# TM 11-5985-352-14

**TECHNICAL MANUAL**

**OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE MANUAL**

# ANTENNA GROUP
# PART OF DIRECTION FINDER SET
# AN/TRQ-30(V)1, 2, AND 4

**HEADQUARTERS, DEPARTMENT OF THE ARMY**

**JULY 1977**

CHANGE
NO. 2

HEADQUARTERS
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Washington, DC, 12 January 1984

# OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE MANUAL ANTENNA GROUP, PART OF DIRECTION FINDER SET AN/TRQ-30(V)1, 2, AND 4 (NSN 5895-00-168-8282)

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DISTRIBUTION:

To be distributed in accordance with DA Form 12-51A-1, Operators Maintenance requirements for AN/TRQ-30.

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No. 1

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# Operator's, Organizational, Direct Support, and General Support Maintenance Manual ANTENNA GROUP, PART OF DIRECTION FINDER SET AN/TRQ-30(V)1, 2, AND 4

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29-207 (2)
29-610 (2)

*NG:* State AG (0); Units — None.
*USAR:* None.
For explanation of abbreviations used see AR 310-50.

TECHNICAL MANUAL
No. 11-5985-352-14

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *1 July 1977*

**OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE MANUAL**

# ANTENNA GROUP, PART OF DIRECTION FINDER SET AN/TRQ-30(V)1 , 2, AND 4 (NSN 5895-00-168-8282)

***Current as of 18 May 1977***

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS**

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

**In either case, a reply will be furnished direct to you.**

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## List of Tables

# CHAPTER 1
# INTRODUCTION

## Section I. GENERAL

### 1-1. Scope

*a.* This manual provides operation and maintenance procedures for three configurations of the antenna group for Direction Finder Set AN/TRQ-30(V) (fig. 1-1, 1-2, and 1-3). Instructions are provided for installation, operation, organizational maintenance, equipment functioning, and direct and general support maintenance.

*b.* The following antenna groups are covered:

(1) Antenna group, high frequency (hf) for AN/TRQ-30(V)1.

(2) Antenna group, very high frequency (vhf) for AN/TRQ-30(V)2.

(3) Hf/vhf antenna group for AN/TRQ-30(V)4 (includes 1 and 2 configurations).

*c.* Connections between the antenna groups and the associated direction finder sets are briefly discussed in this manual; for detailed information refer to applica-

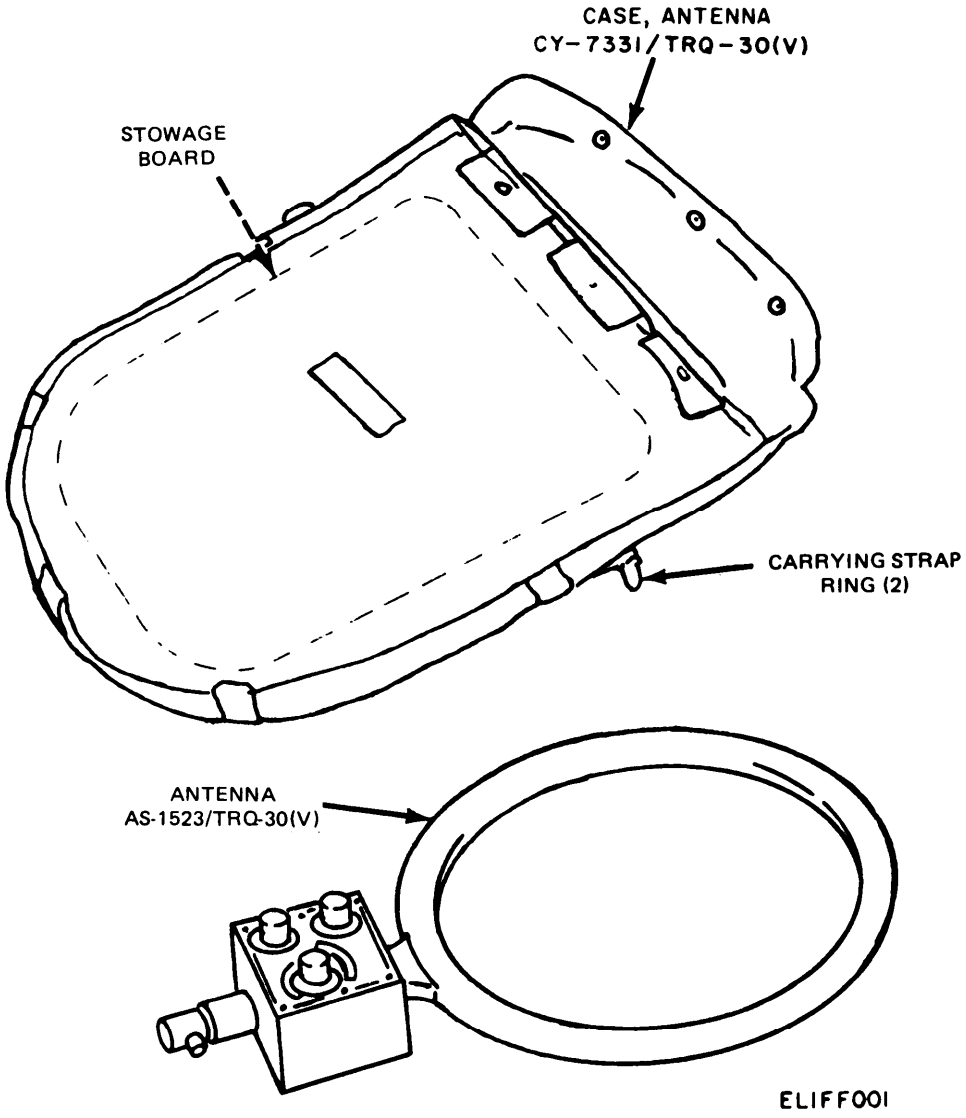



*Figure 1-1. Hf loop antenna and case, part of hf antenna group for AN/TRQ30(V)1.*

ble manuals listed in appendix A.

*d.* The components of end item list is in appendix B, the maintenance allocation chart is included in appendix D, and the expendable supplies and materials list is included in appendix E.

## 1–2. Consolidated Index of Army Publications and Blank Forms

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

## 1–3. Maintenance Forms, Records, and Reports

*a. Reports of Maintenance and Unsatisfactory Equipment.* Department of the Army forms and procedures used for equipment maintenance will be those described by TM 38-750, The Army Maintenance Management System.

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

*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 4610.33C/ AFR 75-18/MCO P4610.19D and DLAR 4500.15.

## 1–4. Reporting Equipment Improvement Recommendations (EIR)

If your equipment needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communications-Electronics Command, ATTN: DRSEL-ME-MP, Fort Monmouth, NJ 07703. We'll send you a reply.

## 1–5. Administrative Storage

Administrative Storage of Equipment issued to and used by Army activities will have preventive maintenance performed in accordance with the PMCS charts before storing. When removing the equipment from administrative storage the PMCS should be performed to assure operational readiness. Disassembly and repacking of equipment for shipment or limited storage are covered in TM 750-244-2.

## 1–6. Destruction of Army Electronics Materiel

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

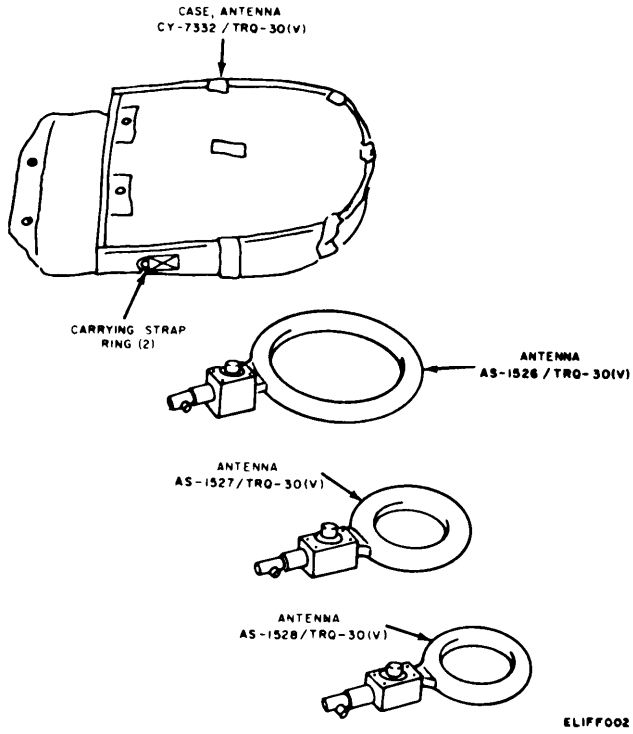



*Figure 1-2. VHF loop antennas and case, part of vhf antenna group for AN/TRQ-30(V)2.*

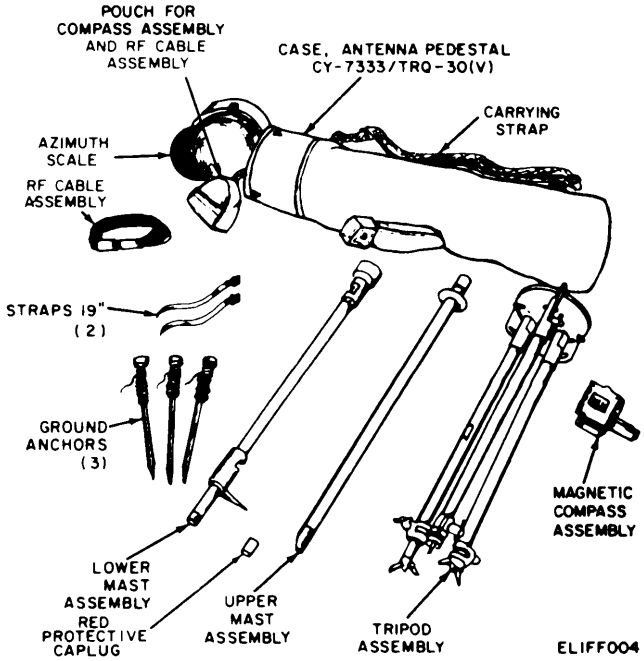



*Figure 1-3. Pedestal, Antenna AB-1110/TRQ-30(V).*

### 1-6.1. Hand Receipts

Hand receipts for Components of End Item (COEI), Basic Issue Items (BII) and Additional Authorization List (AAL) items are published in a hand receipt manual, TM 11-5985-352-14-HR. This manual is published to aid in property accountability and additional copies may be requisitioned from the US Army Adjutant General Publication Center, 1655 Woodson Road, St. Louis, Mo. 63114 in accordance with chapter 3, AR 310-2.

## Section II. DESCRIPTION AND DATA

### 1-7. Common Names

The items that comprise an operable equipment are included in appendix B. Listed below are items of equipment by nomenclature and an associated common name as used throughout this manual.

| *Nomenclature* | *Common name* |
|---|---|
| Antenna AS-1523/TRQ-30(V). | HF loop antenna. |
| Antenna AS-1526/TRQ-30(V), Antenna AS-1527/TRQ-30(V), Antenna AS-1528/TRQ-30(V). | VHF loop antennas (if referenced separately, short nomenclature will be used). |
| Case, Antenna CY-7331/TRQ-30(V). | HF antenna case. |
| Case, Antenna CY-7332/TRQ-30(V). | VHF antenna case. |
| Case, Antenna Pedestal CY-7333/TRQ-30(V). | Antenna pedestal case |
| Pedestal, Antenna AB-1110/TRQ-30(V). | Antenna pedestal assembly (this name excludes antenna pedestal case). |

### 1-8. Purpose and Use

The antenna groups includes physically interchangeable loop antennas, an antenna pedestal assembly, and associated support equipment which are used in conjunction with various configurations of direction finder (df) radio sets. Four loop antennas (fig. 1-4) cover the frequency range of 0.515 MHz through 157.5 MHz and aid the df radio set operator to locate the position of transmitters operating within these ranges through use of detection, df, and triangulation methods.

### 1-9. Description of Loop Antennas and Antenna Cases

*a. Loop Antennas* (fig. 1-4). The loop antennas are designed to fit into position on the upper mast assembly (para 1-10c), aligned with the tapered end of the mast, and locked securely in place by an antenna locking setscrew. A typical loop antenna consists of a control box, which contains the circuits for tuning the loop to the monitored frequency; a connector for radio-frequency (rf) signal connection to the associated re-

ceiver equipment; and a loop, which includes one or more turns of wire sealed in polyurethane foam within a fiberglass-resin shield. Refer to paragraph 1-13 for tabulated data, weight, and dimensions of each of the four loop antennas used with the AN/TRQ-30(V).

*b. Loop Antenna Cases* (fig. 1-1 and 1-2). Two loop antenna cases are provided; one to store the hf loop antenna, the other to store the three vhf loop antennas. The two antenna cases are similar except for size and inner compartments. They are made of canvas

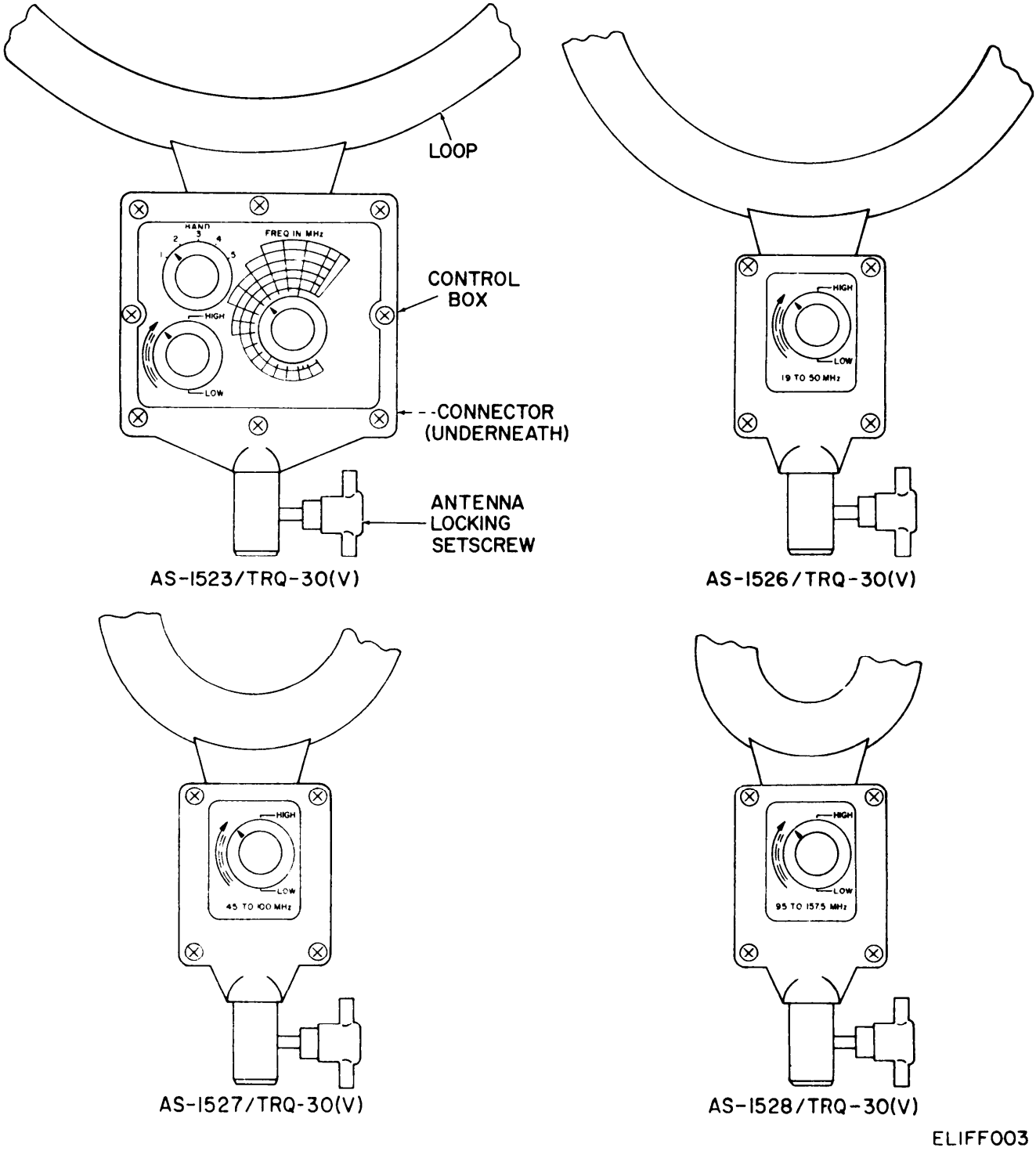



*Figure 1-4. Loop antennas.*

with an opening at one end, closed by a flap which can be secured by metal fasteners. A carrying strap ring is attached to each side of either case to allow the addition of a carrying strap that is equipped with snap-hook fasteners for conversion to a shoulder bag. The hf antenna case has one compartment which is equipped with a removable stowage board on which the hf loop antenna is secured to prevent breakage. The vhf antenna case has three inner compartments to store separately the three vhf antennas (no stowage board is provided with this case). Details of storage are further illustrated on figure 3-3.

## 1-10. Description of Pedestal, Antenna AB-1110/TRQ-3)(V)

(fig. 1-4 and 1-5)

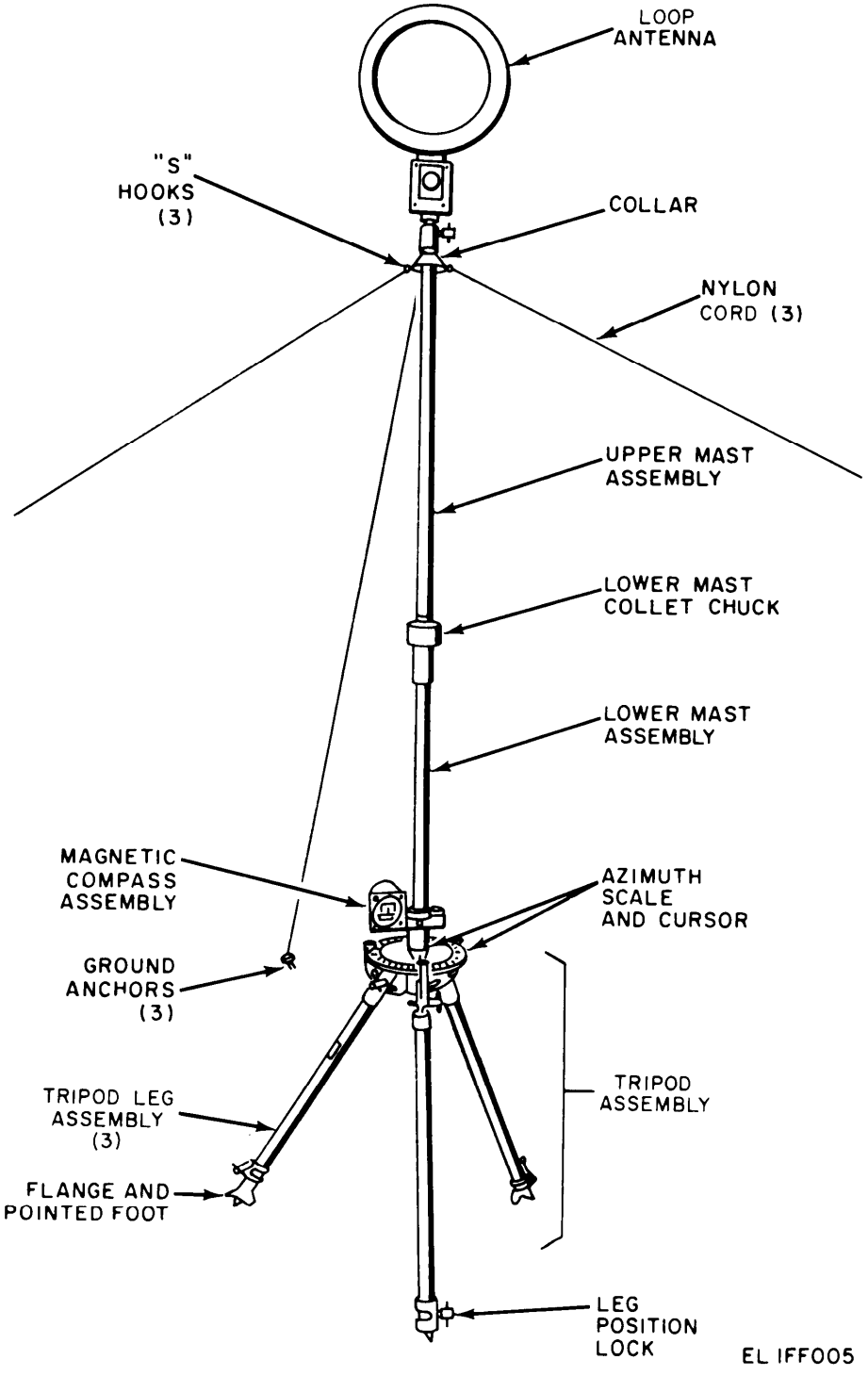



*Figure 1-5. Antenna pedestal assembly setup with loop antenna installed.*

The AB-1110/TRQ-30(V) includes an antenna pedestal assembly, rf cable assembly, a carrying strap, two retaining straps, and an antenna pedestal case. The antenna pedestal assembly, shown set up in figure 1-5 with a loop antenna installed, includes a tripod assembly, lower mast assembly, upper mast assembly, compass assembly, and three ground anchor assemblies. The components of the AB-1110/TRQ-30(V) are described in *a* through *f* below.

