure. 3-13)

Controls or indicators	Function
RESET circuit breaker pushbutton	Use to start equipment in low temperatures Reset heater circuit. Trips automatically when heater circuit becomes overloaded.
RUN-START switch (three-position toggle).	When held in START position, starts generator winterization heater. If heater become overloaded, RESET button must be pushed in before placing switch in START position. After RUN-START switch is held in START position from 2 to 4 minutes, heater OPERATING lamp indicator lights RUN-START switch may then be placed in RUN position to put generator heater in full operation. In off (center) position, stops generator heater.
ENGINE CONTROLS MANUAL HANDCRANK START- - MOTE START switch (two-position toggle). Note. Throughout remainder of this manual, down position of this switch is referred to as REMOTE START position.	MANUAL HANDCRANK START position starts ignition circuit when handcranking. REMOTE START position starts ignition circuit by remote control or by means of START-OFF-STOP switch.
Heater OPERATING red indicator lamp	When lighted, indicates winterized heater is in operation.
START-OFF-STOP switch (three-position momentary toggle).	When held in START position, starts engine. When held momentarily in STOP position, stops engine This switch is spring loaded to return to OFF position when released from either START or STOP position.
Oil pressure gauge ----------	Indicates pounds per square inch of oil pressure being delivered to engine bearing
Coolant temperature gauge ----------	Indicates temperature of engine coolant
Battery charger ammeter ----------	Indicates rate in amperes at which batteries are being recharged.
400 CYCLE CIRCUIT BREAKER--- switch (two position circuit --------- breaker).---------- ----------	Serves as main load switch and overload trip for 400-cycle circuit. Trips automatically if 400-cycle circuit becomes heavily overloaded. (in some of the newer TKQ-2 systems, the function of the 28v dc circuit breaker has been deleted).
28V DC CIRCUIT BREAKER -------- switch (two-position circuit --------- breaker).	Serves as main load switch and overload trip for 28-volt dc circuit. Trips automatically if 28volt dc circuit becomes heavily overloaded.
Voltmeter selector switch ----------	Used to check 400 cycle voltage from each phase to neutral (A-N, B-N, C-N).
Voltmeter ----------	Indicates voltage of phase selected by voltmeter selector switch.
Frequency meter----------	Indicates frequency of altenator output voltage in cps.
PHASE A AMPS ammeter----------	Indicates load amperage of phase A 400-cycle voltage.
PHASE B AMPS ammeter----------	Indicates load amperage of phase B 400-cycle voltage.
PHASE C AMPS ammeter ----------	Indicates load amperage of phase C 400-cycle voltage

3-10. 1 Generator Set, Gasoline Engine HF 10.0--MD, Controls and Indicators

Refer to TM 5-6115-450-15 for a list of controls and indicators and the illustration for Generator Set, Gasoline Engine HF-10. 0-MD.

3-10.2 Antenna AS-1729/VRC, Control, and Connectors (fig. 3-13.1)

Controls or indicators	Function
Switch S81 (10-position rotary)	Provide manual selection of proper antenna tuning components for 10 frequency-band segments as marked. *Note.* Switch S1 is not used when control cable is connected to connector J2.

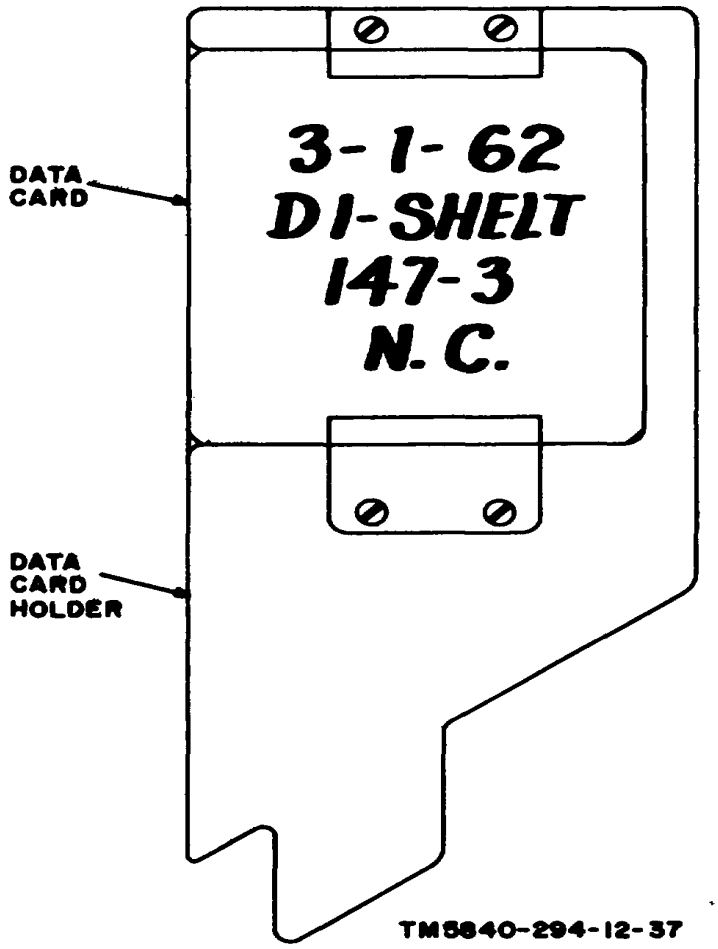


Figure 3-6. Processor-viewer data card and data cardholder.

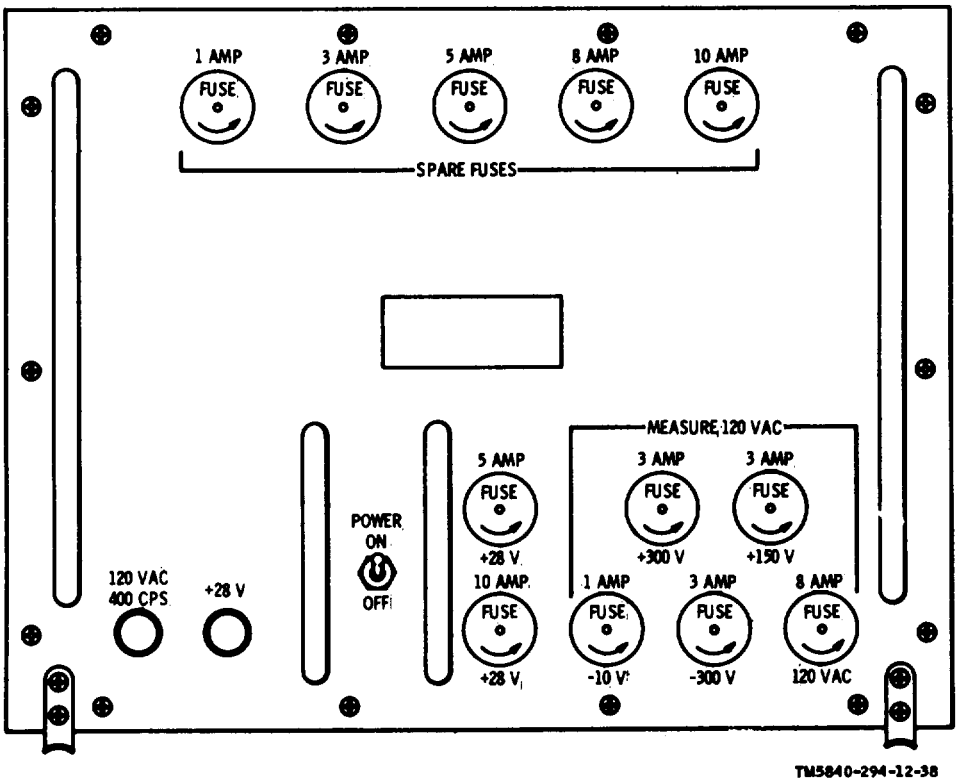


Figure 3-7. Power Supply PP-4338/TKQ-2, controls and indicators.

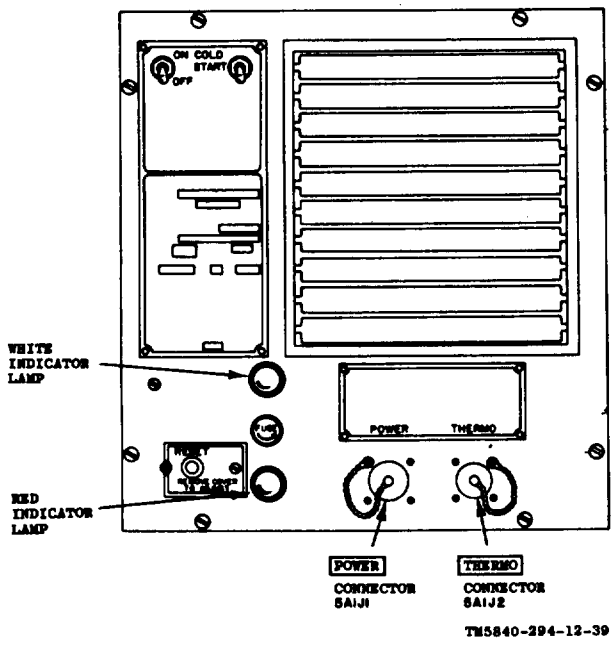


Figure 3-8. Heater, Hunter model UH-48, type II (heater A).

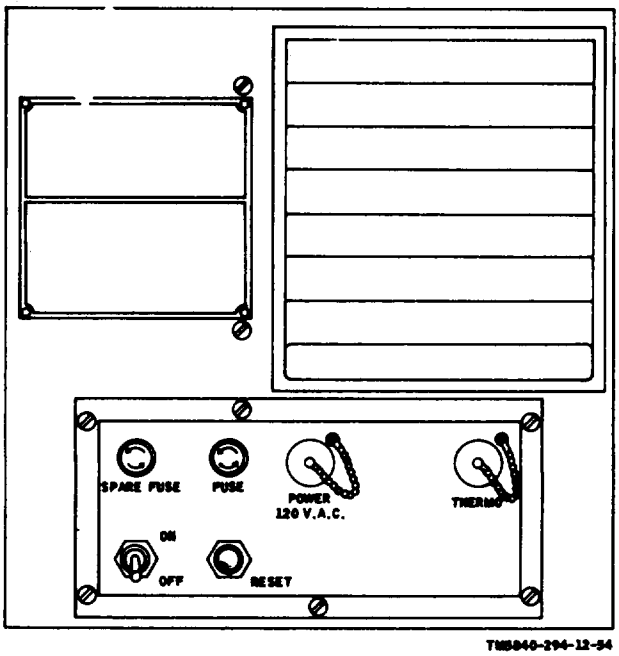


Figure 3-9. Heater, Hunter model UH-48, type II (heater B).

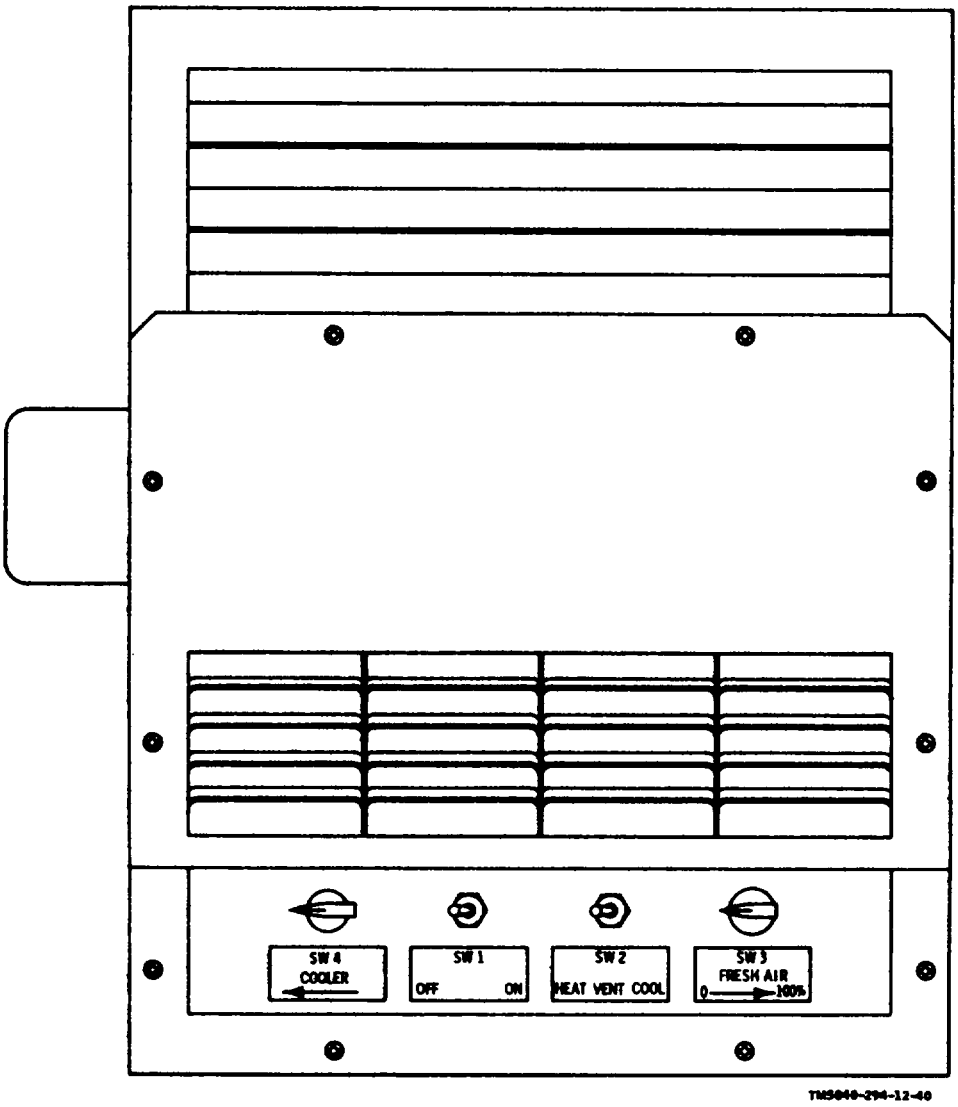


Figure 3-10. Air conditioner evaporator section, controls and indicators.

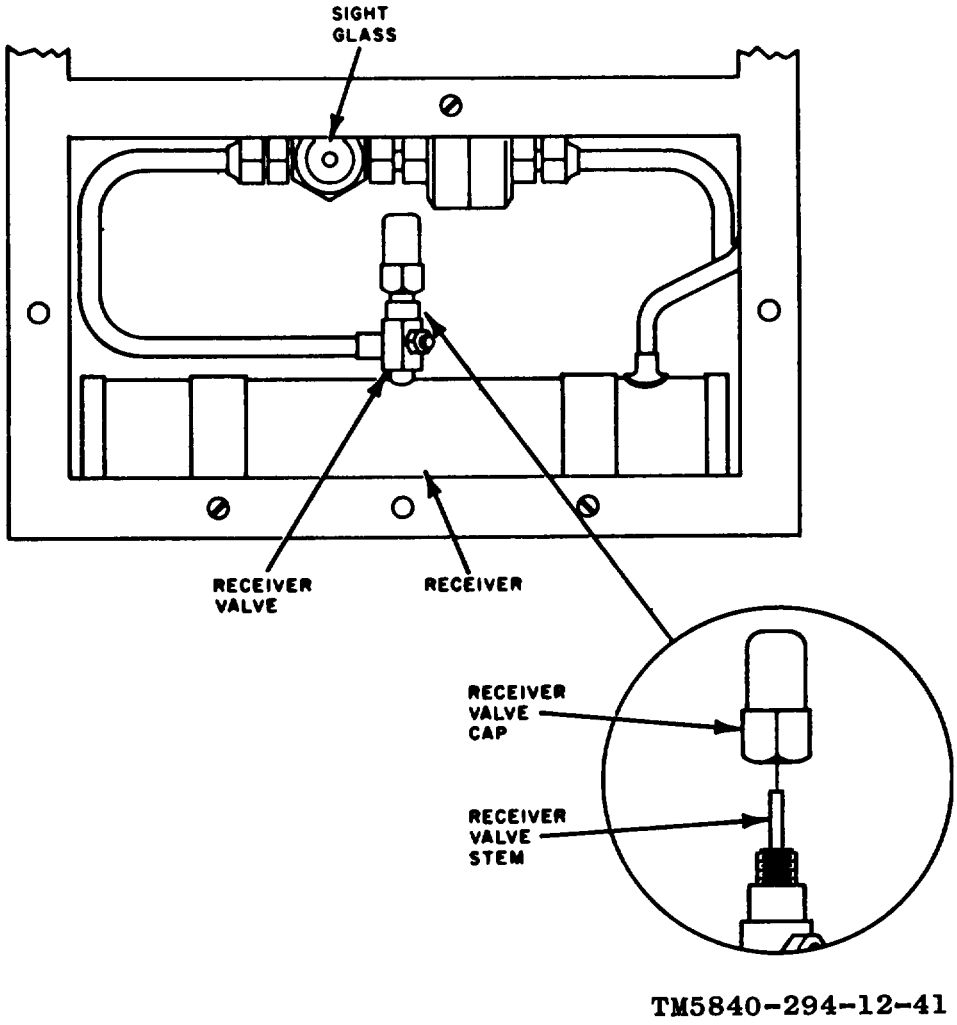


Figure 3-11. Air conditioner condenser section, front panel (air-intake grille removed)

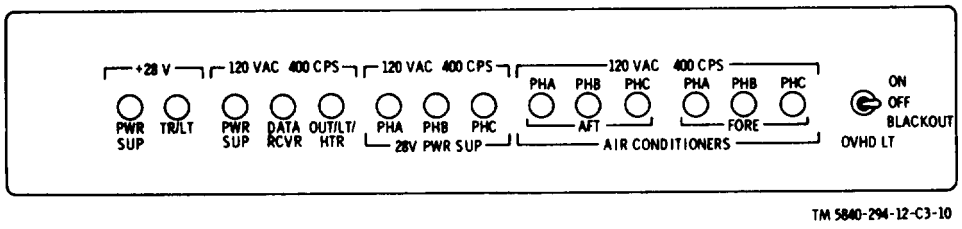


Figure 3-12. Junction box front panel

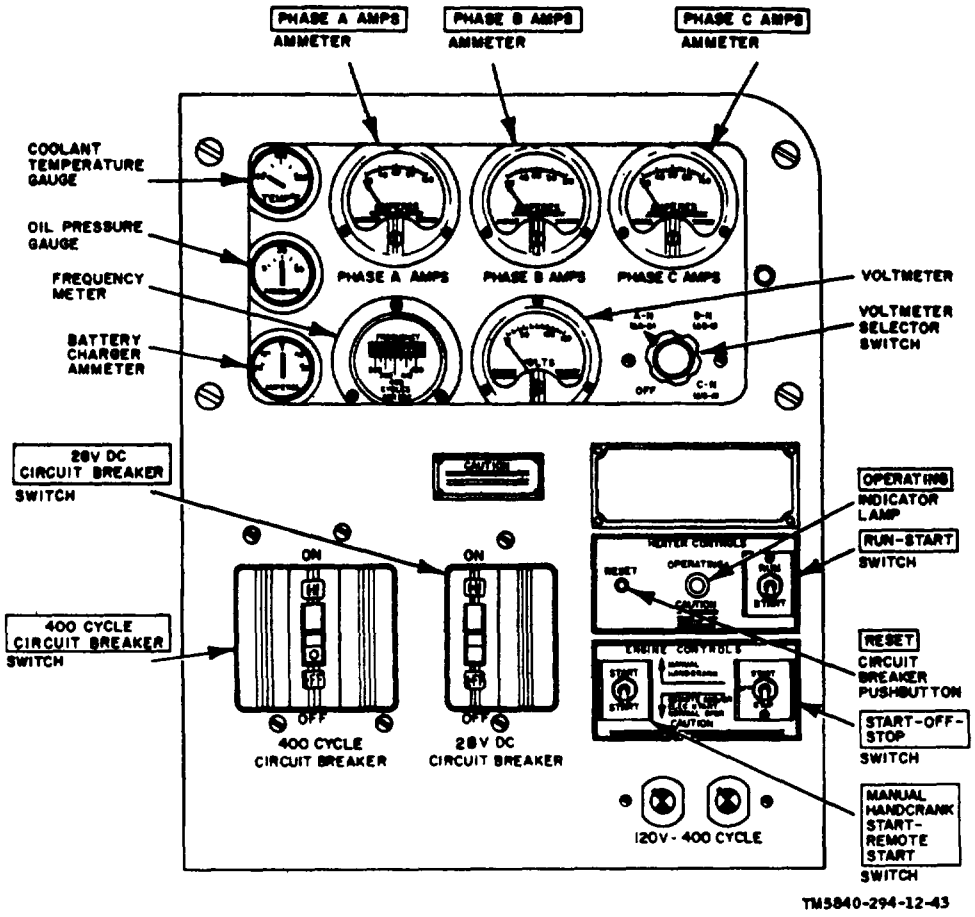


Figure 3-13. Generator Set Gasoline Engine PU-107A/U, controls and indicators

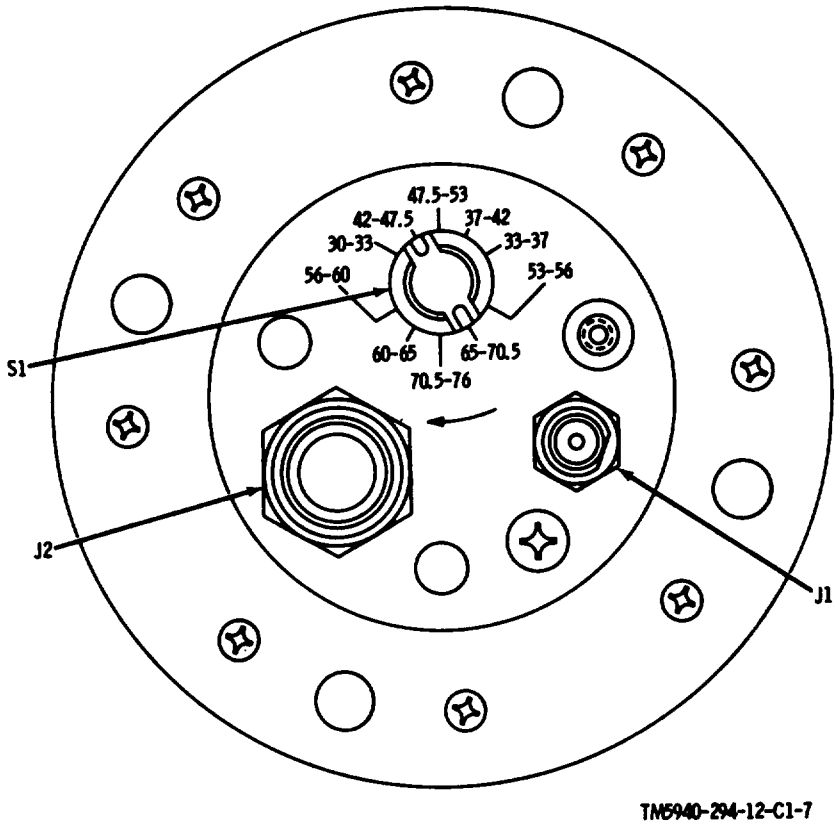


Figure 3-13.1. Antenna AS-1729/VRC, switch and connectors (on Matching Unit-Base, Antenna MX-6707/VRC).

Section II. OPERATION UNDER USUAL CONDITIONS

Note: The term generator set in this section refers to the PU-107A/U. When the HF-10.0-MD is being used, refer to TM 5-6115-450-15.

3-11. Preliminary Control and Indicator Settings

a. Set the POWER switch (fig. 3-7) on the power supply to OFF.

b. Set the 400 CYCLE CIRCUIT BREAKER (fig. 3-13) on the generator set to OFF.

c. Set and wind the chronometer (clock) in the processor-viewer data chamber assembly (fig. 2-6). For instructions on gaining access to the clock, refer to TM 11-5841-237-10.

3-12. Prestarting Checks

a. Check the generator set fuel supply to be sure of enough fuel to operate the generator set for the duration of the mission.

b. If the heater is to be used, check the heater fuel supply.

Note. When performing the next step, follow the instructions in TM 11-5841-10.

c. Be sure the processor-viewer is ready for use and is supplied with film and enough developer for duration of the mission. Be sure that the developer is fresh and newly mixed, the waste tank is empty, and the mirrors above the tank are clean.

3-13. Starting Procedure

Before starting this procedure, be sure the preliminary control and indicator settings (para 3-11) have been made and the prestarting checks (para 3-12) have been completed. If an abnormal indication is obtained during the starting procedure, refer to the daily preventive maintenance checks and services chart (para 4-5).

a. To start the generator set electrically, proceed as follows:

Warnings: Do not use handcrank when start-

ing the generator set electrically. Injury may result.

Note. The manual throttle is not used for normal starting. When the generator set is run under no-load conditions, or when the engine is to be started in cold temperatures, refer to TM 5-5264 for instructions on the use of the manual throttle.

(1) Set MANUAL HANDCRANK START-REMOVE START switch (fig. 3-13) to REMOVE START.

(2) Set START-OFF-STOP switch to START. Hold the switch in this position from 10 to 15 seconds. If the engine fails to start, release the switch for 10 seconds then try to start the engine again. If several attempts to start the engine are unsuccessful, refer to TM -5264 for instructions.

b. To start the generator set manually, proceed as follows:

Caution: Be sure START-OFF-STOP switch is in OFF position before performing the following procedure.

(1) Set MANUAL HANDCRANK START-REMOVE START switch to MANUAL HANDCRANK START position.

(3) For cold weather starting, pull out the hand choke on the front of the unit.

(4) Crank the engine; use a strong, quick, upward pull. Repeat as necessary, being careful not to overchoke the engine.

(5) When the engine starts, return the MANUAL HANDCRANK START-REMOTE START switch to RE- MOTE START

c. Check the generator set indicators (fig. 3-13) for the readings listed below. If any reading is not specified, refer to TM 5-5264 for instructions.

(1) Oil pressure gage: between 15 and 21.

(2) Battery charger ammeter: ½ to 5 amperes.

(3) Coolant temperature gage: 170°(after warmup).

(4) Voltmeter: 120 to 126 volts.

(5) Frequency meter: 400 to 415 cps.

d. Set 400 CYCLE CIRCUIT BREAKER (fig. 3-13) on the generator to ON.

e. Turn on the shelter light if needed. Set OVHD LT switch (fig. 3-12) to BLACKOUT if the tactical situation warrants. If light is needed when the entrance door is open, set OVHD LT switch to ON.

f. If required, start the heater as follows:

(1) Set the heater thermostat, on the shelter left wall (fig. 1-8), for the desired temperature.

(2) Set ON-OFF switch (fig. 3-8 or 3-9) to ON. White indicator lamp on heater control panel (heater A only) will light. (During operation of heater, white indicator lamp will go on and off as heater passes through on and off cycles.) If a malfunction occurs, white indicator lamp will go out, red indicator lamp (heater A only) will light, and heater will stop operating. In case of a malfunction, refer to heater instruction manual.

g. If required, start the air conditioners as follows:

Note. If the air conditioners fail to function properly when the starting procedure is being performed, set ON-OFF switch SW1 (fig. 3-10) to OFF and refer to the air conditioner instruction manual.

(1) Verify that the refrigerant lines and interconnecting electrical cables are properly installed (para -8*e*).

(2) Remove the air intake grill (fig. 23) from the air conditioner condenser section.

(3) Remove the receiver valve cap (fig. 3-11) from the receiver valve located immediately behind the air-intake grill removed as instructed in (2) above.

(4) Turn the receiver valve stem counter-clockwise as far as it will go.

(5) Replace the receiver valve cap.

(6) Adjust FRESH AIR control switch SW3 (fig. 3-10) for desired mixture of outside air and return air.

(7) Set HEAT-VENT-COOL selector switch SW2 to VENT.

(8) Set ON-OFF switch SW1 to ON. Listen for the evaporator fan to start.

(9) For cooling, set HEAT-VENT-COOL

selector switch SW2 to COOL.. For heating, set HEAT-VENT-COOL selector switch SW2 to HEAT.

(10) Adjust COOLER control switch SW4 for the desired temperature.

Note. After air conditioner has operated 5 minutes, observe sight glass (fig. 3-11). Refrigerant should be yellowish-green (chartreuse) in color and free of air bubbles. If air bubbles are in the sight glass or the refrigerant is either yellow or green (or missing), set ON-OFF switch SW1 to OFF and refer to higher category maintenance.

h. Set controls on the following units as indicated:

Control	Position
Power supply (fig. 3-7):	
POWER switch	ON
Processor-viewer (fig. 3-5):	
ON-OFF switch	ON
Data receiver (R-1335/G) (fig. 3-1):	
POWER ON-OFF switch	ON
MODE SELECTOR switch.	FM
SELECTOR switch	OFF
SQUELCH control	OFF
VIDEO GAIN control	Midposition
AUDIO GAIN control	Extreme ccw position
FREQUENCY 1 MC STEPS and . 05 MC STEPS knobs.	Set to assigned frequency.
Data receiver (R-1335A/G) (fig. 3-1. 1):	
ON-OFF switch	ON
AM-FM switch	FM
METER SELECT SW switch	AGC
SQUELCH control	Operator preference
VIDEO GAIN control	Midposition
AUDIO GAIN control	Fully ccw
MEGACYCLES X10, MEGACYCLES X1 and MEGACYCLES switches.	Set to desired frequency.
QUIETING DB switch	Operator preference
FREQ MC control	Set to approximate assigned frequency.
Video decoder (fig. 3-3):	
SELECTOR switch	OFF
AIRCRAFT IDENTIFICATION switch.	ON
HEADING DEGREES control	
DRIFT ANGLE switch	AUTOMATIC
GROUND SPEED switch	AUTOMATIC
FILM DRIVE switch	OFF
Video decoder (fig. 3-3.1):	
RANGE switch	25 or 50
D/A converter (fig. 3-4):	
TEST switch	OFF
+ 28 VDC and 120 VAC circuit breakers	Press to ON position
Communications receiver-transmitter (fig. 3-2):	
POWER switch	LOW or HIGH
SQUELCH switch	OLD ON
LIGHT switch	ON
SPEAKER switch	ON
BAND switch	A or B (depending on assigned frequency).
MC-TUNE and KC-TUNE knobs	Set to assigned frequency.