*a. Tripod Assembly* (fig. 1-5 and 1-6). The tripod assembly includes three similar tripod legs (the difference is a nameplate on one) pivoted from a tripod head. Each tripod leg assembly is comprised of two tubular telescoping fiberglass sections that must be replaced as one assembly. The upper section of each tripod leg assembly attaches to a pivot position, 120 degrees spacing around the tripod head, with a machine screw and self-locking nut. A tripod leg-lock setscrew and slot arrangement is used near the pivot position to allow each leg to be collapsed (vertical) or in an offset position relative to the tripod head. The collapsed position allows storage or carrying the tripod assembly in the antenna pedestal case while the offset position affords stable installation. The lower end of the upper leg section is fitted with a leg position lock that accepts the lower leg section and locks it in the desired telescoping length. The lower leg section includes a flange and pointed foot at the bottom end for leg emplacement. The lower mast assembly is fitted through the opening in the center of the tripod head and is secured by the mast retaining setscrew. The azimuth cursor is fixed to the lower mast assembly *(b* below) and rotates with it as the loop antenna is turned. Azimuth cursor position is read out on the azimuth scale which is held in place by three azimuth scale retaining screws.

*b. Lower Mast Assembly and Compass Assembly.* The lower mast assembly is a fiberglass tubing section which connects between the upper mast assembly and the tripod head. The mast assembly is under cut beneath the azimuth cursor to provide a position-lock when the retaining setscrew is tightened. The cursor rotates in alignment with the mast and loop antenna. The magnetic compass assembly which includes a pilot's magnetic compass, bracket, bubble level and retaining screw, is mounted to the mast through a notch and threaded mounting insert.

*c. Upper Mast Assembly* (fig. 1-5). The upper mast assembly is also constructed of fiberglass tubing and includes a tapered adapter at its lower end which mates with the lower mast assembly through a collet chuck fitted with a collet nut that can be hand-tightened. The upper end of the mast assembly accepts the loop antenna which is locked into position by the antenna locking setscrew on the loop antenna adapter. A flat metal collar, located near the upper end of the mast assembly, provides mounting holes for the three ground anchor S-hooks and nylon cord to insure a stable installation.

*d. Ground Anchor Assemblies.* Three ground anchor assemblies are provided to guy the antenna pedestal assembly. Each assembly includes a 9-inch ground anchor with attached 10-foot nylon cord terminated with an S-hook for installation on the upper mast guy ring collar.

*e. Antenna Pedestal Case* (fig. 1-3). The antenna pedestal case is especially designed to store and carry the components of the AB-1110/TRQ-30(V), It is made of canvas and resembles a golf bag with an outer pocket and an attached cover at one end of the case which can be secured in the closed position. The outer pocket stores the ground anchor assemblies; the inner compartments store the pedestal assembly, the two retaining straps, compass assembly, rf cable assembly, and azimuth scale. A protective caplug is provided to fit over the tapered end of the upper mast assembly during stowage, The two retaining straps are used to secure the pedestal assembly in its stowage arrangement to prevent breakage. A carrying strap is provided that can be attached to the two carrying strap rings which are permanently attached to the outer surface of the antenna pedestal case. The main compartment in the antenna pedestal case stores the pedestal assembly, held together by the two retaining straps; a compass pouch near the case cover stores the compass assembly and rf cable assembly; a flap inside the case cover stores the azimuth scale. Details of storage are provided in paragraph 3-9 and figure 3-4.

*f. Rf Cable Assembly* (fig. 1-3). The rf cable assembly is provided as part of the AB-1110-TRQ-30(V) to connect between the loop antenna being used and the antenna input of the receiver. The rf cable assembly consists of approximately 12 feet of type RG-58C/U cable terminated at each end with a type UG-88F/U connector.

## 1-11. System Applications

A typical direction finder system includes a radio direction finder set, one or more loop antennas, antenna pedestal assembly and associated equipment, With all system components interconnected, direction finding is accomplished by physically rotating the loop antenna until a minimum signal level (null) is obtained on the receiver. The direction in which the loop antenna faces is read off on the azimuth scale. Triangulation techniques are used to eliminate ambiguities when determining the true location of the desired signal source.

## 1-12. Additional Equipment Required

Radio Receivers R-1218/UR and R-1518/UR, or equivalent, with an appropriate headset are required

but are not supplied with the AN/TRQ-30(V) antenna groups to make up a complete radio direction finder system.

## 1-13. Tabulated Data

*a. Antenna AS-1523/TRQ-30(V)*

Frequency range . . . . . 0.515 MHz to 21.0 MHz
Frequency bands (5). . . . . Band 1–0.515 MHz to 1.20 MHz
Band 2–1.03 MHz to 2.60 MHz
Band 3–2.03 MHz to 5.30 MHz
Band 4–3.83 MHz to 9.40 MHz
Band 5–8.46 MHz to 21.0 MHz
Dimensions:
Height . . . . . 18-5/8 inches
Width . . . . . 12-3/16 inches
Depth . . . . . 3-1/8 inches
Weight . . . . . 2 lb

*b. Antenna AS-1526/TRQ-30(V).*

Frequency range . . . . . 19.0 MHz to 50 MHz (one band)
Dimensions:
Height . . . . . 14 inches
Width . . . . . 8-11/16 inches
Depth . . . . . 3-1/4 inches
Weight . . . . . 18 oz.

*c. Antenna AS-1527/TRQ-30(V).*

Frequency range . . . . . 45 MHz to 100 MHz (one band)
Dimensions:
Height . . . . . 10-1/2 inches
Width . . . . . 5-3/16 inches
Depth . . . . . 2-3/4 inches
Weight . . . . . 14 oz.

*d. Antenna AS-1528/TRQ-30(V),*

Frequency range . . . . . 95 MHz to 157.5 MHz (one band)
Dimensions:
Height . . . . . 9-1/8 inches
Width . . . . . 3-3/4 inches
Depth . . . . . 2-3/4 inches
Weight . . . . . 13 oz.

*e. Characteristics Common To All Antennas.*

Calibration and tuning range accuracy . . . . . ±5% maximum
Instrument error . . . . . ±2° maximum
Direct-to-reciprocal error . . . . ±5° maximum
Null depth . . . . . 30 db minimum from point of maximum response

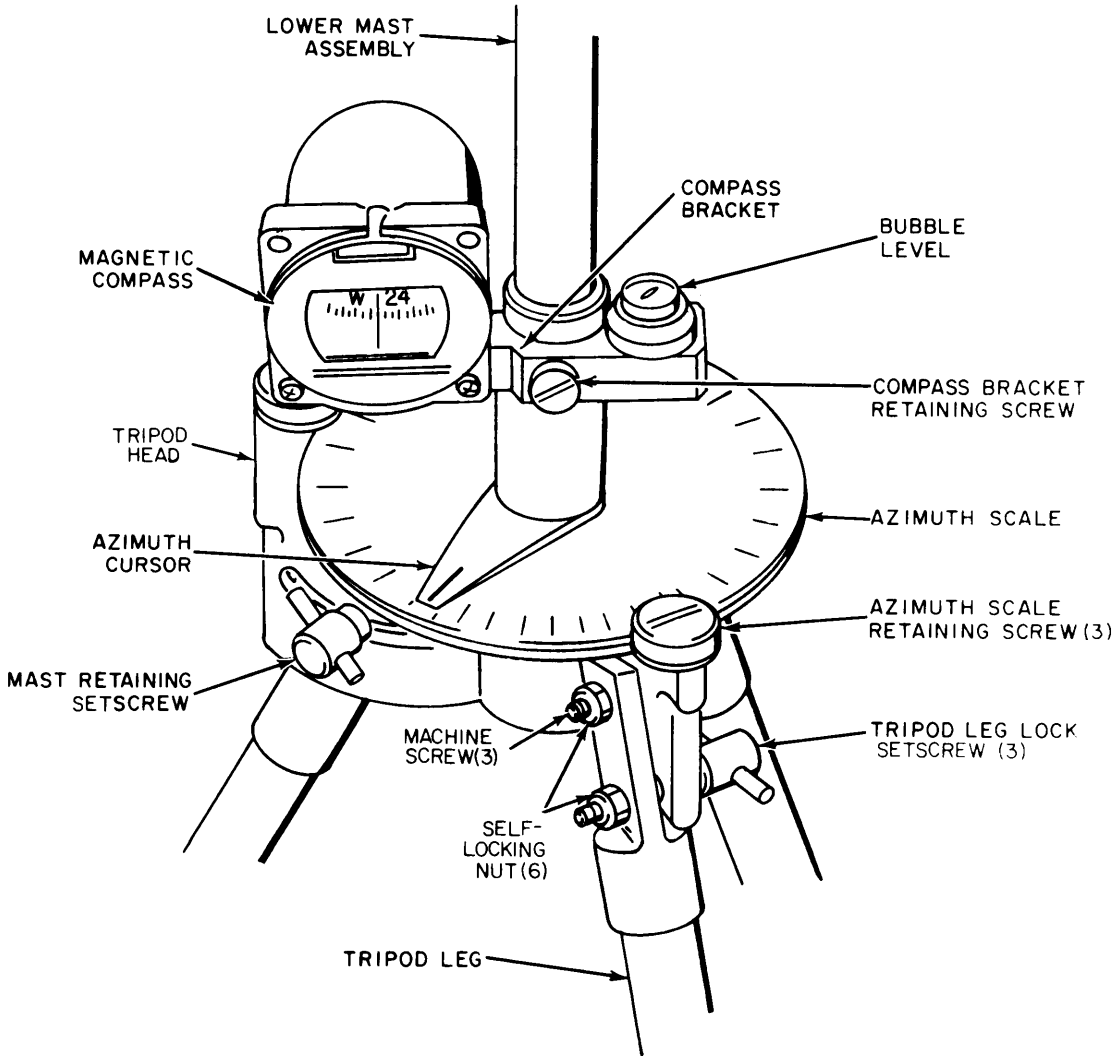



*Figure 1-6. Tripod assembly, upper section.*

# CHAPTER 2
# SERVICE UPON RECEIPT AND INSTALLATION

## Section I. SERVICE UPON RECEIPT OF EQUIPMENT

### 2-1. Unpacking
(fig. 2-1)

The equipment complements of the hf and vhf antenna groups are listed in appendix B. The equipment is packed for shipment with the AB-1110/TRQ-30(V) in one fiberboard carton and the loop antennas and antenna cases in another carton. Typical unpacking procedures follows:

*a.* Cut gummed tape that seals the top of the carton.

*b.* Remove waterproofed barrier material and packing lists.

*c.* Remove and open inner package and remove contents.

### 2-2. Checking Unpacked Equipment

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

*b.* Check to see that the equipment is complete as listed on the enclosed equipment packing lists. Report all discrepancies in accordance with TM 38-750. The equipment should be placed in service even though a minor assembly or part that does not affect proper functioning is missing.

*c.* Check to see whether the equipment has been modified. (Equipment which has been modified will have the MWO number near the nomenclature plate.) Check also to see whether all currently applicable MWO's have been applied. (Current MWO's applicable to the equipment are listed in DA Pam 310-7.)

*d.* For dimensions, weights, and volume of packaged items, see SB 700-20. Refer to appendix B for items comprising an operable equipment.

## Section II. INSTALLATION INSTRUCTIONS

### 2-3. Tools, Test Equipment, and Materials Required for installation

No tools or test equipment are required for installation. All necessary installation items are supplied with the equipment. Refer to figures 1-5 and 1-6 for typical installation procedures.

### 2-4. Siting

*a.* Carefully consider the possibility or rf reflections and obstructions when selecting a site for the direction finder equipment. Choose a site that is free of buildings, trees, metal fences and large structures and other radio antennas. These obstructions may interfere with received signals and cause bearing errors. The best location for the equipment is a large, clear, open site, such as the top of a hill or flat meadow.

*b.* Direction-finding errors may be caused by the location of metallic objects near the loop that have lengths close to or greater than one-eighth wavelength. This equals 6-1/2 feet at 19 MHz, and 1.25 feet at 100 MHz. Locate the equipment at least 100 feet from large objects.

*c.* The ground conditions should provide enough support to maintain the antenna erect, at 90° to the ground horizontal. A tripod level is located on the compass mounting bracket to indicate the vertical position of the mast.

### 2-5. Installation
(fig. 1-5 and 1-6)

Assemble the equipment as follows:

*a.* Place the equipment on a dry operating surface near the selected antenna site.

*b.* Release and open the cover of the antenna pedestal case.

*c.* Remove the compass pouch that contains the compass assembly and rf cable assembly, making sure the cover of the pouch is secure so that its contents do not fall out.

*d.* Remove the pedestal assembly from the antenna pedestal case and set the case aside in a safe place.

*e.* Release the two retaining straps that secure the pedestal assembly in storage and remove the upper and lower mast assemblies and set them aside in a safe place; store the two retaining straps in the antenna pedestal case for future use.

*f.* Loosen the tripod leg lock setscrews and swing the tripod legs outward approximately 20°, then tighten each tripod leg lock setscrews. Place the tripod assembly on a level surface.

*g.* Loosen the leg position locks on the tripod leg assemblies, extend legs as necessary to coarsely level the tripod, then tighten locks. Final leveling will be accomplished with the aid of the magnetic compass assembly bubble level when antenna pedestal assembly is completed.

*h.* Remove the azimuth scale from the flap inside the antenna pedestal case cover and install it on the tripod head by loosening the three azimuth scale retaining screws. Retighten the screws enough to hold the azimuth scale in place.

*i.* Loosen the mast retaining setscrew and insert the lower mast assembly into the tripod head. Tighten the mast retaining setscrew.

*j.* Remove the red protective caplug from the upper mast and store the caplug in the antenna pedestal case for future use.

*k.* Loosen the lower mast collet nut and insert the upper mast assembly. Be sure the tapered end of the upper mast mates properly with the lower mast assembly; tighten the collet nut.

*l.* Remove the ground anchor assemblies from the

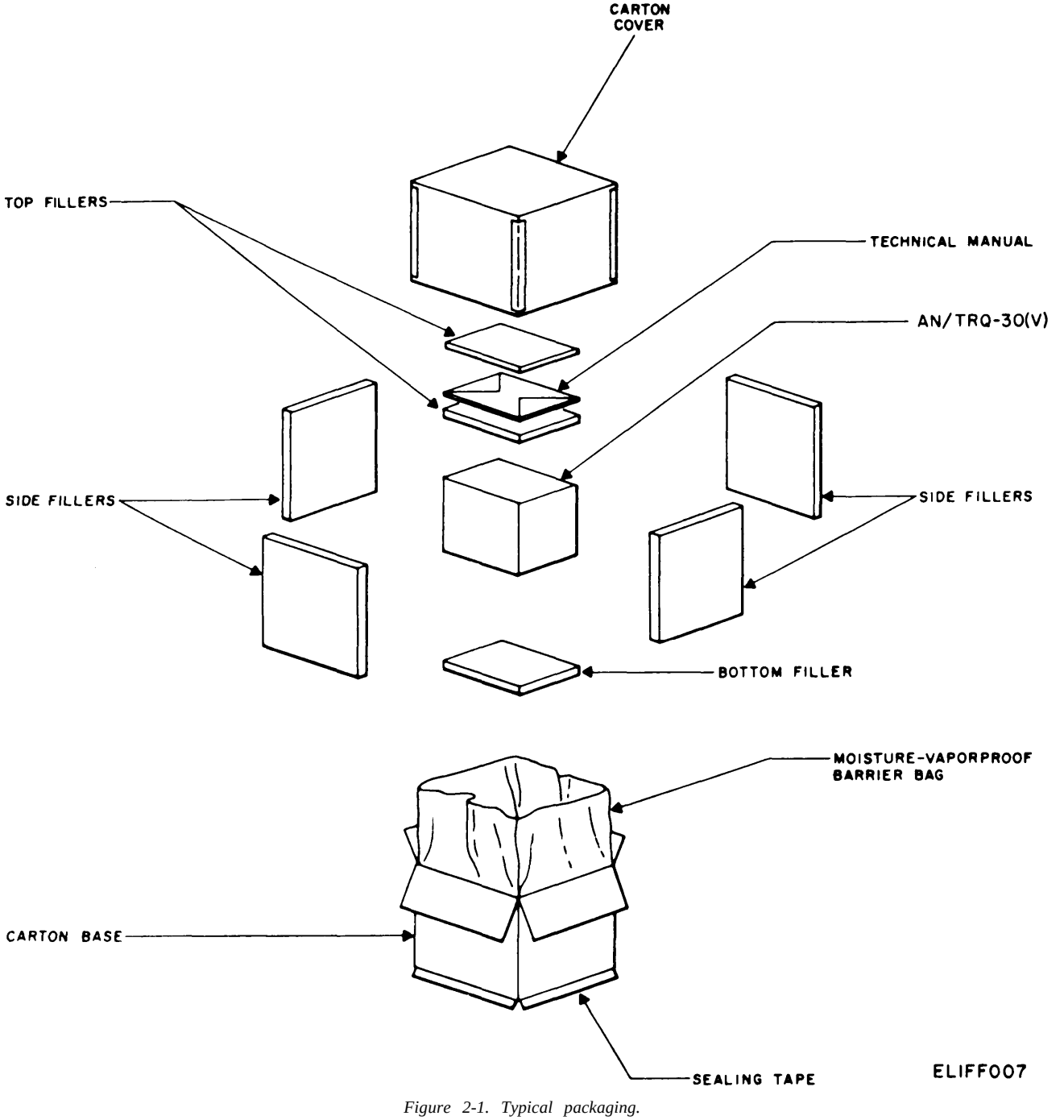



*Figure 2-1. Typical packaging.*

outer pocket of the antenna pedestal case.

*m.* Connect the S-hooks of the three ground anchor assemblies to the collar on the upper mast assembly.

*n.* Remove the rf cable assembly and compass assembly from the compass pouch (c above).

*o.* Install the magnetic compass assembly on the lower mast assembly and tighten the compass bracket retaining screw.

*p.* Position all tripod feet firmly on the ground and secure the ground anchors at 120° locations around the tripod. It may be necessary to readjust the length of the tripod leg assemblies and placement of ground anchors until a level attitude of the antenna is obtained. Use the bubble level on the magnetic compass bracket as a guide.

*q.* Remove the appropriate loop antenna from its antenna case. Use the following guide for loop antenna selection:

(1) 0.5 to 21 MHz — use Antenna AS-1523/TRQ-30(V).

(2) 19 to 50 MHz — use Antenna AS-1526/TRQ-30(V).

(3) 45 to 100 MHz — use Antenna AS-1527/TRQ-30(V).

(4) 95 to 157.5 MHz – use Antenna AS-1528/TRQ-30(V).

*r.* Loosen the antenna locking setscrew on the selected loop antenna and install it on the upper mast assembly. Orient the loop antenna so that the antenna locking setscrew slides into the slot in the upper mast assembly; tighten the antenna locking setscrew.

*s.* Connect the rf cable assembly between the rf connector on the loop antenna control box and antenna input jack on the associated receiver unit.

*t.* Operate the equipment with the magnetic compass assembly removed from the lower mast assembly. Before removing the magnetic compass assembly, align the mast assembly azimuth scale with North compass heading as follows:

(1) Loosen the mast retaining setscrew and rotate the mast assembly until the magnetic compass indicates North, then tighten the mast retaining setscrew.

(2) Loosen the three azimuth scale retaining screws and rotate the azimuth scale until the azimuth cursor lines up with the “O” line on the azimuth scale.

(3) Tighten the azimuth scale retaining screws.

**NOTE**

This completes antenna orientation. Do not change the azimuth scale position unless the antenna pedestal assembly is relocated.

*u.* Remove the magnetic compass assembly by loosening the compass bracket retaining screw. Store the magnetic compass assembly in its pouch in the antenna pedestal case and secure the pouch cover.

*v.* Allow the mast retaining setscrew to remain loose enough for rotation of mast assembly and loop antenna for operational usage. This setscrew may be tightened once a fix is made to prevent loop antenna movement.

# CHAPTER 3
# OPERATING INSTRUCTIONS

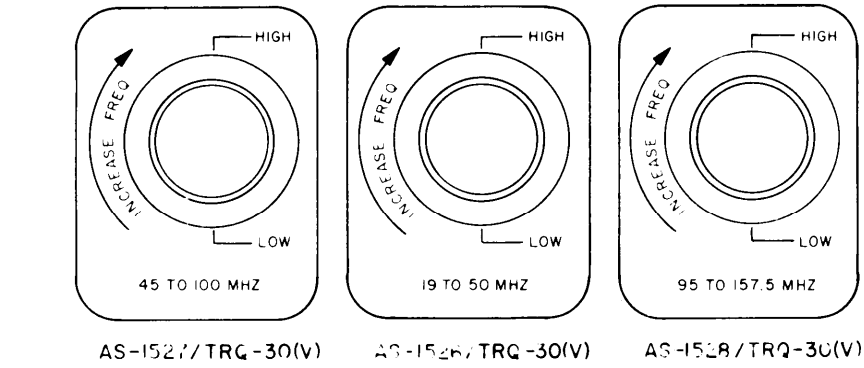
## Section I. CONTROLS AND INSTRUMENTS

### 3-1. General.

This chapter contains operator controls, functioning, and operating procedures under usual and unusual conditions. Operating procedures are described for basic types of operation; local requirements may call for variations of these procedures. Refer to the technical manuals referenced in appendix A for system operating procedures.

### 3-2. Controls, Switches, and Connectors (fig. 3-1)

| Control switches and connections | Function |
|---|---|
| BAND switch (AS-1523/TRQ-30(V) only) | Selects one of five frequency bands for operation:<br>BAND 1-0.515 to 1.20 MHz<br>BAND 2-1.03 to 2.60 MHz<br>BAND 3-2.03 to 5.30 MHz |



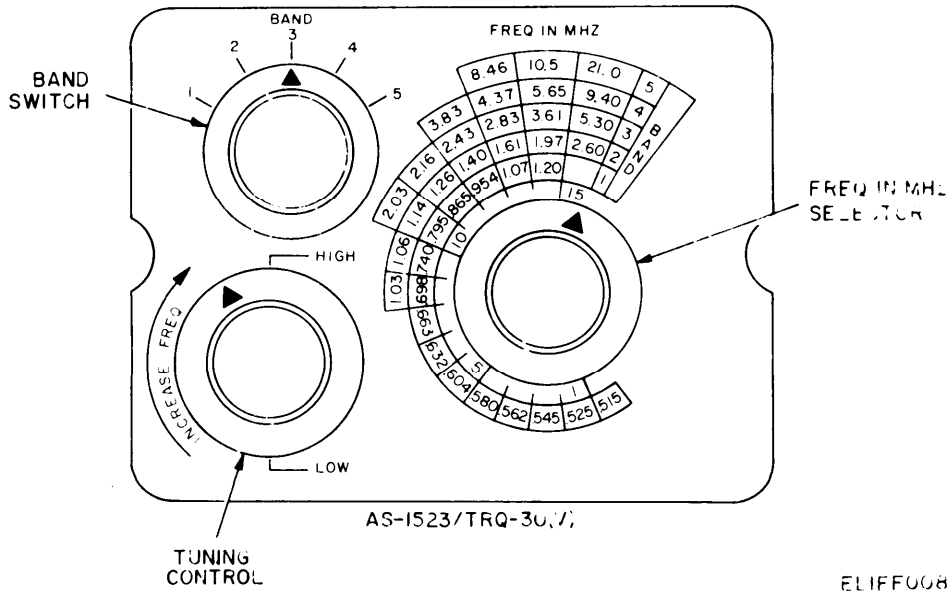




*Figure 3-1. Loop antenna, operator's controls.*

| Control switches and connectors | Function |
|---|---|
| | BAND 4-3.83 to 9.40 MHz<br>BAND 5-8.46 to 21.0 MHz |
| FREQ IN MHz Switch (AS-1523/TRQ-30(V) only) | Coarse-tunes loop antenna for selected frequency band increments; fine-tuning is provided by tuning control. |
| Tuning control (all loop antennas) | Tunes loop antenna for maximum input signal. |
| Connector (all loop antennas) | Connects loop antenna to associated radio receiver via the rf cable assembly. (Connector is located on the bottom of the housing.) |

## Section II. OPERATION UNDER USUAL AND UNUSUAL CONDITIONS

### 3-3. General Operation Principles

*a. Operation.* The direction finder equipment ascertains the position of a known-frequency transmitting station by orientation of a selected loop antenna. The modulated or unmodulated carrier signals received through the loop antenna are detected by radio receiver circuits (in associated equipment) and converted to visual and/or aural indications which are used by the operator to correctly monitor and tune the loop antenna. When the loop antenna is positioned properly, a null is obtained, indicating that the monitored transmissions originate from a source directly in front of the loop (sighting through the center of the loop); or 180° in the opposite direction. This ambiguity, which results from the *figure-eight* loop antenna pattern, is resolved through triangulation techniques.

*b. Null Signal.* The terms "null position" and "null" define loop antenna orientation when a minimum or zero signal response is received, and the antenna and receiver circuits are tuned for the monitored frequency. A null results when either loop antenna broadside faces the transmitting station and provides a sharper or more accurate indication than that obtained with the loop antenna in maximum sense position (directly in line with the transmissions). Consider the loop as an enlarged gun-sighting device. It is necessary to look through the loop aperture toward the transmitting station, which will be the same direction as the maximum signal-received position from the edge of the loop antenna. In the presence of a strong signal, the null will be more clearly defined and narrower; rotation of a few degrees is enough to produce sharp variations in the received signal strength. (On a weaker signal, the width of the null may increase to about 30 to 40°.) The center of the null (or area) is the correct transmitter bearing.

*c. Triangulation.* Because there are always two nulls, a null indication may not always furnish the operator with sufficient information to determine whether the transmitting source is to the front or the rear or the antenna. This 180° ambiguity is resolved through triangulation (para 3-6) by taking two direction finder readings, each from a different location on the same transmitter, and plotting the bearing intersections to determine the true transmitter location.

### 3-4. Hf Loop Antenna Operating Procedure

Use the following procedures for direction finder operation with the hf loop antenna.

*a.* Tune the associated receiver unit for reception on the incoming signal to be located, and note the signal frequency.

*b.* Set the loop antenna BAND switch and FREQ IN MHz control to correspond to the signal frequency.

*c.* Tune the antenna fine tuning control for maximum incoming signal. To obtain a usable indication, it may be necessary to rotate antenna away from null.

*d.* When maximum incoming signal has been tuned, and both receiver and loop antenna tuning controls are peaked, adjust receiver gain controls for a usable visual or aural indication.

*e.* Rotate the loop antenna for a null (minimum receiver signal indication). Readjust receiver gain as necessary.

*f.* When a proper null is obtained, read the signal direction from the azimuth scale. Note that the signal can originate from the direction indicated by the azimuth scale cursor or 180° from that reading caused by the ambiguity described in paragraph 3-3. If the true direction of the signal is in doubt, perform triangulation procedures given in paragraph 3-6.

### 3-5. Vhf Loop Antennas Operating Procedure

Use the following procedures for direction finder operation with vhf loop Antenna AS-1526/TRQ-30(V), AS-1527/TRQ-30(V), or AS-1528/TRQ-30(V).

*a.* With one of the vhf loop antennas installed, tune associated receiver unit for reception on the incoming signal to be located, and note the signal frequency.

*b.* Install the appropriate loop antenna for signal detection within the noted frequency range *(q,* para 2-5). Tune the antenna fine tuning control for maximum incoming signal. To obtain a usable indication, it may be necessary to rotate the antenna away from a null position.

*c.* When maximum incoming signal has been tuned, and both receiver and loop antenna controls are peaked, adjust receiver gain for a usable visual or aural indication.

*d.* Rotate loop antenna for a null (minimum receiver signal indication), Readjust receiver gain as necessary.

*e.* When a proper null is obtained, read the signal direction from the azimuth scale. Note that the signal can originate from the direction indicated by the azimuth cursor, or 180° from the reading because of the ambiguity described in paragraph 3-3. If the true direction of the signal is in doubt, perform triangulation procedures given in paragraph 3-6.

## 3-6. Triangulation Procedures

(fig. 3-2)

To verify the true source of monitored signal transmission, refer to figure 3-2 and perform the following procedures:

*a.* Observe and record the bearing indication of transmitter source.

*b.* Add 90° to the bearing that is 180° or less; subtract 90° from the bearing that is over 180° up to 360°.

*c.* Move the loop antenna (and associated equipment) in the direction of that calculated in *b* above, set up the equipment, and take new bearings.

*d* Note the direction in which the loop must be turned to obtain new null.

*e.* If the loop must be turned counterclockwise, the true bearing is 180° or less; if the loop must be turned clockwise, the true bearing is between 180° and 360°.

## 3-7. Equipment Shutdown Procedure

The antenna group includes only passive components. No special procedures are necessary to shut down the equipment other than disassembly and repacking of the components.

## 3-8. Operation Under Unusual Conditions

The following subparagraphs provide suggestions for operation of the equipment where extreme climatic conditions may exist.

*a. Operation in Arctic Climates.* Subzero temperatures and climatic conditions associated with cold weather may adversely affect equipment functioning, Follow these precautions:

(1) Handle equipment carefully.

(2) Keep equipment clean and dry.

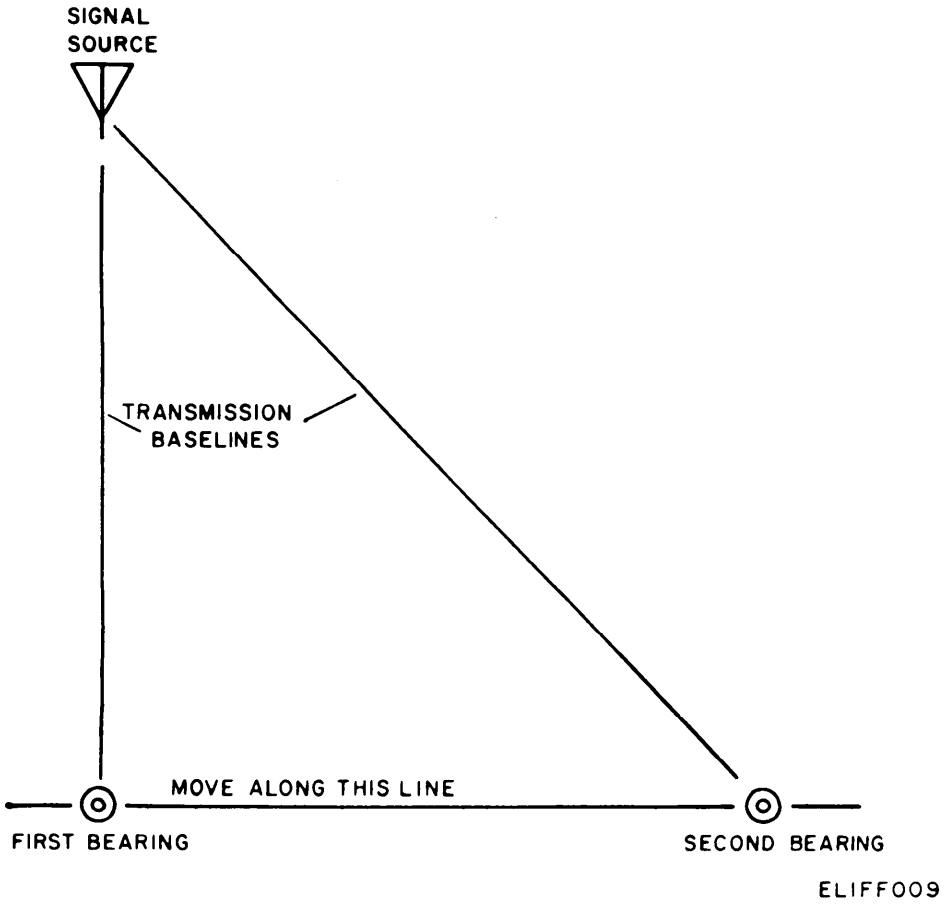



*Figure 3-2. Triangulation techniques.*

(3) Prevent ice from forming on the equipment. Ice formations may inhibit control operation and prevent free antenna movement.

*b. Operation in Desert Climates.* Heat and dryness associated with desert environment will not affect the operation of the equipment. However, dust storms can cause controls to bind, prevent free operation of the mast mechanism, and damage associated receiver equipment. When the equipment is not in use, cap all connectors and store assemblies in plastic bags.

*c. Operation in Salt Spray.* Keep equipment clean and dry and wipe salt spray from exposed metal surfaces. When not in use, store equipment in respective carrying cases.

## 3-9. Preparation for Movement

When a mission is completed or it becomes necessary to move to a new location, disassemble and repack the equipment as follows:

**CAUTION**

Be sure that all components are clean and dry before replacement in respective carrying cases.

*a.* If the magnetic compass has not been removed

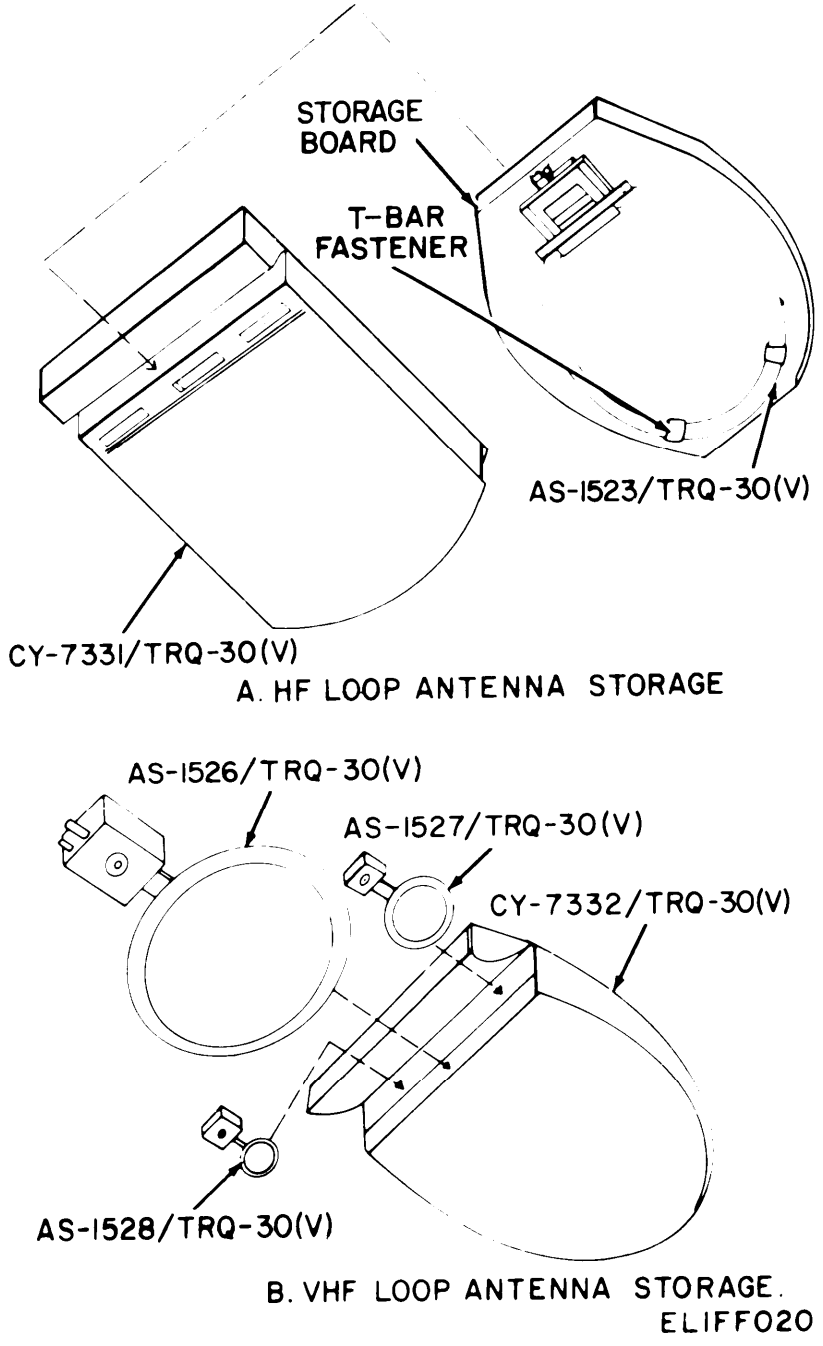



*Figure 3-3. Storage of loop antennas.*

during installation, loosen the compass bracket retaining screw and remove the magnetic compass assembly from the lower mast assembly (fig. 1-6). Store the compass assembly in its pouch (fig. 3-4) that is attached in the pedestal carrying case.