3-14. Preparation for Operation

a. The processor-viewer must be prepared for operation just before the operating period. Follow instructions contained in TM 11-5841-237-10 for cassette removal, film loading and threading, processing solution preparation, and processing tank filling.

b. After completing the starting procedure (para 3-13), allow 10 minutes for processor- viewer heating elements to reach proper operating temperatures. The video decoder FILM DRIVE switch (fig. 3-3) remains in the OFF position to prevent film movement in processor- viewer during warmup period.

c. Remove the data card holder cover (fig. 1-14) and remove the data card holder (fig. 2-6) from the processor-viewer. Write mission information (mission number, aircraft identification number, etc.) on the data card and replace the data card holder and data card holder cover. Be sure that the data card holder cover is fastened securely.

d. Set the data receiver SELECTOR switch (fig. 3-1) to each of its voltage positions and verify that the pointer of the MONITOR meter is in the 0 $\pm$ 10 area of the dial for each position. If any reading is not within limits, refer the equipment to higher category maintenance.

*d.*1 Set the data receiver (R-1335A/G) METER SELECT SW switch (fig. 3-1.1) to the following positions and check to see that the

pointer of the monitor meter is indicating in the green area (RFO, SW OSC, HF OSC, MF OSC, LF OSC, 28 VDC, and 18 VDC). After verification, set the METER SELECT SW switch to AGC since the monitor meter is calibrated to indicate agc voltage proportional to signal strength. The transmitted frequencies are monitored in this position.

Note. RF MIX CUR, 1ST IE, and AUDIO positions for use by maintenance personnel only.

e. Set the video decoder SELECTOR switch (fig. 3-3) to each of its seven voltage positions and verify that the pointer of the MONITOR $\pm$ 10 MAXIMUM meter is in 0 $\pm$ 10 area of the dial for each position. If any reading is not within limits, refer the equipment to higher category maintenance.

f. With the METER SELECT SW switch (R-1335A/G) set to AGC and the SWITCH TUNING pushbutton switch pressed, slowly rock the FREQ MC control for a maximum indication on the monitor meter.

g. Use the communications receiver-transmitter to communicate with the operator in the aircraft and check to see that mapping data is being transmitted.

h. When the data receiver SIGNAL STRENGTH meter (R-1335/G) indicates in the green area, a signal is being received; when the RF CARR lamp (R-1335A/G) is lighted on the data receiver front panel, a signal is being received.

Note. If it is suspected that the transmitted frequency is out of tolerance, first set the MEGACY-CLES switch (R-1335A/G) above and below its setting for a maximum indication on the monitor meter. Then peak the monitor meter with the FREQ MC control.

i. Adjust the AUDIO GAIN control to con- firm mapping data audio signal reception; then rotate the AUDIO GAIN control to the extreme ccw position.

j. Observe the video decoder AIRCRAFT IDENTIFICATION indicator lamps and check to see that the number displayed is the same as that assigned to the surveillance aircraft and recorded on the data card (para 3-14c).

3-15. Operating Procedure

a. Set the video decoder SELECTOR switch to VIDEO. Adjust the data receiver VIDEO GAIN control for zero (null) indication on the video decoder MONITOR $\pm$ 10 MAXIMUM meter.

b. When the operator in the aircraft reports the start of the radar mapping run, set the video decoder FILM DRIVE switch to ON to start the processor-viewer film movement.

c. Set the processor-viewer VIEW switch to BRIGHT or DIM as required.

d. Perform the following procedure to provide aircraft heading information for the HDG (fig. 2-6) indicator in the processor- viewer data chamber:

(1) Communicate with the operator in the aircraft to obtain aircraft heading information.

(2) Adjust the video decoder HEADING DEGREES control to the setting that corresponds to the aircraft heading information received.

e. Press the processor-viewer MANUAL DATA EXPOSE switch to record the data chamber information on the film.

Note. To prevent superimposing data chamber image on the film, do not press the MANUAL DATA EX-POSE switch again until the entire data chamber printout on film is in view.

f. When the recorded map comes in view on the processor-viewer, check the ft and mt maps for complete sweeps (sweep trace is visible over its full length). If one or both map sweep traces are not completely in view, adjust ft or mt video bias adjustment R9 or R29 respectively (fig. 1-11) as required. These controls are screwdriver adjustments that are accessible by removing the protective cap on top of the video decoder (fig. 1-11). Clockwise rotation of either control will darken the respective sweep trace. As viewed from the front of the video decoder, R9 is the left control and R29 is the right control.

g. Examine the recorded mt map presentation for correct background (residue). Sufficient fixed target background information is required on the mt map to facilitate interpretation of the moving target information. If adjustment is required, communicate with the operator in the aircraft and instruct him to adjust the RESIDUE control on the AN/AKT- 18 power distribution panel.

Clockwise rotation of the RESIDUE control will darken the
fixed-target background on the mt map.

h. Check the groundspeed and drift angle indications on the map data chamber printout. If the indications do not agree with the flight plan, communicate with the operator in the aircraft and verify the data. If failure of automatic groundspeed or drift angle (or both) transmission is suspected, accurate recording of maps still can be obtained by manual control of these data. Refer to *i* below for manual control procedure of groundspeed data, and to *j* below for manual control procedure of drift angle data. *i.* Perform manual control of groundspeed data (map film speed) as follows:

(1) Set the video decoder GROUND SPEED switch to MANUAL.
(2) Determine the aircraft groundspeed by communicating with the surveillance aircraft operator.
(3) Adjust the video decoder GROUND SPEED KNOTS control to the groundspeed setting determined ((2) above).
(4) Repeat the procedure given in (2) and (3) above as required during mapping run.

j. Perform manual control of drift angle data as follows:

(1) Set the video decoder DRIFT ANGLE switch to MANUAL.
(2) Determine aircraft drift angle by communicating with the surveillance aircraft operator.
(3) Adjust the video decoder DRIFT ANGLE DEGREES control to the drift angle setting determined in (2) above.
(4) Repeat the procedure given in (2) and (3) above as required during the mapping run.

k. During normal operation of automatic groundspeed and drift angle transmission, the aircraft groundspeed and drift angle can be determined, in addition to the indication provided by the processor-viewer data chamber printout, by operation of the video decoder front panel controls and indicator. Refer to l and m below.

l. Determine the aircraft groundspeed as follows:

(1) Set the video decoder SELECTOR switch to GROUNDSPEED.
(2) Adjust the GROUNDSPEED KNOTS control until a zero (null) indication is obtained on the video decoder MONTIOR + 10 MAXIMUM meter.(3) Aircraft ground speed is determined by the setting (at null) of the GROUNDSPEED KNOTS control.

m. Determine the aircraft drift angle as follows:

(1) Set the video decoder SELECTOR switch to DRIFT ANGLE.
(2) Adjust the video decoder DRIFT ANGLE DEGREES control until a zero (null) indication is obtained on
the video decoder MONTIOR + 10 MAXIMUM meter.
(3) Aircraft drift angle is determined by the setting (at null) of the DRIFT ANGLE DEGREES control.

3-16. Recognition and Identification of Jamming

Under real or simulated tactical conditions, the data receiver of the data receiving set will likely by jammed by the enemy. Jamming is easily accomplished by transmission of a strong signal on the same frequency and thereby make it impossible for the data receiver to receive the signal being transmitted from the mapping aircraft. Unusual noises or strong interference resulting in distortion of the map being produced by the processor-viewer may be caused by enemy jamming, signals from a friendly station, noise from a local source (electric motors, auto ignition, etc.), or a defective data receiver. An experienced operator can, by listening to the loudspeaker connected to data receiver AUDIO connector 9A2J2, (or HDSGT AUDIO OUT connector 9J103 in the R-1335A/G) determine the validity of the signal. Enemy jamming signals may be typed as continuous wave (cw) or modulated signals. A jamming signal may be intended to block a single frequency. This is called spot jamming. The enemy may also use one or several transmitters to jam a block or band of frequencies. This method is called barrage jamming.

a. Continuous Wave Jamming . Cw jamming is transmitted as a steady carrier. This signal beats with another signal and produces a steady hum in the headset. Cw jamming signals may also be keyed by the use of a random on-and-off signal or actual code characters keyed to destroy the usefulness of the encoded converted video signal being transmitted.

b. Modulated 'Jamming. Modulated jamming signals consist of noise, laughter, singing, music, various tones, or most any unusual sound, or it may be a combination of these sounds. Various types of modulated jamming signals are explained below.

(1) *S*p*ark.* The spark is one of the simplest, most effective, and most easily produced jamming signals. This type of signal sounds very rough and raspy, and sometimes like an electric motor with sparking brushes. It is very broad. Therefore, it will interfere with a large number of communication frequencies.

(*2) Sweep through.* The sweep through signal is the result of sweeping or moving a carrier back and forth across the frequency to be jammed at a slow or rapid rate. The numerous signals of varying amplitude and frequency produce a sound like that of a low flying airplane passing overhead.

This type of jamming is effective over a broad range of frequencies. When varied rapidly, it is effective against all types of signals including voice.

(*3*) *Stepped tones or bagpipes.* This signal usually consists of several separate tones. The tones are transmitted in the order of first increasing and then decreasing pitch, repeated over and over. The audible effect is like the sound of a Scottish bagpipe.

(*4*) *Noise.* Noise is random both in amplitude and frequency. It is considered one of the more effective types of jamming modulation. It produces a sound similar to that heard when a receiver is not tuned to a station and the volume or gain control is turned to maximum to produce a rushing sound.

(*5*) *Gulls.* This signal consists of a quick rise and slow fall of a variable audio-frequency. The sound is similar to the cry of the sea gull.

(*6*) *Tone.* This signal consists of a single audio-frequency of unvarying tone. It produces a steady howl in the headset. Another use of tone is to vary it slowly and produce a howling sound of varying pitch.

3-17. Anti-jamming

When it is known that a receiver is being jammed, the operator will notify his superior officer immediately and continue to operate the equipment. To provide maximum intelligibility or usefulness of the jammed signals, change to new radio channels, as prearranged with the operator in the surveillance aircraft.

3-18. Stopping Procedure

The entire equipment may be shut down or placed in a standby condition, or individual major units may be de-energized, Stop the equipment or place it in a standby condition as follows:

a. Set video decoder FILM DRIVE switch (fig. 3-3) to OFF to place equipment in standby condition.

b. To stop equipment, proceed as follows:

(1) Set video decoder FILM DRIVE switch to OFF.

(2) Set processor-viewer ON-OFF switch to OFF.

(3) Set power supply POWER switch to OFF.

(4) Turn off heater or air conditioners, as applicable.

Note. When air conditioner is turned off in (4) above and shutdown is to be for a long period, pump down air conditioner condenser sections as described in paragraph 5-6*a* through *h*

(5) generator set 400 CYCLE CIRCUIT BREAKER to OFF

(6) Set generator set START-OFF START switch to OFF.

(7) Clean processor-viewer in accordance with instructions in TM 11-841-287-10. In hot weather, remove film from processor-viewer.

Section III OPERATIONS UNDER UNSUAL CONDITIONS

3-19. General

a. The data receiving set is designed as an all-weather equipment. However, certain ambient temperatures are needed for proper operation of the processor-viewer. These ambient temperatures are maintained by the heaters in the processor block of the processor-viewer. Temperatures within the shelter are controlled by use of the air conditioners, and thermostat-controlled heater.

b. Refer to the following technical manuals for additional information on operation under unusual conditions:

Manuel	Equipment
TM 11-6841-237-10	Recorder-Processor-Viewer, Radar Mapping RO 166/UP.
TM 5-5264	Generator Set, Gasoline Engine PU-107A/U.

Manuel	Equipment
Manual packed with equipment	Heater, Hunter, Model UH48 Type II.
Manual packed with equipment.	Air Conditioner, Therm-Air Model CE-6A-400

3-20. Operation at Low Temperatures

When the data receiving set is being operated in low temperatures (arctic climates), maintain heat within the shelter by continuing to operate the heater between missions. This will reduce the time needed to warm up the equipment.

a. Be sure the heater thermostat is kept at a setting that will maintain the temperature within the shelter at or above 41°F. (+5°C.).

b. Do not attempt to run film through the processor-viewer until the film has become pliable from the warmth of the ambient operating temperature of the shelter.

c. Maintain a constant check on the data and communications antennas. Heavy coatings of ice may form on the antennas and reduce receiving efficiency. The added weight of the ice may also damage the equipment.

d. External connectors may freeze together. Before attempting to use force to disconnect them, apply enough heat to melt any ice that may have formed.

3-21.Operation at High Temperatures

a. Do not allow the ambient temperature inside the shelter to rise above 131 °F. (55° C.).The data receiving set will lose efficiency at higher temperatures Adjust the air conditioner COOLER control switches (SW4) to maintain the shelter temperature between 70° and 80° F.

b. Heat and dust or sand are major problems in desert areas Frequent dusting and cleaning of the equipment is required to properly maintain desert-operated equipment. Keep a close check on the condition of the shelter and equipment filters

3-22. Operation Under Poor Signal Conditions

If higher-category maintenance determines that poor reception is not caused by equipment malfunction, the poor reception may be caused by improper site selection of trying to operate at an extended range (over 50 miles). Moving the data receiving set a few feet may improve signal reception. Care in site selection will minimize this problem.

CHAPTER 4
MAINTENANCE INSTRUCTIONS

Section I. GENERAL

4-1. Scope of Maintenance

This chapter contains instructions covering organizational maintenance of Receiving Set, Radar Data AN/TKQ-2. The maintenance functions covered are listed below together with a reference to the paragraph covering the specific maintenance function. Tools, materials, and test equipment required for maintenance are listed in paragraph 4-2.

a. Preventive maintenance (para 4-3).
b. Daily maintenance (para 4-4).
c. Weekly maintenance (para 4-6).
d. Monthly maintenance (para 4-8).
e. Quarterly maintenance (para 4-10).
f. Cleaning (para 4-12 through 4-14).
g. Lubrication (para 4-15).
h. Touchup painting (para 4-16).
i. Troubleshooting (para 4-17).

4-2. Tools, Materials and Test Equipment Required

a. Tools. All tools required are contained in Tool Kit TK-115/G.

b. Materials.
(1) Cleaning cloth.
(2) Wire brush.
(3) Cleaning compound (Federal stock No. 7930-395-9542).
(4) Lubricating oil, general purpose, preservative (PL-Special).
(5) Grease, aircraft and instrument (GL) (MIL-G3-8278).
(6) Fine sandpaper.
(7) Graphite (U.S. Army Specification 2-64A, Amend. 1).
(8) Insulating compound, electrical (MIL-I-8660).

c. Test Equipment.
(1) Multi-meter AN/USM-223. (See literature packed with equipment.)
(2) Test set, Receiving Set, Radar Data AN/GKM-2A.

4-3. Preventive Maintenance

a. Preventive maintenance is the systematic are, inspection, and servicing of equipment to maintain it in serviceable condition, prevent break downs, and assure maximum operational capability. Preventive maintenance is the responsibility of all maintenance categories concerned with the equipment and includes the inspection, testing, and repair or replacement of parts, subassemblies, or units that inspection and tests indicate would probably fail before the next scheduled service period. Preventive maintenance checks and services of the data receiving set at the organizational maintenance categories are made at daily, weekly, monthly, and quarterly intervals unless otherwise directed by the commanding officer. The preventive maintenance checks and services should be scheduled concurrently with the maintenance checks and services schedule of the carrying vehicle.

b. Maintenance forms and records to be used and maintained on this equipment are specified in TM 38-750.

4-4. Daily Maintenance

Perform the maintenance functions indicated in the daily preventive maintenance checks and services chart (para 4-5) one each day and under the special conditions listed below.

a. Before operating the equipment each time it is installed at a new site.

b. When an operating component of the equipment is reinstalled after removal for any reason.

c. At least once each week if the equipment is maintained in standby condition.

4-5. Daily Preventive Maintenance Checks and Services Chart

Note. In the *references* column, references to "Para 4-18" are to a troubleshooting chart which indicates the probable trouble if a correct result is not obtained during operational checks (sequence numbers 20 through 41). The troubleshooting chart also indicates the checks and corrective measures to be taken by organizational maintenance personnel.

Sequence No.	Item	Procedure	Reference
1	Completeness	See that equipment is complete	App B.
2	Installation	See that equipment is properly installed.	Para 2-6 through 2-13.
3	Cleanliness	See that equipment is clean	Para 4-12 and 4-13.
		GENERATOR SET	
		Note. The term *generator set* in this chart refers to the PU-107A/U. When the HF-10.0-MD is being used, refer to TM 5-6115-45015.	
4	Cable connections	Tighten cable connections on terminal board.	Para 2-13.
5	Starting	Start generator set and allow it to warm up before proceeding with next step.	Para 3-12.
6	Oil pressure gage	Verify reading of 15 to 21 psi	TM 5-5264.
7	Battery charger ammeter.	Verify reading of 1/2 to 5 amperes.	TM 5-5264.
8	Coolant temperature gage.	Verify reading of 170°	TM 5-5264.
9	Voltmeter	Verify reading from 120 to 126 Volts	TM 5-5264.
10	Frequency meter	Verify reading from 400 to 415 cps	TM 5-5264.
11	PHASE A AMPS PHASE B AMPS, and PHASE C AMPS ammeters.	Verify reading of 0 on each ammeter.	TM 5-5264.
12	400 CYCLE CIR CUIT BREAKER	Set to ON and make sure it will remain in ON position.	TM 5-5264.
		SHELTER EXTERIOR	
14	Rear ventilation port	Verify that rear ventilation port cover is secured in open position.	Fig. 1-4.
15	Front ventilation ports	Verify that ventilation ports are open and ventilation port covers are installed in storage positions.	Fig. 1-5
16	Cables and cable connections.	Check all exterior cables for damage. See that all cable connections are tight.	Para 4-24 and 4-25.
		SHELTER INTERIOR	
17	OVHD LT switch	Note. Check to insure that all circuit breakers are pushed in a. Set OVHD LT switch to ON and verify that desk lamp lights.	Para 4-18.

Sequence No.	Item	Procedure	Reference
		b. Set OVHD LT switch to BLACKOUT. Close shelter door and verify that desk lamp lights.	
		c. Open shelter door and verify that desk lamp goes out.	
18	Inter-cabling and connectors.	Check all interconnecting cables (fig. 2-7) and connectors for cracks and breaks. Repair or replace cables that are cracked or have broken connectors. Make sure all connections are tight.	Para 2-14.
19	Knobs, dials, switches, meters and indicators. that mechanical action of each	During operational checks (items 20 through 41), verify knob, dial, and switch is smooth and free of external or internal binding. Check meter faces for damage. Make sure pointers are not bent or stuck.	Refer to higher category maintenance.
		POWER SUPPLY	
20	120 VAC 400 CPS indicator lamp and +28 V indicator lamp.	With POWER switch set to ON lamps should light.	Para 4-18.
21	Internal blower	Set POWER switch to OFF After a short wait, set POWER switch to ON and listen for internal blower to start.	Para 4-18.
22	Fuses	Check for burned-out fuses *Note.* Be sure system has been in operation for at least 3 minutes before making following checks	Para 4-28.
23	Output voltages	Set video decoder SELECTOR switch to each of its seven voltage positions. Verify that video decoder MONTIOR $\pm$10 MAXIMUM meter pointer reads 0 $\pm$10 for each switch position, then set SELECTOR switch to OFF.	Para 4-18.
		DATA RECEIVER (R-1335/G)	
24	Input power	a. Set ON-OFF switch to ON and verify that POWER indicator lights.	*a.* Para 4-18.
		b. Set SELECTOR switch to 120 VAC and verify that MONTIOR meter pointer reads 0 $\pm$10.	b. Para 4-18.

Sequence No.	Item	Procedure	Reference
25	Internal power supply voltages.	Set SELECTOR switch to +24V -24V, +150V, and +100V and verify that MONTIOR meter pointer reads 0 ± 10 for each switch setting, then set SELECTOR switch to OFF.	Pars 4-18.
26	FREQUENCY Controls.	a. Connect AN/GKM-2A test set as follows: (1) Connect test set cable W1 between test set POWER INPUT connector J1 and shelter 115-vac outlet. (2) Disconnect plug 5W9P1 from data receiver ANTENNA connector 9A1J2. (3) GROUND SPEED KNOTS switch to 150. (4) VIDEO switch to OFF. MODULATION switch to ON.	Pars 4-18.
27	AUDIO GAIN control.	Turn data receiver AUDIO GAIN control clockwise, then counterclockwise, and verify that 1,000-cps audio output varies.	Para 4-18.
	DATA RECEIVER R-1335A/G		
27.1	Input power	Set ON-OFF switch to ON and check to see that PWR ON indicator lights.	Para 4-18.
27.2	Integral power supply voltages.	Set METER SELECT SW switch to 18 VDC and 28 VDC and check to see that receiver monitor meter pointer indicates in green area for each switch setting.	Para 4-18.
27.3	FREQUENCY controls.	a. Connect AN/GKM-2A test set as follows: (1) Connect test set cable W1 between test set POWER INPUT connector J1 and shelter 115-volt ac outlet. (2) Disconnect plug 5WP1 from data receiver connector 9W3J1. (3) Connect test set cable W5 between test set RF OUTPUT 240 MC connector J8 and data receiver connector 9W3J1.	Pars 4-18.

Sequence No.	Item	Procedure	Reference
		b. Set test set controls as follows: (1) POWER .witch to ON. (2) DRIFT ANGLE DEGREES switch to 0. (3) GROUND SPEED KNOTS switch to 150. (4) VIDEO witch to OFF. (5) MODULATION switch to ON. (3) Connect test set cable W5 butw6.cn tent get RF OUPT 240 MC connector J8 and data receiver ANTENNA connector 9A1J2. b. Set test set controls as follows: (1) POWER switch to ON. (2) DRIFT ANGLE DEGREES switch to 0	Para 4-18.
27.4 ----------	AUDIO GAIN ----------	Rotate data receiver AUDIO GAIN control clockwise, to verify that 1-kc audio output varies; rotate AUDIO GAIN control to extreme counter-clockwise position.	Para 4-18.

D/A CONVERTER, VIDEO DECODER, TARGET
INDICATOR, AND PROCESSOR-VIEWER

Note. When power is turned on in video decoder, target Indicator, or process-viewer, check to see that Internal blowers are operating.

28	D/a converter ppd segment ment voltage output.	a. Connect AN/GKM-2A test set as follows: (1) Connect P1 of test set cable W3 to test set VIDEO OUPT connector J2. (2) Connect P2 of test set cable W3 to Adapter, Connector. UG-914/U (part of test set). (3) Disconnect P2 of data receiving set cable 5W6 from data receiver VIDEO connector 9A2J3 and connect it to other end of adapter. (4) Connect P2 of test set cable W2 to test set DATA TEST connector J6. (5) Disconnect data receiving set cable 5W23 from d/a converter connector 11J4. (6) Connect P1 of test set cable W2 to d/a converter connector 11J4.	a. TM 11-862-827-12.
		b. Set test set VIDEO switch to 111S. Depress test set DATA ANNOTATION TEST switch and verify that S111 appears in test set DATA TEST window.	b. Para 4-18.
		c. Set test set VIDEO switch to 222N. Depress test set DATA ANNOTATION TEST switch and verify that N 222 appears in test set DATA TEST window.	c. Para 4-18.

Sequence No.	Item	Procedure	Reference
		d. Set test set VIDEO switch to 555W. Depress test set DATA ANNOTATION TEST switch and verify that W555 appears in test DATA TEST window.	d. Para 4-18.
		e. Set test set VIDEO switch to 888N. Depress test set DATA ANNOTATION TEST switch and verify that N 888 appears in test set DATA TEST window. Disconnect P1 of test set cable W2 from d/a converter connector 11J4 and reconnect P1 of data receiving set cable 6W23 to connector 11J4.	
29----------	Video decoder aircraft identification.	a. Change AN/GKM-2A test set connections as follows: (1) Disconnect P2 of data receiving set cable 5W22 from video decoder connector 3J4. (2) Disconnect P1 of data receiving set cable 5W6 from d/a converter VIDEO IN connector J2 and connect it to video decoder connector 3J4.	a. TM 11-6625-827-12.
		b. Set test set ACFT IDENT switch 1 to ON. Set video decoder AIRCRAFT IDENTIFICATION switch to ON. Verify that video decoder AIRCRAFT IDENTIFICATION indicator lamp 1 flickers.	b. Para 4-18.
		c. Set test set ACFT IDENT switch 2 to ON. Verify that video decoder AIRCRAFT IDENTIFICATION indicator lamps 1 and 2 flicker.	c. Para 4-18.
		d. Set test set ACFT IDENT switch 4 to ON. Verify that video decoder AIRCRAFT IDENTIFICATION indicator lamps 1, 2, and 4 flicker.	d Para 4-18.
		e. Set test set ACFT IDENT switch 8 to ON. Verify that video decoder AIRCRAFT IDENTIFICATION indicator lamps 1, 2, 4, and 8 flicker.	e. Para 4-18.
		f. Hold video decoder AIRCRAFT IDENTIFICATION switch in TEST position. Verify that video decoder AIRCRAFT IDENTIFICATION indicator lamps 1, 2, 4, and 8 stay lighted as long as switch is held in TEST position	f. Para 4-18.

Sequence No.	Item	Procedure	Reference
30----------	Video decoder drift angle circuitry.	a. Set video decoder DRIFT ANGLE switch to AUTOMATIC. Set test set DRIFT ANGLE DEGREES switch to -10. Set video decoder SELECTOR switch to DRIFT ANGLE. Set video decoder DRIFT ANGLE DEGREES control to -10. After video decoder MONITOR +10 MAXIMUM meter has stabilized, verify that meter pointer reads 0 ± 10.	a. Para 4-18
		b. Set test set DRIFT ANGLE DEGREES switch and video decoder DRIFT ANGLE DEGREES control to +10. Verify that video decoder MONTIOR +10 MAXIMUM meter pointer reads 0 + 10 after meter has stabilized.	b. Para 4-18.
31----------	Video decoder ground speed circuitry.	a. Set video decoder GROUND SPEED switch to AUTOMATIC. Set video decoder SELECTOR switch to GROUND SPEED. Make sure test set GROUND SPEED KNOTS switch is set to 150. Set video decoder GROUND SPEED KNOTS control to 150. After video decoder MONTIOR ± 10 MAXIMUM meter ha stabilized, verify that meter pointer reads 0 ± 10.	a. Para 4-18.
		b. Set test set GROUND SPEED KNOTS witch to 800. Set video decoder GROUND SPEED KNOTS switch to 800. Verify video decoder MONTIOR ±10 MAXIMUM meter pointer reads 0±10 after meter has stabilized.	b. Para 4-18
32----------	Processor-viewer film drive and processing Systems.	Prepare processor-viewer in accordance with TM-11-5841-237-10. Set video decoder FILM DRIVE switch to ON. Set processor-viewer ON-OFF witch to ON. Listen for internal blower to start. Allow 10 minutes warm-up then verify following:	
		a. Film starts to move.	a. Par 4-18
		b. Processor pumps start.	b. Para 4-18 .
		c. After about 5 minutes, developer appear on processor roller.	c. Par 4-18.
		d. Developer block heaters Case near processor block assembly becomes warm.	d Para 4-18.

Sequence No.	Item	Procedure	Reference
33	Processor viewer VIEW switch.	Set to DIM or BRIGHT as desired. Verify that entire area of film under observation window is uniformly illuminated.	Para 4-18.
34	Processor-viewer FAST FILM ADV switch.	Press in toward observation window and release quickly. Verify that film quickly advances several inches	Para 4-18.
35	Target indicator crt circuitry.	Set test set VIDEO switch to BARS. Verify that bare appear on film after 2 minutes	Para 4-18.
36	Target indicator crt sweep length.	Attach test set accessory mask to processor-viewer. Position mask over center of fixed target (left) test pattern with vertical lines on mask superimposed on vertical lines on film. Verify that 5 bars and 5 spaces appear between 40 (km) marks on mask.	Para 4-18.
37	Processor-viewer film-speed and data chamber instruments, and video decoder drift-angle circuitry.	a. Set test set GROUND SPEED KNOTS switch to 150. Set video decoder HEADING DEGREES control to 0. Depress processor viewer MANUAL DATA EXPOSE switch, wait exactly 10 minutes, then depress switch again. (1) Reading of HDG indicator image is 0° ±5. (2) Reading of GRD SPEED indicator image is 150 knots ±10. (3) Distance between mark above first HDG indicator image and mark above second HDG indicator image is same as distance between FILM SPEED marks on accessory mask	a. Para 4-18.
		b. Set test set GROUND SPEED KNOTS switch to 300. Set video decoder HEADING DEGREES control to 90. Depress processor-viewer MANUAL DATA EXPOSE switch, wait exactly 5 minutes, then depress switch again. (1) Reading of HDG indicator image is 90°' ±5. (2) Reading of GRD SPEED indicator image is 300 knots ±10. (3) Distance between mark above first HDG indicator image and mark above second HDG indicator image is same as	b. Pars 4-18.

		28-VOLT DC POWER SUPPLY	
37.1	Output voltage	Set video decoder SELECTOR switch to + 28 V. Verify that video decoder MONTIOR ± 10 MAXIMUM meter pointer reads 0±10.	Para 4-18.
		COMMUNICATIONS RECEIVER-TRANSMITTER	
38	Input power	Set POWER switch to HIGH or LOW. Set LIGHT switch to ON. Verify that channel dial light glows.	Para 4-18.
39	Operation	Perform operating procedure in TM 11-820401-10. Verify satisfactory reception and transmission of voice communications	Para 4-18.

Sequence No.	Item	Procedure	Reference
		AIR CONDITIONERS	
40	Operation	Perform starting procedure (para 3-13*g*. After air conditioners have operated 5 minutes, verify that sight glass is free of bubbles and refriger ant is neither yellow, green, nor missing.	Refer to higher maintenance category.
		HEATER	
41	Operation	Perform starting procedure (para 3-13*f*. Verify that white indicator lamp lights as described in starting procedure.	Refer to higher maintenance category.

4-6. Weekly Maintenance

Perform the maintenance functions indicated in the weekly preventive maintenance checks and services chart (para 4-7) once each week. The weekly preventive maintenance functions are in addition to those included in the daily preventive maintenance checks and services chart (para 4-5).