*b.* Disconnect the rf cable assembly that is connected between the loop antenna connector and the receiver unit, clean as necessary, and store in the compass pouch of the antenna pedestal case; secure the flap cover of the pouch.

**CAUTION**

Before storage of the hf loop antenna be sure to attach it securely to its stowage board to prevent breakage during handling and transport.

*c.* Loosen the retaining setscrew on the loop an-

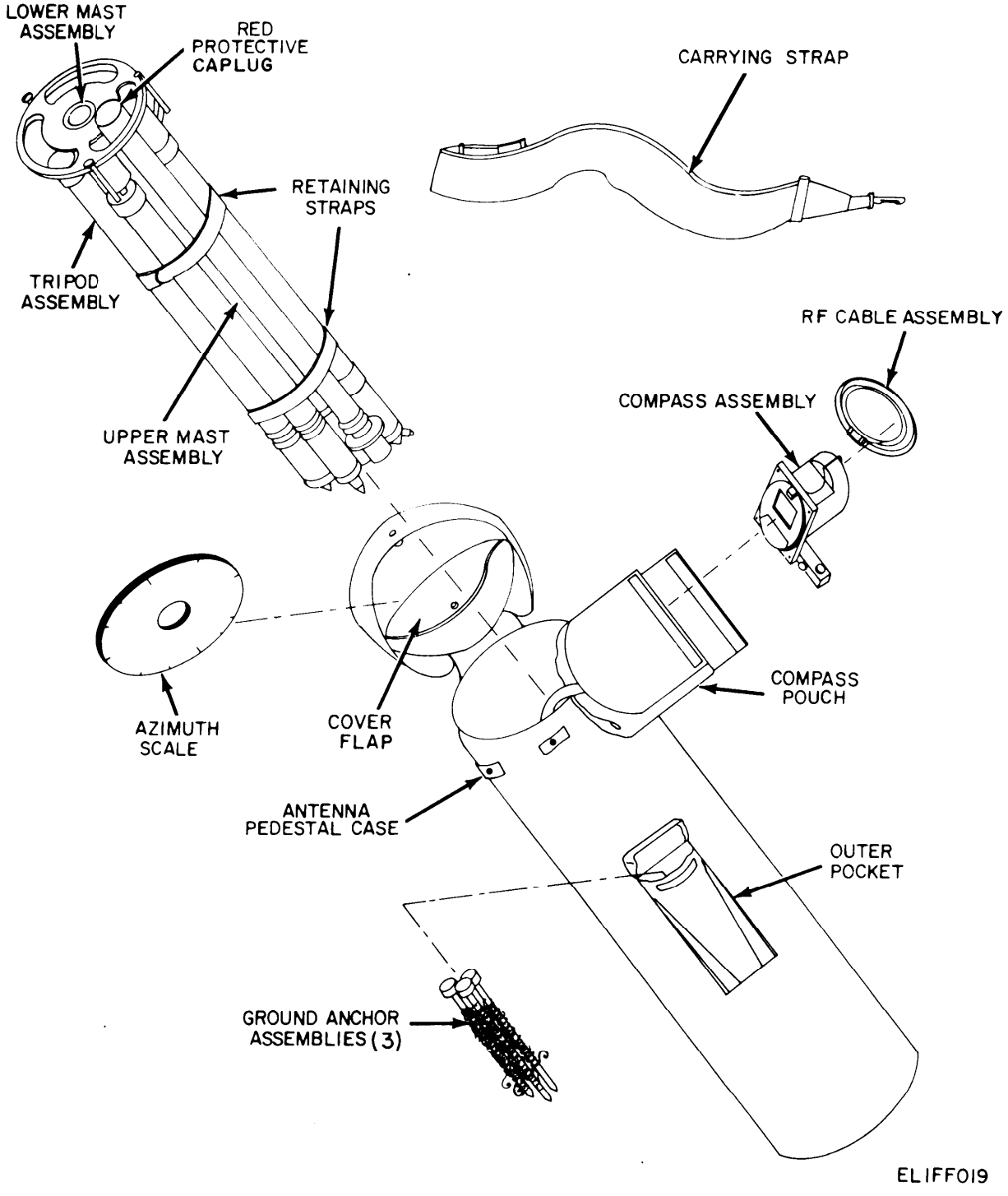



*Figure 3-4. Storage of AB-1110/TRQ-30(V) components.*

tenna, remove the antenna from the upper mast assembly, and store it in its respective antenna case (fig. 3-3). Note the above caution with respect to storage of the hf loop antenna.

*d.* Pull out the ground anchors and disconnect the S-hooks from the guy ring on the upper mast assembly (fig. 1-5).

*e.* Clean the ground anchors and store them in the outer pocket (fig. 3-4) of the antenna case; secure the flap cover of the pocket.

*f.* Loosen the lower mast collet nut, remove the upper mast assembly, and temporarily set it aside in a safe place.

*g.* Loosen the mast retaining setscrew (fig. 1-6), remove the lower mast assembly, and temporarily set it aside in a safe place.

*h.* Loosen the azimuth scale retaining screws and remove the azimuth scale. Store the azimuth scale in the flap (fig. 3-4) inside the cover of the antenna pedestal case and secure the flap.

*i.* Lift the tripod assembly from the ground and collapse it by loosening the tripod leg lock setscrews.

**CAUTION**

The tripod assembly must be completely collapsed before storing. Be sure each tripod leg is telescoped together.

*j.* Clean all components of the antenna pedestal assembly and dry them with a clean cloth.

*k.* Insert the lower mast assembly into the bottom of the tripod head center hole and secure by tightening the mast retaining setscrew. Tighten the lower mast collet nut. Bring all three tripod legs together with the flat portion of the tripod feet retaining the lower mast collet nut. Tighten all tripod leg lock setscrews and leg position locks.

*l.* Install the red protective caplug on the tapered end of the upper mast assembly, then push the end with the red plug through one of the openings in the tripod head casting and have the opposite end even with the collet nut of the lower mast. Secure the assembly with the two retaining straps.

*m.* Insert the secured pedestal assembly in the antenna pedestal case as shown in figure 3-4.

*n.* Check to see that the flap cover on the compass pouch is secure and insert the pouch in the antenna pedestal case.

*o.* Close the antenna pedestal carrying case cover and secure it with the cover fasteners.

# Chapter 4
# ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

## Section I. TOOLS AND EQUIPMENT

### 4-1. Scope of Organizational Maintenance

The maintenance duties at this category are listed below together with a reference to the paragraphs covering the specific maintenance functions. The paragraphs include instructions for performing corrective maintenance.

*a.* Repainting and refinishing (para 4-3).
*b.* Lubrication (para 4-4).
*c.* Preventive maintenance checks and services (para 4-5).
*d.* Cleaning (para 4-7).
*e.* Knob replacement (para 4-10).

### 4-2. Tools, Materials, and Test Equipment Required for Organizational Maintenance

No special tools or test equipment are required for organizational maintenance. Refer to the maintenance allocation chart (MAC) in appendix D and the following listing:

*a.* Tool Kit, Electronic Equipment TK-101/G.
*b.* Multimeter AN/USM-223.
*c.* Trichlorotrifluoroethane (item 1, app E, NSN 6850-00-105-3084).
*d.* Cleaning cloth (item 2).
*e.* Fine sandpaper (No. 000) (item 3),
*f.* Soft bristle brush (item 4).
g. Grease (MIL-G-4343) (item 5).
*h.* Paint (olive drab, 34087) (item 6).
*i.* Paint brush (item 7).

## Section II. REPAINTING, REFINISHING, AND LUBRICATION INSTRUCTIONS

### 4-3. Repainting and Refinishing Instructions

**CAUTION**

Do not use any abrasive material (sandpaper or steel wool) to smooth the surface of the loop antennas. Clean as directed in paragraph 4-7. The loop antennas have a special conductive paint beneath the outer coat that must not be removed. *Apply paint only to surfaces that were originally painted.*

*a.* When the finish on the equipment has been badly scarred or damaged, further damage can be prevented by touching up the bared surfaces. Use trichloroethane on affected areas, use No. 000 sandpaper on the antenna pedestal assembly surfaces only,

*b.* Remove dirt from the equipment by cleaning affected areas with trichloroethane. In severe cases, it may be necessary to use compound to soften the bad spots and sandpaper (on the antenna pedestal only) to complete the preparation for painting. Apply paint with a small brush; brush two thin coats of paint on the bare spots to protect it from further deterioration. Refer to TM 43-0139, Painting Instructions for Field Use. Approved paints and finishes are listed in SB 11-573. Original outer coating paint is olive drab number 34087.

### 4-4. Lubrication Instructions

*a.* Loop antennas require no lubrication. However, the antenna pedestal assembly requires the application of a small amount of light grease (MIL-G-4343 or equal) on the lock screws once every 180 days.

## Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

### 4-5. General

**NOTE**

Refer to TM 750-244-2 for proper procedures for destruction of this equipment to prevent enemy use.

*a.* Organizational preventive maintenance procedures are designed to help maintain equipment in serviceable condition. They include items to be checked and how to check them. These checks and services, described in Table 4-1, outline inspections that are to be made before operation and at specific monthly (M) intervals.

(1) BEFORE OPERATION, perform your B

PMCS to be sure that your equipment is ready to go.

(2) MONTHLY PMCS are important checks to keep serious problems from suddenly happening. Perform MONTHLY as well as BEFORE OPERATION PMCS if:

*(a)* You are the assigned operator and have not operated the item since the last MONTHLY.

*(b)* You are operating the item for the first time.

(3) When an item of equipment is reinstalled after removal, for any reason, perform the necessary B PMCS (Table 4-1) to be sure the item meets the readiness reporting criteria.

(4) Use the ITEM NO. column in the PMCS table to get the number to be used in the TM ITEM NO. column on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) when you fill out the form.

*b.* Routine checks like CLEANING, PRESERVATION, DUSTING, WASHING, CHECKING FOR FRAYED CABLES, STOWING ITEMS NOT IN USE, COVERING UNUSED RECEPTACLES, AND CHECKING FOR LOOSE NUTS AND BOLTS, LOOP ANTENNA MOUNTING, AND COMPLETENESS are not listed as PMCS checks. They are things that you should do any time you see they must be done. If you find a routine check like one of those listed in your PMCS, it is because other operators reported problems with this item.

**NOTE**

When you are doing any PMCS or routine checks, keep in mind the warnings and cautions.

**WARNINGS**

- Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.
- Compressed air is dangerous and can cause serious bodily harm if protective means or methods are not observed to prevent a chip or particle (of whatever size) from being blown into the eyes or unbroken skin of the operator or other personnel. Goggles must be worn at all times while cleaning with compressed air. Compressed air shall not be used for cleaning purposes except where reduced to less than 29 pounds per square inch gage (psig) and then only with effective chip guarding and personnel protective equipment. Do not use compressed air to dry parts when trichlorotrifluoroethane has been used.

**NOTES**

The PROCEDURES column in your PMCS charts instruct how to perform the required checks and services. Carefully follow these instructions and, if tools are needed or the chart so instructs, get organizational maintenance to do the necessary work.

If your equipment must be in operation all the time, check those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

*c.* Deficiencies that cannot be corrected must be reported to higher category maintenance personnel. Records and reports of preventive maintenance must be made in accordance with procedures given in TM 38-750.

Paragraph 4-6 deleted.

## 4-7. Cleaning

Inspect the exterior surfaces of the equipment. All exterior surfaces should be clean and free of dirt, grease, and fungus.

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

**WARNING**

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

*Table 4-1. Organizational Preventive Maintenance Checks and Services Chart*

B — Before M – Monthly

| Item No. | Interval B | Interval M | Items to be Inspected | Procedures |
|---|---|---|---|---|
| 1 | * | | AN/TRQ-30(V) 1, 2, & 4 | Perform all operational checks as described in para 3-4 and 3-5. |
| 2 | | ● | Mission Essential Equipment | Check for completeness and satisfactory condition of the equipment. Reporting missing items. |

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

*b.* Remove grease, fungus, and ground-in dirt from the surfaces using a cloth dampened (not wet) with tricloroethane (para 4-2).

*c.* Remove dust or dirt from cable connectors with a brush.

*d.* Clean the control knobs; use a soft clean cloth. If dirt is difficult to remove, dampen the cloth with water; mild soap may be used for more effective cleaning.

## Section IV. ORGANIZATIONAL TROUBLESHOOTING

### 4-8. Troubleshooting

The responsibilities of the organizational repairman are limited to correction of equipment failures which can be remedied by replacement of individual loop antennas or a defective cable assembly. All maintenance procedures relating to test, repair or overhaul are to be accomplished at a higher category of maintenance.

*a. Loop Antenna.* Use substitution methods to determine whether a specific loop antenna is defective. To insure that the problem is not caused by incorrect loop selection, check to see that selected loop antenna is being used in the appropriate frequency band, as listed in paragraph 4-9.

*b. Rf Cable Assembly.* If replacement of a loop antenna does not correct the problem, replace the rf cable assembly. Defective rf cable assemblies are not reparable. Use the multimeter for cable continuity checks.

### 4-9. Loop Antennas and Assigned Frequency Band

| Antenna | Receiver | Frequency band |
|---|---|---|
| AS-1523/TRQ-30(V) | R-1218/UR | 0.515 MHz to 21.0 MHz, in five bands: |
| | | 1- 0.515 MHz to 1.20 MHz |
| | | 2- 1.03 MHz to 2.60 MHz |
| | | 3- 20.3 MHz to 5,30 MHz |
| | | 4- 3.83 MHz to 9.40 MHz |
| | | 5- 8.46 MHz to 21.0 MHz |
| AS-1526/TRQ-30(V) | R-1518/UR | 19.0 to 50 MHz |
| AS-1527/TRQ-30(V) | R-1518/UR | 45 to 100 MHz |
| AS-1528/TRQ-30(V) | R-1518/UR | 95 to 157.5 MHz |

### 4-10. Removal and Replacement of Knobs

Each of the control knobs is secured to the respective shaft by a setscrew. Before removing a knob, set the control to a readily identifiable position so that the replacement knob can be set accurately to the same original position. To replace a knob, loosen or remove the setscrew and carefully lift the knob from the shaft. Before replacement, check to see that the knob dial pointer tracks properly with dial markings.

# CHAPTER 5
# FUNCTIONING OF EQUIPMENT

## 5-1. General

This chapter describes the functioning and characteristics of the antenna group for Direction Finder Set AN/TRQ-30(V).

## 5-2. Functional Description

*a. Introduction.* The balanced, shielded loop is the most commonly used antenna for hf and vhf direction finding. As shown in the cross-sectional view (fig. 5-1), a typical electrostatically shielded loop antenna consists of one or more turns of a conductor positioned within a shielded tube of a nonferrous, highly conductive material. A gap is provided at the top of the loop so the shield does not act as a shorted turn, preventing the loop conductor from coupling to the received signal. The loop antenna has a *figure-eight* pattern (fig. 5-2) so that direction finding is accomplished by nulling out received signals. When the plane of the loop is perpendicular to the direction of the vertically polarized signal, as shown in figure 5-3, the voltages induced in the two effective arms of the loop are equal in amplitude and phase. A balanced loop acts the same way as a push-pull device; therefore, voltages induced in the two arms are added out-of-phase and cancel, causing a null to appear. When the loop plane faces the signal source, induced voltages in the loop arms have a maximum phase separation, and maximum output signal is supplied. Both sides of a loop must be at the same potential with respect to system ground. Capacitive unbalance to ground between the two sides of the loop produces a voltage which has an in-phase/out-phase relationship with the loop terminal voltage. The unbalance signal is equivalent to the signal obtained from a vertical monopole and shifted 90° in phase. Antenna pattern distortion because of loop unbalance is designed *antenna effect,* which is usually characterized by *filling-in* and shifting the nulls in the antenna pattern. Because antenna effect can be greatly reduced using an electrostatic shield, the shielded loop is used more often than the unshielded loop.

*b. Loop Functioning and Description.* A typical loop antenna is a shielded, one to seven turn structure, fed by an unbalanced 50-ohm transmission line. The shield is broken at the upper point and measures approximately 1 inch in cross-section diameter. Loop conductors are supported concentrically within the shield by an insulating foam. A protective skin protects the shield from physical damage.

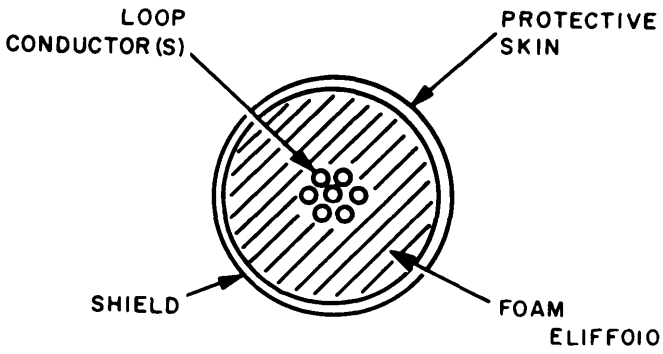



*Figure 5-1. Cross-section of typical loop antenna.*

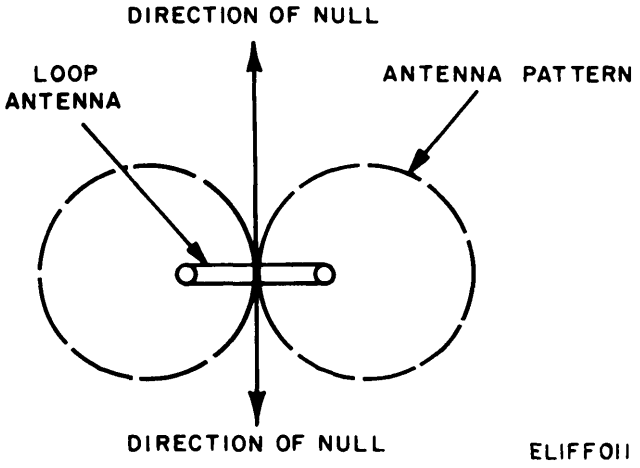



*Figure 5-2. Figure-eight antenna patterns.*

*c. Vhf Loop Antennas.* Three loop antennas provide vhf direction-finding capability. The loops have figure-eight patterns (fig. 5-2) so that direction finding is accomplished by nulling out the received signal.

(1) Each of the three vhf loops is a shielded, single-turn structure fed in an unbalanced way from a 50-ohm transmission line (fig. 5-4). The shield is broken at the uppermost point and in cross section measures approximately 1 inch in diameter. A single loop conductor is placed concentrically within the shield. A fiberglass-resin skin protects the shield and the loop is supported by an insulating foam. The outer diameters of the AS-1526/TRQ-30(V), AS-1527/TRQ-30(V), and AS-1528/TRQ-30(V) are approximately 8-11/16, 5-3/16, and 3-3/4 inches, respectively.

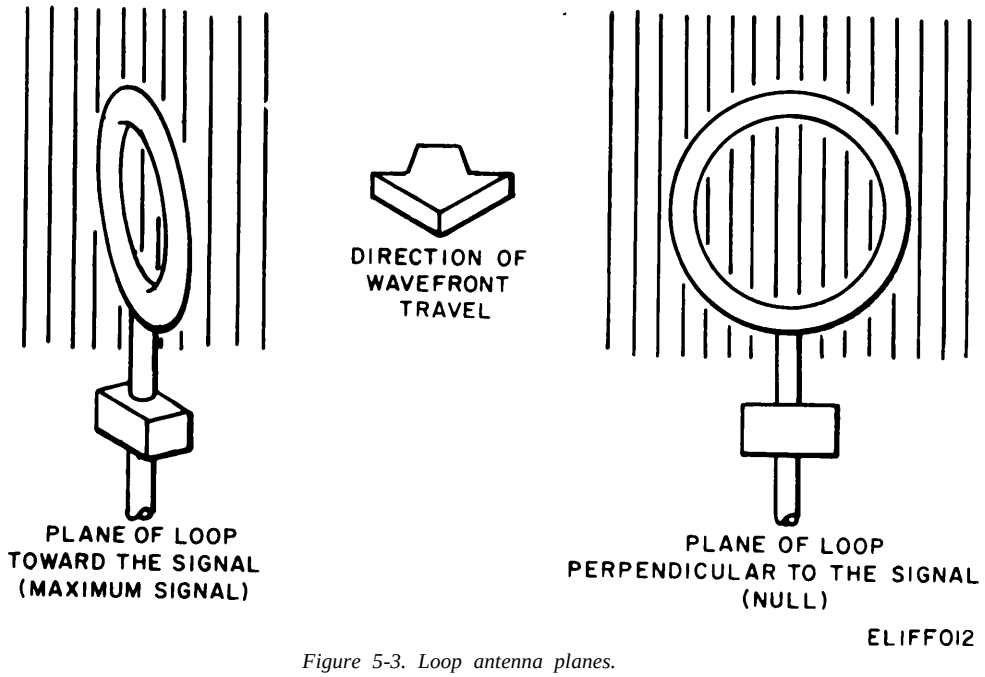
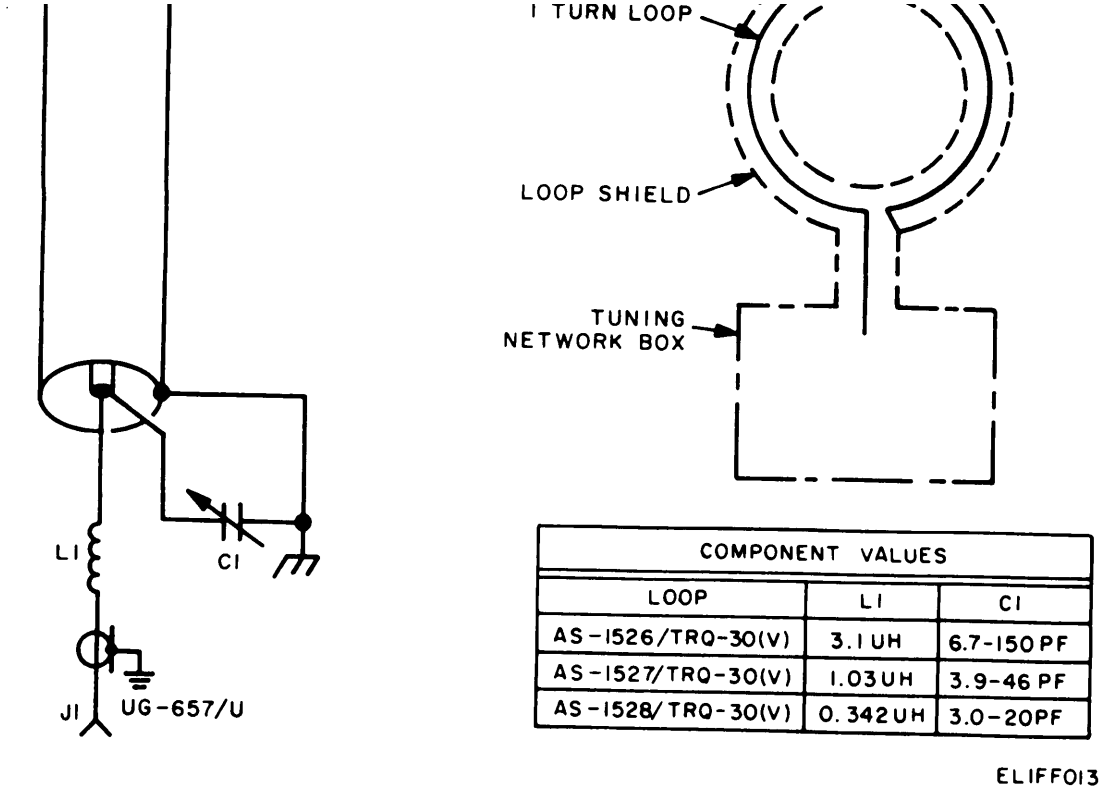



*Figure 5-3. Loop antenna planes.*

(2) A tuning network connected to each of the loops is used to match the output in the loop to the 50-ohm coaxial transmission line. The tuning network (fig. 5-4) consists of variable capacitor C1 and series inductor L1. Capacitor C1 (tuning control) is adjusted to resonance at each frequency of interest. The output of the vhf loop antennas is provided at J1 for connection to a receiver.




| COMPONENT VALUES | | |
|---|---|---|
| LOOP | L1 | C1 |
| AS-1526/TRQ-30(V) | 3.1 UH | 6.7-150 PF |
| AS-1527/TRQ-30(V) | 1.03 UH | 3.9-46 PF |
| AS-1528/TRQ-30(V) | 0.342 UH | 3.0-20 PF |

*Figure 5-4. Vhf loop antenna, schematic diagram.*

*d. HF Loop Antenna* (fig. 5-5). The hf loop antenna operates similarly to the vhf loop antennas *(c* above), except that this loop has provision for direction finding through five frequency bands. Also, the hf loop uses seven turns of conductors, whereas the vhf loops use only one.

(1) The hf loop antenna is a shielded seven-turn structure fed in an unbalanced way from a 50-ohm transmission line. The shield is broken at the uppermost point and is approximately 1 inch in diameter in cross section. The loop conductors are insulated magnet wire and are arranged to provide specific number of turns for each band. Seven, five, three, two, and one turns are selected by BAND switch S1 for bands 1, 2, 3,4, and 5, respectively. The conductors are supported concentrically within the shield by an insulating foam. A fiberglass resin skin protects the shield from physical damage. The outer diameter of the loop is 12-3/16 inches.

(2) A tuning network, consisting of an inductance (L1 through L5) variable capacitance (C1 through C15), matches the loop to a 50-ohm transmission line. BAND switch S1 changes the number of turns in use on each band and switches in the proper amount of inductance. The capacitance is varied with step switch S2 (FREQ IN MHz control), which switches in fixed steps of capacitance (C2 through C15), and a variable trimmer C1 (tuning control) connected in parallel. The tuning control fine tunes the loop to resonate at the selected frequency. The output of the loop antenna is provided at J1 for connection to a receiver.

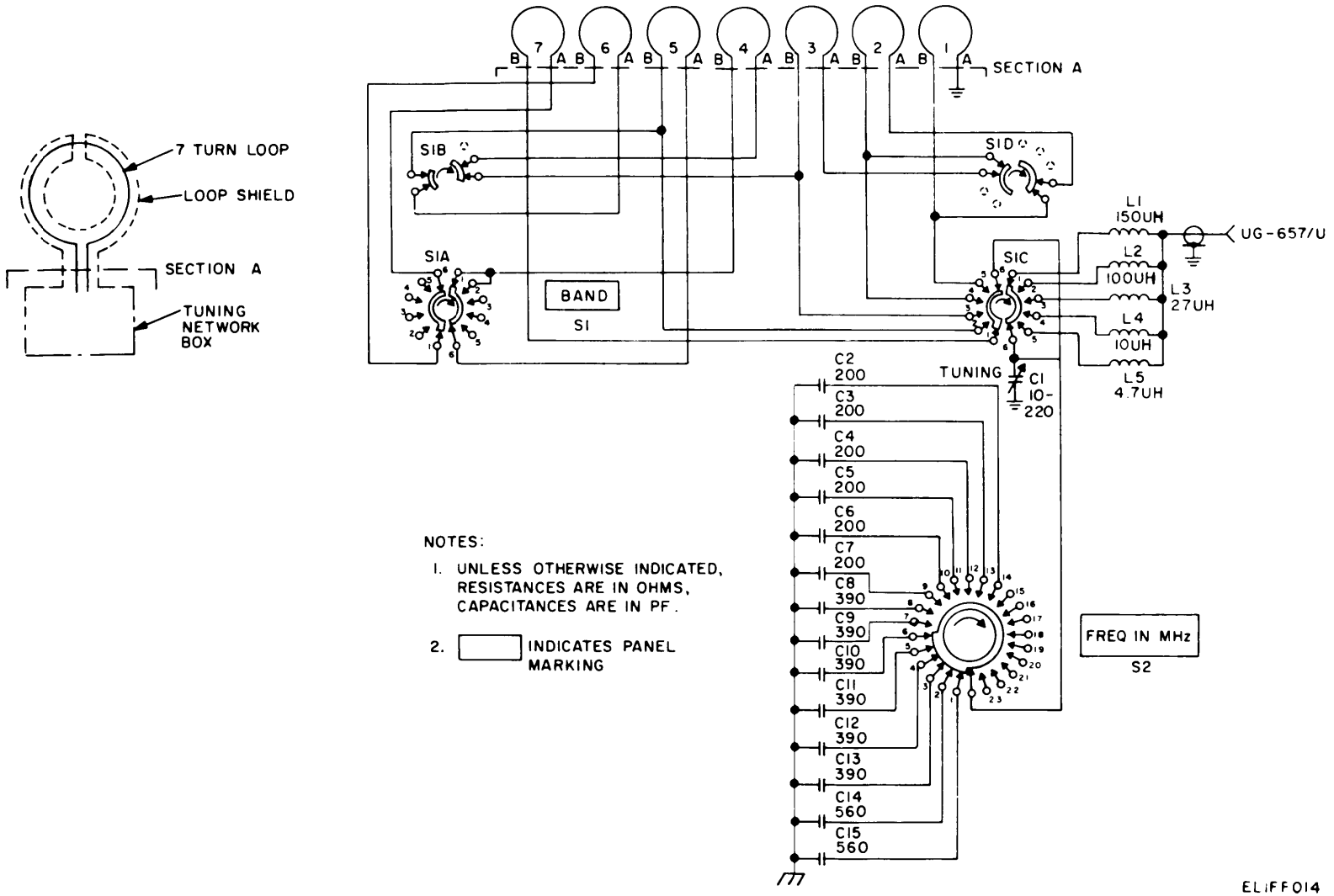



*Figure 5-5. Hf loop antenna, schematic diagram.*

# CHAPTER 6
# DIRECT AND GENERAL SUPPORT MAINTENANCE

## Section I. GENERAL

### 6-1. Scope of DS and GS Maintenance

*a.* All maintenance procedures for the equipment covered within this manual are within the scope of direct and general support maintenance and are covered in this chapter. Maintenance duties assigned to direct and general support are listed below, together with references to paragraphs covering specific maintenance functions. No tools or materials other than those listed in paragraph 6-2 are required.

(1) Performance tests (para 6-3).

(2) Physical tests and inspections (para 6-4).

(3) Troubleshooting (table 6-6).

(4) Replacement of components (para 6-11 through 6-18).

*b.* Testing procedures are prepared for use by direct and general support personnel responsible for support maintenance of electronic equipment to determine the acceptability of repaired equipment. These procedures set forth the specific requirements that repaired equipment *must* meet before it is returned to the using organization.

*c.* Comply with the instructions preceding each chart. Perform each step in sequence to insure desired test results. Do not vary the sequence. For each step, perform all the actions required in the *Control settings* column, then perform each test procedure, verifying it against the respective performance standard.

### 6-2. Test Equipment, Tools, and Materials Required

All test equipment, tools and materials required to perform the testing procedures for direct and general support are listed below. Refer to the MAC for national stock numbers.

*a. Test Equipment.*

| *Test equipment* | *Technical manual* | *Common name* |
|---|---|---|
| Indicator, Standing Wave IM-175/U | TM 11-6625-545-15 | Standing wave indicator |
| Signal Generator AN/USM-44B | TM 11-6625-508-10 | Vhf signal generator |
| Signal Generator AN/GRM-50 | TM 11-6625-573-15 | Hf signal generator |
| Bolometer, HP Type HP-476 (or equivalent) | | Bolometer |
| Attenuator CN-970/U (or equivalent) (2 required) | | 6-db attenuator |
| Antenna, fabricated from solid copper wire, AWG #12, 36 in. lg. | | Transmitting antenna |
| Multimeter AN/USM-223 | TM 11-6625-654-14 | Multimeter |

*b. Tools and Materials.*

| | | |
|---|---|---|
| Tool Kit, Electronic Equipment TK-105/G | SC 5180-91-CL-R07 | Tool kit |

## Section II. DIRECT AND GENERAL SUPPORT TROUBLESHOOTING

### 6-3. Performance Tests

Antenna groups for the AN/TRQ-30(V) include only passive components which cannot be tested dynamically apart from the associated direction finder equipment. However, certain static tests and inspections may be accomplished on the loop antennas which will expose apparent malfunctions or other improper conditions and indicate if the individual loop antennas are operational. These tests include the following:

*a.* Physical tests and inspections (para 6-4).

*b.* Hf loop antenna frequency band check (para 6-5).

*c.* Vhf loop antennas frequency band check (para 6-6).

*d.* Continuity and short circuit tests (para 6-8, 6-9, and 6-10).

### 6-4. Antenna Group for AN/TRQ-30(V), Physical Tests and Inspections

*a. Test Equipment and Materials.* None required.

*b. Test Connections and Conditions.* None required.

*c. Procedure.*

| Step | Control settings | | Test procedure | Performance standard |
|---|---|---|---|---|
| | Test equipment | Equipment under test | | |
| | N/A | Controls may be in any position. | a. Inspect all controls and mechanical assemblies for loose or missing screws, bolts, or nuts. | *a.* Screws, bolts, and nuts tight; none missing. |
| | | | *b.* Inspect connector for looseness or damage. | *b.* No looseness or damage evident. |
| | | | *c.* Inspect cable assembly for connector damage, frayed or broken wiring. | *c.* No damage to connector or wiring evident. |
| | | | *d.* Inspect control boxes for damage, missing parts, and condition of finish. Inspect condition of finish and panel lettering. | *d. No* damage or missing parts evident. External surfaces intended to be painted will not show bare metal. Panel lettering will be legible. |
| | | | **NOTE**<br>Touchup painting is recommended instead of refinishing wherever practicable. Screw heads, connectors and plated fastener parts will not be painted or polished with abrasives. | |
| | | | *e.* Inspect pedestal assembly components for damaged fittings, missing parts, bent, cracked, or broken mast or leg sections, operation of setscrew locks. | *e.* No damaged or missing parts evident. |
| | N/A | Controls may be in any position. | *a.* Rotate panel switches through all positions. | *a.* Switches operate freely without binding and rubbing against panel, or excessive looseness. Switches have positive detent action. |
| | | | *b.* Rotate tuning controls throughout limits of travel. | *b.* Controls rotate freely without binding or looseness. |
| | N/A | N/A | Inspect external surfaces of loop antennas for dents, cracks, or punctures. | No dents, cracks, or punctures evident. |
| | N/A | N/A | Check control unit for applicable modification work orders. | None. |

## 6-5. Hf Loop Antenna Frequency Band Check

*a. Test Equipment and Materials.*

| *Nomenclature* | *Common name* |
|---|---|
| Indicator, Standing Wave IM-175/U | Standing wave indicator |
| Generator, Signal AN/GRM-50 | Hf signal generator |
| Bolometer, Hewlett-Packard Model HP-476 | Bolometer |
| Attenuator CN-970/U | 6-db attenuator |
| Antenna (36 inch length of #12 solid copper wire) | Transmitting antenna |

*b. Test Connections and Conditions.*

(1) Connect the test equipment to the power source, turn on the test equipment and allow a 10-minute warmup period before starting test procedures.

(2) Connect the test equipment to the loop antenna under test as shown in figure 6-1 (using hf signal generator). Position loop sideways to transmitting antenna for maximum signal reception.

**NOTE**

To assure continuous frequency coverage, there should be a frequency overlap from one FREQ IN MHz step to the next on each band and from one band to the next, on the hf antenna. There should also be a frequency overlap between antennas; hf to vhf antennas (AS-1526/TRQ-30(V)).