4-7. Weekly Preventive Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	Reference
1	Shelter ventilation port filter.	Remove and clean	Para 4-13a, b, c,
2	Component filters	Remove and clean	Para 4-13d.
3	Air conditioners	Clean	Para 4-13e.
4	Component mount ings.	Check all component mount- ings. Tighten loose nuts or bolts. Replace missing hard- ware when required.	None.
5	Processor-viewer	Check for rust, corrosion, dirt, dust, and dried chemical residue. Check rollers for nicks, scratches, and burns. Check lamps in data chamber.	TM 11-5841-237-10

Sequence No.	Item	Procedure	Reference
6	Generator set	Check general condition	TM 5-5264 (PU-107A/U). TM 5-6115 450-15 (HF-10.0-MD).
7	Communications antenna.	Unscrew antenna elements and swab joint threads with insulating compound, electrical. (MIL-I-8660).	None.

4-8. Monthly Maintenance

Perform the maintenance functions indicated in the monthly preventive maintenance checks and services chart (para 4-9) once each month. A month is defined as approximately 30 calendar days of 8-hour-per-day operation. If the equipment is operated 16 hours a day, the monthly preventive maintenance checks and services should be performed at 15-day intervals. Adjustment of the maintenance interval must be to compensate for any unusual operating conditions. The requirement for monthly preventive maintenance checks and services is not limited to equipment in everyday use. These preventive maintenance checks and services must also be performed on equipment maintained in a standby (ready for immediate operation) condition. Equipment in limited storage, which requires servicing before operation, does not require monthly maintenance.

4-9. Monthly Preventive Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	Reference
1	Generator set battery compartment.	Check for evidence of water leakage, condensation, and corrosion.	TM 5-5264 (PU-107A/) TM 5-6115-450-15 (HF-10.0-MD).
2	Generator set batteries	Test batteries	TM 5-5264 (PU-107A/U). TM 5-6115-450-15 (HF-10.0-MD).
3	Lubrication	Lubricate shelter and other equipment.	Para 4-15.

4-10. Quarterly Maintenance

Quarterly preventive maintenance checks and services on the data receiving set are required. Weekly and monthly preventive maintenance checks and services constitute a part of the quarterly preventive maintenance checks and services (para 4-11) and must be performed concurrently. All deficiencies or shortcomings will be recorded in accordance with the requirements of TM 38-750.

4-11. Quarterly Preventive Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	Reference
1	Preservation	Check all surfaces for rust and corrosion. Remove rust and corrosion and spotpaint bearspots.	Para 4-16.
2	Publications	See that all publications are complete, serviceable, and current.	DA Pam 310-4.
	Modifications	Check DA Pam 310-7 to determine if new applicable MWO's have been published. All URGENT MWO's must be applied immediately ALL NORMAL MWO's must be scheduled.	TM 38-750 and DA Pam 310-7

4-12. Cleaning Exterior Surfaces

Inspect the exterior and interior of the shelter, and the exterior surfaces of components. All surfaces should be clean and free of dust, dirt. grease, and fungus.

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

***Caution*: Do not press on indicator or meter faces when cleaning; the instruments may be damaged.**

a. Shelter Interior. Remove dust and loose dirt from the shelter interior and exterior surfaces of all components installed in the shelter with a clean, soft cloth. Use a brush to remove dust and dirt from plugs and jacks. A cloth dampened (riot wet) with cleaning compound may be used to remove grease, fungus, and ground-in dirt from the component cases.

b. Shelter Exterior. Wash the exterior of the shelter with water from a low-pressure hose or a bucket. Be sure the shelter door and ventilation ports are closed before washing the shelter exterior.

c. Trailer. Clean the trailer in accordance with instructions.

d. Generator Set. Clean the generator set in accordance with instructions contained in TM 5-5264.

4-13. Cleaning Filters

a. Removing Shelter Ventilation Port Filter. Before removing the shelter ventilation port filter, scribe a mark on the upper right side of the filter as a guide for positioning the filter when replacing it. To remove the filter, rotate the filter retaining bar (fig. 1-6), located at top of filter slot, out of the way; then lift the filter up and out.

b. Cleaning Shelter Ventilation Port Filter. Tap the filter lightly against a solid object to remove loose dirt, then wash it thoroughly with soap and water. Before replacing the filter in the shelter (c below), apply a light coating of lubricating oil (PL-Special) over the fil- ter surfaces and allow excess oil to drain off.

c. Installing Shelter Ventilation Port Filter. Install the shelter ventilation port filter in its original position (scribe mark at upper right side). Rotate the filter retaining bar to the down position to secure filter in place.

d. Cleaning Component Filters. The target indicator, video decoder, and power supply are equipped with one filter each. In each case, the filter is located in the component base. To remove a filter for cleaning, remove the bottom cover of the component and loosen the Phillip's screws that secure the filter in place. To clean a filter, wash it with soap and water. Always allow a filter to dry before replacing it in the component.

e. Cleaning Air Conditioners. Clean the air condition coils, filter, and fans as described in the manual packed with the equipment.

4-14. Cleaning Processor-Viewer Rollers

Clean the processor-viewer rollers as described in TM 11-5841-237-10. Two containers for storing nitric acid solutions used for cleaning the processor roller are stored in the processor case (fig. 1-30) mounted on the out- side rear wall of the shelter. One container is for storage of 70-percent nitric acid solution. The other container is for preparation and storage of 10-percent nitric acid solution, and also for cleaning the processor roller in the 10-percent nitric acid solution. To prepare the 10-percent nitric acid solution in this container, fill the container with distilled water to LEVEL 1 (indicated on container) and then fill with 70-percent nitric acid solution to LEVEL 2.

***Caution*: Do not soak the processor roller in the 10-percent nitric acid solution for more than 4 hours; damage to the porous material will result. The processor roller is fragile, and must be handled carefully.**

4-15. Lubrication

a. Lubrication of Shelter. Under ordinary conditions of temperature and humidity, use the lubricating oil (PL-Special) and graphite (para 4-2*b*) to lubricate the items listed below monthly. In excessively hot, humid, or dirty environments, more frequent lubrication may be required.

(1) Door latches.
(2) Padlock (use graphite only).
(3) Door hinges.
(4) Ventilation port cover hinge.
(5) Sliding surfaces that show signs of wear.
(6) heater louver pivots and linkage.
(7) Mounting clamp screws threads and pivots.
(8) Antenna mast.

b. *Lubrication of Other Equipment.* Lubricate the generator set, trailer, and air conditioners in accordance with instructions contained in the applicable technical manual.

4-16. Touchup Painting Instructions

Remove rust and corrosion from metal surfaces by sanding them lightly with fine sandpaper. Brush two thin coats of paint on the bare metal to protect it from further corrosion. Refer to applicable cleaning and refinishing practices and materials specified in TM 9-213 and TB SIG 364.

Section II. TROUBLESHOOTING

4-17. General

Troubleshooting of the data receiving set is based on the operational check contained in the daily preventive maintenance checks and services chart (para 4-5). To troubleshoot the equipment, start with item 5 of paragraph 4- and perform each step in the order given. When abnormal condition or result is observed, check the *references* column to locate corrective measures. If paragraph 4-18 is listed in the *references* column, locate the appropriate trouble symptom in the troubleshooting chart and perform the corrective measures indicated. If corrective measures given in the

troubleshooting chart do not eliminate the trouble, Replace the component indicated with a component known to be functioning properly. Refer the component removed to a higher maintenance category. Paragraphs 4-19 through 4-25 contain supplementary trouble-shooting information. Refer to paragraph 4-26 for removal and replacement instructions.

4-18. Troubleshooting Chart

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	a. Shelter lamps do	a. Loose cable connection at 115-vac, 400-cps input connector 5J2, OUT/LT/ breaker on junction box tripped, or loose connection in junction box.	a. Check circuit breaker and not light. cable connection. If circuit breaker is not tripped and HTR circuit cable connection is tight but lamps still do not light, refer to higher maintenance category.
		b. Interlock blackout switch (fig. 1-6) defective.	b. Refer to higher maintenance Category
2	a. Power supply 120 VAC 400 CPS indicator lamp does not light.	a. Loose cable connection at 5J2 or 120 VAC PWR SUP circuit breaker on junction box tripped.	a. Check circuit breaker and cable connection. If circuit breaker is not tripped and cable connection is tight, replace lamp (para 4-23).
	b. Power supply +28 V indicator lamp does not light	b. 120 VAC for 28V PWR SUP or +28 V PWR SUP circuit breaker on junction box tripped.	b. Same as *a* above
		c. Defective 28-volt dc power supply	c. Replace 28-volt dc power supply. (para 4-33.1).
3	Power supply internal blower does not Start.	Blower motor or associated circuitry defective.	Replace power supply (para 4-30).
	Video decoder MONITOR±10 MAXIMUM meter is not in 0±10 area of dial for one or more switch position	a. Power supply defective.	a. Replace power supply (para 4-30).
		b. Power supply fuse blown.	b. Replace fuses (para 4-23).
5	a. Date receiver POWER indicator lamp does not light.	a. 120 VAC DATA RCVR circuit breaker on junction box tripped or indicator lamp burned out.	a. Check circuit breaker. Replace lamp if required (para 4-23).
	b. Date receiver MONITOR meter pointer is not in 0 ± 10 area of dial.	b. Loose connection in interconnection box or faulty power source.	b. If no indication is obtained on MONTIOR meter, check for loose connection on interconnection box terminal board. If meter reading is out of tolerance, check generator set output (TM 5-6264).
6.	Data receiver MONITOR meter pointer is not in 0 ± 10 area of dial for one or more switch settings.	Data receiver integral power supply defective	Replace data receiver (para 4-32).

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
7	Data receiver cannot be tuned to proper	FREQUENCY controls defective	Replace data receiver (para 4-32).
8	Data receiver audio output does not vary when AUDIO GAIN control is adjusted.	AUDIO GAIN control defective.	Replace data receiver (para 4-32).

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
8.1	Data receiver (R-1335A/G) PWR ON indicator lamp does not Light.	120 VAC DATA RCVR circuit breaker on junction box tripped indicator lamp burned out, or AC LINE fuse F102 blown	Check circuit breaker. Replace lamp If required (para 4-23). Replace fuse if required (para 4-23).
8.2	Data receiver (R-1335A/G) monitor meter does not indicate properly for one or more positions of METER SELECT SW switch.	28 VDC fuses f101 blown, power supply defective, or modules defective.	Replace fuse if required. Replace data receiver (para 4-32.1).
8.3	Data receiver (R-1335A/G) cannot be turned to proper frequency.	Frequency controls defective.	Replace data receiver (para 4-32.1).
8.4	Data receiver (R-1335A/G) audio output does not vary when AUDIO GAIN control is adjusted.	AUDIO GAIN control defective	Replace data receiver (para 4-32.1).

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
9	a. S 111 does not appear in test set DATA TEST window.	a. D/a converter defective.	a. Replace d/a converter (para 4-33).
	b. N 222 does not appear in test set DATA TEST window.	b. Same as a above.	b. Same as a above.
	c. W 555 does not appear in test set DATA TEST window.	c. Same as a above.	c. Same as *a* above.
	d. N 888 does not appear in test set DATA TEST window.	d. Same as a above.	d. Same as a above.
10	a. Video decoder AIR-CRAFT IDENTIFICA-TION indicator lamp 1 does not flicker.	a. Burned-out indicator lamp or faulty circuitry.	a. Check indicator lamp. If lamp is defective, replace (para 4-23). If lamp is not defective, re-place video decoder (para 4-29).
	b. Video decoder AIR-CRAFT IDENTIFICA-TION indicator lamps 1 and 2 do not flicker.	b. Same as a above	b. Same as a above.
	c. Video decoder AIR CRAFT IDENTI-FICATION indicator lamps 1, 2, and 4 do not flicker.	c. Same as a above.	c. Same as a above.
	d. Video decoder AIR-CRAFT IDENTI-FICATION indicator lamps 1, 2, 4, and 8 do not flicker.	d. Same as a above.	d. Same as a above.
	e. Video decoder AIR CRAFT IDENTI-FICATION indicator lamps 1, 2, 4, and 8 do not light and stay lighted.	e. Video decoder aircraft identi-fication circuitry defective.	e. Replace video decoder (para 4-29).
11	Video decoder MONTIOR ± 10 MAXIMUM meter pointer is not in 0 ± 10 area of dial during drift-angle tests.	Video decoder drift-angle circuitry defective.	Replace video decoder (para 4-29).
12	Video decoder MONTIOR ± 10 MAXIMUM meter pointer is not in 0 ± 01 area of dial during groundspeed tests.	Video decoder groundspeed cir-cuitry defective.	Replace video decoder (para 4-29).
13	a. Film does not move.	a. Processor-viewer not securely mounted on target indicator or faulty component.	a. Check for proper mounting of processor-viewer. Verify that connectors 2J5-2J6 and 4P1-4P2 are correctly mated. If processor-viewer is properly mounted and film still does. not move, disconnect plug 5W4P1 and check for +250

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
			vdc at connector 3J2-26. If correct voltage is present, replace processor-viewer. If correct voltage is not present, replace video decoder.
	b. Processor pumps do not start.	b. Defective motor or wiring.	b. Replace processor-viewer (para 4-27).
	c. Developer does not appear on processor roller.	c. Developer in short supply.	c. Refill developer supply tank with fresh developer.
	d. There is no evidence of developer block heaters starting.	d. Developer block heater circuitry defective.	d. Replace processor-viewer (para 4-27).
14	Film under observation window is not uniformly illuminated.	Lamps in film illumination assembly burned out.	Replace lamps (TM 11-5841-237-20).
15	Film does not advance when FAST FILM ADV switch is pressed.	Faulty switch.	Replace processor-viewer (para 4-27).
16	Bars do not appear on fixed target or moving target film.	Crt tubes or associated circuitry defective	Replace target indicator (para 4-28).
17	Five bars and five spaces do not appear between 40 (km) marks on accessory mask.	Target indicator crt sweep length out of adjustment.	Replace target indicator (para 4-28).
18	a. Symptoms are as follows:	a. The following may be defective	a. Proceed as follows:
	(1) Reading of HDG indicator image is not specified Tolerance	(1) HDG indicator or video decoder.	(1) Replace defective processor-viewer (para 4-27) or video decoder (para 4-29).
	(2) Reading of GRD SPEED indicator image is not within specified tolerance	(2) GRD SPEED indicator or video decoder defective.	(2) Same as (1) above.
	(3) Distance between marks above HDG indicator images is not same as distance between accessory mask FILM SPEED marks.	(3) Processor-viewer film-drive system or video decoder defective	(3) Same as (1) above.
	b. Reading of DRIFT indicator image is not within specified tolerance	b. DRIFT indicator defective.	b. Replace processor-viewer (para 4-27).
	c. Black line on film does not conform to drift-angle marks on accessory mask.	c. Video decoder drift-angle circuitry defective.	c. Replace video decoder (para 4-29).
19	Dial light does not glow---------	Lack of input power.	Check connections between communications receiver-transmitter, Mounting MT-1029/VRC, and interconnection box (para 2-14).

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
20----------	Satisfactory reception and transmission of voice communications cannot be achieved.	Communications receiver-transmitter defective.	Replace communications receiver-transmitter (para 4-34).

4-19. Visual Inspection

Trouble in the data receiving set may be caused by abnormal conditions that are easy to see. Before using more involved procedures to locate trouble, inspect the equipment. Possible causes of trouble that may be located by visual inspection are listed below.

a. Improper control settings.
b. Incorrect or loose cable connections (fig. 2-7).
c. Worn or broken cables or connectors.
d. Burned-out fuses.
e. Poor ground connection.
f. Low line voltages.
g. Indications of overheating of a cable or component.

Note. Refer to the applicable publication listed in appendix A for instructions on visually inspecting the generator set, processor-viewer, communications receiver-transmitter, heater, and air conditioners.

4-20. Sectionalization of Trouble

a. If major components or the entire system is dead, the malfunction may be found in the power supply, power cables, or power supply regulator interlocks. Loose or broken pins in cable connectors are the most common cause of power source failure. This type of failure can usually be isolated by carefully inspecting the cable connector.

b. Loss of the - 300-volt dc supply will cause the +150- and +300-volt dc outputs to become lower. Under this condition, the video decoder MONTIOR ±10 MAXIMUM meter will show low indication for these voltages. If this situation occurs and the trouble cannot be found in the power cables or fuses, replace the power supply.

c. If a fuse consistently fails, or the video decoder MONTIOR +10 MAXIMUM meter indicates higher than normal or fluctuating voltages, more severe trouble is developing. If this situation occurs, shut down the equipment and refer to higher maintenance category.

Caution: **Never replace a fuse with a fuse having a higher current rating. A slow-blow fuse of the proper rating may be used as an aid in sectionalizing a malfunction but should be replaced with the proper fuse at the completion of tests.**

4-21. Continuity Checks

A procedure for checking the continuity of external cables and/or wiring of the data receiving set is outlined below. Disconnect the cable or wire before starting the continuity check.

a. Multiconductor Cables. This procedure is for multiconductor cables with a male connector on one end and a female connector on the other end. It may be used however, for cables that have any combination of connectors.

(1) Connect ohmmeter common probe to connector shell. Set ohmmeter for highest resistance scale and use ohms probe to check each connector pin. Any ohmmeter reading below 1 megohm indicates a leakage path between connector shell and pin and is defective.

(2) Connect the ohmmeter common probe to a connector pin. With the ohmmeter set for the highest resistance scale, use the ohms probe to check each remaining connector pin. Continuity should not be indicated in any of the checks. Connect the ohms probe to another pin and repeat the procedure. Continue this procedure until all connector pins have been checked.

(3) Connect the ohmmeter common probe to a pin of one connector. With the ohmmeter set for the highest resistance scale, connect the ohms probe to the matching contact of the other connector and check for continuity. Repeat the procedure for the remaining connector pins and contacts.

b. Coaxial Cables.

(1) Connect the ohmmeter probe to the shell of the connector body. With the ohmmeter set for the highest resistance scale, connect the ohms probe to the center conductor (pin) of the connector'. 'The ohmmeter should not indicate continuity.

(2) Connect the ohmmeter common probe to the center conductor pin of the connector. With the ohmmeter set for the lowest scale, connect the ohms probe to the center conductor (pin) of the (connector at the other end of the cable. The ohmmeter should indicate continuity.

(3) Connect the ohmmeter common probe to the body of the connector on one end of the cable. With the ohmmeter set for the lowest resistance scale, connect the ohms probe to the body of the connector at the other end of the cable. The ohmmeter should indicate continuity.

c. Harnessed Wires.

(1) Locate the ends of the wire to be checked.

(2) Connect the ohmmeter common probe to the ground. With the ohmmeter set for the highest resistance scale, connect the ohms probe to one end if the w. The ohmmeter should not indicate continuity.

(3) Connect the ohmmeter common probe to one end of wire. With the ohmmeter set for the lowest resistance scale, connect the ohms probe to the other end of the wire. The ohmmeter should indicate. continuity.

4-22. Repairs

Repairs that can be made by organizational maintenance personnel are limited to the replacement of defective lamps and fuses, and cable and wiring repairs. Instructions for performing these functions are given in paragraphs 4-23, 4-24, and 4-25.

4-23. Replacement of Defective lamps and Fuses

a. *Removal and Replacement of Lamps (Except Data Receiver R-1335/G).*

(1) Remove translucent plastic cover from lamp.
(2) Unscrew light cap.
(3) Remove lamp from light cap and insert new lamp.
(4) Screw light cap back on.
(5) Replace translucent plastic cover.

b. Removal and Replacement of Fuses.

Note. On data receiver (R-1335A/G) remove metal dust covers to reach the fuse holders.

(1) Turn fuse holder counterclockwise and pull it out.
(2) Remove fuse from fuse holder.
(3) Insert new fuse in fuse holder.
(4) Replace fuse holder and lock it in position by turning it clockwise.

c. Removal and Replacement of R-1335/G Data Receiver Illumination Lamps (fig. 4-1).

Two lamps, 9A1DS1 and DS2, mounted to the underside of a mounting bracket, illuminate the MEGACYCLES dial on the front panel of the upper drawer of the data receiver. To remove and replace DS1 and/or DS2, proceed as follows:

(1) Set ON-OFF switch to OFF.
(2) Disconnect coaxial connector between upper and lower drawers at IF OUTPUT jack 9A1J1 and IF OUTPUT jack 9A2J5.
(3) Loosen four panel screws and pull upper drawer partially out of cabinet.
(4) Remove two screws, lockwashers, and flat washers securing bracket.
(5) Slide bracket to left to clear gear train front plate.
(6) Turn bracket over and remove defective lamp by pushing in on lamp and turning counterclockwise.
(7) Replace defective lamp by pushing in on lamp and turning clockwise.
(8) Slide bracket back in place and secure with two screws, lockwashers, and flat washers.
(9) Slide upper drawer back into cabinet and tighten four panel screws.
(10) Connect coaxial connector between upper and lower drawers at IF OUTPUT jack 9A1J1 and IF INPUT jack 9A2J5.

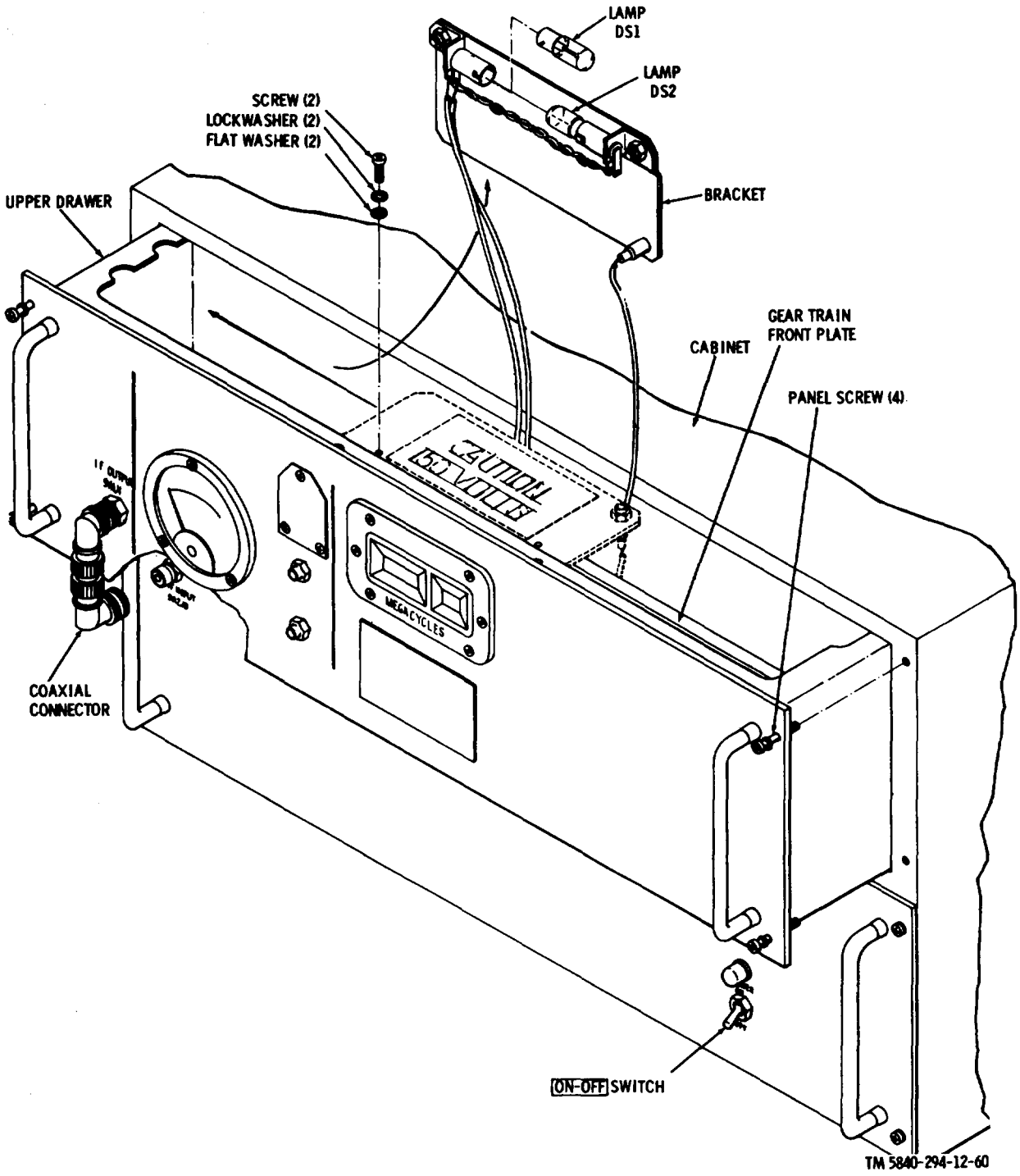


Figure 4-1. Removal and replacement of data receiver illumination lamps.

4-24. Multiconductor Cable Repair

If the cable insulation is worn or damaged, wrap impaired area with plastic electrical tape.

If a continuity check (para 4-21) indicates the cable is defective but the defect cannot be located, obtain a piece of cable of the same

length and type as the defective cable and change connectors as indicated below.

a. Disassemble cable connectors as follows:
   (1) Loosen cable clamp screws.
   (2) Unscrew cable clamp and slide back along cable
   (3) Unscrew retaining nut and slide back along cable
   (4) Using a screwdriver, remove the follower from around grommet and slide it back along cable.
   (5) Pull grommet clear of pin inserts.
   (6) Unsolder wires from solder pots of pin inserts.

b. Assemble connectors on new cable as follows:
   (1) Slip cable clamp retaining nut, and follower onto cable.
   (2) Pass wires through grommet and solder wires to connector.
   (3) Set grommet firmly around pin inserts.
   (4) Seat follower over grommet.
   (5) Screw retaining nut into position.
   (6) Screw cable clamp onto retaining nut.
   (7) Tighten cable clamp screws.

4-25. Typical Coaxial Cable Repair

Use the procedure shown in figure 4-2 to repair a defective cable. When a defective cable is to be repaired, obtain a piece of cable of the same length and type as the defective cable. Transfer .the connectors from the defective cable to the new cable in accordance with the procedure.

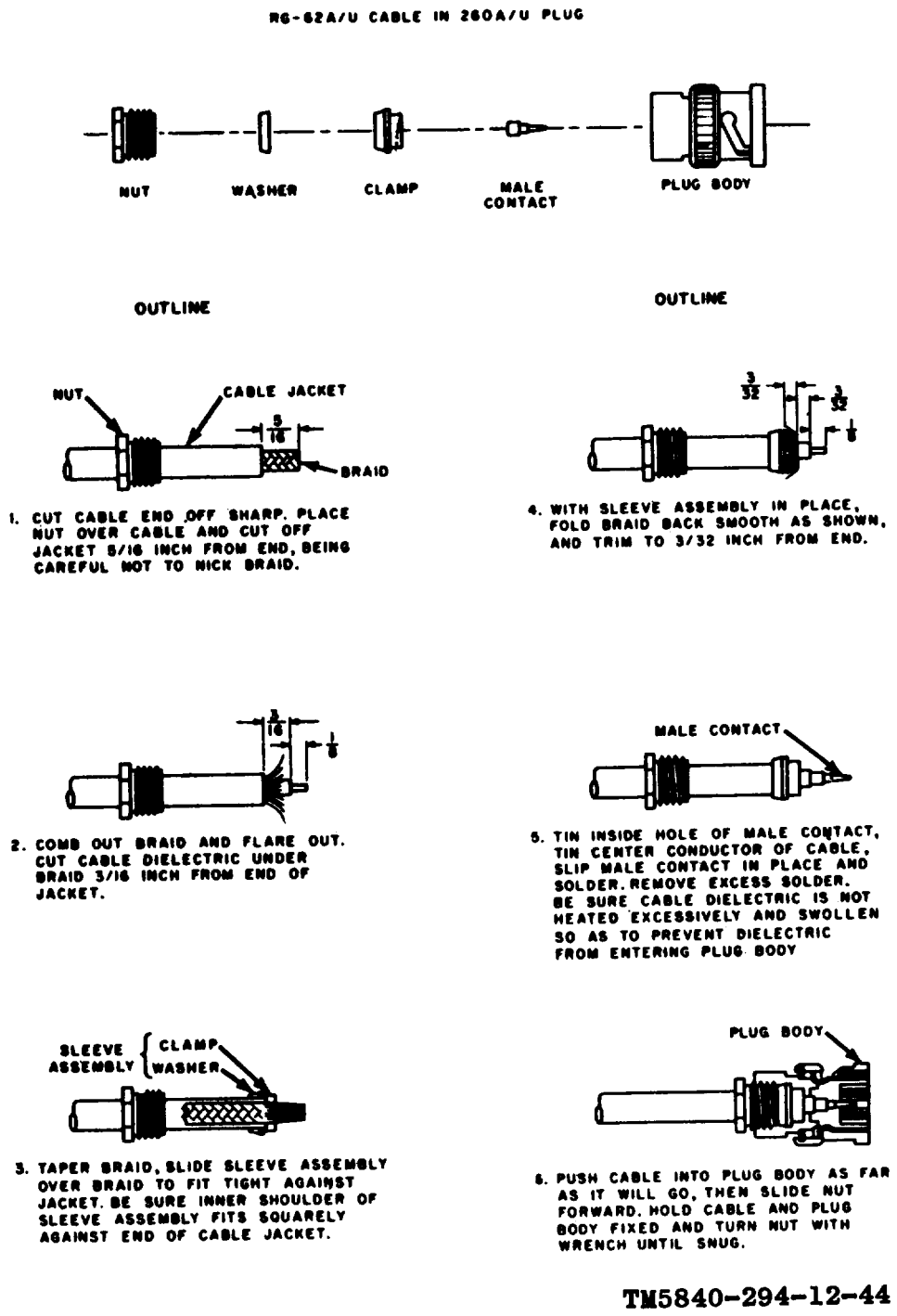


Figure 4-2. Typical coaxial cable repair.

Section III. COMPONENT REMOVAL AND REPLACEMENT

4-26. General

When a component is determined through troubleshooting procedures to be defective, it must be replaced with a component known to be functioning properly. Procedures for removing and replacing individual components are described in the paragraphs listed below.

a. Processor-viewer (para 4-27).
b. Target indicator (para 4-28).
c. Video decoder (para 4-29).
d. Power supply (para 4-30).
e. Hv power supply (para 4-31).
f. Data receiver (para 4-32).
g. D/a converter (para 4-33).
h. Communications receiver-transmitter (para 4-34).
i. Heater (para 44-35).
j. 28-volt dc power supply (4-33.1).