*c. Procedure.*

| Step | Control settings | | Test procedure | Performance standard |
|---|---|---|---|---|
| | Test equipment | Equipment under test | | |
| 1 | Adjust hf signal generator output level to + 10 dbm (into 50 ohms); 30% modulate the signal generator with 1000 Hz. | Set BAND switch to BAND 1; FREQ IN MHz switch to lst-position (.515/.525) | *a.* Adjust loop antenna tuning control to maximum clockwise position (HIGH). | *a.* None. |
| | | | *b.* Vary hf signal generator output frequency until loop antenna peaks, as indicated on the standing wave indicator | *b.* Hf signal generator output frequency is _____MHz + _____ MHz. (table 6-1) |
| | | | *c.* Adjust loop antenna tuning control to maximum counterclockwise position (LOW). | *c.* None. |

| Step | Control settings | | Test procedure | Performance standard |
|---|---|---|---|---|
| | Teat equipment | Equipment under test | | |
| | | | *d.* Vary hf signal generator output frequency until loop antenna peaks, as indicated on the standing wave indicator. | *d.* Hf signal generator output frequency is _____MHz ± _____ MHz. |
| 2 | Same as step 1. | Successively rotate FREQ IN MHz switch through remaining positions. | Stop in each switch position to perform the frefrequency check procedures outlined in steps 1 *a* through *d*. | Refer to table 6-1 for hf signal generator output frequencies at HIGH and LOW tuning. |
| 3 | Same as step 1. | Set BAND switch to BAND 2; FREQ IN MHz switch successively rotated from 9th position (1.03/1.06) to full position (1.97/ 2.60). | Stop in each position to perform the frequency check procedures outlined in steps 1 *a* through *d.* | Refer to table 6-2 for hf signal generator output frequencies at HIGH and LOW tuning. |
| 4 | Same as step 1. | Send BAND switch to BAND 3: FREQ IN MHz switch successively rotated from 11th position (2.03/2.16) to final position (3.61/ 5.30). | Stop in each position to perform the frequency check procedures outlined in steps 1 *a* through *d.* | Refer to table 6-3 for hg signal generator output frequencies at HIGH and LOW turning. |
| 5 | Same as step 1. | Set BAND switch to BAND 4; FREQ IN MHz switch successively rotated from 13th position (3.83/4.37) to final position 5.65/ 9.40). | Stop in each position to perform the frequency check procedures outlined in steps 1 *a* through *d.* | Refer to table 6-4 for hf signal generator output frequencies at HIGH and LOW tuning. |
| 6 | Same as step 1. | Set BAND switch to BAND 5; FREQ IN MHz switch successively rotated from 14th position (8.46/10.05) to final position 10.5/ 21.0). | Stop in each position to perform the frequency check procedures outlined in steps 1 *a* through *d.* | Refer to table 6-5 for hf signal generator output frequencies at HIGH and LOW tuning. |

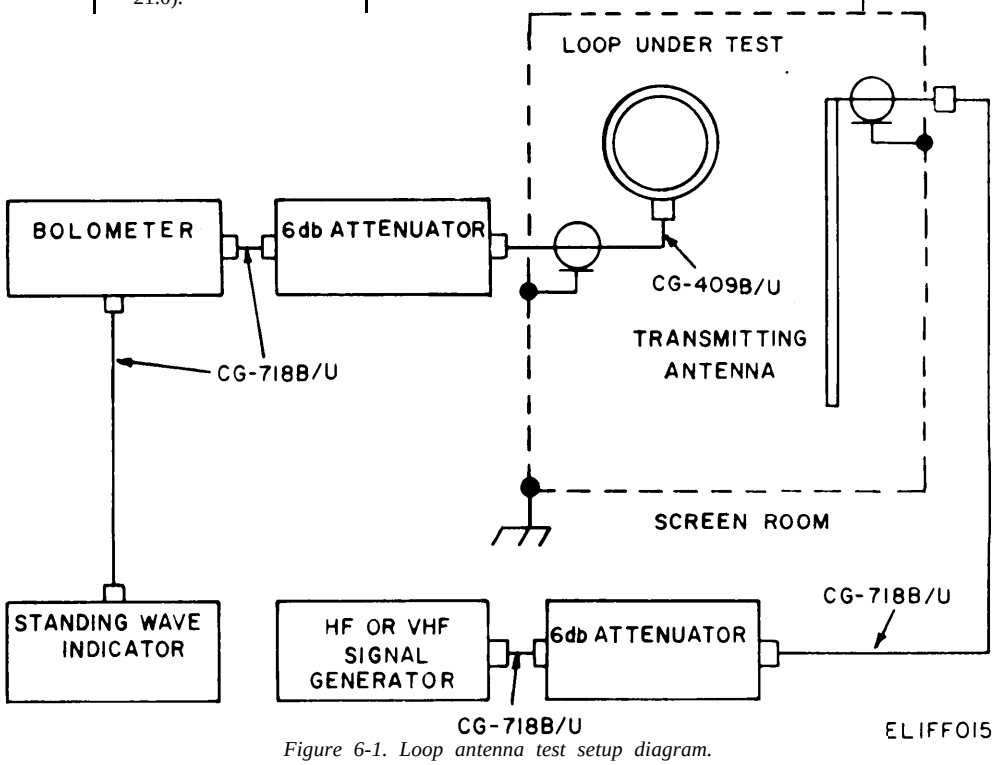



*Figure 6-1. Loop antenna test setup diagram.*

*Table 6-1. HF Loop Antenna Frequency Band Check, Band 1*

| FREQ IN MHz Switch Position | Tuning Control Setting LOW (MHz max) | HIGH (MHz min) |
|---|---|---|
| .515/.525 | .515 | .520 |
| .525/.545 | .534 | .535 |
| .545/.562 | .553 | .554 |
| .562/.580 | .570 | .571 |
| .580/604 | .591 | .592 |
| .604/.632 | .617 | .618 |
| .632/.663 | .647 | .648 |
| .663/.698 | .680 | .681 |
| .698/.740 | .718 | .720 |
| .740/.795 | .765 | .770 |
| .795/.865 | .825 | .835 |
| .865/.954 | .905 | .915 |
| .954/1.07 | 1.00 | 1.02 |
| 1.07/1.20 | 1.12 | 1.20 |

*Table 6-2. HF Loop Antenna Frequency Band Check, Band 2*

| FREQ IN MHz Switch Position | Tuning Control Setting LOW(MHz max) | HIGH(MHz min) |
|---|---|---|
| 1.03/1.06 | 1.03 | 1.04 |
| 1.06/1.14 | 1.09 | 1.10 |
| 1.14/1.26 | 1.19 | 1.20 |
| 1.26/1.40 | 1.32 | 1.33 |
| 1.40/1.61 | 1.47 | 1.53 |
| 1.61/1.97 | 1.69 | 1.88 |
| 1.97/2.60 | 2.06 | 2.60 |

*Table 6-3. HF Loop Antenna Frequency Band Check, Band 3*

| FREQ IN MHz Switch Position | Tuning Control Setting LOW(MHz max) | HIGH(MHz min) |
|---|---|---|
| 2.03/2.16 | 2.03 | 2.09 |
| 2.16/2.43 | 2.26 | 2.32 |
| 2.43/2.83 | 2.55 | 2.70 |
| 2.83/3.61 | 2.97 | 3.44 |
| 3.61/5.30 | 3.79 | 5.30 |

*Table 6-4. HF Loop Antenna Frequency Band Check, Band 4*

| FREQ IN MHz Switch Position | Tuning Control Setting LOW(MHz max) | HIGH(MHz min) |
|---|---|---|
| 3.83/4.37 | 3.83 | 4.17 |
| 4.37/5.65 | 4.58 | 5.40 |
| 5.65/9.40 | 5.90 | 9.40 |

*Table 6-5. HF Loop Antenna Frequency Band Check, Band 5*

| FREQ IN MHz Switch Position | Tuning Control Setting LOW(MHz max) | HIGH(MHz min) |
|---|---|---|
| 8.46/10.5 | 8.46 | 10.0 |
| 10.5/21.0 | 11.0 | 21.0 |

## 6-6. VhF Loop Antennas Frequency Band Check

*a. Test Equipment and Materials,*

| Nomenclature | Common name |
|---|---|
| Indicator, Standing Wave IM-175/U | Standing wave indicator |
| Generator, Signal AN/USM-44B | Vhf signal generator |
| Bolometer, Hewlett-Packard Model HP-476 | Bolometer |
| Attenuator, Hewlett-Packard Model HP-355C | 6-db attenuator |
| Antenna (36 inch length of #12 solid copper wire) | Transmitting antenna |

*b. Test Connections and Conditions.*

(1) Connect the test equipment to the power source, turn on the test equipment and allow a 10-minute warmup period before starting test procedures.

(2) Connect the test equipment to the loop antenna under test as shown in figure 6-1 (using vhf signal generator). Position loop sideways to transmitting antenna for maximum signal reception.

*c. Procedure.*

| Step | Control settings: Test equipment | Control settings: Equipment under test | Test procedure | Performance standard |
|---|---|---|---|---|
| 1 | Adjust vhf signal generator output level to + 7 dbm (into 50 ohms): 30% modulate the signal generator with 1000 Hz. | None. Use AS-1526/TRQ-30(V) loop antenna. | *a.* Adjust loop antenna tuning control to maximum clockwise position (HIGH).<br>*b.* Vary vhf signal generator output frequency until loop antenna peaks, as indicated on the standing wave indicator.<br>*c.* Adjust loop antenna tuning control to maximum counterclockwise position (LOW).<br>*d.* Vary vhf signal generator output frequency until loop antenna peaks, as indicated on the standing wave indicator. | a. None.<br>*b.* Vhf signal generator output frequency is 50 MHz minimum.<br>*c.* None.<br>*d.* Vhf signal generator output frequency is 19 MHz maximum. |
| 2 | Same as step 1. | None. Use AS-1527/TRQ-30(V) loop antenna. | Repeat the procedures in step 1, checking for loop antenna response at HIGH and LOW tuning. | With tuning control at HIGH, vhf signal generator frequency is 100 MHz minimum; with tuning control at LOW, vhf signal generator frequency is 45 MHz maximum. |
| 3 | Same as step 1. | None. Use AS-1528/TRQ-30(V) loop antenna. | Repeat the procedures in step 1, checking for loop antenna response at HIGH and LOW tuning. | With tuning control at HIGH, vhf signal generator frequency is 157.5 MHz minimum: with tuning control at LOW, vhf signal generator frequency is 95 MHz maximum. |

## 6-7. Maintenance Procedures

*a. General.* The first step in servicing is to observe the operation of the equipment and note what operations can and cannot be accomplished. This will help to localize the trouble to a particular component or group of components. The second step is to isolate the fault, which means tracing the fault to a defective part responsible for the abnormal operation. Some faults, such as broken circuit board wiring, or wires that connect between control, switches, or cable assemblies can often be located by sight. The majority of the faults, however, must be isolated by continuity checks and component substitution.

*b. Visual Inspection.* The purpose of visual inspection is to locate faults without testing or measuring circuits. All visual signs should be observed and an attempt made to localize the fault to a particular area or isolate it to a particular component.

*c. Testing Procedures.* After any repair of the equipment always test it for satisfactory performance before returning the equipment to the user or placing it in repaired stock. Refer to paragraphs 6-5 and 6-6 for testing procedures. (These procedures can also be used to check the performance of the equipment before starting to troubleshoot it as this may localize the trouble.)

*d. Troubleshooting Chart.* The troubleshooting chart (table 6-6) provides procedures based on symptoms of trouble and recommended procedures that will aid in localizing and finally isolating the trouble. Maintenance of the antenna group is limited to replacement of assemblies and components based on observation of abnormal operating conditions, or inability of the loop antennas to comply with the performance standards. Failures which are peculiar to the antenna group will generally result from either of the following items, or a combination thereof:

(1) Defective rf cable assembly.

(2) Incorrectly positioned control knobs.

(3) Defective loop antenna and/or control box components.

(4) Mechanical failure in antenna pedestal assembly.

*Table 6-6. Troubleshooting Procedure*

| Item | Symptom | Probable cause | Corrective |
|---|---|---|---|
| 1 | System completely inoperative. | Defective rf cable assembly. | Check continuity of cable assembly (para 6-8); replace if necessary. |
| 2 | Individual loop antenna does not receive transmissions. | *a.* Incorrect choice of loop antenna. | *a.* Use appropriate loop antenna (q, para 2-5). |
| | | *b.* Incorrectly positioned FREQ IN MHz or BAND switch knob (AS-1523/TRQ-30(V) only) | *b.* Check and/or re-position knobs (para 4-10). |
| | | *c.* Defective loop antenna. | *c.* Perform loop antenna continuity checks (para 6-9 and 6-10); repair or replace, as necessary. |
| 3 | Mechanical failure in antenna pedestal assembly. | Damaged fittings, missing parts; bent, cracked, or broken mast or leg sections. | Visual inspection, replace part or parts, as necessary. |

*e. Parts Replacement.* Refer to paragraphs 6-11 through 6-18 for assembly and parts replacement procedures.

## 6-8. Cable Assembly Continuity and Short Circuit Test

Use the multimeter as an ohmmeter to check for continuity or short circuits in the wiring of the rf cable assembly. The rf cable assembly is a shielded single-conductor coaxial cable terminated on both ends with a type UG-88F/U plug. Check for end-to-end continuity between the center connector pins; check for continuity between the outer housing (shield) of the connectors. Check for shorts between inner and outer conductors (center pin and housing of the connectors). Flex cable while performing continuity and short tests to show up intermittent breaks and shorts. The cable assembly is nonreparable and should be replaced if failures are observed.

## 6-9. Hf Loop Antenna Continuity Checks

The following subparagraphs describe continuity tests for the loop antenna and control box (fig. 5-5) which will aid in locating defective switches, wiring, or open coils. Coil resistance is negligible and defective coils will be indicated by an open circuit. Capacitor failures, other than shorts or leakage, should be suspected if the loop antenna operates on some channels, but not on all channels. Use component substitution techniques to locate defective capacitors.

*a. FREQ IN MHz Switch Continuity Checks.* Rotary switch S2 is a single-deck 23-position switch with 14 active positions. The wiper section initially contacts and shorts out six switch terminals and, as it is rotated

clockwise, the total shunt capacitance decreases in small, predetermined increments, raising the tuned frequency of the lc circuit until the final switch position, where the only capacitance remaining is that of fine tuning control C1. The chart below lists the capacitors that are in parallel in each switch position. Failure of a switch contact, open or shorted capacitor, or defective fine tuning control will result in inconsistent operation. The loop antenna will be tunable at some frequencies, but not on all frequencies. Check for continuity between the switch terminals as follows:

| *FREQ IN MHz switch S2 position* | *Read continuity between S1C-6 and S2-* | *Shunt capacitors* |
|---|---|---|
| 1 | 1, 2, 3, 4, 5, 6, | C10 - C15 |
| 2 | 2, 3, 4, 5, 6, 7 | C9 - C14 |
| 3 | 3, 4, 5, 6, 7, 8 | C8 - C13 |
| 4 | 4, 5, 6, 7, 8, 9 | C7 - C12 |
| 5 | 5, 6, 7, 8, 9, 10 | C6 - C11 |
| 6 | 6, 7, 8, 9, 10, 11 | C5 - C10 |
| 7 | 7, 8, 9, 10, 11, 12 | C4 - C9 |
| 8 | 8, 9, 10, 11, 12, 13 | C3 - C8 |
| 9 | 9, 10, 11, 12, 13, 14 | C2 - C7 |
| 10 | 10, 11, 12, 13, 14 | C2 - C6 |
| 11 | 11, 12, 13, 14 | C2 - C5 |
| 12 | 12, 13, 14 | C2 - C4 |
| 13 | 13, 14 | C2 and C3 |
| 14 | 14 | C2 |
| 15 | . . . . . | |

*b. BAND Switch S1 Continuity Checks.* BAND switch S1 is a five-position, four-deck rotary switch which selects the L-component for the tuned lc network. The most effective method for checkout of the switch and inductive circuit is to connect the ohmmeter between the center and ground terminals of connector J1. Rotating BAND switch S1 through all five positions and observing the meter for continuity (allowing for minimal series resistance offered by inductors L1 through L5) will provide an affirmative indication of the condition of the series antenna loop coil windings, switch S1 continuity, and coils L1 through L5 series resistance. If an open circuit is indicated, refer to the following list and schematic diagram (fig. 5-5) to locate faulty components.

| *BAND switch position* | *Series-connected antenna loops* | *Series inductors* |
|---|---|---|
| 1 | Sections 1 thru 7 | L1 |
| 2 | Sections 1 thru 5 | L2 |
| 3 | Sections 1, 2, 3 | L3 |
| 4 | Sections 1,2 | L4 |
| 5 | Section 1 | L5 |

**NOTE**

The antenna loop is nonreparable. The indication of an open antenna loop winding requires replacement of the entire loop antenna.

## 6-10. Vhf Loop Antenna Continuity Checks

The vhf loop antennas (fig. 5-4) contains few circuit components. In addition to the inductance of the loop antenna coil, the assembly includes a variable capacitor (tuning control), C1; series inductance, L1, connector, J1; and interconnecting wiring. If a loop antenna fails, check these components or substitute and replace, as necessary.

# Section III. REPLACEMENT OF PARTS

## 6-11. General Parts Replacement Techniques

The following general precautions should be observed when replacing parts in this equipment.

*a.* For parts removal and replacement, always work on a clean, flat work surface. When replacing parts in df loop antennas or pedestal assemblies, make sure that mating surfaces are clean and free of nicks, burrs, or surface irregularities. Blow out interior of cases with clean compressed air source.

*b.* Whenever an electrical part such as a resistor, capacitor, or coil is to be removed, note the exact position of the part before removing it. Replace the part in the same position.

*c.* Use a low-wattage soldering iron (25 watts maximum) when replacing components or repairing wiring on printed circuit boards. Excessive soldering heat can damage printed wiring.

*d.* When removing and replacing control knobs, preset the control to a readily identifiable position and install replacement control knobs to line up in exactly the same position.

## 6-12. Removal and Replacement Procedures

Procedures for removal and replacement of hf and vhf loop antenna components are described in paragraphs 6-13 and 6-14. The loop antennas cannot be disassembled; therefore, removal and replacement procedures are provided only for authorized components. Removal and replacement procedures for components of the antenna pedestal assembly are described in paragraph 6-15.

## 6-13. Disassembly of Hf Loop Antenna (fig. 6-2)

The hf loop antenna is shown disassembled in figure 6-2. The following procedures cover removal and replacement of O-ring and internal components of the hf loop antenna.

*a. O-Ring Removal and Replacement.* The O-ring (20) can be replaced when the loop antenna housing (1) and cover assembly (22) are disassembled.

(1) Loosen the eight captive screws (2) and washers (3) that secure the cover assembly (22); remove

cover assembly from the loop antenna housing (l) far enough to unsolder the wire from J1.

(2) Unsolder the wire from J1 and separate the rover from the remaining housing assembly.

(3) Carefully remove the old O-ring (20).

**CAUTION**

Be careful when installing new O-ring to prevent damage from excessive stretching.

(4) Spread a thin coating of silicone grease (MIL-G-4343 or equal) on the O-ring surface.

(5) Install new O-ring in position and press firmly into grooved track.