4-27. Removal and Replacement of Processor-Viewer

a. Removal.

(1) Disconnect cable 5W23 (P2) from processor-viewer connector 4J5.
(2) Turn two upper front cover fasteners (fig. 1-14) one-quarter turn counterclockwise.
(3) Use screwdriver to turn seven lower front cover fasteners counterclockwise, and remove lower front cover.

Caution: **When performing instructions in (4), (5), and (6) below, do not grasp any internal parts of the processor-viewer.**

(4) Lift upper front cover and loosen two upper mounting screws (fig. 2-6) with screwdriver.
(5) While supporting processor-viewer, use screwdriver to loosen two lower mounting screws.
(6) Gently disengage mating connectors by withdrawing processor-viewer away from target indicator.
(7) Hold processor-viewer by carrying handle and lift it from target indicator.
(8) Replace two dust covers (fig. 1-14).
(9) Replace lower front cover and tighten seven lower front cover fasteners.
(10) Fasten upper front cover by turning two upper front cover fasteners one-quarter turn clockwise.

b. Replacement. Install processor-viewer in accordance with instructions in paragraph 2-12b.

4-28. Removal and Replacement of Target Indicator

a. Removal.

(1) Remove processor-viewer (para 4 27).
(2) Install plastic safety cover on front of target indicator.
(3) Remove safety wire, and loosen two lower wingnut and bushing retainers, permitting them to swing free of rack (fig. 1-26).
(4) Pull forward on target indicator until sliding rack is pulled all the way out.
(5) Disconnect plugs 5W2P2, 5W4P2, 5W5P2, and 5W14P2 through 5W17P2 from target indicator connectors.
(6) Loosen two upper wingnut and bushing retainers, permitting them to swing free of target indicator.
(7) Lift front of target indicator slightly. Pull target indicator forward to disengage guide pins at rear of rack.
(8) Remove target indicator from rack.

b. Replacement.

(1) With mounting frame sliding rack pulled all the way out, position target indicator on sliding rack so that mounting bushings at rear of target indicator mate guide pins at rear of rack (fig. 1-26).
(2) Position two upper wingnut and bushing retainers over mounting base cleats on target indicator and tighten them.
(3) Connect plugs 5W2P2, 5W4P2, 5W5P2, and 5W14P2 through

5W17P2 to target indicator connectors 2J1, 2J2, 2J3, 2J16, 2J18, 2J17, and 2J15, respectively.

(4) Push target indicator to rear until sliding rack engages spring-loaded detents.

(5) Depress spring-loaded detents and push indicator until sliding rack is all the way to rear of mounting.

(6) With sliding rack all the way to rear of mounting, swing two lower wingnut and bushing retainers into position and tighten them to secure sliding rack in place.

(7) Replace safety wire (a(3) above).

(8) Remove safety cover.

(9) Install processor-viewer (para 2- 21*b*).

4-29. Removal and Replacement of Video Decoder

a. Removal.

(1) Remove safety wire, and loosen two wingnut and bushing retainers on fixed rack, permitting them to swing free of rack.

(2) Pull forward on video decoder until sliding rack is pulled all the way out.

(3) Disconnect plugs 5W3P2, 5W4P1, 5W5P1, and 5W22P2 from video decoder connectors.

(4) Loosen two wingnut and bushing retainers (fig. 1-24) on sliding rack, permitting them to swing free of video decoder.

(5) Lift front of video decoder slightly. Pull video decoder forward to disengage guide pins at rear of rack.

(6) Remove video decoder from rack.

b. Replacement.

(1) With mounting frame sliding rack pulled all the way out, position video decoder on sliding rack so that guide bushings at rear of video decoder mate guide pins at rear of rack.

(2) Position two sliding rack wingnut and bushing retainers (fig. 1-24) over mounting base cleats on video decoder and tighten them.

(3) Connect plugs 5W3P2, 5W4P1, 5W5P1, and 5W22P2 to video decoder connectors 3J1, 3J2, 3J3, and 3J4 respectively.

(4) Push video decoder to rear until sliding rack engages spring-loaded locking bars.

(5) Depress spring-loaded locking bars and push video decoder until sliding rack is all the way to the rear of mounting.

(6) With sliding rack all the way to rear of mounting, position two fixed rack wingnut and bushing retainers over mounting base cleats (fig. 1-24) on sliding rack and tighten them.

(7) Replace safety wire (a(1) above).

4-30. Removal and Replacement of Power Supply

a. Removal.

(1) Remove safety wire, and loosen two wingnut and bushing retainers on fixed rack, permitting them to swing free of rack.

(2) Pull forward on power supply until sliding rack is pulled all the way out.

(3) Disconnect plugs 5WIP1, 5W5P1, 5W3P1, and 5W21P2 from power supply connectors.

(4) Loosen two wingnut and bushing retainers (fig. 1-25) on sliding rack, permitting them to swing free of power supply.

(5) Lift front of power supply slightly. Pull power supply forward to disengage guide pins at rear or rack.

(6) Remove power supply from rack.

b. Replacement.

(1) With mounting frame sliding rack pulled all the way out, position power supply on sliding rack so that mounting bushings at rear of power supply mate guide pins at rear of rack.

(2) Position two sliding rack wingnut and bushing retainers over mounting base cleats on power supply and tighten them.

(3) Connect plugs 6W1P1, 5W2P1, 5W3P1, and 5W21P2 to power supply connectors 1J1, 1J2, 1J3, and 1J4, respectively.

(4) Push power supply to rear until sliding rack engages spring-loaded locking bars.
(5) Depress spring-loaded locking bars and push power supply until sliding rack is all the way to rear of mounting.
(6) With sliding rack all the way to rear of mounting, position two fixed rack wingnut and bushing retainers over mounting base cleats on sliding rack and tighten them.
(7) Replace safety wire (a(1) above).

4-31. Removal and Replacement of Hv Power Supply

a. Removal.
(1) Disconnect plugs 5W14P1 through 5W17P1 from hv power supply connectors.
(2) Remove safety wire and loosen clamp screw that secures hv power supply to shock mount (fig. 1-27) by turning it counterclockwise.
(3) Pull hv power supply forward and lift it from shock mount.

b. Replacement.
(1) Position hv power supply so that its base plate engages shoulders at sides of shock mount.
(2) Slide hv power supply to rear of shock mount.
(3) Turn clamp screw clockwise to secure hv power supply base plate to shock mount.
(4) Replace safety wire (a(2) above).
(5) Connect plugs 5W14P1 through 5W17P1 to hv power supply connectors 10J1 through 10J4, respectively.

4-32. Removal and Replacement of Data Receiver (R-1335/G)

a. Removal.
(1) Disconnect plugs 5W6P2, 5W7P1, and 5W9P1 and the LS-166/S from data receiver connectors.
(2) Remove safety wire, and loosen two wingnut and bushing retainers that secure data receiver to shock mount (fig. 1-23).
(3) Lift front of data receiver slightly. Pull data receiver forward to disengage guide pins at rear of shock mount.
(4) Remove data receiver from shock mount.

b. Replacement.
(1) Position data receiver in mounting frame so that mounting bushings on rear of data receiver mate guide pins at rear of mounting frame.
(2) Position two wingnut and bushing retainers over data receiver mounting base cleats and tighten them.
(3) Replace safety wire (a(2) above).
(4) Connect plug 5W6P2 to data receiver VIDEO connector 9A2J3.
(5) Connect plug 5W7P1 to data receiver POWER connector 9A2J1.
(6) Connect plug 5W9P1 to data receiver ANTENNA connector 9A1J2.
(7) Connect LS-166/U.

4-32.1. Removal and Replacement of Data Receiver (R-1335A/G)

a. Removal.
(1) Disconnect plugs 5W6P2, 5W7P1, and 5W9P1 and the LS-166/U (speaker) from the data receiver connectors.
(2) Remove the safety wire and loosen the two wingnuts and bushing retainers that secure the data receiver to the shock mount (fig. 1-23).
(3) Lift the front of the data receiver slightly and pull the data receiver forward to disengage the guide pins at the rear of the shock mount.
(4) Remove the data receiver from the shock mount.

b. Replacement.
(1) Position the data receiver in the shock mount so that the mounting bushings at the rear of the data receiver mate with the guide pins at the rear of the shock mount.
(2) Position the two wingnuts and bushing retainers over the data receiver shock mount adapter cleats and tighten them.
(3) Replace the safety wire.

(4) Connect plug 5W6P2 to data receiver VIDEO connector 9J114.
(5) Connect plug 5W7P1 to connector 9W1J2.
(6) Connect plug 5W9P1 to connector 9W3J1.
(7) Connect the LS-166/U to connector 9W1J1.

4-33. Removal and Replacement of D/a Converter

a. Removal.
(1) Disconnect plugs 5W6P1, 5W21P1, 5W22P1 and 5W23P1 from d/a converter connectors.
(2) Remove safety wire and loosen two wingnuts and bushing retainers that secure d/a converter to shock mount (fig. 1-28).
(3) Lift side of d/a converter slightly and pull to the right to free unit from shock mount
(4) Remove d/a converter from shock mount.

b. Replacement.
(1) Place d/a converter in shock mount and slide it to left.
(2) Make sure lip on d/a converter is secured by curved section at rear of shock mount.
(3) Swing two wingnuts up and tighten them to secure d/a converter in shock mount.
(4) Replace safety wire (*a*(2) above).
(5) Connect plugs 5W6P1, 5W21P1, 5W22P1 and 5W23P1 to d/a converter connectors 11J2, 11J1, 11J3, and 11J4, respectively.

4-33.1. Removal and Replacement of 28-Volt Dc Power Supply

a. Removal.
(1) Remove the three self-locking nuts (fig. 1-14.1) from the terminal end cover of the 28-volt dc power supply and remove the cover assembly.
(2) Disconnect cable connector 5W24P1 from 28-volt dc power supply input connector 5A4J1 (fig. 1-14.1).
(3) Disconnect cable 5W25 lug terminals from the terminal studs of terminal board 5A4TB1 (fig. 1-14.1) by removing two sets of nuts, lock washers, and flat washers.
(4) Reinstall the flat washers, the lock washers, and the nuts (removed in (3) above) on the terminal studs of terminal board 5A4TB1. Tighten nuts fingertight.
(5) Replace the cover assembly on the terminal end of the 28-volt dc.power supply with the three self-locking nuts (removed in (1) above).
(6) Remove the four screws, the four lockwashers, and the four flat washers that hold the 28-volt dc power supply to the shelter wall and remove the 28-volt dc power supply.

b. Replacement.
(1) Remove the three self-locking nuts (fig. 1-14.1) from the terminal end cover of the 28-volt dc power supply and remove the cover assembly.
(2) Remove the two sets of nuts, lock-washers, and flat washers from the terminal studs of terminal board 5A4TB1 (fig. 1-14.1).
(3) With the four screws, the four lock-washers, and the four flat washers (removed in a (6)), secure the 28-volt dc power supply to the rear shelter wall with the terminal end toward the shelter door.

NOTE

The polarity of the terminal studs of terminal board SA4TB1 are stamped on the ends of the studs

(4) Connect the white conductor of cable 5W25 to the terminal stud stamped positive(+) with the flat washer, the lockwasher, and the nut. Tighten the nut until the lockwasher slot is closed.
(5) Connect the black conductor of cable 6W25 to the terminal stud stamped negative (-) with the flat washer, the lockwasher, and the nut. Tighten the nut until the lockwasher slot is closed.
(6) Install the cover assembly on the terminal end of the 28-volt dc power supply with the three self-locking nuts (removed in (1) above).

4-34. Removal and Replacement of Communications Receiver-Transmitter

a. Removal.

(1) Disconnect plug 5WllP2 from communications receiver-transmitter AN connector.

(2) Disconnect plug 5W12P1 from communications receiver-transmitter ANTCONT connector.

(3) Disconnect microphone from communications receiver-transmitter MIKE connector.

(4) Release two clamps that secure communications receiver-transmitter to Mounting MT-1029/VRC (fig. 1-29).

(5) Slide communications receiver-transmitter forward and lift it from mounting.

b. Replacement.

(1) Place communications receiver-transmitter in Mounting MT-1029/VRC and slide it to rear of mounting to engage connector 5J24 (fig 1-29).

(2) Secure communications receiver-transmitter in Mounting MT-1029/VRC by tightening two clamps.

(3) Connect plug 5W11P2 to communications receiver-transmitter ANT.connector.

(4) Connect microphone to communications receiver-transmitter MIKE connector.

(5) Connect plug 5W12P1 to communications receiver-transmitter ANT.CONT. connector.

4-35. Removal and Replacement of Heater

a. Removal.

(1) Remove 10 screws that secure shelf support assembly to shelter wall and ledge, and remove this assembly.

(2) Loosen hose clamp and disconnect heater fresh-air intake flexible hose.

(3) Loosen coupling and disconnect fuel supply line from rear of heater.

(4) Disconnect pipe union to separate exhaust pipe from heater nipple.

(5) Disconnect plugs 5W8P1 and 5W1OPlfrom heater connectors 5A1J1 and5AIJ2.

(6) Remove six bolts and flat washers that secure heater to shelf, and re-move heater.

(7) If heater is to be replaced,remove four screws that secure heater mounting plate to bottom of heater and transfer mounting plate to new units, using 'the same four screws that were removed

b. .Replacement

(1) Heater mounting plate must be secured to bottom of heater before in-stalling heater on shelf.

(2) Position heater so that three mounting holes on each side of heater mate mounting holes in shelf.

(3) Secure heater in place using six bolt sand flat washers (a(6) above).

(4) Connect pipe union on heater exhaust pipe and tighten.

(5) Connect heater fresh-air intake flexible hose to shelter intake port and tighten clamp.

(6) Connect fuel supply line at rear of heater and tighten coupling.

(7) Connect plugs 5W8P1 and 5W10P1to heater connectors.

(8) Replace shelf and shelf support assembly using 10 screws (a(1l)above).

(9) After reinstallation of heater, reseal around exhaust pipe, on top of roof; use adhesive, type 1, per MIL-A-8623.

CHAPTER 5

SHIPMENT, LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE

Section I. CONVERSION FOR TRANSIT

5-1. General

a. Transit Over Normal Roads. Follow the instructions in this section when preparing the data receiving set for transit over normal roads. Two men are needed for handling units of the equipment. If cross-country or air lift transit, or limited-size transport vehicles are required, additional preparations are necessary(b below).

b. Preparation for Cross-Country Travel or Airlift. When the data receiving set is to be transported cross-country on the truck, or by airlift, the storage case and the processor-viewer transit case must be removed from the shelter to reduce weight, and transported separately. During airlift operations, at least one shelter ventilation port must be open. In addition, make certain that the shelter is prepared for limited-size transport vehicles by securing the data antenna mast and removing the data antenna mast adapter and top section (para 5-3*k* and *l*).

5-2. Storing Processor-Viewer

a. Remove processor-viewer from target indicator (para 4-27).

b. Store processor-viewer in processor-viewer transit case.

Note. Do not perform the next step until the procedures described in paragraphs 5-3 through 5-7*g* have been completed.

c. If transit over normal road is planned, store processor-viewer transit case in shelter(para 5-7*h*).

5-3. Storing Data Antenna and Securing Data Antenna Mast

a. Lower data antenna mast.
b. Disconnect cable W6 from Adapter, Connector UG-999A/U on data antenna.
c. Disconnect cable W6 from connector 5J11on shelter rear wall.
d. Store cable W6 in storage case.
e. Support data antenna while removing quick-release pin that secures data antenna to data antenna mast (para 2-5).
f. Lift data antenna from data antenna mast.
g. Place data antenna in three clamps (fig.1-5) on shelter roof with antenna base facing rear of shelter.
h. Position antenna base against backplate (fig. 1-6) at rear of shelter top.
i. Close and tighten three clamps to secure data antenna in place.
j. Secure data antenna mast as follows:
(1) Attach the clamp ends of the two tie-down assemblies to the cleats (two) on the data antenna mast top plate (fig. 5-1).
(2) Tighten tiedown assemblies by clos ing latches.
k. When preparing for cross-country travel or airlift (or any condition where the shelter is inserted into limited-size space or transport vehicles), remove the antenna mast adapter and top section as follows:
(1) Loosen and remove release bolt (fig.5-1).

(2) Remove adapter, top section, and sleeve (as a unit) by lifting up. Figure 5-2 shows the data antenna' mast prepared for limited size storage.
(3) Replace release bolt in mast top section and sleeve and tighten to prevent loss.
(4) Store adapter, top section, sleeve, and release bolt in storage case.

5-4. Storing Communications Antenna (AT-912/VRC)

a. Unscrew Antenna Element AT-1095/ VRC (fig. 1-18) from Antenna Element AT- 1096/VRC.

b. Unscrew Antenna Element AT-1096/ VRC from Base, Antenna Support AB-719/ VRC.

c. Store Antenna Elements AT-1095/VRC and AT-1096/VRC on shelf formed by shelter right wall as shown in figure 1-3.

5-4.1 Storing Communications Antenna (AS-1729/VRC)

a Unscrew Antenna Element AS-1730/ VRC, with Antenna Element AT-1095/VRC attached, from Matching Unit-Base, Antenna MX-6707/VRC (fig. 1-18.1).

b. Unscrew Antenna Element AT-1095/ VRC from Antenna Element AS-1730/VRC.

c. Store Antenna Elements AT-1095/VRC and AS-1730/VRC on the shelf formed by the shelter right wall as shown in figure 1-3.

5-5. Storing Heater Supply Hose and Heater Supply Hose Adapter

a. Disconnect heater supply hose from shelter fuel line fitting (fig. 2-3).

b. Screw protective cap onto shelter fuel line fitting.

c. Disconnect heater supply hose from heater supply hose adapter.

d. Remove heater supply hose adapter from 5gallon gasoline can.

e. Remove gasoline from hose by lifting one end.

f. Store heater supply hose and heater supply hose adapter in storage case.

5-6. Storing Air Conditioner Condenser Sections

Note. The air conditioner condenser sections must be pumped down before storing. For this reason, power from the generator set is required when initial steps of the following procedure are being performed.

a. Remove air intake grill (fig. 2-3) from each air-conditioner condenser section by loosening three quarter-turn captive screws.

b. Set ON-OFF switch SW1 (fig. 3-10) on one air-conditioner condenser section to ON.

c. While air conditioner is running, remove receiver valve cap (fig. 3-11) immediately behind air intake grill (a above).

d. Turn receiver valve stem (fig. 3-11) clockwise as far as it will go.

e. Replace receiver valve cap.

Caution: Do not allow air conditioner to run when no refrigerant is visible in the sight glass (fig. 3-11) when performing the step in *f* below.

f. Observe sight glass. When refrigerant stops flowing through sight glass, set ON- OFF switch SW1 to OFF.

g. Replace air intake grill and tighten three quarter-turn captive screws.

h. Repeat b through g above to pump down second air-conditioner condenser section.

i. Disconnect two power cables (W4/W6, fig. 1-4) from between air-conditioner con- denser sections and connectors 5J4 and 5J5 (fig. 2-3) on junction panel and store them in storage case.

Note. When performing next step use one wrench to hold refrigerant line condenser fitting stationary and a second wrench to turn refrigerant line coupling.

Caution: Do not allow refrigerant line con-denser fitting to turn when performing next step. Avoid kinking or twisting refrigerant line.

j. Disconnect interconnecting electrical cable W7/W8 (fig. 2-3) and two refrigerant lines from one air-conditioner condenser section.

k. Push four-hole rubber grommet free of air-conditioner interconnection port (toward shelter interior).

l. Pull air-conditioner interconnection assembly into shelter.

m. Disconnect air-conditioner interconnection assembly from air-conditioner evaporator section.

n. Install protective cap to seal air-condi-tioner interconnection port.

o. Install dust caps (stored in storage case)on refrigerant lines and store air-conditioner interconnection assembly in storage case.

p Hold air-conditioner condenser section firmly against condenser mounting blocks (fig.2-3) while loosening four captive studs. Weight of unit will be supported by condenser mounting frame flanges until lifted free.

q. Remove air-conditioner condenser section and place it inside shelter.

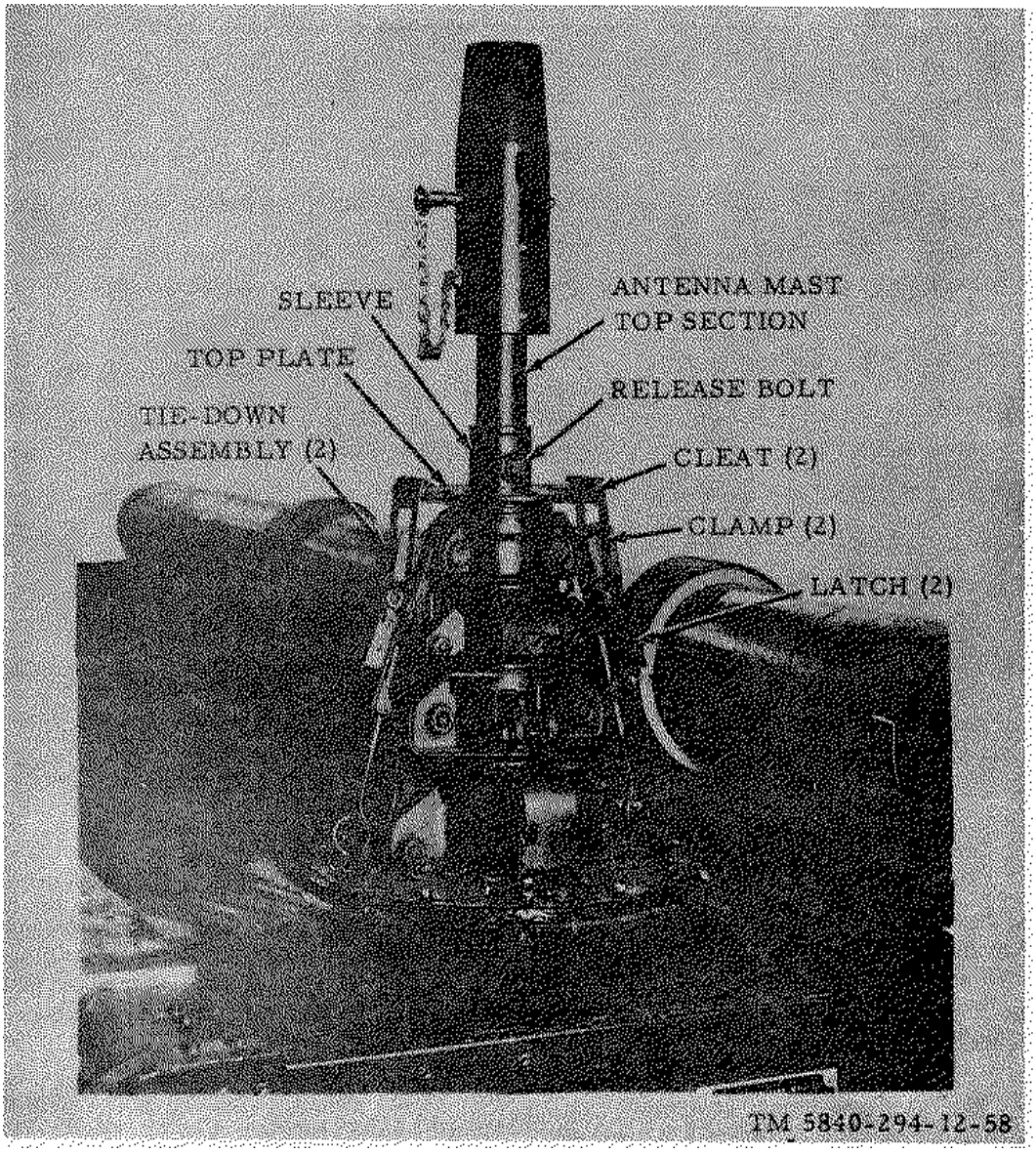


Figure 5-1. Data antenna mast tiedown assemblies

r Lift air conditioner condenser section to a point where two mounting frame flanges will slide onto mounting bracket lugs (fig. 1-7) on top section of condenser storage mounting bracket.

s. Adjust position of air conditioner con-denser section until four captive studs in con-denser mounting frame mate four holes in mounting bracket lugs.

t. Tighten four captive studs until lock-washers beneath them are compressed.

u. Loosen four captive screws (fig. 2-3) and remove air-intake port cover from its storage position.

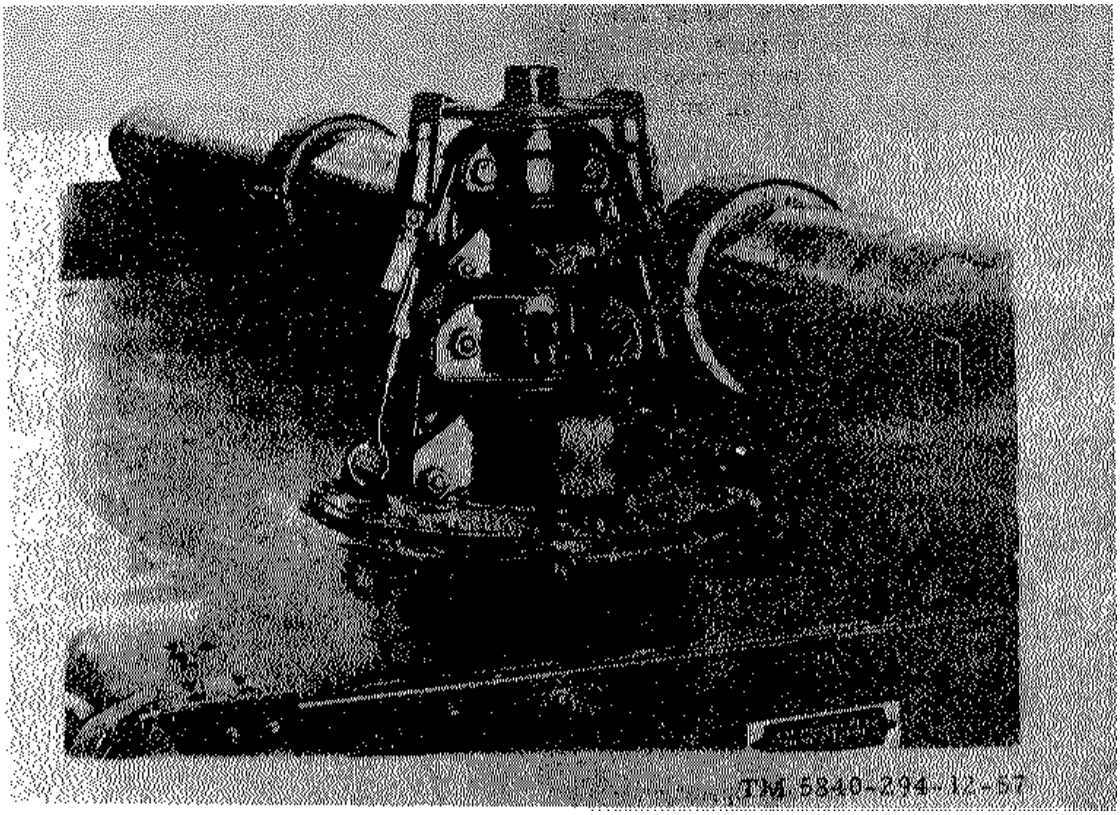


Figure 5-2. Data antenna mast secured for limited-size storage.

v. Install air-intake port cover in front of air conditioner air-intake port and tighten four captive screws.

w. Repeat *i* through *v* above to store second air conditioner condenser section.

5-7. Storing Miscellaneous Equipment

a. Disconnect ground strap from binding post E1 (fig. 2-3) on junction panel.

b. Remove ground rod from ground.

c. Remove ground strap from ground rod and store it in storage case.

d. Store ground rod on shelf formed by shelter right wall, as shown in figure 1-3.

e. Secure rack-mounted equipment.

f. Place any loose items in storage case.

g. Strap chair in front of worktable.

h. For normal road transit, store processor-viewer transit case (para 5-2c) and storage case as shown in figure 2-2. For other than normal road transit, refer to paragraph 5-1*b*.

i. Close and lock shelter doors.

j. Close and secure truck tailgate.

k. Secure shelter ventilation port covers in transit (closed) position.

Note. Leave one ventilation port open if transit by air is planned.

l. Stow generator set exhaust tube in trailer.

m. Remove fuel drum adapter, put cap on gas can, and store it in trailer.

n. Drain flexible fuel hose, then disconnect it from generator set.

o. Coil flexible fuel hose and store it in trailer.

p. Disconnect power cables from shelter and generator set and store them in storage case.

Note. For short distance/time relocations, leave cables connected at generator and store them in trailer

q. Tie down trailer tarpaulin flaps.

r. Release support leg on trailer drawbar assembly (fig. 1-21) and place it in transit position.

s. Couple trailer lunette to pintle of towing vehicle.

t. Connect safety chains and intervehicular cable.

u. Release trailer handbrake levers.

Section II. DEMOLITION TO PREVENT ENEMY USE

5-8. Authority for Demolition

Demolition of the equipment will be accomplished only upon order of the commander. The priorities for destruction are established in paragraph 5-9 and the recommended methods of destruction are given in paragraph 5-10.

5-9. Priorities for Destruction

To assure maximum damage to the data receiving set in minimum time, destroy the equipment components and materiel in the following order:

a. Video decoder.

b. Records, radar imagery, and operating instructions that are subject to security regulations.

c. Data receiver.

b. Records, radar imagery, and operating instructions that are subject to security regulations.

c. Data receiver.

d. D/a converter.

e. Data antenna.

f. Communications receiver-transmitter.

g. Power supplies.

h. Processor-viewer.

i. Target indicator.

j. Cables and control panels.

k. Generator set, trailer, and tires.

l. All other components and materiel.

5-10. Methods of Destruction

Use any of the following methods to destroy the equipment. If possible, remove the highest priority components from shelter (paras 4-27--4-34) to permit maximum accessibility for destruction.

Warnings:

1. Be sure the generator set is not operating before attempting any demolition operation.

2. Guard eyes against splattering acid when smashing batteries.

3. Cathode-ray tubes implode violently, and may shower splinters of glass. Stand to one side of the target indicator being destroyed, protect eyes, and smash the cathode-ray tubesfirst.

4. Be cautious in the use of explosives and incendiary devices. They should be used only under conditions of extreme urgency.

5. Avoid bodily contact with the Freon refrigerant when destroying the air conditioners. When the air conditioners are in use, refrigerant will be present in both condenser and evaporator sections. Under storage conditions, refrigerant will be confined to the evaporator sections. Under either condition, special care must be taken in destroying the precharged refrigerant lines.

6. Avoid bodily contact with nitric acid solutions in containers on shelter rear wall.

a. Smash. Smash the controls, tubes, coils, switches, capacitors, transformers, and meters; use sledges, axes, handaxes, pickaxes, hammers or crowbars. Smash generator set control panel, radiator, carburetor, cylinder head, spark plugs, block, manifold, distributor, and storage batteries.

b. Cut. Use axes, handaxes, machetes, or other tools to cut the cabling, and wiring. Use a heavy axe or machete to cut the interconnecting cables in a number of places. Slash component internal cabling and harnesses. Cut the generator set and truck radiators, tarpaulin and hoses.

c. Burn. Pour gasoline, kerosene, oil or other flammable fluid on all instruction literature and equipment, and ignite. If components are not mounted, insert incendiary grenades into each component.

d. Explode. If explosives are necessary, use firearms, grenades, or TNT.

e. Disposal. Bury or scatter the destroyed parts in slit trenches, foxholes, or throw them into streams.

APPENDIX A

REFERENCES

The following is a list of applicable references available to the operator and organizational repairman of Receiving Set, Radar Data AN/TKQ-2:

DA Pam 810-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (typ7, 8, and 9), Supply Bulletins, and Lubrication Orders
DA Pam 310-7	U.S. Army Equipment Index of Modification Work Orders
TB SIG 291	Safety Measures To Be Observed When Installing and Using Whip Antennas, Field Type Masts, Towers, Antennas, and Metal Poles That Are Used With Communication, Radar, and Direction Finder Equipment (TO81P5-1)
TB SIG 746-10	Field Instructions for Painting and Preserving Electronics Command Equipment
TM 5-5264	Generator Set, Electric, Portable, Gasoline-Driven, Tabular Steel Frame Mounting 12 1/2 Kw, 120-208 Volt, 400 Cycle, Single or 8 Phase, and 2 1/2 Kw, 28 Volt, Dc Hollingsworth Model PU-107A/U
TM 5-6115-450-15	Operator, Organizational, DS, GS, and Depot Maintenance Manual: Generator Set, Gasoline Engine: 10 Kw, AC, 120/240V Single Phase, 1W/208 V-8 Phase, 400 Hertz Skid Mounted (Less Engine) (MIL Design MDL HF 10.0-MD) FSN 6115-937-1793
TM 9-213	Painting Instructions For Field Use
TM 11-5820-401-10	Operator's Manual: Radio Sets AN/VRC-12 and ANI/VRC-43, -44, -45, -46, -47, -48, and -49
TM 11-5820-401-20	Organizational Maintenance Manual Including Repair Parts and Special Tool Lists: Radio Sets AN/VRC-12 and AN/VRC-43, -44, -45, -46, -47, -48, and -49.
TM 11-6820-680-12	Organizational Maintenance Manual (Including Repair Parts List): Recorder-Processor-Viewers Radar Mapping RO-166/UP, RO-166A/UP, RO-166B/UP, RO-166C/UP, and RO-166D/UP
TM 11-5841-255-12	Organizational Maintenance Manual Including Repair Parts List: Transmitting Set, Radar Data AN/AKT-18 and Test Facilities Kit MK-856/AKT-18
TM 11-5895-284-12	Organizational Maintenance Manual: Radar Surveillance Sets AN/APS-94, AN/APS-94A, AN/APS-94A, AN/APS-94B, and AN/APS-94C (U).
TM 11-5965-222-15P	Operator, Organizational, Field and Depot Maintenance Repair Parts and Special Tool Lists and Maintenance Allocation Chart: Dynamic Loudspeaker LS-166U.
TM 11-5965-262-13	Organizational and DS Maintenance Manual Including Repair Parts and Special Tool Lists: Headset-Microphone H-161/U and H-161A/U
TM 11-6625-827-12	Operator and Organizational Maintenance Manual: Test Set, Receiving Set, Radar Data AN/GKM-2A
TM 38-750	Army Equipment Record Procedures

APPENDIX B

BASIC ISSUE ITEMS LIST (BILL) AND ITEMS TROOP

INSTALLED OR AUTHORIZED LIST (ITIAL)

Section I. INTRODUCTION

B-1. Scope

This appendix lists only basic issue items re-quired by the crew/operator for installation, operation, and maintenance of Receiving Set, Radar Data AN/TKQ-2 and Test Facilities Kit MK-1148/TKQ-2.

B-2. General

This Basic Issue Items and Items Troop In-stalled or Authorized List is divided into the following sections:

a. Basic Issue Items List-Section II. A list, in alphabetical sequence, of items which are furnished with, and which must be turned in with the end item.

b. Items Troops Installed or Authorized List-Section III. Not applicable

B-3. Explanation of Columns

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

a. Illustration. This column is divided as follows:

(1) *Figure Number*. Indicates the figure number of the illustration in which the item is shown.

(2) *Item Number*. 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.

SECTION II. BASIC ISSUE ITEMS LIST

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) FEDERAL STOCK NUMBER	(3) PART NUMBER	(4) FSCM	(5) DESCRIPTION USABLE ON CODE	(6) U/M	(7) QTY FURN WITH EQUIP
1-22		5841-857-1381	SM-D-395177	80063	CASE, RECORDER (P/o RO-166B/UP)	EA	1
1-30		5840-999-8321	AM-D-497672 OR 201-45436	80063 OR 94990	CASE, PROCESSOR ROLLER CLEANING ASSEMBLY	EA	1
1-3		4210-383-7128		81349	EXTINGUISHER, FIRE, CARBON DIOXIDE: TYPE 1 CLASS 15LB VEHICLE NONSHATTERABLE LOW TEMPERATURE	EA	1
1-3		5975-777-6781		81349	ROD, GROUND: MIL-R-11461 TYPE 2 STYLE 15	EA	1

APPENDIX C

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

C-1.General

This appendix provides a summary of the maintenance operations covered in the equipment literature for Receiving Set, Radar Data AN/TKQ-2. It authorizes levels of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

C-2. Explanation of Format for Maintenance Allocation Chart

a. Group Number. Group numbers correspond to the reference designation prefix as- signed in accordance with ASA Y32.16, Electrical and Electronics Reference Designations. They indicate the relation of listed items to the next higher assembly.

b. Component Assembly Nomenclature. This column lists the item names of component units, assemblies, subassemblies, and modules on which maintenance is authorized.

c. Maintenance Function. This column indicates the maintenance level at which performance of the specific maintenance function is authorized. Authorization to perform a function at any level also includes authorization to per- form that function at higher levels. The codes used represent the various maintenance levels as follows:

Codes	*Maintenance Level*
C.....	Operator/Crew
O	Organizational Maintenance
F	Direct Support Maintenance
H.....	General Support Maintenance
D.....	Depot Maintenance

d. Tools and Equipment. The numbers appearing in this column refer to specific tools and equipment which are identified by these numbers in section III.

e. Remarks. Self explanatory.

C-3. Explanation of Format for Tool and Test Equipment Requirements

The columns in the tool and test equipment requirements chart are as follows:

a. Tools and Equipment. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool for the maintenance function.

b. Maintenance Category. The code, in this column indicate the maintenance category normally allocated the facility.

c. Nomenclature. This column lists tools, test and maintenance equipment required to perform the maintenance functions.

d. Federal Stock Number. This column lists the Federal stock number.

e. Tool Number. Not used.

SECTION II. MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) FUNCTIONAL GROUP COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTIONS INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD	(4) TOLS AND EQUIPMENT	(5) REMARKS
1	RECEIVING SET, RADAR DATA AN/TKQ-2	0												Visual
			0										20, 24	
			F										4, 5, 6, 10, 11,	
													12, 13, 16, 19	
													23	
			H										1 thru 6,	
													10 thru 17,	
													19, 21, 22, 25,	
													26, 27	
			D										1 thru 18,	
													20, 21, 22, 25,	
													26, 27	
				0									24	
					0								24	
					F								23	
						H							1, 2, 3, 4, 5, 7, 8,	
													9, 10 thru 15	
													20, 22	
							H						1, 2, 3, 4, 5, 7, 8,	
													9, 10 thru 15,	
													20 21	
								0					24	
									0				24	
										F			16, 23	
										H			16, 23	
											H		1 thru 6, 10	
													thru 17, 19, 21,	
													22, 25, 26, 27	
											D		15, 22	Depot facilities
												D		Depot facilities
2	ANTENNA ELEMENT AT-1095/VRC &													
	AT-1096/VRC	0												Visual
				0									24	
							0						24	
								0					24	
									D					Depot facilities
									D					Depot facilities

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SECTION II. MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) FUNCTIONAL GROUP COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTIONS											(4) TOLS AND EQUIPMENT	(5) REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AN/TKQ-2 (continued)													
3	ANTENNA RADOME AS-1097A/GR	0						0					24	Visual
									0				24	
										F			23	
4	ACCESSORY KIT	0												Visual
									0					
										F			23	
5	CABLE ASSEMBLIES	0												Visual
								0						
									0					
										F			23	
6	CONVERTER-STORER, SIGNAL DATA CV-2093/TKQ-2	0												Visual
			F										5, 6, 7, 10, 11, 12, 13, 23	
				F									5, 6, 7, 10, 11, 12, 13, 23	
					F								11, 23	
					H								11, 22	
						D								Depot facilities
							D							Depot facilities
								0					24	
									0				24	
										F			10, 11, 16, 23	
										H			10, 11, 14, 16, 21 22, 26, 27	
											D			Depot facilities
7	HEADSET, CHEST H-161/GR									F			23	See TM 11-5965-262-13 for Maintenance Allocation
8	AIR CONDITIONING													Maintained by mobility command

SECTI0N II. MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) FUNCTIONAL GROUP COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTIONS											(4) TOLS AND EQUIPMENT	(5) REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AT/TKQ-2 (continued)													
9	DECODER VIDEO ASSEMBLY KY-564/ /TKQ-2	0												Visual
			F										10 thru 13, 19	
				F									10 thru 13	
					F								23	
						D								Depot facilities
							D							Depot facilities
								0					24	
									0				24	
										F			10, 11, 12, 19, 23	
										H			5, 9, 10, 11, 12	
													14, 19, 22, 26, 27	
										D				Depot facilities
											D			Depot facilities
9A	AMPLIFIER, SERVO ASSEMBLY	0												Visual
			F										10 thru 13, 19	
			H										8 thru 15, 19,	
													23	
			D											Depot facilities
				F									10, 23	
					F								10, 23	
						H							10, 12, 13, 22	
							D							Depot facilities
								0					24	
									0				24	
										F			10 thru 13, 19	
											H		5, 9, 10, 11, 12	
													14, 19, 22, 26, 27	
												D		Depot facilities
9B	DECODER, PULSE ASSEMBLY													Same as 9A
9C	GENERATOR, SWEEP ASSEMBLY													Same as 9A
9D	GENERATOR, REFERENCE SIGNAL													Same as 9A
9E	HOUSING, VIDEO DECODER													Same as 9A

SECTION II. MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) FUNCTIONAL GROUP COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTIONS											(4) TOLS AND EQUIPMENT	(5) REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AN/TKZ-2 (continued													
9F	MONITOR, VOLTAGE DEVIATION													Same as 9A
9G	SYNCHRONIZER, ELECTRICAL													Same a s9A
10	GENERATOR SET PU-375/G													Maintained by mobility command
11	INDICATOR, RADAR TARGET IP-795/TKQ-2	0												Visual
			F										5, 6, 10 thru 13, 19, 23	
				F									10thru 13, 19 23	
					F									
						D								Depot facilities
							D							Depot facilities
								0					24	
									0				24	
										F			5, 6, 10 thru 13, 19, 23	
											H		1, 5, 6, 8, 9, 10 thru 16, 19, 22, 25, 26, 27	
												D		Depot facilities
11A	AMPLIFIER, DC, MOVING TARGET ASSEMBLY		0											Visual
				F									5, 6, 10, thru 13, 19, 23	
					F								10 thru 13, 19 23	
						F								
							D	D						Depot facilities
									0				24	
										0			24	
											F		5, 6, 10 thru 13, 19, 23	

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SECTION II. MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) FUNCTIONAL GROUP COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTIONS											(4) TOLS AND EQUIPMENT	(5) REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AN/TKQ-2 (continued)													
11A	AMPLIFIER, DC, MOVING TARGET ASSEMBLY (continued)									H			5, 6, 8, 9, 10 thru 15, 19, 22, 26, 27	
											D	D		Depot facilities
11B	AMPLIFIER, DC, TARGET ASSEMBLY													Same as 11A
11C	INDICATOR, RADAR TARGET ASSEMBLY													Same as 11A
11D	RADAR TARGET INDICATOR													Same as 11A
12	INTERCONNECTING BOX	0												Visual
				0									24	
									0				24	
										F			23	
											H		22	
13	POWER SUPPLY H.V., PP-4339/TKQ-2	0												Visual
			0										11, 24	
			F										10, 23	
								0					23	
									F				23	
										H			22	
										D			22	
											D		10, 14, 22, 26, 27	

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SECTION II. MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) FUNCTIONAL GROUP COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTIONS											(4) TOLS AND EQUIPMENT	(5) REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AN/TKQ-2 (continued)													
14	POWER SUPPLY PP-4338/TKQ-2	0												Visual
			0										11, 24	
			F										10, 11, 23	
				F									10, 11, 23	
								0					24	
									0				24	
										0			11, 24	
										F			10, 11, 23	
										H			10, 11, 14, 19, 22, 26, 27	
											D		10, 11, 14, 18 21, 22, 26, 27	
15	RECEIVER RADIO R-1335/G	0												Visual
			F										4, 5, 6, 10, 11, 12, 13, 23	
				F									4, 5, 6, 10, 11, 12, 13, 23	
					F								4, 5, 6, 10, 11, 12, 13, 23	
						H							1, 4, 5, 6, 9, 12, 13, 15, 22, 26, 27	
							D							Depot facilities
								0					23	
								0					23	
									F				10, 11, 16, 23	
									H				1, 2, 3, 4, 5, 6, 9, 10, 11, 14, 19, 22, 26, 27	
										D			1 thru 19, 22, 25, 26, 27	
16	RECEIVER-TRANSMITTER RT-524/VRD													Maintenance breakout is contained in TM11-5820-401-20.
17	RECORDER-PROCESSOR VIEWER													Maintenance breakout is contained in TM 11-5841-237-
20.	RADAR MOPING RO-166B/UP													

SECTION II. MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) FUNCTIONAL GROUP COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTIONS											(4) TOLS AND EQUIPMENT	(5) REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AN/TKQ-2 (continued)													
18	SHELTER, ELECTRONIC EQUIPMENT S-339/TKQ-2	0												Visual
									D					Depot facilities
										D				Depot facilities
18A	ANTENNA MATCHING UNIT MX-2799/VRC													Maintenance breakout is contained in TM 11-5820-401-20.
18B	BASE, ANTENNA SUPPORT AB-719/VRC	0												Visual
									0				23	
18C	HEATER	0												Visual
			F										23	
								F					23	
									F				23	
										D	D		22	
18D	LOUDSPEAKER LS-166/U	0												Inspect
									0				24	
										F			23	
18E	JUNCTION BOX	0												Visual
				0									24	
									F				23	
										D			22	

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOL AND TEST EQUIPMENT REQUIREMENTS				
TOOLS AND EQUIPMENT	**MAINTENANCE CATEGORY**	**NOMENCLATURE**	**FEDERAL STOCK NUMBER**	**TOOL NUMBER**
		AN/TKQ-2 (continued)		
1	H, D	ANALYZER, SPECTRUM TS-723/U	5950-538-385O	
2	H, D	ATTENUATOR, VARIABLE CN-796/U	59B5-831-5991	
3	H, D	COUNTER, ELECTRONIC, DIGITAL READOUT AN/SM-207		
(See Note 4)				
4	F, H, D	FM FREQUENCY SIGNAL GENERATOR AN/Ut(-70	6625-519-2104	
5	F, H, D	GENERATOR, SIGNAL AN/URX-127	6625-783-5965	
(See Note 1)				
6	F, H, D	GENERATOR, SIGNAL AN/USM-44A	6625-539-9685	
7	D	GENERATOR, SIGNAL AN/USM-205		
8	H, D	GENERATOR, SIGNAL SG-321/U		
(See Note 6)				
9	H, D	GENERATOR, SIGNAL SG-299A/U	6625-808-5584	
10	F, H, D	MULTIMETER ME-26B/U	6625-646-9409	
11	O, F, H, D	MILTIMETER AN/USM-223		
12	F, H, D	OSCILLOSCOPE AN/USM-140A	6625-066-2525	
(See Note 2)				
13	F, H, D	OSCILLOSCOPE SUBASSEMBLY, VERTICAL CHANNEL, HIGH GAIN, WIDE BAND PREAMPLIFIER		
(See Note 3)		AM-3568/USM		
14	H, D	PROD, TEST MX-2517/U	6625-511-5383	
15	H, D	PULSE GENERATOR SET AN/UPM-15	6625-643-5969	
16	F, H, D	REPAIR KIT, PRINTED WIRING BOARD MX-772/U		
17	H, D	STOP WATCH, CHRONOMETER	6645-719-8760	
18	D	TEST SET, ELECTRON TUBE TV-2/U	6625-669-0263	
19	H, D	TEST SET, ELECTRON TUBE TV-7/U	6625-820-0064	

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SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOL AND TEST EQUIPMENT REQUIREMENTS				
TOOLS AND EQUIPMENT	**MAINTENANCE CATEGORY**	**NOMENCLATURE**	**FEDERAL STOCK NUMBER**	**TOOL NUMBER**
		AN/TKQ-2 (continued)		
		AN/TKQ-2 (continued)		
20	O, D	TEST SET, RECEIVING SET, RADAR DATA AN/GKM-2A6625-855-8996		
21	H, D	TEST SET, TRANSISTOR AN/USM-171		
(See Note 5)				
22	H, D	TOOL KIT, ELECTRONIC EQIPMENT TK-100/G	5180-605-0079	
23	F	TOOL KIT, ELECTRONIC EQUIPMENT TK-105/G	5180-610-8177	
24	0	TOOL KIT, RADIO REPAIRMAN TK-115/G	5180-856-1578	
25	H, D	TRAWSFORMER, VARIABLE CN-16/U	5950-235-2086	
26	H, D	VOLTMETER; ELECTRONIC ME-202/U,	6625-709-0288	
27	H, D	VOLTMETER, ELECTRONIC ME-30/U	66254-643-1670	
		NOTE 1: USE AUDIO OSCILIATOR TS-382/U UNTILL GENERATOR, SIGNAL AN/URM-127 BECOME AVAILABLE.		
		NOTE 2: USE OSCILLOSCOPE AN/USM-81 UNTIL OSCILLOSCOPE AN/USM-140A BECOMES AVAILABLE.		
		NOTE 3: USED WITH OSCILLOSCOPE AN/USM-140 ONLY.		
		NOTE 4: USE FREQUENCY METER AN/USM-26( ) UNTIL THE AN/USM-207 BECOMES AVAILABLE.		
		NOTE 5: USE TEST SET TRANSISTOR TS-1863/U UNTIL THE AN/USM-171 BECOMES AVAILABLE.		
		NOTE 6: USE GENERATOR, SIGNAL SG-298/U UNTIL THE SG-321/U BECOMES AVAILABLE.		

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APPENDIX D

ORGANIZATIONAL REPAIR PARTS

Section I. INTRODUCTION

D-1. Scope

This appendix contains a list of repair parts required for the performance of organizational maintenance for Receiving Set, Radar Data AN/TKQ-2 and Test Facilities Kit MK-1148/ TKQ-2.
Note. No special tools, test and support equipment are required.

D-2. General

The repair parts list is divided into the following sections:

a. Prescribed Load Allowance (PLA), Sec- tion II. The PLA is a consolidated listing of repair parts allocated for initial stockage at the organizational maintenance category. This is a mandatory minimum stockage allowance.

b. Repair Parts for Organizational Maintenance, Section III. Repair parts authorized for organizational maintenance are included in this section.

Note. All indexes noted below are cross referenced to index numbers. The index numbers appear in ascending sequence in column 1 of the repair parts list (para D-3a). The index number for the particular item will be the same for the item in all sections of this appendix

c. *Federal Stock Number Cross-Reference to Index Number, Section IV.* This is a cross- reference index of Federal stock number to index numbers.

d. Figure and Item Number Cross-Reference to Index Number, Section V. This is a cross- reference index of figure number and item number (or reference designation) to index number. The figure numbers are listed in numerical sequence; item numbers and/or reference designations are listed for each figure.

e. Reference Designation Cross-Reference to Index Number, Section VI. This is a cross-reference index of reference and/or item numbers to index numbers.

D-3. Explanation of Columns

An explanation of the columns is given below.

a. Source, Maintenance, and Recoverability Codes (SMR) and Index Numbers Column. The first line in this column lists the applicable SMR codes for the part. Listed in ascending order, within each group, directly below the SMR codes is the index number assigned to the repair part.

(1) *Source code (S*). The selection status and source for the listed item is noted here. Source codes and their explanations are as follows:

Code	*Explanation*
P	Applies to repair parts that are stocked in or supplied from the GSA/DSA, or Army supply system, and authorized for use at indicated maintenance categories.
G	Applies to major assemblies that are procured with PEMA funds for initial issue only to be used as exchange assemblies at DSU and GSU category. These assemblies will not be stocked above DSU and GSU category or re- turned to depot supply category.

(2) Maintenance code (M). The lowest category of maintenance authorized to install the listed item is noted here.

Code	*Explanation*
C	Operator, crew
O	Organizational maintenance Operator/crew

(3) *Recoverability code (R).* The information in this column indicates whether unserviceable item should be returned for recovery or salvage. Re-

coverability code and its explanations 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 which are economically repairable at DSU and GSU activities and normally are furnished by supply on an exchange basis.

b. Federal Stock Number Column. The Federal stock number for the item is listed in this column.

c. Description Column. This column indi-cates the Federal item name and any additional description of the item required, the manufacturer's part number (reference number), and the applicable five-digit Federal supply code for manufacturers (para D-5). Usable on code column is not used. For subsequent appearances of the same item, the manufacturer's code and part number (reference number) are omitted. The words "same as" followed by the index number assigned to the item when it first appeared in the list will follow the item name, e.g., "RESISTOR, FIXED, COMPOSITION: SAME AS A298."

d. Unit of Measure Column. The unit used as a basis of measure (e.g., ea, pr, ft, yd, etc.) is indicated in this column.

e. Quantity Incorporated in Unit Column. The quantity of repair parts in an assembly is given in this column.

f. Maintenance Allowances Column.

(1) The maintenance allowance columns are divided into subcolumns. Indicated in each subcolumn opposite the first appearance of each item is the total quantity of items authorized for the number of equipments supported. Subsequent appearances of the same item will have no entry in the allowance columns, but will have a reference in the description column to the first appearance of the item. Items authorized for use as required, but not for initial stockage, are identified with an asterisk in the allowance column.

(2) The quantitative allowances for organizational category of maintenance represents one initial prescribed load for a 15-day period for the number of equipments supported. Units and organizations authorized addition prescribed loads will multi], the number of prescribed loads author-ized by the quantity of repair part is reflected in the appropriate density column to obtain the total quantity of repair parts authorized.

(3) Subsequent changes to organizational allowances will be limited as follows: No change in the range of items is authorized. If additional items are considered necessary, recommendation should be forwarded to Commanding General, U.S. Army Electronics Command, ATTN: AMSEL-ME-NMP-R, Fort Monmouth, N.J.07703, for exception or revision to the allowance list. Revisions to the range of items authorized will be made by the USA ECOM National Maintenance Point based upon engineering experience, demand data, or TAERS information.

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 callout number or reference designation used to reference the item in the illustration appears in this column.

D-4. Location of Repair Parts

a. This appendix contains three cross-reference indexes (secs. IV, V, and VI), to be used to locate a repair part when either the Federal stock number, reference number (manufacturer's part number), figure number, or reference designation is known. The first column in each cross-reference index is prepared, as applicable, in numerical or alphanumerical sequence. The last column of each cross-reference index lists the index number assigned to the part

b. Refer to the appropriate cross-reference

index (para D-2*c*, *d*, and *e*) and note the index number in the last column; then refer to the repair parts list to locate the index number which is listed in ascending order in column 1 of the repair parts list.

D-5. Federal Supply Codes

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

Code	*Manufacturer*
49956	Raytheon Co.
71744	Chicago Miniature Lamp Works
80058	Joint Electronic Type Designation System
80063	Army Electronics Command
80211	Motorola Inc. Chicago Center, Government Electronics Div.
81349	Military Specifications
88044	Aeronautical Standards, Gr.
94990	Motorola Inc. Government Electronics Div.
96906	Military Standards

SECTION II. PRESCRIBED LOAD ALLOWANCE (CONTINUED)

(1) FEDERAL STOCK NUMBER	(2) DESCRIPTION USABLE ON CODE	(3) 15-DAY ORG. MAINT. ALLOWANCE (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100
	ACCESSORY KIT, ELECTRONIC EQUIPMENT SM-D-497709				
2910-305-2881	ADAPTER, FUEL CAN TO HOSE: SCC99551; 80058	*	*	1	1
4720-091-8813	HOSE ASSEMBLY: AN6270-4-72; 88044	*	*	1	1
5935-636-9117	ADAPTER, CONNECTOR: UG-999A/U	*	*	1	1
6240-947-2787	LAMP, INCANDESCENT: Yellow light, located in shelter; SM-B-497597; 80063	1	2	3	5
8125-926-9116	BOTTLE, SCREW CAP: N1-35; 81349	*	*	1	1
	GROUP 1 POWER SUPPLY PP-4338/TKQ-2				
5920-280-5002	FUSE, CARTRIDGE: F03A250VO10A; 81349 (Note: 1 installed, 1 spare.)	1	2	5	8
5920-284-7732	FUSE, CARTRIDGE: FO3A250V8A; 81349 (Note: 1 installed, 1 spare.)	1	2	3	5
5920-296-0679	FUSE, CARTRIDGE: FO3A250V5A; 81349 (Note: 1 installed, 1 spare.)	1	2	3	5
5920-296-1517	FUSE, CARTRIDGE: F03A25OV3A; 81349 (Note: 3 installed, 1 spare.)	2	4	8	13
5920-665-2881	FUSE, CARTRIDGE: FO3A250VLA; 81349 (Note: 1 installed, 1 spare.)	1	2	5	8
5960-543-1753	ELECTRON TUBE: 6528; 81349	1	3	6	10
5960-577-3078	ELECTRON TUBE: 5687WA; 81349	2	4	8	13
5960-681-0301	SHIELD, ELECTRON: MS24232-5; 96906	1	2	4	6
5960-988-6450	SHIELD, ELECTRON: MS24279-1; 96906	1	2	4	6
6240-155-7836	LAMP: MS25237-327; 96906	1	2	5	8
6240-155-7857	LAMP: MS25237-328 96906	1	2	5	8
	GROUP 1A1				
	POWER SUPPLY ECOM DWG SM-D-496693				
5960-583-4071	ELECTRON TUBE: 5744WB; 81349	1	3	6	10
5960-690-9657	ELECTRON TUBE: 6112; 81349	1	3	6	10
	GROUP 2A2				
	AMPLIFIER, DC ECOM DWG SM-D-496700				
5960-261-8679	ELECTRON TUBE: 6021; 81349	2	5	9	15

SECTION II. PRESCRIBED LOAD ALLOWANCE (CONTINUED)

(1) FEDERAL STOCK NUMBER	(2) DESCRIPTION USABLE ON CODE	(3) 15-DAY ORG. MAINT. ALLOWANCE (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100
5960-686-7952	SHIELD, ELECTRON: SM-C-496798; 80063	*	1	2	3
5960-809-2028	SHIELD, ELECTRON: MS24276-6; 96906	*	*	1	1
	ELECTRON TUBE: 6082WA; 81349	1	2	5	8
	GROUP 2A3				
	AMPLIFIER, DC ECOM DWG SM-D-496701				
5960-892-3461	ELECTRON TUBE: 6082WB; 81349				
	1	1	2	5	8
	GROUP 3				
	DECODER, VIDEO KY-564/TXQ-2				
5355-616-9659	KNOB: MS91525-1; 96906	*	1	1	2
5355-656-1358	KNOB: MS91525-2; 96906	*	*	1	1
6240-723-3378	LAMP, NEON:SM-B-497418; 80063	1	2	5	8
	GROUP 3A1				
	DECODER, PULSE ECOM DWG SM-D-496706				
5960-193-5145	ELECTRON TUBE: 5751; 81349	2	6	12	20
5960-262-0210	ELECTRON TUBE: 5814A; 81349	1	3	6	10
5960-752-0249	SHIELD, ELECTRON: MS24232-4; 96906	*	1	1	2
5960-846-6372	ELECTRON TUBE: 5670; 81349	1	3	6	10
	GROUP 3A2				
	GENERATOR, SWEEP ECOM DWG SM-D-496707				
5960-262-0167	ELECTRON TUBE: 12AT7WA; 81349	1	3	6	10
	GROUP 3A3				
	GENERATOR, REF ECOM DWG SM-D-496708				
5960-237-6917	ELECTRON TUBE: 5725; 81349	1	2	5	8
5960-681-9768	SHIELD, ELECTRON: MS24232-1; 96906	*	*	1	1
	GROUP 3A5				
	AMPLIFIER, SERVO ECOM DWG SM-D-496710				
5960-262-1357	ELECTRON TUBE: 5654/6AK5W; 81349	1	2	3	5
5960-518-3091	ELECTRON TUBE: 6005; 81349	1	2	3	5
5960-686-8086	SHIELD, ELECTRON: MS24232-3; 96906	*	*	1	1
	GROUP 3A7				
	AMPLIFIER ECOM DWG SM-D-49712				
5960-605-9192	ELECTRON TUBE: 6829; 81349	1	2	5	8
5960-725-0527	SHIELD, ELECTRON: MS24232-6; 96906	*	*	1	1