(6) Resolder the wire removed in (2) above.

| | |
|---|---|
| 1 | Loop antenna housing |
| 2 | Screw (8) |
| 3 | Washer (8) |
| 4 | Knob (3) |
| 5 | Boot |
| 6 | Panel |
| 7 | Variable capacitor (tuning control) |
| 8 | BAND switch S1 |
| 9-13 | Rf coils |
| 14 | FREQ IN MHz switch S2 |
| 15 | Circuit board |
| 15 A | Capacitor, fixed |
| 15 B | Capacitor, fixed |
| 15 C | Capacitor, fixed |
| 16 | Nut |
| 17 | Lockwasher |
| 18 | Washer |
| 19 | Setscrew |
| 20 | O-ring |
| 21 | Coaxial connector |
| 22 | Cover assembly |
| 23 | Cover |
| 24 | Threaded insert |
| 25 | Nameplate |

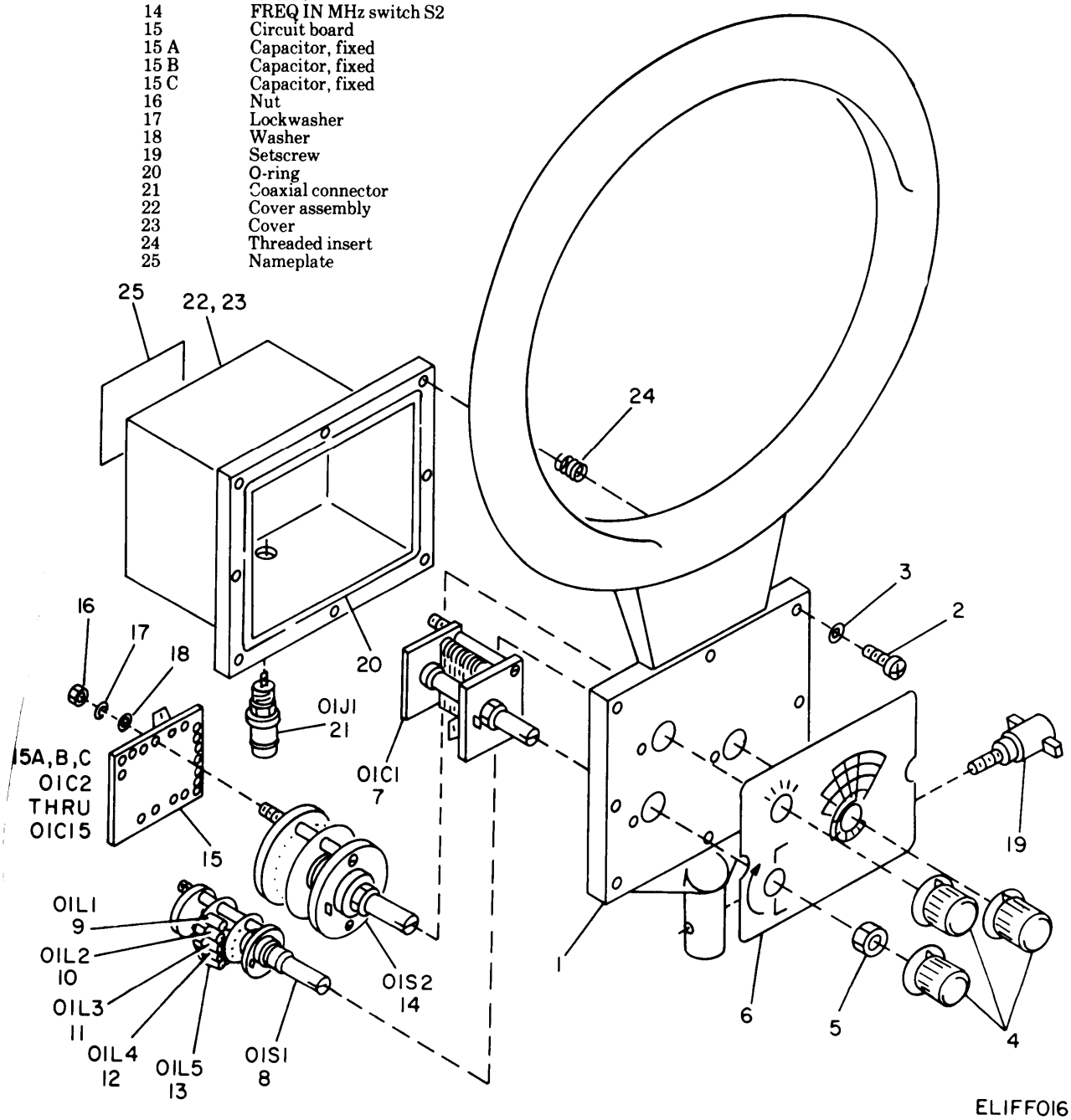



*Figure 6-2. Hf loop antenna, exploded view.*

(7) Reassemble cover assembly (22) and loop antenna housing (1); check to see that O-ring is seated properly, Tighten captive screws (2).

*b. Removal and Replacement of Components.* Interior components are accessible for removal and replacement once the loop antenna housing and cover assembly are disassembled (a(1) and (2) above). Coils L1 through L5 (9 through 13) are located on BAND switch S1 (8); capacitors C2 through C15 (15A through 15C) are located on the circuit board (15); FREQ IN MHz switch S2 (14), fine tuning control C1 (7), BAND switch S1 (8), and coaxial connector J1 (21) are easily removed and replaced for maintenance purposes. Refer to paragraph 4-10 for removal and replacement of knobs.

## 6-14. Disassembly of Vhf Loop Antennas

(fig. 6-3)

A typical vhf loop antenna is shown disassembled in figure 6-3, Basic disassembly and reassembly, and component removal and replacement procedures are similar to those given for the hf loop antenna (para 6-13). Index numbers also differ, but can be easily related.

## 6-15. Disassembly of Antenna Pedestal Assembly

(fig. 6-4)

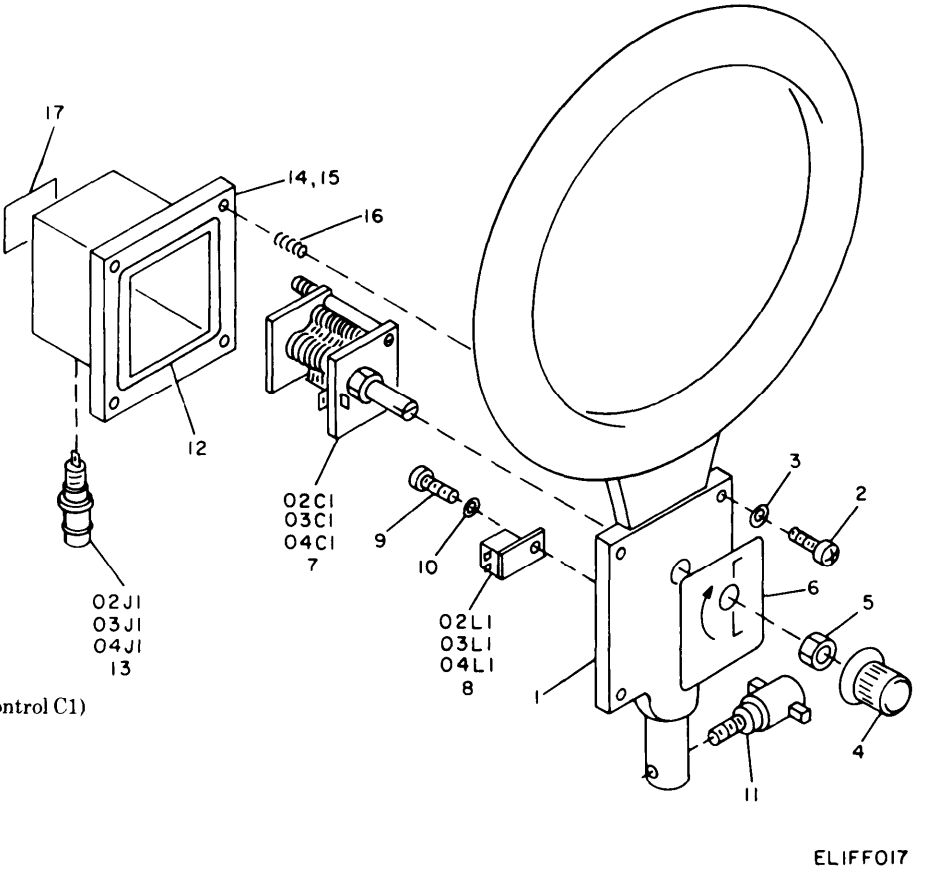
An exploded view of the antenna pedestal assembly is shown in figure 6-4. Removal and replacement procedures are provided only for components with repair authorized and spares available at this category of maintenance. Damage to nonrepairable items, such as the upper mast assembly, or components thereof, necessitates replacement of the complete upper mast assembly. Similarly, structural damage to the lower mast assembly, or individual tripod leg assemblies, requires replacement of the complete assembly.

## 6-16. Disassembly of Magnetic Compass Assembly

(21, fig. 6-4)

After the magnetic compass assembly (21) is removed from the lower mast assembly (17), it can be disassembled to a mounting bracket (22), bubble level (25), and magnetic compass (27A).

*a. Removal and Replacement of Magnetic Compass.*




| | |
|---|---|
| 1 | Loop antenna housing |
| 2 | Screw (4) |
| 3 | Washer (4) |
| 4 | Knob |
| 5 | Boot |
| 6 | Panel |
| 7 | Variable capacitor (tuning control C1) |
| 8 | Rf coil |
| 9 | Screw |
| 10 | Washer |
| 11 | Setscrew |
| 12 | C-ring |
| 13 | Coaxial connector |
| 14 | Cover assembly |
| 15 | Cover |
| 16 | Threaded insert |
| 17 | Nameplate |

*Figure 6-3. Typical vhf loop antenna, exploded view.*

(1) Remove two machine screws (23) and washers (24).

(2) Remove magnetic compass (27A).

(3) Install replacement compass.

(4) Replace two machine screws (23) and washers (24).

*b. Removal and Replacement of Bubble Level.*

(1) Remove machine screw (26).

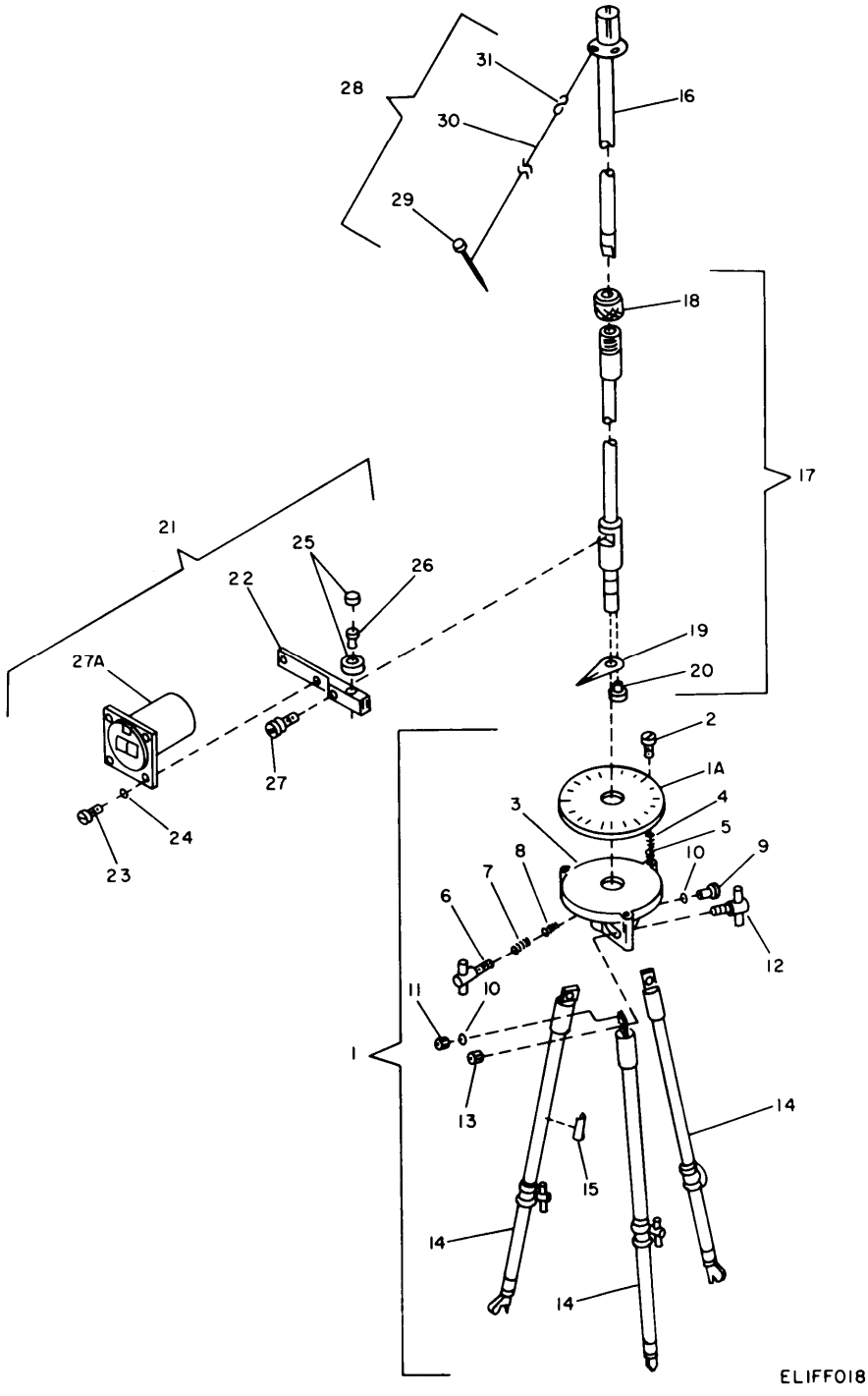
(2) Remove bubble level (25).

(3) Install replacement bubble level.

(4) Replace machine screw (26).

## 6-17. Disassembly of Tripod Assembly

The tripod assembly (1, fig. 6-4) includes the azimuth scale (1A) tripod head (3), three tripod leg assemblies (14), and attaching hardware. Each of these is individually replaceable. Threaded inserts (7, 8) are used in the tripod head (3) to provide threaded surfaces for




| | |
|---|---|
| 1 | Tripod assembly |
| 1A | Azimuth scale |
| 2 | Azimuth scale retaining screw (3) |
| 3 | Tripod head |
| 4 | Screw thread insert (3) |
| 5 | Screw thread insert (3) |
| 6 | Mast retaining screw |
| 7 | Screw thread insert |
| 8 | Screw thread insert |
| 9 | Machine screw (3) |
| 10 | Washer (3) |
| 11 | Self-locking nut (3) |
| 12 | Tripod leg lock screw (3) |
| 13 | Self-locking nut (3) |
| 14 | Tripod leg assembly (3) |
| 15 | Nameplate |
| 16 | Upper mast assembly |
| 17 | Lower mast assembly |
| 18 | Nut |
| 19 | Azimuth cursor |
| 20 | Machine screw (3) |
| 21 | Magnetic compass assembly |
| 22 | Compass bracket |
| [illegible] | Machine screw (2) |
| | Washer (2) |
| | Bubble level |
| [illegible] | Machine screw |
| 27 | Compass bracket retaining screw |
| 27A | Magnetic compass |
| 28 | Ground anchor assembly (3) |
| [illegible] | Ground anchor (3) |
| | Guy line (3) |
| | S-hook (3) |

*Figure 6-4. Antenna pedestal assembly, exploded view.*

mast retaining screw (6). If these inserts are damaged, refer to higher maintenance category for replacement. Similarly, three sets of inserts (4, 5) are used for the azimuth scale retaining screw (2).

*a. Removal and Replacement of Azimuth Scale.*

(1) Remove three azimuth scale retaining screws (2).

(2) Lift off azimuth scale (1A).

(3) Install replacement azimuth scale.

(4) Replace azimuth scale retaining screws (2) fingertight.

*b. Removal and Replacement of Tripod Leg Assembly.*

(1) Remove locknut (13).

(2) Unscrew tripod leg lock screw (12).

(3) Remove self-locking nut (11), two washers (10), and machine screws (9).

(4) Remove tripod leg assembly (14).

**NOTE**

One of the tripod leg assemblies bears a nameplate (15). All replacement tripod leg assemblies are stocked with a nameplate attached; do not attempt to remove the nameplate.

(5) Install replacement tripod leg assembly.

(6) Note order of replacement of items 9, 10, and 11. Washer (10) fits on machine screw (9) before the screw is inserted into the tripod head. The other washer (10) then fits on the screw and secured in place with self-locking nut (11).

(7) Replace tripod leg lock screw (12) and self-locking nut (13).

## 6-18. Disassembly of Lower Mast Assembly

The lower mast assembly (17, fig. 6-4) must be replaced as a complete assembly if the mast section is damaged. However, the collet nut (18) and azimuth cursor (19) may be replaced individually.

*a. Removal and Replacement of Azimuth Cursor.*

(1) Remove three machine screws (10).

(2) Note orientation for replacement and remove azimuth cursor (19).

(3) Replace azimuth cursor with the pointer in line with the notch that accepts the compass assembly.

(4) Replace three machine screws (20).

# APPENDIX A
# REFERENCES

| | |
|---|---|
| DA Pam 310-1 | Consolidated Index of Army Publications and Blank Forms. |
| SB 11-573 | Painting and Preservation of Supplies Available for Field Use for Electronics Command Equipment. |
| SB 38-100 | Preservation, Packaging, Packing, and Marking Materials, Supplies, and Equipment Used by the Army. |
| SC 5180-91-CL-R07 | Tool Kit, Electronic Equipment TK-105/G (NSN 5180-00-610-8177). |
| SC 5180-91-CL-R13 | Tool Kit, Electronic Equipment TK-101/G (NSN 5180-00-064-5178). |
| TB 43-0118 | Field Instructions for Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters. |
| TM 11-5820-641-14 | Operator's, Organizational, Direct Support, and General Support Maintenance Manual: Receiving Set, Radion AN/URR-70 (NSN 5820-00-013-8911). |
| TM 11-5820-770-14 | Operator's, Organizational, Direct Support, and General Support Maintenance Manual: Receiving Set, Radio AN/URR-71 (NSN 5820-00-013-8944). |
| TM 11-5985-352-14-HR | Hand Receipt Manual Covering End Item/Components of End Item (COEI), Basic Issue Items (BII), and Additional Authorization List (AAL) for Antenna Group, Part of Direction Finder Set AN/TRQ-30(V)1, 2, and 4. |
| TM 11-6625-508-10 | Operator's Manual: Signal Generators AN/USM-44 and AN/USM-44A. |
| TM 11-6625-545-15 | Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual: Indicators, Standing Wave Ratio IM-175/U (NSN 6625-00-892-5670) and IM 75B/U (NSN 6625-00-862-3480). |
| TM 11-6625-573-14 | Operator's, Organizational, Direct Support and General Support Maintenance Manual for Generator, Signal AN/GRM-50 (NSN 6625-00468-8353). |
| TM 11-6625-654-14 | Operator's, Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools List) for Multimeter AN/USM-223. |
| TM 38-750 | The Army Maintenance Management Systems (TAMMS). |
| TM 43-0139 | Painting Instructions for Field Use. |
| TM 740-90-1 | Administrative Storage of Equipment. |
| TM 750-244-2 | Procedures for Destruction of Electronics Materiel to Prevent Enemy Use. |

# APPENDIX B
# COMPONENTS OF END ITEM LIST

## Section I. INTRODUCTION

### B-1. Scope

This appendix lists integral components of and basic issue items for the Antenna Group P/O AN/TRQ-30 to help you inventory items required for safe and efficient operation.

### B-2. General

This Components of End Item List is divided into the following sections:

*a. Section II — Integral Components of the End Item.* Not applicable. These items, when assembled, comprise the Antenna Group P/O AN/TRQ-30 and must accompany it whenever it is transferred or turned in. The illustrations will help you identify these items.

*b. Section III – Basic Issue Items.* Not applicable. These are the minimum essential items required to place the Antenna Group P/O AN/TRQ-30 in operation, to operate it, and to perform emergency repairs. Although shipped separately packed they must accompany the Antenna Group P/O AN/TRQ-30 during operation and whenever it is transferred between accountable officers. The illustrations will assist you with hard-to-identify items. This manual is your authority to requisition replacement BII, based on TOE/MTOE authorization of the end item.

### B-3. Explanation of Columns

*a. Illustration.* This column is divided as follows:

(1) *Figure number.* Indicates the figure number of the illustration on which the item is shown.

(2) *Item number.* The number used to identify item called out on the illustration.

*b. National Stock Number.* Indicates the National stuck number assigned to the item and which will be used for requisitioning.

*c. Description.* Indicates the Federal item name and, if required, a minimum description to identify the item. The part number indicates the primary number used by the manufacturer, 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. Following the part number, the Federal Supply Code for Manufacturers (FSCM) is shown in parentheses.

*d. Location.* The physical location of each item listed is given on this column. The lists are designed to inventory all items in one area of the major item before moving onto an adjacent area.

*e. Usable on Code.* Not applicable. "USABLE ON" codes are included to help you identify which component items are used on the different models. Identification of the codes used on these lists are:

| *Code* | *Used on* |
|---|---|
| 1 | Antenna Group AN/TRQ-30(V1) |
| 2 | Antenna Group AN/TRQ-30(V2) |
| 3 | Antenna Group AN/TRQ-30(V4) |

*f. Quantity Required (Qty Reqd).* This column lists the quantity of each item required for a complete major item.