SECTION II. PRESCRIBED LOAD ALLOWANCE (CONTINUED)

(1) FEDERAL STOCK NUMBER	(2) DESCRIPTION USABLE ON CODE	(3) 15-DAY ORG. MAINT. ALLOWANCE (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100
	GROUP 5 SHELTER, ELECTRICAL EQUIPMENT S-339/TKQ-2				
5340-999-9090	HAND CRANK: KMPHK160-00; GEROH	*	*	1	1
5355-925-6890	KNOB, PRESSURE: SM-C-497457; 80063 (Note: Used on the upper and lower clamp to secure antenna.)	*	1	1	2
5840-999-6903	HOLDER, ROLLER ACID CONTAINER: SM-D-497681; 80063	*	*	1	1
5985-923-0549	ADAPTER, ANTENNA TO ANTENNA BASE: SM-D-497600; 80063	*	*	1	1
6640-999-4743	CAP, ACID CNTR: SM-C-497677; 80063	*	*	1	1
	BOTTLE, SCREW CAP: SM-C-497674; 80063	*	*	1	1
	GROUP 9A1 RECEIVER SUBASSEMBLY MX-6838A/G				
5355-087-9037	KNOB: SM-B-510266; 80063	*	*	1	1
5355-995-7288	KNOB: MS91522-1; 96906	*	*	1	1
6240-155-8706	LAMP: MS15571-2; 96906	1	2	5	8
	GROUP 9A1A2 AMPLIFIER, IF.ECOM DWG SM-D-509531				
5960-060-6613	ELECTRON TUBE: 7586; 81349	2	4	8	13
	GROUP 9A1A3 OSCILLATOR, RF ECOM DWG SM-D-509625				
5960-230-5226	ELECTRON TUBE: 5636; 81349	1	2	3	5
5960-883-0971	ELECTRON TUBE: 7486; 81349	2	4	8	13
	GROUP 9A2 RECEIVER SUBASSEMBLY MX-6833/G				
5920-280-8342	FUSE, CARTRIDGE: FO2A250VIA; 81349	1	3	6	10
	FUSE, CARTRIDGE: FO2B120V2A; 81349	1	2	5	8
	GROUP 9 RECEIVER, RADIO R-1335A/G				
5355-680-1357	KNOB, CONTROL: MS91528-IF2B; 96906	*	1	1	2
5355-814-0470	KNOB, CONTROL: MS91528-OFIB; 96906	1	2	r	8
5920-010-6652	FUSE, CARTRIDGE: FO2A250V3A; 81349	1	2	5	8

SECTION II. PRESCRIBED LOAD ALLOWANCE (CONTINUED)

(1) FEDERAL STOCK NUMBER	(2) DESCRIPTION USABLE ON CODE	(3) 15-DAY ORG. MAINT. ALLOWANCE (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100
	LIGHT, PANEL: (Red); 65-29393L01; 94990	1	2	5	8
	DRAWER, ASSEMBLY RECEIVER MOTOROLA PART NO. 01-34719BO1				
5355-556-0145	KNOB (MEGACYCLES): MS91528-1K2B; 96906	*	*	1	2
	DIAL-KNOB LOCK, ELECTRONIC COMPONENT: KL1251G; 49956	*	*	1	1
	KNOB, CRANK: 36-31529BO1; 80211	*	*	1	1
	LAMP, INCANDESCENT: 65-15054A12; 71744	1	2	5	8
	GROUP 11A1 DETECTOR ECOM DWG SM-D-497876				
5955-813-6397	CRYSTAL: CR37A/U (128 KC); 81349	*	*	1	1

SECTION III. REPAIR PARTS FOR ORGANIZATIONAL MAINTENANCE

(1)	(2)	(3)	(4)	(5)	(6)				(7)		
					15-DAY ORGANIZATIONAL MAINTENANCE ALW				ILLUS-TRATION		
SMR CODE	FEDERAL STOCK NUMBER	DESCRIPTION REF NUMBER & MFR CODE — USABLE ON CODE	UNIT OF MEAS	QTY INC IN UNIT	(a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(a) FIG NO.	(b) ITEM NO.	
G-C-R AOO1	5840-788-5218	REIVINC SET, RADAR DATA AN/Tl-2: (This item is nonexpendable.) ACCESSORY KIT, ELECTRONIC EQUIPMENT S-D-497709							1-1		
P-C 1999B	5935-636-9117	ADAPTER, CONNECTOR UG-999A/U	ea	1	*		*	1	1-17 1-22 2-7		6CP1
P-C I99C	8125-926-9116	BOTTLE, SCREW CAP: NO-35: 81349	ea	1	*	*	1	1			
P-C	2910-305-2881	ADAPTER,FUEL CAN TO HOSE: SCC99551; 80058	ea	1	*	*	1	1	1-22		
P-C J022	4720-091-8813	HOSE ASSEMBLY: AN6270-4-72; 88044	ea	1	*	*	1	1	1-22		
P-C J023J	6240-947-2787	LAMP, INCANDESCENT: Yellow light, located in shelter; SM-B-497597; 80063 GROUP 1 POWER SUPPLY PP-4338/TKQ-2	ea	1	1	2	3	5			
P-C 1V6 B147	5960-577-3078	ELECTRON TUBE: 5687WA; 81349	ea	3	2	4	8	13		1V2,	1V5,
P-C 1V4 B148	5960-543-1753	ELETRON TUBE: 6528; 81349	ea	3	1	3	6	10		1V1,	1V3,
P-C B157	5920-665-2881	FUSE, CARTRIDGE: F0A250VA; 81349 (Note: 1 installed, 1 spare)	ea	2	1	2	5	8	3-7		1F3
P-C B158	5920-280-5002	FUSE, CARTRIDGE: FO3A250VOA; 81349 (Note: 1 installed, 1 spare)	ea	2	1	2	5	8	3-7		1F7
P-C B159	5920-296-1517	FUSE, CARTRIDGE: F03A25OV3A; 81349 (Note: 3 installed, 1 spare)	ea	4	2	4	8	13	3-7	1F4,	1F5, 1F6
P-C B160	5920-296-0679	FUSE, CARTRIDGE: PO3A250A; 81349 (Note: 1 installed, 1 spare)	ea	2	1	2	3	5	3-7		1F1
P-C B161	5920-284-7732	FUSE, CARTRIDGE: P03A250V8A, 81349 (Note: 1 installed, 1 spare)	ea	2	1	2	3	5	3-7		1F2
P-C B165	6240-155-7836	LAMP: MS25237-327, 96906	ea	1	1	2	5	8	3-7		1DS1
P-C B165A	6240-155-7857	LAMP: MS25237-328; 96906	ea	1	1	2	5	8	3-7		1DS2
P-O B194	5960-681-0301	SHIELD, ELECTRON: MS24232-5; 96906	ea	3	1	2	4	6			
P-O B195	5960-988-6450	SHIELD, ELECTRON: MS24279-1,96906	ea	3	1	2	4	6			
		GROUP 1A1 POWER SUPPLY ECOM DWG SM-D-496694									
P-C B033	5960-583-4071	ELECTRON TUBE: 5744WB, 81349	ea	1	1	3	6	10			1A1V1
P-C	5960-690-9657	ECECTRON TUBE:6112, 81349	ea	1	1	3	6	10			1AV2
		GROUP 1A2 POWER SUPPLY ECOM MN SOD-496694									
P-C B033	5960-583-4071	ELECTRON TUBE: SAME AS BOO6	ea	1							1A2V1
P-C B034	5960-690-9657	ELECTRON TUBE: SAME AS B007	ea	1							1A2V2
		GROUP 1A3 POWER SUPPLY ECOM DWG SM-D-496695									
P-C B063	5960-583-401	ELECTRON TUBE: SAME AS B006	ea	1							1A3V1
P-C B064	5960-690-9657	ELECTRON TUBE: SAME AS B007	ea	1							1A3V2

SECTION III. REPAIR PARTS FOR ORGANIZATIONAL MAINTENANCE (CONTINUED)

(1) SMR CODE INDEX NO.	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REF NUMBER & MFR CODE / USABLE ON CODE	(4) UNIT OF MEAS UNIT	(5) QTY INC IN	(6) 15-DAY ORGANIZATIONAL MAINTENANCE ALW (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(7) ILLUSTRATION (a) FIG NO.	(b) ITEM NO.
		GROUP 1A4 POWER SUPPLY ECOM DWG SM-D-496696 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL GROUP 2 INDICATOR, RADAR MAPPING IP-795/TKQ-2 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL GROUP 2A1 INTERCONNECTING BOX ECOM DWG SM-D -497649 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL GROUP 2A2 AMPLIFIER, DC ECOM DWG SM-D-496700									
P-C C107	5960-261-8679	ELECTRON TUBE: 6021; 81349	ea	6	2	5	9	15		2A2V1, 2A2V2, 2A2V3, 2A2V5, 2A2V6, 2A2V7
P-C C108		ELECTRON TUBE: 6082WA, 81349	ea	2	1		2	5	8	2A2V4, 2A2V8
P-0 C122	5960-809-2028	SHIELD, ELECTRON: MS24276-6; 96906	ea	2	*	*		1	1	
P-0 C123	5960-686-7952	SHIELD, ELECTRON: SM-C-496798; 80063	ea	6	*	1	2	3		
		GROUP 2A3 AMPLIFIER, DC, ECOM DWG SM-D-496701								
P-C C178	5960-261-8679	ELECTRON TUBE: SAME AS C107	ea	6						2A31, 2A3V2, 2A3V3, 2A3V5, 2A3V6, 2A3V7
P-C C179	5960-892-3461	ELECTRON TUBE: 6082WB; 81349	ea	2	1	2	5	8		2A3V4, 2A3V8
P-0 C193	5960-809-2028	SHIELD, ELECTRON: SAME AS C122	ea	2						
P-0 C194	5960-686-7952	SHIELD, ELECTRON: SAME AS C123	ea	6						
		GROUP 2A4, 2A5 INDICATOR, RANGE, ECOM DWG SM-D-496702 NO PARTS AUTHORIZED FOR STOCKAGE AT OGANIZATIONAL GROUP 3 DECODER, VIDEO KY-564/TKQ-2								
P-0 D558	5355-616-9659	KNOB: MS91525-1; 96906	ea	3	*	1	1	2	3-3	
P-C D559	6240-723-3378	LAMP, NEON: SM-B-497418, 80063	ea	4	1	2	5	8	3-3	3DS1 thru 3DS4
P-0 D619A	5355-656-1358	KNOB: MS91525-2; 96906	ea	1	*	*	1	1	3-3	
		GROUP 3A1 DECODER, PULSE ECOM DWG SM-D-496706								
P-C DO50A	5960-846-6372	ELECTRON TUBE: 5670; 81349	ea	2	1	3	6	10		3A1V5, 3A1V7
P-C DO51	5960-193-5145	ELECTRON TUBE: 5751; 81349	ea	3	2	6	12	20		3A1V3, 3A1V4, 3A1V6
P-C D052	5960-262-0210	ELECTRON TUBE: 5814A; 81349	ea	2	1	3	6	10		3A1V1, 3A1V2
P-0	5960-752-0249	SHIELD, ELECTRON: MS24232-4; 96906	ea	2	*	1	1	2		
P-O DO67	5960-681-0301	SHIELD, ELECTRON: SAME AS B194	ea	5						

SECTION III. REPAIR PARTS FOR ORGANIZATIONAL MAINTENANCE (CONTINUED)

(1) SMR CODE INDEX NO.	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REF NUMBER & MFR CODE	USABLE ON CODE	(4) UNIT OF MEAS UNIT	(5) QTY INC IN	(6) 15-DAY ORGANIZATIONAL MAINTENANCE ALW (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(7) ILLUSTRATION (a) FIG NO.	(b) ITEM NO.
		GROUP 3A2 GENERATOR, SWEEP ECOM DWG SM-D-496707									
P-C D120	5960-262-0167	ELECTRON TUBE: 12AT7WA; 81349		ea	3	1	3	6	10		3A2V1, 3A2V4, 3A2V5
P-C D121	5960-193-5145	ELECTRON TUBE: SAME AS DO51		ea	3						3A2V3, 3A2V6, 3A2V7
P-C D122	5960-262-0210	ELECTRON TUBE: SAME AS D052		ea	1						3A2V2
P-0 D135	5960-681-0301	SHIELD, ELECTRON: SAME AS B194		ea	7						
		GROUP 3A3 GENERATOR, REF ECOM DWG SM D-496708									
P-C D209	5960-262-0167	ELECTRON TUBE: SAME AS D120		ea	2						3A3V2, 3A3V7
P-C D210	5960-237-6917	ELECTRON TUBE: 5725; 81349		ea	1	1	2	5	8		3A3V4
P-C D211	5960-193-5145	ELECTRON TUBE: SAME AS D051		ea	4						3A3VI, 3A3V3, 3A3V5, 3A3V8
P-C D212	5960-262-0210	ELECTRON TUBE: SAME AS D052		ea	1						3A3V6
P-0 D230	5960-681-9768	SHIELD, ELECTRON: MS24232-1; 96906		ea	1	*	*	1	1		
P-0 D231	5960-681-0301	SHIELD, ELECTRON: SAME AS B194		ea	7						
		GROUP 3A4 SYNCHRONIZER ECOM DWG SM-D-496709									
P-C D281	5960-262-0167	ELECTRON TUBE: SAME AS D120		ea	2						3A4V1, 3A4V3
P-C D282	5960-577-3078	ELECTRON TUBE: SAME AS B147		ea	1						3A4V4
P-O D283	5960-193-5145	ELECTRON TUBE: SAME AS D051		ea	1						3A4V5
P-C D284	5960-262-0210	ELECTRON TUBE: SAME AS D052		ea	2						3A4V2, 3A4V6
P-O D291	5960-681-0301	SHIELD, ELECTRON: SAME AS B194		ea	6						
		GROUP 3A5 AMPLIFIER, SERVO ECOM DWG SM-D-496710									
P-C D351	5960-262-1357	ELECTRON TUBE: 5654/6AK5W; 81349		ea	1	1	2	3	5		3A5V5
P-C D352	5960-846-6372	ELECTRON TUBE: SAME AS D050A		ea	1						3A5V4
P-C D353	5960-237-6917	ELECTRON TUBE: SAME AS D210		ea	1						3A5V2
P-C D354	5960-193-5145	ELECTRON TUBE: SAME AS DO51		ea	3						3A5V1, 3A5V3, 3A5V6
P-C D355'	5960-518-3091	ELECTRON TUBE: 6005; 81349		ea	2	1	2	3	5		3A5V7, 3A5V8
P-0 D378	5960-681-9768	SHIELD, ELECTRON: SAME AS D230		ea	2						
P-0 D379	5960-686-8086	SHIELD, ELECTRON: MS24232-3; 96906		ea	2	*	*	1	1		
P-0 D380	5960-752-0249	SHIELD, ELECTR0N: SAME AS D066A		ea	1						

SECTION III. REPAIR PARTS FOR ORGANIZATIONAL MAINTENANCE (CONTINUED)

(1) SMR CODE INDEX NO.	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REF NUMBER & MFR CODE — USABLE ON CODE	(4) UNIT OF MEAS UNIT	(5) QTY INC IN	(6) 15-DAY ORGANIZATIONAL MAINTENANCE ALW (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(7) ILLUSTRATION (a) FIG NO.	(b) ITEM NO.
P-0 D381	5960-681-0301	SHIELD, ELECTRON: SAME AS B194	ea	3						
		GROUP 3A6 MONITOR, VOLTAGE, ECOM SM-D-496711 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL GROUP 3A7 AMPLIFIER ECOM DWG SM-D-49712								
P-C D469	5960-846-6372	ELECTRON TUBE: SAME AS D050A	ea	2						3A7V2, 3A7V3
P-C D470	5960-193-5145	ELECTRON TUBE: SAME AS D051	ea	1						3,A7V1
P-C D471	5960-605-9192	ELECTRON TUBE: 6829; 81349	ea	2	1	2	5	8		3A7V4, 3A7V5
P-0 D485	5960-752-0249	SHIELD, ELECTRON: SAME AS D066A	ea	2						
P-0 D486	5960-681-0301	SHIELD, ELECTRON: SAME AS B194	ea	1						
P-0 D486A	5960-725-0527	SHIELD, ELECTRON: MS24232-6; 96906	ea	2	*	*	1	1		
		GROUP 4 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL GROUP 5 SHELTER, ELECTRICAL EQUIPMENT S-339/TKQ-2								
P-C F053	5985-923-0549	ADAPTER, ANTENNA TO ANTENNA BASE: SM-D-497600; 80063	ea	1	*	*	1	1	2-4	
P-0 F062B		BOTTLE , SCREW CAP: C-497674; 80063	ea	1	*	·	1	1	1-30	
P-0 F062E	6640-999-4743	CAP, ACID CNTR: SM-C-497677; 80063	ea	1	*	*	1	1	1-30	
P-0 F062T	5840-999-6903	HOLDER, ROLLER ACID CONTAINER: SM-D-497681; 80063	ea	1	*	*	1	1	1-30	
P-C F203	5340-999-9090	HAND CRANK: KMPHK160-00; GEROH	ea	1	*	*	1	1	1-3	
P-0 F406C	5355-925-6890	KNOB, PRESSURE: SM-C-497457; 80063 (NOTE: Used on the upper and lower clamp to secure antenna.)	ea	3	*	1	1	2		
		GROUP 6 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL GROUPS 7 AND 8 AIR CONDITIONER NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL GROUP 9 RECEIVER, RADIO R-1335/G GROUP 9A1 RECEIVER SUBASSEMBLY MX-6838A/G									
P-C A946A	6240-155-8706	LAMP: MS15571-2; 96906	ea	2	1	2	5	8	4-1	9A1DS1, 9A1DS2
P-0 B001	5355-995-7288	KNOB: MS91522-1; 96906	ea	1	*	*	1	1	1-9 3-1	
P-0 B001F	5355-087-9037	KNOB: SM-B-510266; 80063	ea	1	*	*	1	1	1-9 3-1	
		GROUP 9A1A1 PRESELECTOR ECOM DWG SM-D-510001 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL								

SECTION III. REPAIR PARTS FOR ORGANIZATIONAL MAINTENANCE (CONTINUED)

(1) SMR CODE INDEX NO.	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REF NUMBER & MFR CODE / USABLE ON CODE	(4) UNIT OF MEAS UNIT	(5) QTY INC IN	(6) 15-DAY ORGANIZATIONAL MAINTENANCE ALW (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(7) ILLUSTRATION (a) FIG NO.	(b) ITEM NO.
		GROUP 9A1A1A1 TUNING UNIT, RF ECOM DWG SM-D-510026 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL GROUP 9A1A1A2 DRIVE ASSEMBLY PRESELECTOR ECOM DWG SM-D-510021 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL GROUP 9A1A1A1A3 TO SERIAL NO. 35 THEN 9A1A1A3 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL GROUP 9A1A2 AMPLIFIER, IF. ECOM DWG SM-D-509531									
P-C A195	5960-060-6613	ELECTRON TUBE: 7586; 81349	ea	3	2	4	8	13		9A1A2V1, 9A1A2V2, 9A1A2V3
		GROUP 9A1A3 OSCILLATOR, RF ECOM DWG SM-D-509625								
P-C A237	5960-883-0971	ELECTRON TUBE: 7486; 81349	ea	1	2	4	8	13		9A1AV2
P-C A259	5960-230-5226	ELECTRON TUBE: 5636, 81349	ea	1	1	2	3	5		9A1A3V4
P-C A260	5960-883-0971	ELECTRON TUBE: SAME AS A237	ea	3						9A1A3V3, 9A1A3V1, 9A1A3V5
		GROUP 9A1A4 AMPLIFIER, IF. ECOM DWG SM-D-509390 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL GROUP 9A1A5 OSCILLATOR, RF ECOM DWG SM-D-509626 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL GROUP 9A1A6 DETECTOR, RF ECOM DWG SM-D-509326 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL GROUP 9A1A7 OSCILLATOR, RF ECOM DWG SM-D-509534 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL GROUP 9A2 RECEIVER SUBASSEMBLY MX-6833/G									
P-C B855	5920-280-8342	FUSE, CARTRIDGE: F02A250V1A; 81349	ea	3	1	3	6	10	1-9 3-1	9A2F3, 9A2F4, 9A2F5
P-C B856A		FUSE, CARTRIDGE: F0B120V2A; 81349	ea	2	1	2	5	8	9-1 3-1	9A2F1, 9A2F2
P-C B869	5355-616-9659	KNOB: SAME AS D558	ea	4					3-1	
P-C B870	6240-155-7857	LAMP: SAME AS B165A	ea	1						9A2DS1
		GROUP 9A2A1 FILTER BAND PASS ECOM DWG SM-D-509339								
P-C B094	5960-060-6613	ELECTRON TUBE: SAME AS A195	ea	1						9A2A1V1
		GROUP 9A2A2 AMPLIFIER, IF. ECOM DWG SM-D-509539 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL								

SECTION III. REPAIR PARTS FOR ORGANIZATIONAL MAINTENANCE (CONTINUED)

(1) SMR CODE INDEX NO.	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REF NUMBER & MFR CODE / USABLE ON CODE	(4) UNIT OF MEAS UNIT	(5) QTY INC IN	(6) 15-DAY ORGANIZATIONAL MAINTENANCE ALW (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(7) ILLUSTRATION (a) FIG NO.	(b) ITEM NO.
		GROUP 9A2A3 AMPLIFIER, IF. ECOM DWG SM-D-509544 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL								
		GROUP 9A2A4 DETECTOR, RF ECOM DWG SM-D-509541 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL								
		GROUP 9A2A5 AMPLIFIER, AF ECOM DWG SM-D-509352 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL								
		GROUP 9A2A6 DETECTOR, RF ECOM DWG SM-D-509377 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL								
		GROUP 9A2A7 DETECTOR, RF ECOM DWG SM-D-509546 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL								
		GROUP 9A2A8 POWER SUPPLY ECOM DWG SM-D-509508 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL								
		GROUP 9 RECEIVER, RADIO R-1335A/G								
P-C AI62	5920-280-8342	FUSE, CARTRIDGE: SAME AS B855	ea	2						9F103, 9F104
P-C AI64	5920-010-6652	FUSE, CARTRIDGE: F02A250V3A; 81349	ea	2	1	2	5	8		9F101, 9F102
P-0 B533	5355-680-1357	KNOB, CONTROL: MS91528-1F2B; 96906	ea	3	*	1	1	2		9MP13, 9MP14, 9MP15
P-0 E045	5355-814-0470	KNOB, CONTROL: MS91528-OF1B; 96906	ea	1	1	2	5	8		9MP27
P-0 E046		LIGHT, PANEL: (Red); 65-29393LO1; 94990	ea	1	1	2	5	8		9DS102
		DRAWER, ASSEMBLY RECEIVER MOTOROLA PART NO. 01-34719BO1								
P-0 E438		DIAL-KNOB LOCK, ELECTRONIC COMPONENT: KL1251G; 49956	ea	1	*	*	1	1		9A17A1MP36
P-C E527	5920-280-8342	FUSE, CARTRIDGE: SAME AS B855	ea	1						9A17A1F101
P-C E528	5920-010-6652	FUSE, CARTRIDGE: SAME AS A164	ea	2						9A17A1F102, 9A17A1F103
P-0 E537	5355-814-0470	KNOB, CONTROL: SAME AS EO45	ea	4						9A17A1MP43, 9A17A1MP44, 9A17A1MP45, 9A17A1MP46
P-0 E541	5355-556-0145	KNOB (MEGACYCLES): MS91528-1K2B; 96906	ea	1	*	*	1	2		9A17A1MP47
P-O		KNOB, CRANK: 36-31529BO1; 80211	ea	1	*	*	1	1		9A17A1MP48
P-C E543	6240-155-7836	LAMP, INCANDESCENT: SAME AS B165	ea	3						9A17A1DS1, 9A17A1DS101, 9A17A1DS102
P-C E546		LAMP, INCANDESCENT: 65-15054A12; 71744	ea	1	1	2	5	8		9A7A1DS2
		GROUP 10 POWER SUPPLY PP-4339/TKQ-2 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL								

SECTION III. REPAIR PARTS FOR ORGANIZATIONAL MAINTENANCE (CONTINUED)

(1) SMR CODE INDEX NO.	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION / REF NUMBER & MER CODE / USABLE ON CODE	(4) UNIT OF MEAS UNIT	(5) QTY INC IN	(6) 15-DAY ORGANIZATIONAL MAINTENANCE ALW (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(7) ILLUSTRATION (a) FIG NO.	(b) ITEM NO.
		GROUP 11 CONVERTER, STORAGE, SIGNAL DATA CV-2093/TKQ-2 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL								
		GROUP 11A1 DETECTOR ECOM DWG SM-D-497876								
P-C L018	5955-813-6397	CRYSTAL: CR37A/U (128 KC); 81349	ea	1	*	*	1	1		11A1Y1
		GROUP 11A2 DIVIDER, FREQUENCY ECOM DWG SM-D-497877 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL								
		GROUP 11A3 DIVIDER, FREQUENCY ECOM DWG SM-D-497878 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL								
		GROUP 11A4, 6, 8, 11 REGISTER, SHIFT ECOM DWG SM-D-497879 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL								
		GROUP 11A10 COMPARATOR ECOM SM-D-497881 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL								
		GROUP 11A12 COUPLER, DIGITAL ECOM DWG SM-D-497882 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL								
		GROUP 11A13 POWER SUPPLY ECOM DWG SM-D-497883 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL								
		TEST FACILITIES KIT MK-1148/TKQ-2 NO PARTS AUTHORIZED FOR STOCKAGE AT ORGANIZATIONAL								

SECTION IV. INDEX-FEDERAL STOCK NUMBER CROSS REFERENCE

TO INDEX NUMBER

FEDERAL STOCK NUMBER	INDEX NO.
2910-305-2881	J018
4720-091-8813	J022
5340-999-9090	F203
5355-087-9037	B001F
5355-556-0145	E541
5355-616-9659	D558
5355-656-1358	D619A
5355-680-1357	B533
5355-814-0470	E045
5355-925-6890	F406C
5355-995-7288	B001
5840-788-5218	A001
5840-999-6903	F062T
5920-010-6652	A164
5920-280-5002	B158
5920-280-8342	B855
5920-284-7732	B161
5920-296-0679	B160
5920-296-1517	B159
5920-665-2881	B157
5935-636-9117	I999B
5955-813-6397	L018
5960-060-6613	A195
5960-193-5145	D051
5960-230-5226	A259
5960-237-6917	D210
5960-261-8679	C107
5960-262-0167	D120
5960-262-0210	D052
5960-262-1357	D351
5960-518-3091	D355
5960-543-1753	B148
5960-577-3078	B147
5960-583-4071	3006
5960-605-9192	D471
5960-681-0301	B194
5960-681-9768	D230
5960-686-7952	C123
5960-686-8086	D379
5960-690-9657	B007
5960-725-0527	D486A
5960-752-0249	D066A
5960-809-2028	C122
5960-846-6372	D050A
5960-883-0971	A237
5960-892-3461	C179
5960-988-6450	B195
5985-923-0549	F053
6240-155-7836	B165
6240-155-7857	B165A
6240-155-8706	A946A
6240-723-3378	D559
6240-947-2787	J023J
6640-999-4743	F062E
8125-926-9116	I999C

REF. NUMBER	INDEX NO.
36-31529BO1	E542
65-15054A12	E546
65-29393LO1	E046

SECTION V. INDEX-FIGURE AND ITEM NUMBER CROSS REFERENCE

TO INDEX NUMBER

FIG. NO.	ITEM NO. OR REFERENCE DESIGNATION	INDEX NO	FIG. NO.	ITEM NO. OR REFERENCE DESIGNATION	INDEX NO.
1-9	9A2F3, 9A2F4, 9A2F5	B855			
1-17	6CP1	I999B			
1-22	6CP1	I999B			
2-7	6CP1	1999B			
3-1	9A2F3, 9A2F4, 9A2F5, 9A2F1, 9A2F2	B855 B856A			
3-3	3DS1 thru 3DS4	D559			
3-7	1DS1, 1DS2, 1F1, 1F2, 1F3, 1F4, 1F5, 1F6, 1F7	B165 B165A B160 B161 B157 B159 B158			
9-1	9A2F1, 9A2F2	B856			

SECTION VI. INDEX-REFERENCE DESIGNATION CROSS REFERENCE

TO INDEX NUMBER

REFERENCE DESIGNATION	INDEX NO.
1DS1	B165
1DS2	B165A
1F1	B160
1F2	B161
1F3	B157
1F4, 1F5, 1F6	B159
1F7	B158
1V1	B148
1V2	B147
1V3, 1V4	B148
1V5, 1V6	B147
1A1V1	B006
1A1V2	B007
1A2V1	B003
1A2V2	B034
1A3V1	B063
1A3V2	B064
2A2V1, 2A2V2, 2A2V3	C107
2A2V4	C108
2A2V5, 2A2V6, 2A2V7	C107
2A2V8	C108
2A3V1, 2A3V2, 2A3V3	C178
2A3V4	C179
2A3V5, 2A3V6, 2A3V7	C178
2A3V8	C179
3DS1 thru 3DS4	D559
3A1V1, 3A1V2	D052
3A5V4	D352
3A1V3, 3A1V4	D051
3A1V5	D050A
3A1V6	D051
3A1V7	D050A
3A2V1	D120
3A2V2	D122
3A2V3	D121
3A2V4, 3A2V5	D120
3A2V6, 3A2V7	D121
3A3V1	D211
3A3V2	D209
3A3V3	D211
3A3V4	D210
3A3V5	D211
3A3V6	D212
3A3V7	D209
3A3V8	D211
3A4V1	D281
3A4V2	D284
3A4V3	D281
3A4V4	D282
3A4V5	D283
3A4V6	D284
3A5V1	D354
3A5V2	D353
3A5V3	D354
3A5V5	D351
3A5V6	D354
3A5V7, 3A5V8	D355
3A7V1	D470
3A7V2, 3A7V3	D469
3A7V4, 3A7V5	D471
6CP1	1999B
9A1DS1, 9A1DS2	A946A
9A1A2V1, 9A1A2V2, 9A1A2V3	A195
9A1A3V1	A260
9A1A3V2	A237
9A1A3V3	A260
9A1A3V4	A259
9A1A3V5	A260
9A2DS1	B870
9A2F1, 9A2F2	B856A
9A2F3, 9A2F4, 9A2F5	B855
9A2A1V1	B094

SECTION VI. INDEX-REFERENCE DESIGNATION CROSS REFERENCE TO INDEX NUMBER (CONTINUED)

REFERENCE DESIGNATION	INDEX NO.	REFERENCE DESIGNATION	INDEX NO.	REFERENCE DESIGNATION	INDEX NO.
9A17A1DS1	E543				
9A17A1DS2	E546				
9A17A1DS101, 9A17A1DS102	E543				
9A17A1F101	E527				
9A17ALF102, 9A17A1F103	E528				
9A17A1MP36	E438				
9A17A1MP43. 9A17A1MP44, 9A17A1MP45, 9A17A1MP46	E537				
9A17A1MP47	E541				
9A17A1MP48	E542				
9DS102	E046				
9F101, 9F102	A164				
9F104, 9F105	A162				
9MP13, 9MP14, 9MP15	B533				
9MP27	E045				
11A1Y1	L018				

APPENDIX E
DIFFERENCE DATA FOR AN/TKQ-2A
Section I. DESCRIPTION AND DATA

E-1. Scope

This appendix contains difference data necessary to describe the electrical and physical differences between Receiving Sets, Radar Data AN/TKQ-2 and Receiving Set, Radar Data AN/TKQ-2A. The data contained in the previous chapters of this technical manual apply to both versions of the AN/TKQ-2, except for the deletions, modifications, and additions that change the equipment to the AN/TKQ-2A configuration. The AN/TKQ-2A components are mounted in Shelter, Electrical Equipment S-339B/TKQ-2. The differences in equipment are listed below:

a. Converter-Storer, Signal Data CV-20931 TKQ-2.

This component is deleted in the AN/TKQ-2A configuration.

b. Base, Shock Mount, Electrical Equipment MT-3616/TKQ-2. This mount is used to secure the CV-2093/TKQ-2 and is not used in the AN/TKQ-2A configuration.

c. Decoder, Video KY-564AITKQ-2. This component is the same as the KY-564/TKQ-2 except for changes that make it usable to decode signals from either an AN/AKT-18 or AN!AKT-18A. Changes to the front panel consist of the addition of two switches and two indicator lamps. Internally, the pulse decoder (3A1) module is redesigned to include the original functions and some additional functions, using all solid-state circuitry. Also, minor changes have been made to modules 3A2, 3A3 and 3A7.

d. Recorder-Processor-Viewer, Radar Mapping RO-166FIUP. This component is the same as the RO-166E/UP except for minor internal changes consisting of a modification to the metering roller drive assembly (gear change), the addition of two fluid drain holes, and the addition of insulating compound to aid fluid drainage. For additional details on the differences between RO-166 models, refer to TM 11-5820-680-12.

e. Indicator, Radar Target IP-1236ITKQ-2A. This component is the same as the IP-795/TKQ-2 except for minor changes to two modules in the component to make it operate with both the AN/AKT-18 and AN/AKT-18A.

f. Oscilloscope ANIUSM-281E. This component is added in the AN/TKQ2A configuration and is used to monitor the test video output of Receiver, Radio R-1335A/G. In the shelter, the AN/USM-281E is located in the position of the Receiver-Transmitter, Radio RT-524/VRC which has been relocated to a position above Receiver, Radio R-1335A/G.

g. Mounting Base, Electrical Equipment MT-4803/TKQ-2A. This mounting is used to mount Oscilloscope AN/USM-281E on the Oscilloscope/Communications Receiver-Transmitter Mounting Bracket (h below)

h. Oscilloscope/Communications Receiver-Transmitter Mounting Bracket. This mounting bracket is added to the AN/TKQ-2A configuration to support the mountings of Oscilloscope AN/USM-281E and Receiver-Transmitter, Radio RT-524/VRC.

i. Antenna Mounting Bracket 07-POO034L. This adapter, when attached to Mast AB-924/TKQ-2, permits Antenna AT-197/GR to be used to receive the data transmission in place of Antenna-Radome AS-1097A/GR.

NOTE

Antenna AT-197/GR (NSN 5985-00-219-7454) must be requisitioned by the user.

j. Coax Adapter KH99-09 (Kings Electronics Co.).

This adapter is used to connect antenna cable W6 to Antenna AT-197/GR.

E-2. Purpose and Use

The purpose and use of Receiving Set, Radar Data AN/TKQ-2A is the same as the AN/TKQ-2 except for the differences listed below:

a. Receiving Set, Radar Data AN/TKQ-2A operates with Transmitting Set, Radar Data AN/AKT-18A (airborne portion of data transfer system). The AN/AKT-18A receives radar mapping information from Radar Surveillance Set AN/APS-94D.

b. A permanent photographic film radar map of fixed and moving targets is produced on Recorder-Processor-Viewer, Radar Mapping RO-166F/UP. Radar mapping ranges of 25 of 50 kilometers to the left or right (not both simultaneously) of the aircraft flight path are displayed on the RO-166F/UP.

c. Present position display (ppd) data is not received from the AN/AKT-18A and is not processed in the AN/TKQ-2A.

d. Signal flow through components of the AN/TKQ-2A is shown in figure E-1.

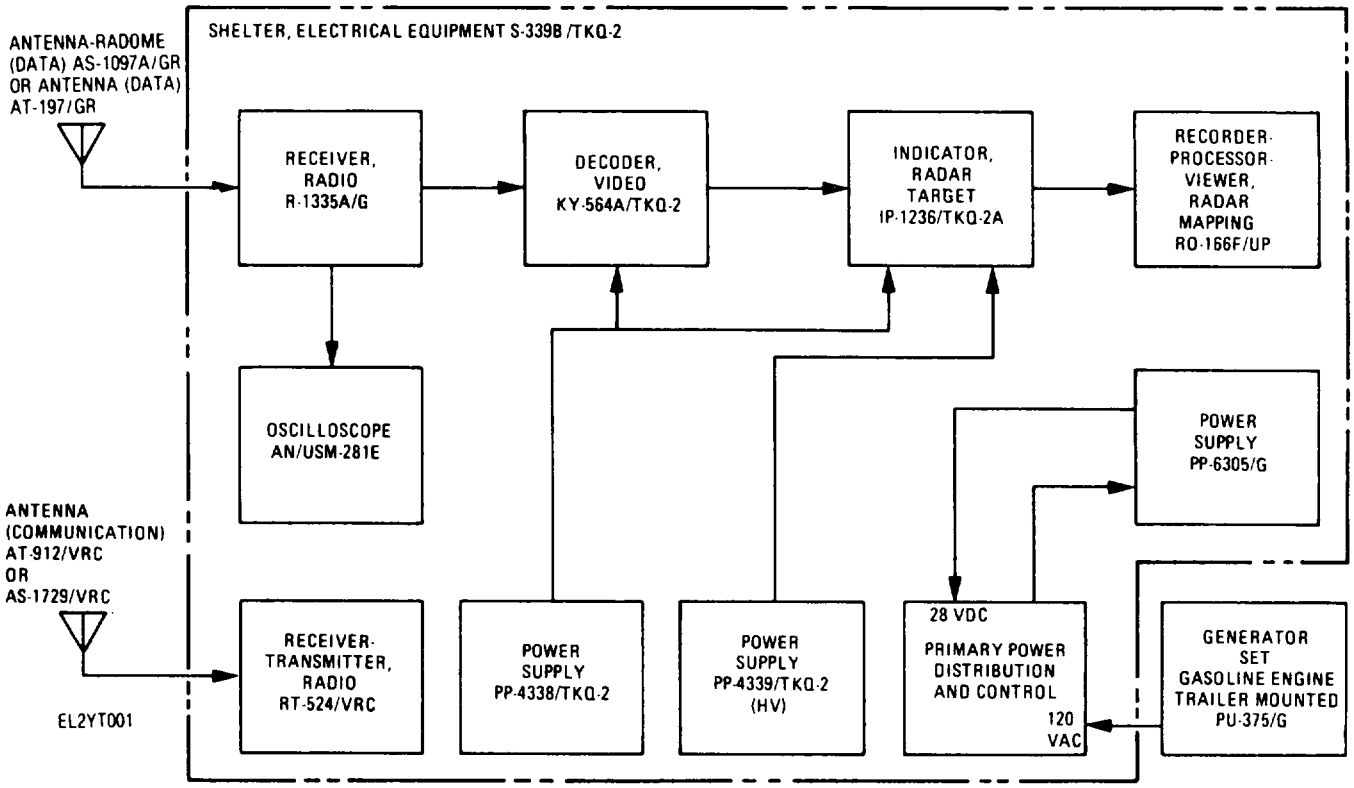

Figure E-1. Receiving Set, Radar Data AN/TKQ-2A, block diagram

E-3. Technical Characteristics

Technical characteristics for the ANrKQ-2A are the same as for the AN/TKQ-2 except as follows:

a. General.

Display range ..... 25 or 50 kilometers on one side of aircraft flight path.

Range delay ..... 0 through 50 kilometers (in 10 km steps), depending on setting of airborne AN/APS-94D controls.

Transportability ..... Shelter, Electrical Equipment S-339B/TKQ-2 in Truck, 3/4-ton, 4 x 4, Cargo M37, which tows Generator Set, Gasoline Engine, Trailer-Mounted PU-375/G (not part of AN/TKQ-2A).

b. Radar Data Receiving System.

Data receiver ..... Receiver, Radio R-1335A/G.
Data signal characteristics:
Signal information ..... Moving-target video, fixed-target video, drift-angle data, ground speed data, and aircraft identification.
Receiving range (line of sight) for mapping aircraft ..... 100 miles at 225 MHz and 399.95 MHz.

c. Indicating System.

Type of indicating system ..... Recorder-Processor-Viewer, Radar Mapping RO-16*FF*UP, attached to Indicator, Radar Target IP-1236/TKQ-'2A
Type of presentation ..... Illuminated continuous photoradar maps (ft and mt) recorded on a single strip film.
Presentation and recording duration ..... Approximately 8 hours per cassette, depending on film-transport speed. Continuous operation is limited to, one roll of film or a 12-hour capability of developer fluid.
Power source..... Decoder, Video KY-564A/TKQ-2.

d. Power Supply System.

Generator set ..... One of three generator sets may be used with the AN/TKQ-2A.
Radar data receiving system power supply:
Output voltages ..... -300 vdc at 394 milliamperes; -10 vdc at 1.335 amperes; +28 vdc at 9.2 amperes; +150 vdc at 310 milliamperes; + 250 vdc at 1.2 milliamperes; +300 vdc at 23.1 milliamperes.

e. Shelter.

Type ..... Shelter, Electrical Equipment S-339B/TKQ-2.

f. Monitoring System.

Oscilloscope AN/USM-281E display ..... (Refer to NAVELEX 0969-162-5010).

E-4. Components of Receiving Set, Radar Data AN/TKQ-2A

Weights and dimensions for the modified components (Decoder, Video KY-564A/TKQ-2; Indicator, Radar Target IP-1236/TKQ-2A; Recorder-Processor-Viewer, Radar Mapping RO-166F/UP) and Oscilloscope AN/USM-281E are listed below. All other unmodified components of the AN/TKQ-2A are listed in paragraph 1-6.

Qty	Fig. No.	Item	Height (in.)	Depth in.)	Width (in.)	Unit weight (lb)
1	E3	Decoder, Video KY-564A/TKQ-2	13 5	20.75	17.25	45.0
1	1-14	Recorder-Processor-Viewer, Radar Mapping RO-166F/UP	17.6	10.2	12.5	42.0
1	1-12	Indicator, Radar Target IP-1236/ TKQ2A	10.0	19.25	12.5	42.0
1	E-5	Oscilloscope AN/USM-281E	11.0	24.5*	9.0	31.75

*Dimension does not include oscilloscope front cover.

E-5. Items Comprising an Operable Receiving Set, Radar Data AN/TKQ2A

Modified and additional items added to the AN/TKQ-2 configuration to make an operable Receiving Set, Radar Data AN/TKQ-2A are listed below. All other reused items (except deleted Converter-Storer Signal Data CV-2093/TKQ-2; Base, Shock Mount, Electrical Equipment MT-3616/TKQ-2; and coaxial cables 5W21 and 5W23) are listed in paragraph 1-6.1.

NSN/Part No.	QTY	Nomenclature, part no., and mfr code	Fig. No.
01-P06512H001	1	Receiving Set, Radar Data AN/TKQ-2A, consisting of:	1-1
01-P06540H001	1	Shelter, Electrical Equipment S-339B/TKQ-2 consisting of:	1-3

NSN/Part No.	Qty	Nomenclature, part no., and mfr code	Fig. No.
30-P09980H001	1	Cable assembly, Special Purpose, Electrical: 230-45142;94990 (5W5)	1-22
5995-280-3919	1	Cable Assembly, Radio Frequency CG-530A/U (10ft) (5W6)	1-22
30-P09981H001	1	Cable Assembly, Special Purpose Electrical: (7ft) (5W13)	1-22
07-P00034L	1	Bracket, Antenna Mounting	E4.1
KH99-09	1	Coaxial Adapter	E4.1
01-28650L01	1	Receiver, Radio R-1335A/G	1-9.1
5820-892-9709	1	Base, Shock Mount, Electrical Equipment MT-3461/TKQ-2 (Used with R-1335A/(G)	1-7
01-P06516H001	1	Decoder, Video KY-564A/TKQ-2A	E-3
01-P06515H001	1	Indicator, Radio Target IP-1236/Tkq-2A	1-12
01-P06514H001	1	Recorder-Processor Viewer, Radar Mapping RO-166F/UP	1-3
	1	Oscilloscope AN/USM-281E	Note
01-P06510H001	1	Mounting Base, Electrical Equipment MT-4803/TKQ-2A (used with AN/USM-281E)	E-4

Note: Refer to NAVELEX 0969-162-5010 for information on Oscilloscope AN/USM-281E.

E-6. Nomenclature and Common Names

A list of the nomenclature assignments and common names for the components of Receiving Set, Radar Data AN/TKQ-2A is given below.

Nomenclature	*Common name*
Receiver Set, Radar Data AN/TQK-2A	Data receiving set
Receiver-Transmitter, Radio RT-524/VRC	Communications receiver-transmitter
Receiver, Radio R-1335A/G	Data receiver
Decoder, Video KY-564A/TKQ-2	Video decoder
Recorder-Processor-Viewer, Radar Mapping RO-166F/UP	Processor-viewer
Shelter, Electrical Equipment S-339B/TKQ-2	Shelter
Indicator, radar Target IP-1236/TKQ-2A	Target indicator
Power Supply PP-4338/TKQ-2	Power supply
Oscilloscope AN/USM-281E	Oscilloscope
Truck, 3/4 Ton, 4x4 Cargo M37	Truck
Generator Set, Gasoline Engine, Trailer-Mounted PU-375/G	Trailer-mounted generator set
Generator Set, Gasoline Engine PU-107A/U, or Generator Set, Gasoline Engine HF-10.1-MD	Generator set
Power Supply PP-4399/TKQ-2	Hv power supply
Antenna Radome AS-1097A/GR	Data Antenna
Antenna AS-1729/VRC	Communications antenna
Case, Storage CY-4657/TKQ-2	Storage case
Heater, Hunter Model UH-48, Type II	Heater
Mast AB-924/TKQ-2	Data antenna mast
Power Supply PP-6305/G	28-volt dc power supply

E-7. Description of Receiving Set, Radar Data AN/TKQ-2A

(fig.E-2)

The AN/TKQ-2A is the same as the AN/TKQ-2 except for the addition of Oscilloscope AN/UM-281E (para E-12), changes to the video decoder (para E-9) and target indicator (para E-10); and the deletion of the data annotation converter. Figure E-2 shows the location of Oscilloscope AN/USM-281E and the relocation of the communications receiver-transmitter. A mounting bracket has been added to the shelter to support the oscilloscope and communications receiver-transmitter.

E-8. Description of Shelter, Electrical Equip-ment S-339B/TKQ-2 (Interior)

(fig. E-2)

Installations required inside the shelter to house the AN/TKQ-2A components include the original equip-ment rack that fits against the front wall plus an additional oscilloscope/communications receiver-transmitter mounting bracket. The original equipment mounting rack houses only the data receiver on its mounting rack. The oscilloscope/communications receiver-transmitter mounting bracket attaches to the shelter above the data receiver and fastens to the original mounting rack. This

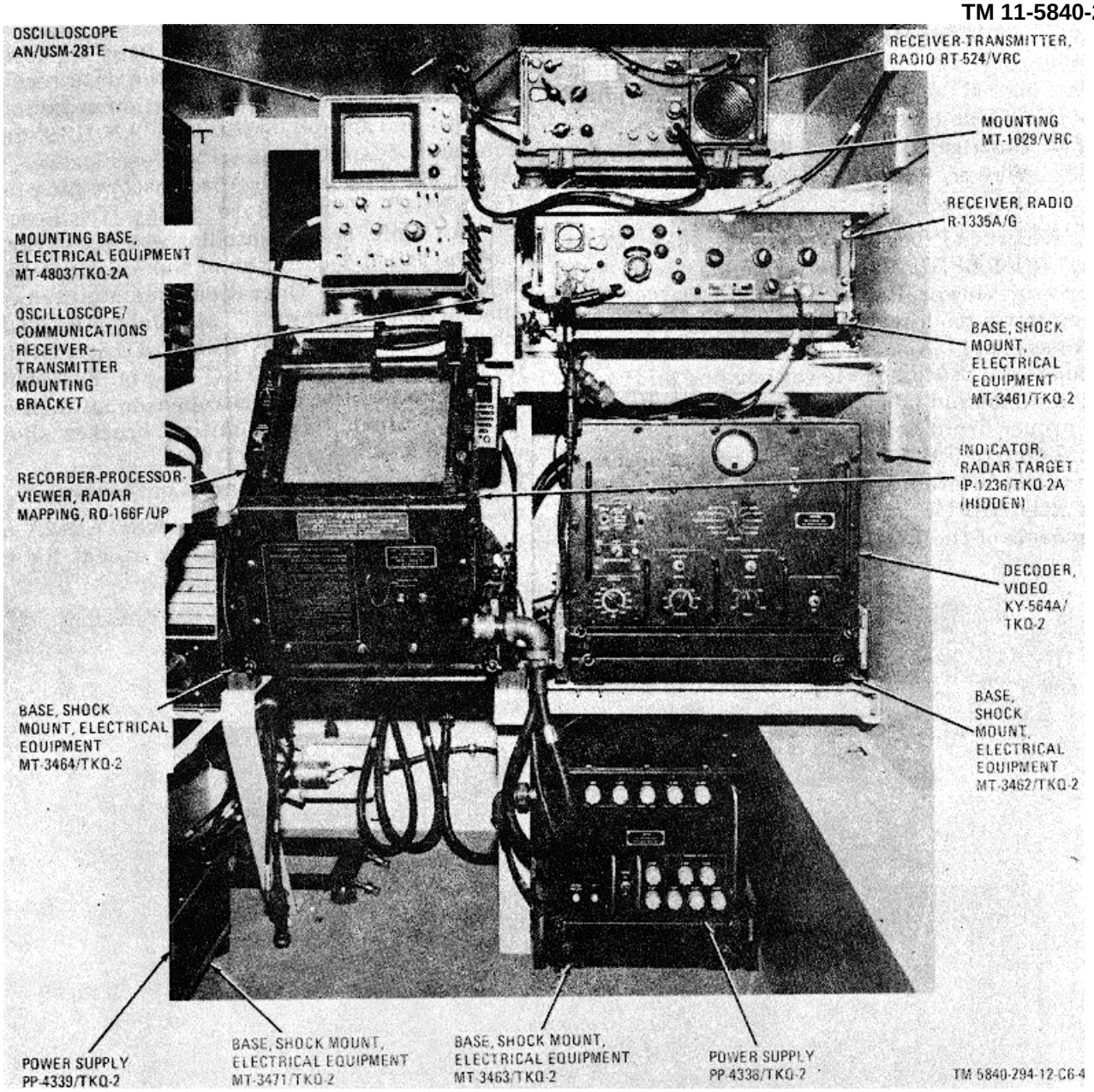

Figure E-2. Receiving Set, Radar Data AN/TKQ-2A, front wall, interior view.

Bracket supports both the oscilloscope on its mounting base and the communications receiver-transmitter on its mounting base.

E-9. Description of Decoder, Video KY-564A/ TKQ-2

(fig. E-3)

Decoder, Video KY-564A/TKQ-2 is the same as Decoder, Video KY-564/TKQ-2 9para 1-13) except for minor external and internal circuit changes. These minor changes make the unit usable in both the AN/TKQ-2 or AN/TKQ-2A configuration. Two toggle switches (ANTENNA SELECT and MODE SELECT) and two antenna select indicators (LEFT and RIGHT) are added to the video decoder front panel. The video de-coder is installed on mounting MT-3462/TKQ-2 in an individual mounting frame beneath the radio equipment inside the shelter.

E-10. Description of Indicator, Radar Target IP-1236/TKQ-2A

(fig. 1-12)

Indicator, Radar Target IP1236/TKQ-2a is the

same as Indicator, Radar Target IP-795/TKQ-2 (para 1-14) except for minor internal circuit changes (addition of four relays and associated wires). The IP-1236/TKQ-2A is installed on mounting MT-3464/TKQ-2 in an individual mounting frame beneath the oscilloscope.

E-11. Description of Recorder-Processor-Viewer, Radar Mapping RO-166F/UP

(fig. 1-14)

a. Recorder-Processor-Viewer, Radar Mapping RO-166F/UP is the same as Recorder-Processor-Viewer, Radar Mapping RO-166E/UP except for a modification to the metering roller drive assembly. Also, two drain holes have been added to the processor-viewer housing and insulation compound added to divert excess fluid to the proper drain holes.

b. Refer to TM 11-5820-680-12 for a description of the differences between the RO-166E/UP and RO-166B/UP, and for differences between all models of the RO-166/UP.

E-12. Description of Oscilloscope AN/USM-281E

Oscilloscope AN/USM-281E is used to monitor video output waveforms from the data receiver and also to aid in the identification of jamming signals (paragraph 3-16). The AN/USM-281E consists of an OS-246A(P)/U oscilloscope, an AM-6566A/U dual trace oscilloscope plug-in, a TD-1086A/U Time Base Delay Oscilloscope Plug-in Unit, and an oscilloscope crt cover. A more detailed description of the AN/USM-281E is covered in the Operation and Maintenance Instructions Technical Manual NAVELEX 0969-162-5010. The AN/USM-281E is installed on Mounting MT-4803/TKQ-2A (fig. E-4) which is attached to the oscilloscope/communications receiver-transmitter mounting bracket shown in figure E-2.

E-13. Description of Minor Components

The minor components in the AN/TKQ-2A are the same as in the AN/TKQ-2 except for the

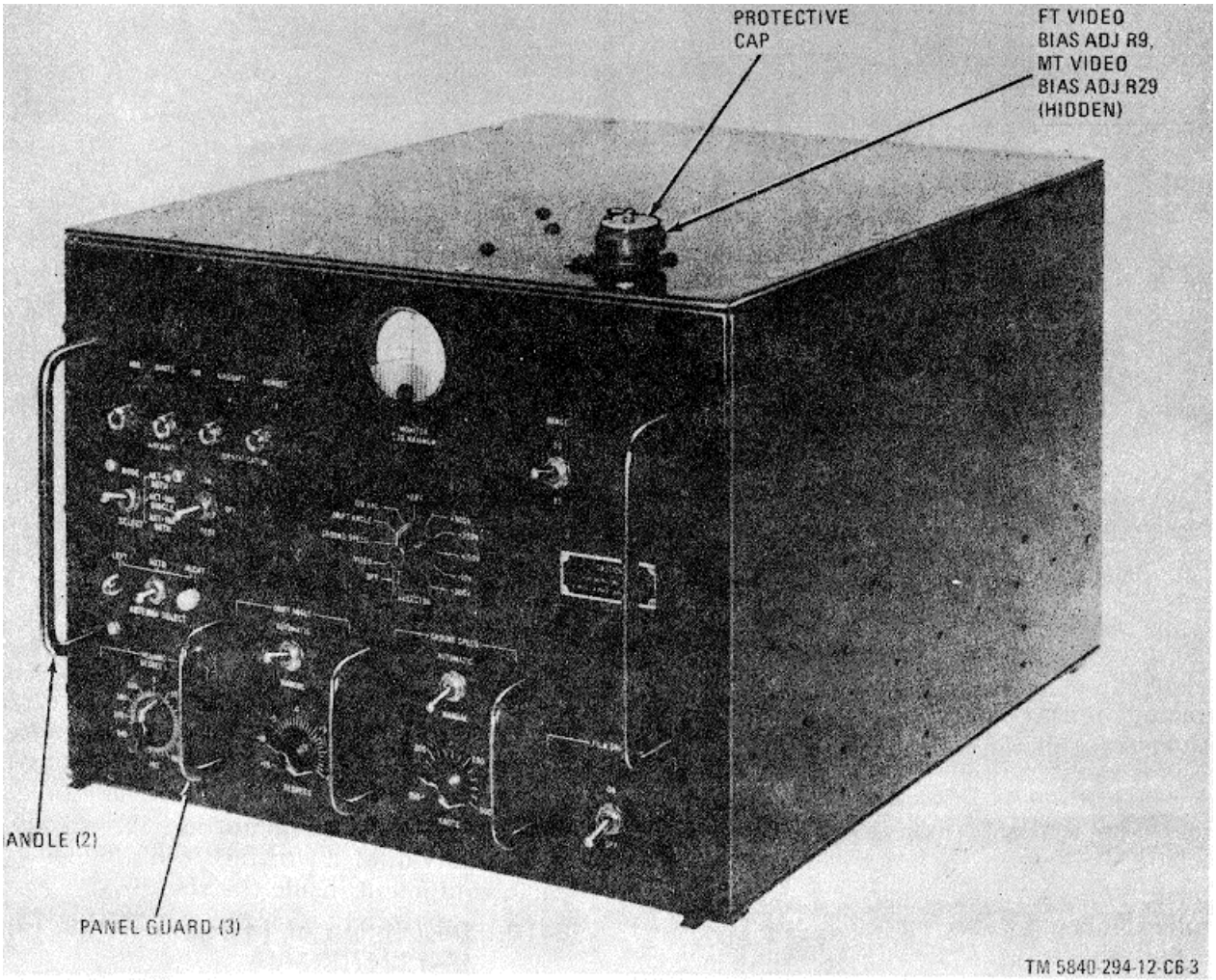

Figure E-3. Decoder, Video KY'-564A/TKQ-2.

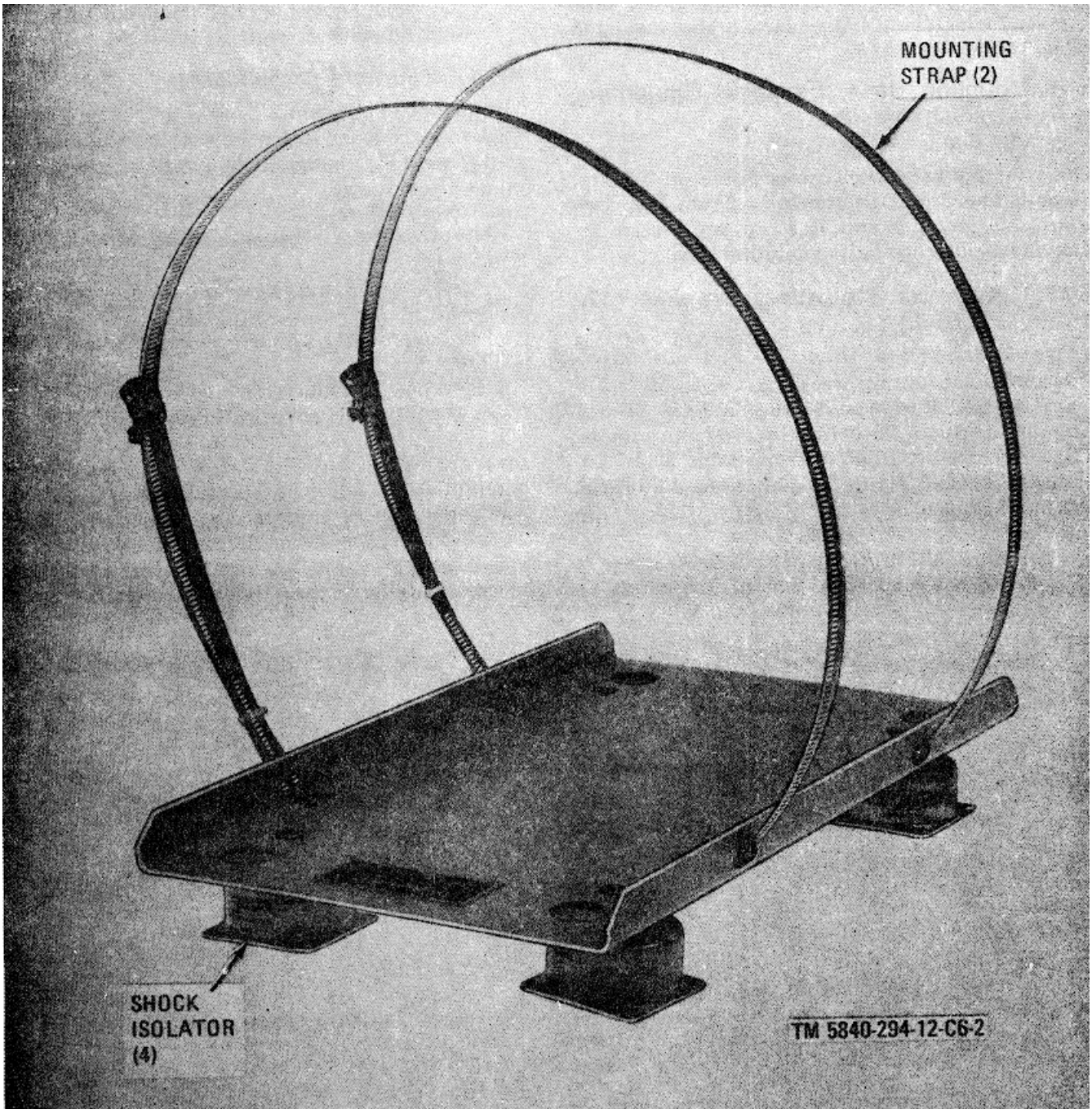

Figure E-4. Mounting Base, Electrical Equipment MT-4803/TKQ-2A

minor components described in paragraphs E-14 through E-17.

E-14. Cable Assembly, Special Purpose, Electrical 5W5 (30-P09980H001)

Cable 5W5 is the same as the cable used in the AN/TKQ-2 configuration (fig. 1-22) except for the addition of one single No. 22 gauge wire and two shielded No. 22 gauge wires, which are all tied with cable straps to the outside of the existing cable. Four additional ferrules are added to form shield terminations for the two shielded wires.

E-15. Cable Assembly, Special Purpose, Electrical 5W13 (30-P09981H001)

Cable 5W13 is the same as the CX-4720/VRC cable used in the AN/TKQ-2 configuration (fig.

1-22) except the cable is built from a 7-foot long, four-conductor (No. 16 gauge wire) rubber-insulated cable.

E-16. Mounting Base, Electrical Equipment MT-4803/TKQ-2A
(fig. E-4)

This mount secures Oscilloscope AN/USM-281E on the equipment rack as shown in figure E-2. Two adjustable, metal, mounting straps are used to secure the oscilloscope to its mounting base.

E-16.1. Antenna Mounting Bracket (07-P00034L)
(fig. E-4.1)

This antenna mounting bracket is used to adapt An-tenna AT-197/GR to Mast AB-924/TKQ-2 in place of Antenna-Radome AS-1097A/GR. Coaxial adapter KH99-09 is used to adapt antenna cable W6 to Antenna AT-197/GR. Figure E-5 shows the AT-197/GR antenna installed.

NOTE

Antenna AT-197/GR (NSN 5985-00-219-7454) is not supplied as part of Receiving Set, Radar Data ANfTKQ-2 and must be requisitioned separately by the user.

E-17. Equipment Application

Equipment application for the ANrTKQ-2A configuration is the same as for the ANITKQ2 configuration (para 1-62 through 1-68) except for the differences listed below:

a. Nomenclature

(1) ANITKQ-2. Change all references to AN/TKQ2A.

(2) ANIAPS-94C. Change all references to AN/APS94D.

(3) ANIAKT-18. Change all references to AN/AKT-18A.

b. Ppd data. Ppd data is not used in the AN/TKQ-2A (para 1-64, and 1-68 not applicable).

c. Simplified Block Diagram. Refer to figure E-7 for a simplified block diagram showing signal flow through the AKT-18A/TKQ2A data transfer system.

d. D/*a converter*. In data signal description (para 1-63 and 1-65), the demodulated encoded converted video signal from the data receiver is applied to the video encounter (not the the d/a converter).

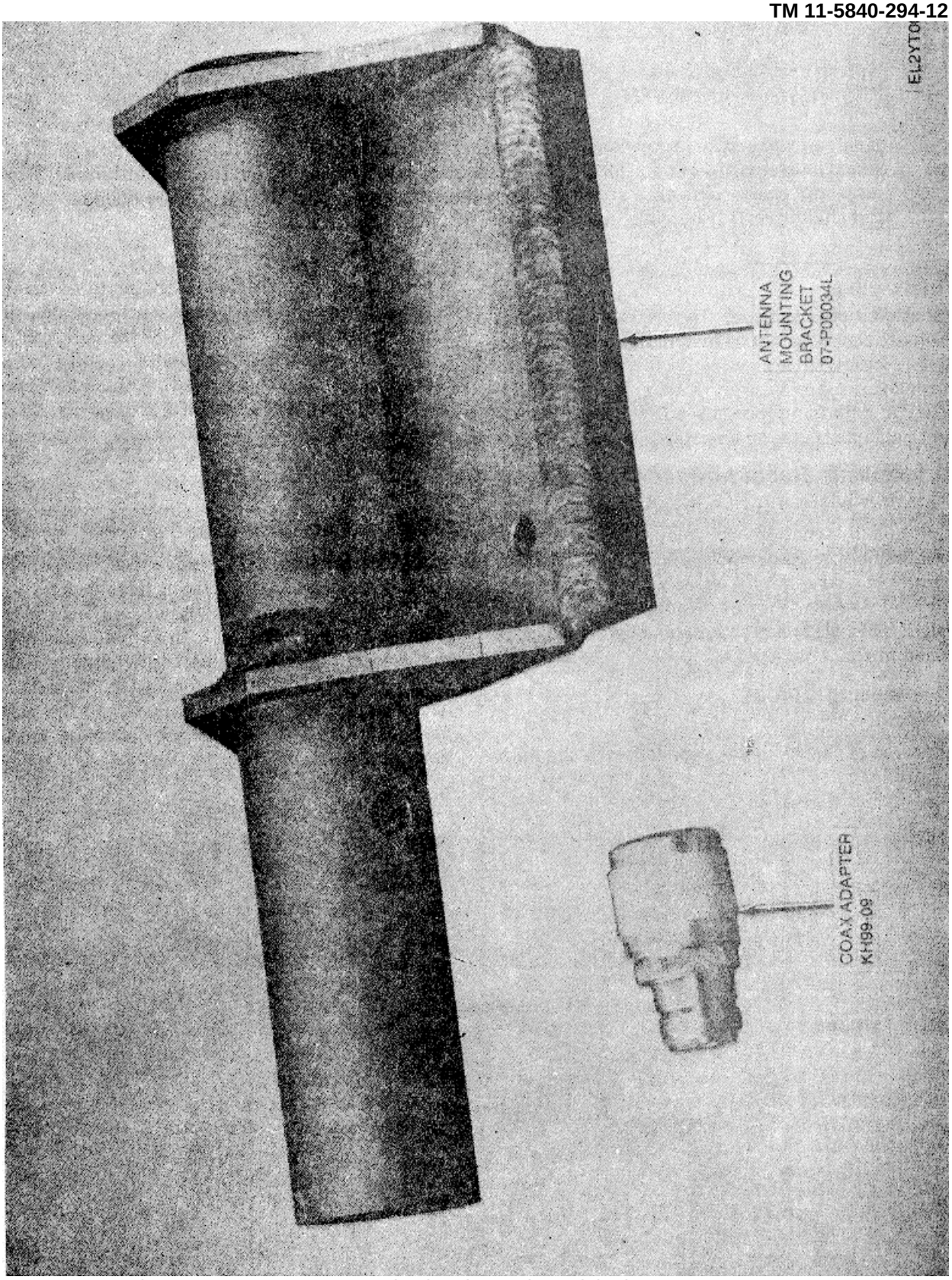

Figure E-4.1. Antenna Mounting bracket and coaxial adapter

Section II. INSTALLATION

WARNING

During installation of this equipment, conform to all safety requirements set forth in TB SIG 291. Injury or DEATH could result from failure to comply with safe practices.

CAUTION

Take precautions to protect the data antenna and data antenna mast in high winds. If winds in excess of 54 knots (62 miles per hour) are anticipated, retract the data antenna mast and remove the data antenna. Store the data antenna in the clamps provided on the shelter roof. If possible, move the data receiving set to a sheltered area

E-18. General

Installation instructions for the AN/TKQ-2A config-uration are the same as the instructions for the AN/TKQ-2 configuration except for changes to Recorder-Processor-Viewer, Radar Mapping RO-166F/UP installation procedure and the shelter component cable checklist as described below.

E-19. Installing Recorder-Processor-Viewer, Radar Mapping RO-166F/UP

Installation instructions for mounting Recorder-Processor-Viewer; Radar Mapping RO-166F/UP on the target indicator are the same as instructions for Recorder-Processor-Viewer, Radar Mapping RO-166B/UP (para 2-12) except for cable 5W23, which is not used in the AN/TKQ-2A.

E-20. Installing Cables

(fig. E-5)

Twenty-two of the 32 cables supplied with the data receiving set are installed by the manufacturer and remain connected. The permanently installed cables are 5W1 through 5W20 (para 1-32 through 1-35, E-14, 1-37 through 1-43, E-15, and 1-45 through 1-52), 5W24 (para 1-27), and 5W25 (para 1-27.1). Cables 5W21 (from Power Supply PP-4338/TKQ-2) and 5W23 (from Recorder-Processor-Viewer, Radar Mapping RO-166F/UP) are not used in the AN/TKQ-2A configuration.

E-21. Cabling Check

After installing the data receiving set components in the shelter, check the cabling connections as described in paragraph 214, steps *a ,b, c, e,* and before starting the generator set. In step *d*, cable 5W23 is not used in the AN/TKQ-2A configuration. Refer to figure E-5 for additional information. All cables connect between components as listed in the table of paragraph 2-14, except for the following modifications and deletions.

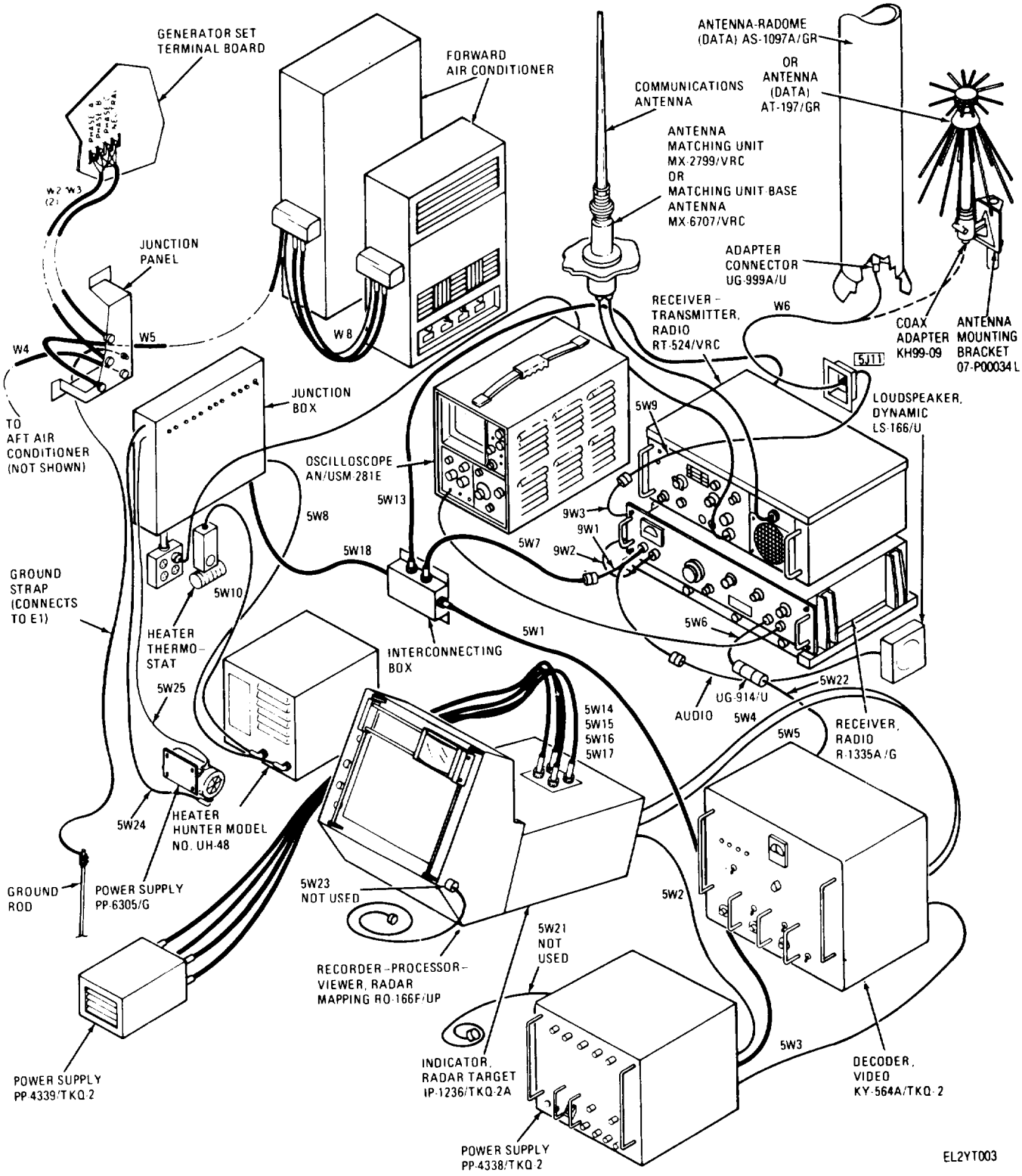

Figure E-5. Pictorial cabling diagram

Cable	Connector	Connects to-	
		Connector	Component
5W6	P1	UG-914/U	Video decoder
5W21	P1	-	Not used
5W22	P1	UG-914/U	Video decoder
5W23	P1	-	Not used

Section III. OPERATING INSTRUCTIONS

E-22. Operating Controls and Indicators

Operating controls and indicators for the AN/TKQ-2A are the same as those for the AN/TKQ-2 except for the deletion of Converter-Storer, Signal Data CV-2093/TKQ-2 and the addition of two controls and two indicators on Decoder, Video KY-564A/TKQ-2 as described in paragraph E-23.

E-23. Decoder, Video KY-564A/TKQ2 Controls and Indicators

(fig. E-6)

The controls and indicators added to the video decoder are listed below:

Control or Indicator	*Function*
MODE SELECT switch (3-position toggle)	Selects either AN/AKT-18 or AN/AKT-18A operating mode as follows. In AKT-18 BOTH mode position, video decoder operates only in the AN/TKQ2 configuration without the fine sync signal. In the AKT-18A SINGLE mode position, video decoder operates only in the AN/TKQ-2A configuration with the fine sync signal. The AKT-18A BOTH mode position is designed for future use.
ANTENNA SELECT switch (3-position toggle)	Manually sets sweeps for single antenna LEFT or RIGHT operation, or in AUTO position automatically selects proper sweep settings.
ANTENNA SELECT indicators	Indicates which antenna the AN/APS-94D radar set is using and also indicates which way the sweep signals are set when the ANTENNA SELECT switch is In AUTO.

E-24. Oscilloscope AN/USM-281E

Operating controls and indicators for the oscilloscope are described in the Operation and Maintenance Instructions Technical Manual NAVELEX 0969-162-5010.

E-25. Starting Procedure

The starting procedure for the AN/TKQ-2A is the same as the procedure for the AN/TKQ-2 (para 3-13) except delete data receiver (R-1335/G), delete and set new video decoder switches as follows:

a. Set MODE SELECT switch to AKT-18A SINGLE.
b. Set ANTENNA SELECT switch to AUTO.

E-26. Operating Procedure

Operating procedure for the AN/TKQ-2A is the same as the procedure for the AN/TKQ-2 (para 3-15) except the RESIDUE control is located on Control, Data Link C-9963/AKT-18A (not AN/AKT-18 power distribution panel).

NOTE

Note which ANTENNA SELECT indicator on video decoder is lit, and then verify that the aircraft antenna is in that mode.

E-27. Recognition and Identification of Jamming

The recognition and identification of jamming signals are the same as described in paragraph 3-16 except jamming may also be detected by viewing the receiver video output waveform on Oscilloscope AN/USM-281E

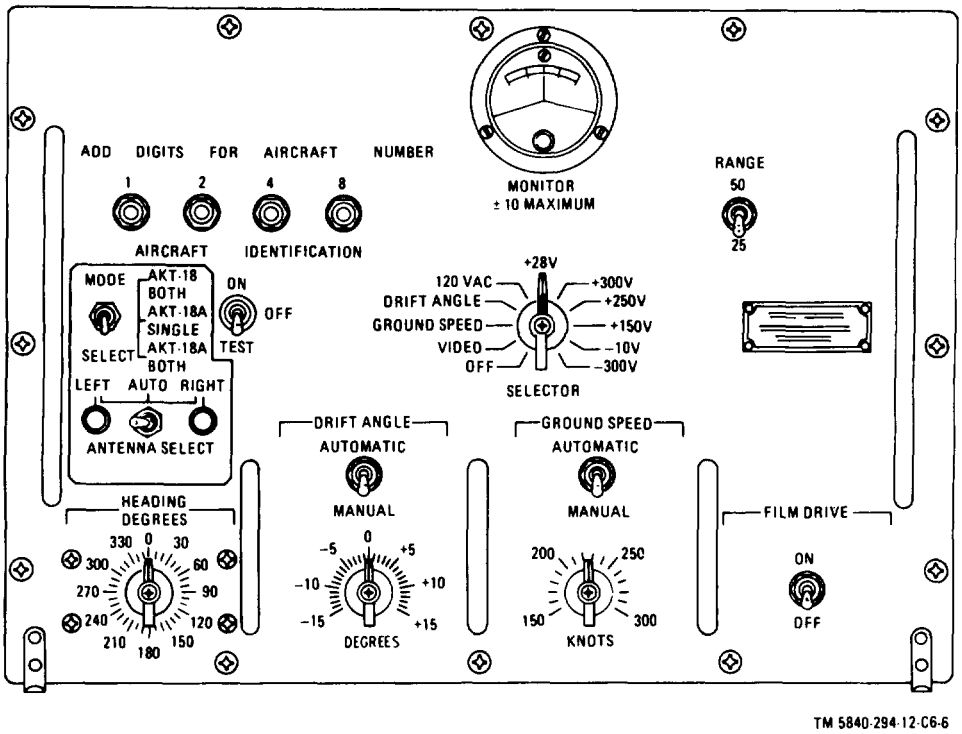

Figure E-6. Decoder, Video KY-564A/TKQ-2, controls and indicators.

Section IV. MAINTENANCE INSTRUCTIONS

E-28. Daily Preventive Maintenance Checks and Services Chart

The daily preventive maintenance checks and services chart for the AN/TKQ-2A is the same as the daily preventive maintenance checks and services chart for the AN/TKQ-2 (para 4-5) except for the difference data listed below:

Sequence No.	Item	Procedure	Reference
		Shelter Interior	
18	Intercabling and connections	Check all interconnecting cables (figs. E-5 and E-7) for cracks and breaks. Repair or replace cables that are cracked or have broken connectors. Make sure all connectors are tight.	Para E-21
19	Knobs, dials, switches, meters, and indicators	During operational checks (items 21 through 23, 27.1 through 27.4, and 29 through 42), verify that mechanical action of each knob, dial, and switch is smooth and free of external binding. Check meter faces for damage. Make sure pointers are not bent or stuck.	Refer to higher category maintenance.
		Data Receiver (R-1335/G)	
24 through 27	(Delete)		
		D/A Converter, Video Decoder, Target Indicator, and Processor-Viewer	
28	(Delete)		
29	Video decoder aircraft identification	a. Change AN/GKM-2A test set connections as follows.	a. TM 11-6625-827-12

D/A Converter, Video Decoder, Target Indicator, and Processor-Viewer-Continued

Sequence No	Item	Procedure	Reference
		(1) Delete. (2) Delete. (3) Set MODE SELECT switch on video decoder to AKT-18 BOTH position.	
36	Target indicator crt sweep length	Same procedure as AN/TKQ-2 except: Set video decoder RANGE switch to 50. **NOTE** Slightly less than 5 bars and 5 spaces may occur due to the display of 50 km instead of 52 km.	Para 4-18
37	Processor-viewer film-speed and data chamber instruments, and video decoder drift-angle circuitry.	*a.* Same procedure as AN/TKQ-2 except: Depress processor viewer MANUAL DATA EXPOSE switch, wait exactly 4 minutes and 52 seconds, then depress switch again. *b.* Same procedures as AN/TKQ2 except. Depress processor-viewer MANUAL DATA EXPOSE switch, wait exactly 2 minutes and 26 seconds, then depress switch again.	*a.* Para 4-18 *b.* Para 4-18
37A	AKT-18A mode	**NOTE** To perform this step, a signal must be available from an AN/AKT-18A or AN/AKT-18A simulator. *a.* Set video decoder MODE SELECT switch to AKT-18A SINGLE. Set video decoder ANTENNA SELECT switch to AUTO. video decoder ANTENNA SELECT switch to AUTO. (1) With radar set in left antenna mode, video decoder antenna select LEFT indicator should light. (2) With radar set in right antenna mode, video decoder antenna select RIGHT indicator should light. (3) Repeat sequence numbers 36 and 37. Verify that spacing between 20 km range marks is 1.57 ±0.06 inches.	Para 4-18 (1) Para 4-18 (2) Para 4-18
		Oscilloscope	
42	Operation	Perform operating procedure.	NAVELEX 0969-162-5010

E-29. Troubleshooting

Troubleshooting of the AN/TKQ-2A is the same as troubleshooting for the AN/TKQ-2 (para 4-18) except for the differences listed in the troubleshooting chart (para E-30).

E-30. Troubleshooting Chart

Item No	Trouble symptom	Probable trouble	Checks and corrective action
5 through 8	(Delete)		
9	(Delete)		
21	AN/USM-281E Oscilloscope does not display a waveform.	Faulty oscilloscope	Refer to NAVELEX 0969-162-5010.
22	In AKT-18A mode (left antenna) video decoder LEFT indicator does not light.	a. Defective indicator lamp. b. Defective video decoder.	a. Replace lamp (para 4-23a). b. Replace video decoder (para 4-29).
23	In AKT-18A mode (right antenna), video decoder RIGHT indicator does not light.	a. Defective indicator lamp. b. Defective video decoder.	a. Replace lamp (para 4-23a). b. Replace video decoder (para 4-29).

E-31. Component Removal and Replacement

Removal and replacement procedures for the AN/TKQ-2A are the same as the removal and replacement procedures for the AN/TKQ-2 (para 4-27 through 4-35) except for the deletion of the data receiver (R-1335/G) and d/a converter (para 4-32 and 4-33). Also, in the AN/TKQ-2A, removal and replacement procedures for Oscilloscope AN/USM-281E (para E-32) have been added.

E-32. Removal and Replacement of Oscilloscope AN/USM-28 I E

a. Removal.

(1) Disconnect oscilloscope power cord from shelter junction box receptacle (fig. E-5), cable from vertical input of oscilloscope, and grounding strap at rear of oscilloscope.

(2) With screwdriver, loosen and then open two mounting straps (fig. E-4) that secure oscilloscope in Mounting Base, Electrical Equipment MT-4803/TKQ-2A.

(3) Lift oscilloscope by handle from mounting base.

b. Replacement.

(1) Grasp oscilloscope handle and place os-cilloscope in Mounting Base, Electrical Equipment MT-4803/TKQ-2A.

(2) Tighten the two mounting straps (fig. E-4) that secure oscilloscope to mounting base.

(3) Connect oscilloscope power cord to shelter junction box receptacle (fig. E-5), cable from VIDEO TEST connector on data receiver to vertical input of oscilloscope, and grounding strap at rear of oscilloscope.

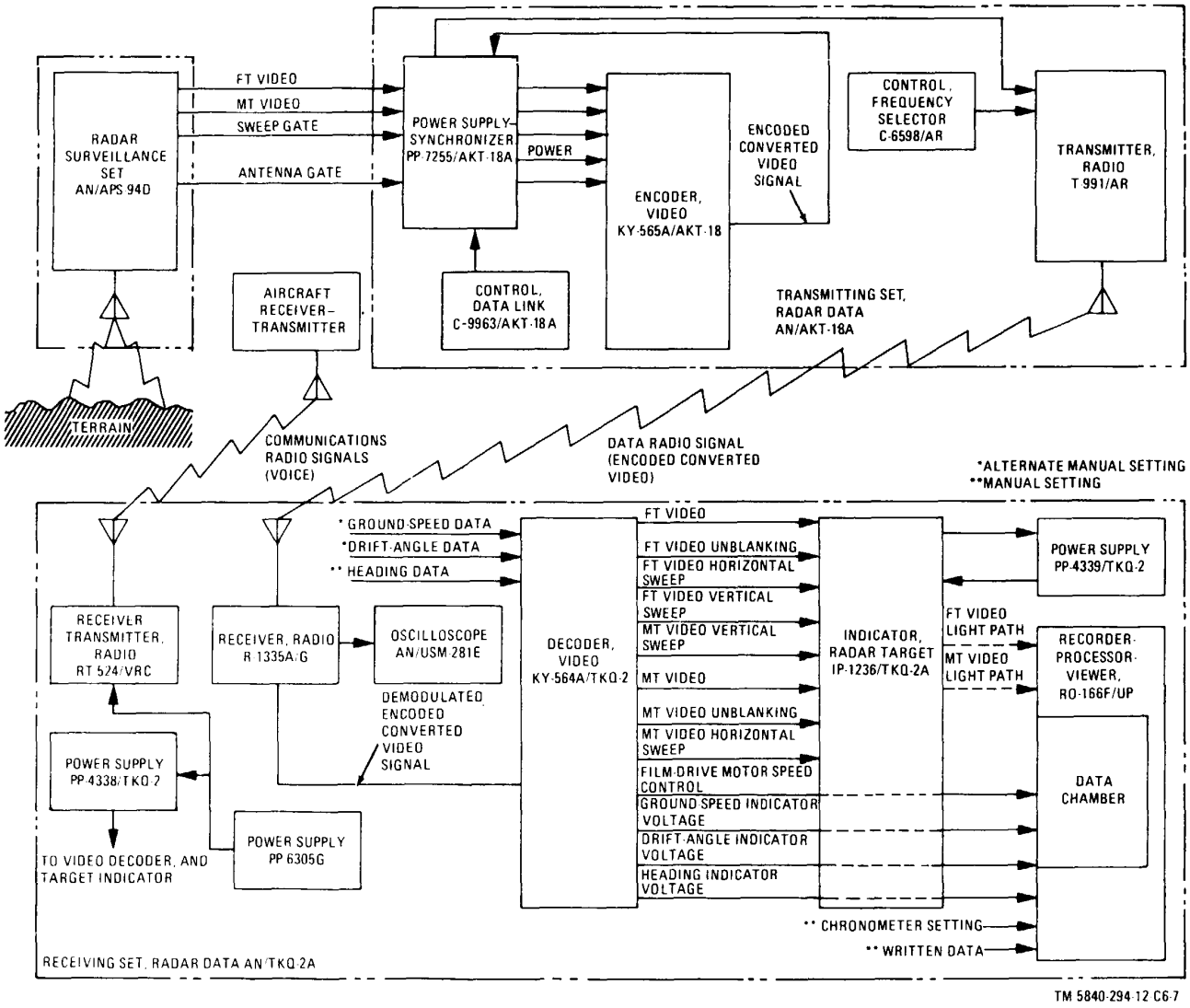

Figure E-7. Radar Surveillance System AN/UPD-2(V), simplified block diagram.

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By Order of the Secretary of the Army:

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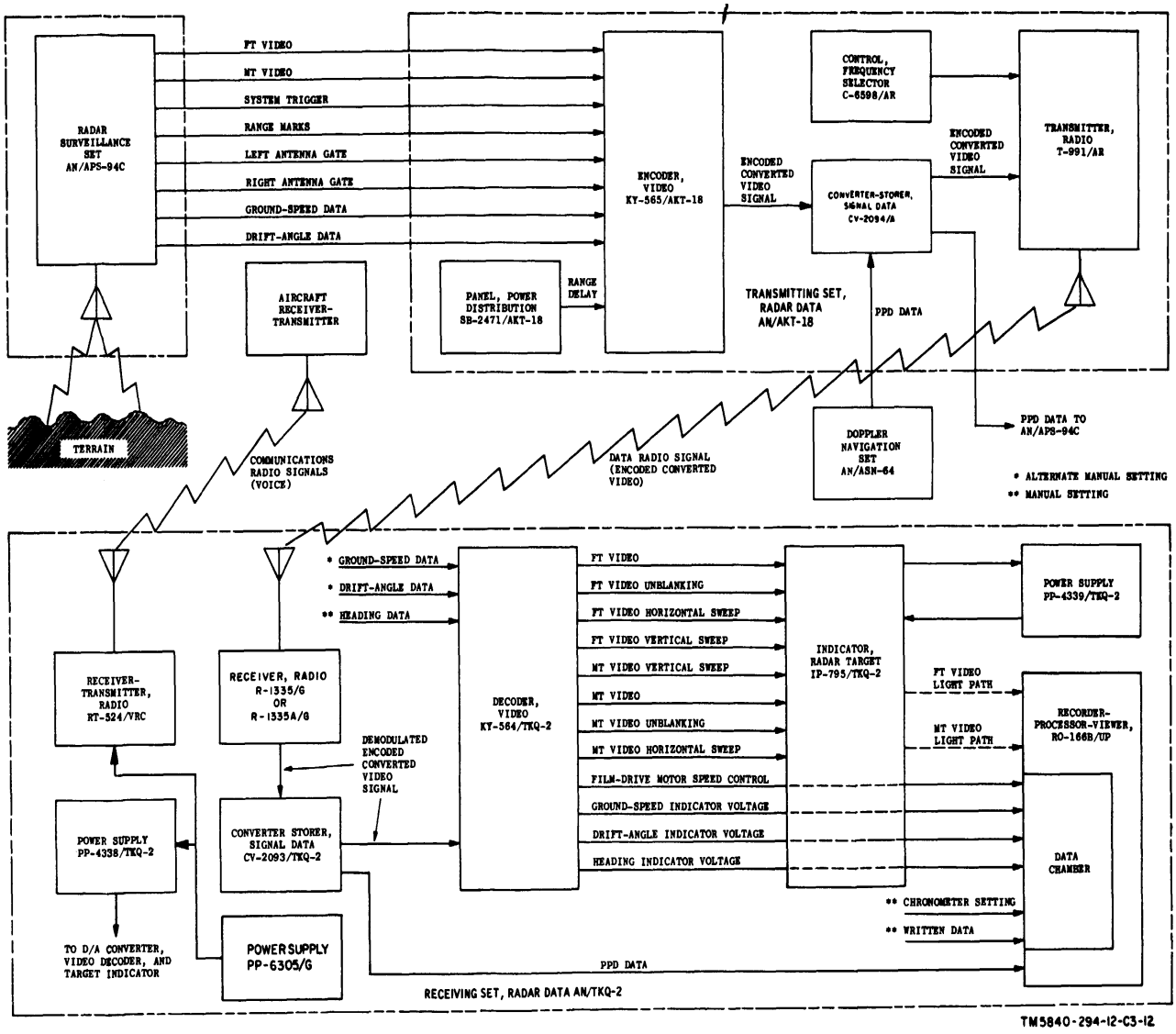

Figure 5-3. Radar Surveillance System AN/UPD-2(V), simplified block diagram.

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