*g. Quantity.* This column is left blank for use during an inventory. Under the Rcvd column, list the quantity you actually receive on your major item. The Date columns are for your use when you inventory the major item.

**(Next printed page is B-3.)**

## SECTION II INTEGRAL COMPONENTS OF END ITEM

| (1) ILLUSTRATION (A) FIG NO. | (1) ILLUSTRATION (B) ITEM NO. | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION PART NUMBER | (3) DESCRIPTION (FSCM) | (4) LOCATION | (5) USABLE ON CODE | (6) QTY REQD | (7) QUANTITY RCVD | (7) QUANTITY DATE |
|---|---|---|---|---|---|---|---|---|---|
| B-1 | 1 | 5985-01-022-6383 | ANTENNA, LOOP<br>SMD879214 | AS-1523/TRQ-30(V)<br>(80063) | | 1,3 | 1 | | |
| B-1 | 2 | 5985-01-022-6384 | ANTENNA, LOOP<br>SMD879215 | AS-1526/TRQ-30(V)<br>(80063) | | 2,3 | 1 | | |
| B-1 | 3 | 5985-01-022-6385 | ANTENNA, LOOP<br>SMD879216 | AS-1527/TRQ-30(V)<br>(80063) | | 2,3 | 1 | | |
| B-1 | 4 | 5985-01-022-6386 | ANTENNA, LOOP<br>SMD879217 | AS-1528/TRQ-30(V)<br>(80063) | | 2,3 | 1 | | |
| B-1 | 5 | 5985-01-022-9697 | PEDESTAL ANTENNA<br>SMD879154 | AB-1110/TRQ-30(V)<br>(80063) | | | 1 | | |
| B-1 | 6 | | TRIPOD ASSY<br>SMD879188 | (80063) | | | 1 | | |
| B-1 | 7 | 5985-01-032-7402 | MAST ASSY, LOWER<br>SMD879157 | (80063) | | | 1 | | |
| B-1 | 8 | 5985-01-032-7400 | MAST ASSY, UPPER<br>SMD879173 | (80063) | | | 1 | | |
| B-1 | 9 | | COMPASS ASSY<br>SMD879179 | (80063) | | | 1 | | |
| B-1 | 10 | | GROUND ANCHOR ASSY<br>SMC879177 | (80063) | | | 3 | | |
| B-1 | 11 | 5995-00-935-2642 | CABLE ASSY, RF<br>SMD68284 | GG-409 H/U<br>(80063) | | | 1 | | |
| B-1 | 19 | | SCALE, AZIMUTH<br>SMD879207 | (98675) | | | 1 | | |

## SECTION III BASIC ISSUE ITEMS

| (1) ILLUSTRATION (A) FIG NO. | (1) ILLUSTRATION (B) ITEM NO. | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION PART NUMBER | (3) DESCRIPTION (FSCM) | (4) LOCATION | (5) USABLE ON CODE | (6) QTY REQD | (7) QUANTITY RCVD | (7) QUANTITY DATE |
|---|---|---|---|---|---|---|---|---|---|
| B-1 | 12 | 5985-01-022-9702 | CASE, ANTENNA<br>SMD917381 | CY-7331/TRQ-30<br>(80063) | | 1,3 | | | |
| B-1 | 13 | | STORAGE BOARD<br>SMC879245 | | | 1,3 | | | |
| B-1 | 14 | 5985-01-022-9703 | CASE, ANTENNA<br>SMD917382 | CY-7332/TRQ-30<br>(80063) | | 2,3 | | | |
| B-1 | 15 | 5985-01-022-9652 | CASE, ANTENNA<br>SMD917383 | CY-7333/TRQ-30<br>(80063) | | | | | |
| B-1 | 16 | | STRAPS, RETAINING<br>SMC879232 | (98675) | | | | | |
| B-1 | 17 | | CAP, PROTECTIVE<br>SMC917465 | | | | | | |
| B-1 | 18 | | CARRYING STRAP<br>2-1-80 | (81337) | | | | | |

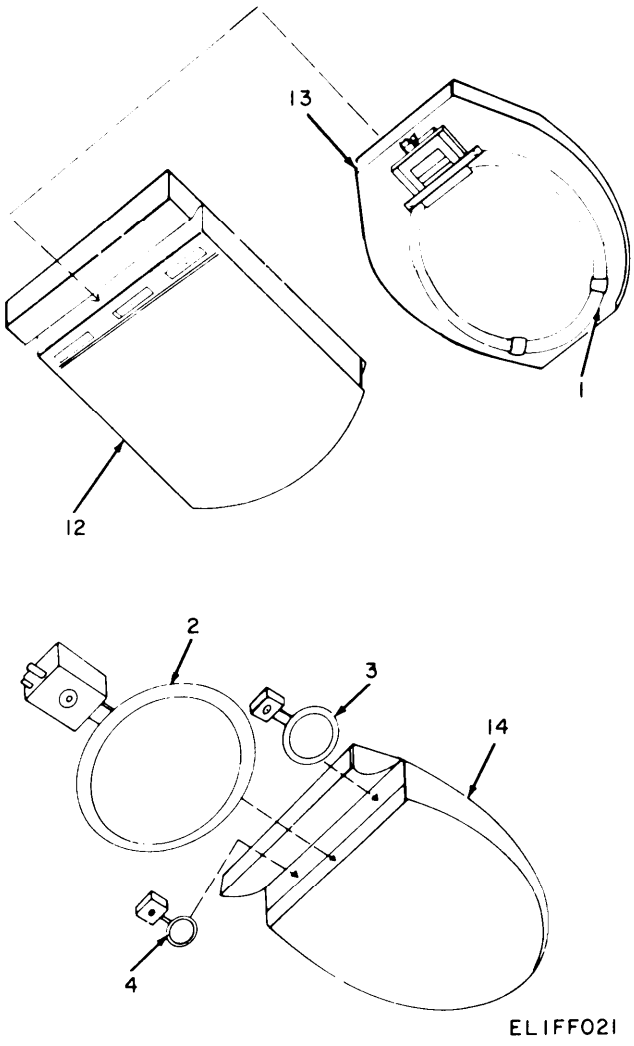



*Figure B-1. ① Antenna Group P/O AN/TRQ-30 (Sheet 1 of 2).*

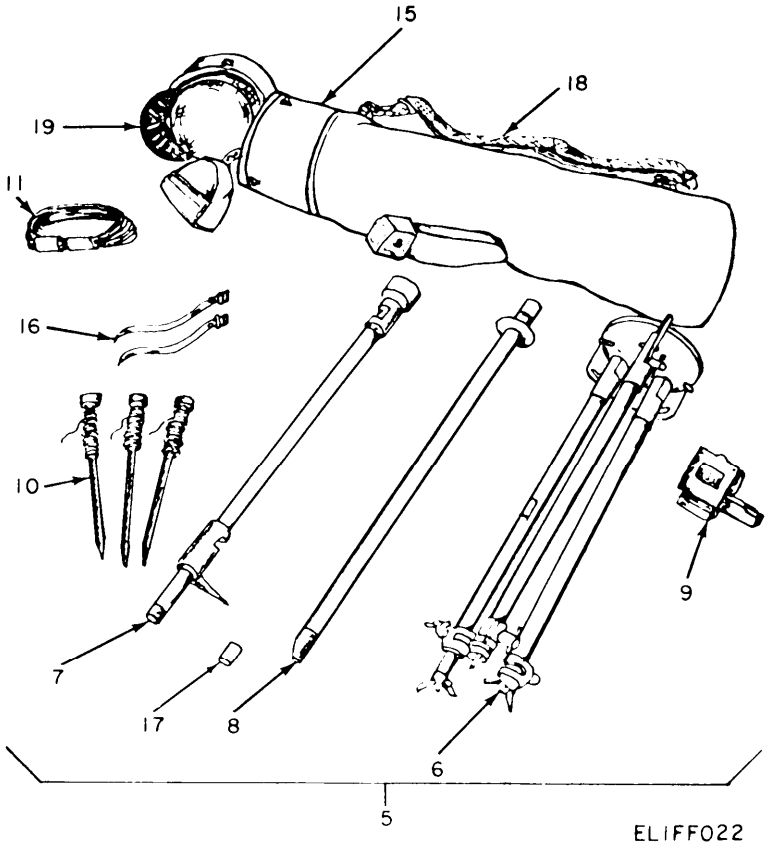



*Figure B-1. ① Antenna Group P/O AN/TRQ-30 (Sheet 2 of 2).*

# APPENDIX D
# MAINTENANCE ALLOCATION

## Section I. INTRODUCTION

### D-1. General

This appendix provides a summary of the maintenance operations for Antenna Group for AN/TRQ-300( )/V. It authorizes categories 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.

### D-2. Maintenance Function

Maintenance functions will be limited to and defined as follows:

*a. Inspect.* To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

*b. Test.* To verify serviceability and to detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

*c. Service.* Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

*d. Adjust.* To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

*e. Align.* To adjust specified variable elements of an item to bring about optimum or desired performance.

*f. Calibrate.* To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

*g. Install.* The act of emplacing, seating, or fixing into position an item, part, module (component or assembly) in a manner to allow the proper functioning of the equipment or system.

*h. Replace.* The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

*i. Repair.* The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system. This function does not include the trial and error replacement of running spare type items such as fuses, lamps, or electron tubes.

*j. Overhaul.* That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) is appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

*k. Rebuild.* Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipments/components.

### D-3. Column Entries

*a. Column 1, Group Number.* Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

*b. Column 2, Component/Assembly.* Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

*c. Column 3, Maintenance Functions.* Column 3 lists the functions to be performed on the item listed in column 2. When items are listed without maintenance functions, it is solely for purpose of having the group numbers in the MAC and RPSTL coincide.

*d. Column 4, Maintenance Category,* Column 4 specifies, by the listing of a "worktime" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the

indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate "worktime" figures will be shown for each category. The number of task-hours specified by the "worktime" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. Subcolumns of column 4 are as follows:

C – Operator/Crew
O – Organizational
F – Direct Support
H – General Support
D – Depot

*e. Column 5, Tools and Equipment.* Column 5 specifies by code, those common tool sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

*f. Column 6, Remarks.* Column 6 contains an alphabetic code which leads to the remark in section IV, Remarks, which is pertinent to the item opposite the particular code.

## D-4. Tool and Test Equipment Requirements (Sect. III)

*a. Tool or Test Equipment Reference Code.* 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 or test equipment for the maintenance functions.

*b. Maintenance Category.* The codes in this column indicate the maintenance category allocated the tool or test equipment.

*c. Nomenclature.* This column lists the noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

*d. National/NATO Stock Number.* This column lists the National/NATO stock number of the specific tool or test equipment.

*e. Tool Number.* This column lists the manufacturer's part number of the tool followed by the Federal Supply Code for manufacturers (5-digit) in parentheses.

## D-5. Remarks (Sect. IV)

*a. Reference Code.* This code refers to the appropriate item in section II, column 6.

*b. Remarks.* This column provides the required explanatory information necessary to clarify items appearing in section II.

**(Next printed page is D-3.)**

## SECTION II MAINTENANCE ALLOCATION CHART
## FOR
ANTENNA GROUP, P/O RECEIVING SET, RADIO AN/TRQ-30( )/V

| (1) GROUP NUMBER | (2) COMPONENT/ASSEMBLY | (3) MAINTENANCE FUNCTION | (4) MAINTENANCE CATEGORY | | | | | (5) TOOLS AND EQPT. | (6) REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | | C | O | F | H | D | | |
| 00 | ANTENNA GROUP | Inspect | | 0.4 | | | | 6 | |
| | | Service | | 0.4 | | | | 6 | |
| | | Install | | 0.6 | | | | 6 | |
| | | Overhaul | | | | | 2.6 | 1 thru 5, 7 thru17 | |
| 01 | ANTENNA AS-1523/TRQ-30(V) | Inspect | | 0.4 | | | | 6 | |
| | | Test | | | 0.9 | | | 1,3thru5, 7thru9 | |
| | NOTE: LOOP AND CONTROL BOX, INDUCTOR, VARI- | Install | | 0.4 | | | | 6 | |
| | ABLE CAPACITOR, FREQ IN MHz SWITCH, BAND | Service | | 0.3 | | | | 6 | |
| | SWITCH AND CONNECTOR ARE NOT REPAIRABLE | Replace | | 0.4 | | | | 6 | |
| | | Repair | | | 1.0 | | | 1,3thru5, 7 thru9 | |
| 02 | ANTENNA AS-1526/TRQ-30(V) | | | | | | | | |
| | NOTE: LOOP AND CONTROL BOX, INDUCTOR, VARIABLE | Inspect | | 0.4 | | | | 6 | |
| | | Test | | | 0.9 | | | 1,2,4,5, 7thru9 | |
| | CAPACITOR, AND CONNECTOR ARE NOT REPAIRABLE. | Install | | 0.4 | | | | 6 | |
| | | Service | | 0.3 | | | | 6 | |
| | | Replace | | 0.4 | | | | 6 | |
| | | Repair | | | 1.0 | | | 1,2,4,5, 7thru9 | |
| 03 | ANTENNA AS-1527/TRQ-30(V) | Inspect | | 0.4 | | | | 6 | |
| | | Test | | | 0.9 | | | 1,2,4,5, 7thru9 | |
| | NOTE: LOOP AND CONTROL BOX, INDUCTOR, VARIABLE | Install | | 0.2 | | | | 6 | |
| | CAPACITOR AND CONNECTOR ARE NOT REPAIRABLE. | Service | | 0.4 | | | | 6 | |
| | | Replace | | 0.2 | | | | 6 | |
| | | Repair | | | 1.0 | | | 1,2,4,5, 7thru9 | |
| 04 | ANTENNA AS-1528/TRQ-30(V) | Inspect | | 0.4 | | | | 6 | |
| | | Test | | | 0.9 | | | 1,2,4,5, 7thru 9 | |
| | NOTE: LOOP AND CONTROL BOX, INDUCTOR, VARIABLE | Install | | 0.2 | | | | 6 | |
| | CAPACITOR AND CONNECTOR ARE NOT REPAIRABLE. | Service | | 0.4 | | | | 6 | |
| | | Replace | | 0.2 | | | | 6 | |
| | | Repair | | | 1.0 | | | 1,2,4,5, 7thru 9 | |
| 05 | PEDESTAL, ANTENNA AB-1110/TRQ-30(V) | Inspect | | 0.2 | | | | 6 | |
| | | Service | | 0.3 | | | | 6 | |
| | NOTE: LOWER MAST ASSEMBLY AND AZIMUTH SCALE, | Install | | 0.3 | | | | 6 | |
| | | Repair | | | 0.9 | | | 7 | |
| | UPPER MAST ASSEMBLY AND GROUND ANCHOR | Replace | | 0.2 | | | | | |
| | ASSEMBLY ARE NOT REPAIRABLE. | | | | | | | | |
| 0501 | TRIPOD ASSEMBLY | Service | | 0.2 | | | | 6 | |
| | | Repair | | | 0.9 | | | 7 | |
| | | Replace | | 0.2 | | | | | |
| | COMPASS MS17983-1 IS NOT REPAIRABLE. | | | | | | | | |
| | CABLE ASSEMBLY CG-409 IS NOT REPAIRABLE. | | | | | | | | |

## SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR

ANTENNA GROUP, P/O RECEIVING SET, RADIO AN/TRQ-30( )/V

| TOOL OR TEST EQUIPMENT REF CODE | MAINTENANCE CATEGORY | NOMENCLATURE | NATIONAL/NATO STOCK NUMBER | TOOL NUMBER |
|---|---|---|---|---|
| 0001 | F | INDICATOR, STANDING WAVE IM-175/U | 6625-00-892-5670 | |
| 0002 | F | GENERATOR, SIGNAL AN/USM-44(R) | 6625-00-857-4352 | |
| 0003 | F | GENERATOR, SIGNAL AN/GRM-50 | 6625-00-268-8353 | |
| 0004 | F | BOLOMETER, HEWLETT-PACKARD MODEL HP-476 | | |
| 0005 | F | ATTENUATOR, HEWLETT-PACKARD MODEL HP-355C | | |
| 0006 | O | TOOL KIT, ELECTRONIC EQUIPMENT TK-101/G | 5180-00-064-5178 | |
| 0007 | F | TOOL KIT, ELECTRONIC EQUIPMENT TK-105/G | 5180-00-610-8177 | |
| 0008 | F | MULTIMETER AN/USM-223 | 6625-00-999-7465 | |
| 0009 | F | COPPER WIRE, SOLID, AWG #12, 36 IN. LG (USE AS ANTENNA) | | |
| 0010 | D | EXTRACTION TOOL, HELI COIL 1227-06 | | |
| 0011 | D | EXTRACTION TOOL, HELI COIL 1227-6 | | |
| 0012 | D | TAP, HELI COIL 7551-06 | | |
| 0013 | D | TAP, HELI COIL 7551-2 | | |
| 0014 | D | TAP, HELI COIL 7551-4 | | |
| 0015 | D | TANG REMOVAL TOOL, HELI COIL 3695-06 | | |
| 0016 | D | TANG REMOVAL TOOL, HELI COIL 3695-2 | | |
| 0017 | D | TANG REMOVAL TOOL, HELI COIL 3695-4 | | |

HISA-FM 2081-74

# APPENDIX E
# EXPENDABLE SUPPLIES AND MATERIALS LIST

## Section I. INTRODUCTION

### E-1. Scope

This appendix lists expendable supplies and materials you will need to operate and maintain the antenna group for the AN/TRQ-30( )/V. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

### E-2. Explanation of Columns

*a. Column 1 – Item Number.* This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, App. D").

*b. Column 2 – Level.* This column identifies the lowest level of maintenance that requires the listed item.

C – Operator/Crew
O – Organizational Maintenance
F – Direct Support Maintenance
H — General Support Maintenance

*c. Column 3 – National Stock Number.* This is the National stock number assigned to the item; use it to request or requisition the item.

*d. Column 4 – Description.* Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

*e. Column 5 – Unit of Measure (U/M).* Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

**(Next printed page is E-3.)**

## SECTION II EXPENDABLE SUPPLIES AND MATERIALS LIST

| (1) ITEM NO. | (2) LEVEL | (3) NATIONAL STOCK NUMBER | (4) DESCRIPTION<br>PART NO. AND FSCM | (5) UNIT OF MEAS |
|---|---|---|---|---|
| 1 | 0 | 6810-00-292-9625 | TRICHLOROETHYLENE<br>OT 620 (81348) | QT. |
| 2 | 0 | 8305-00-222-2423 | CLOTH, CLEANING<br>840492 (19203) | YRD |
| 3 | 0 | 5350-00-186-8855 | SANDPAPER<br>(No. 000) | PKG |
| 4 | 0 | 8020-00-205-6511 | BRUSH, SOFT BRISTLE<br>801457 | 1 EA |
| 5 | 0 | 9150-00-269-8255 | GREASE<br>MIL G 4343 (81349) | 1 LB |
| 6 | 0 | 8010-00-292-3053 | PAINT<br>OLIVE DRAB, 34087 (81349) | GAL |
| 7 | 0 | 8020-00-262-9084 | BRUSH, PAINT<br>125M1-53 (99872) | 1 EA |

# INDEX

## INDEX — Continued

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

# SOMETHING WRONG WITH THIS MANUAL?

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

FROM: (YOUR UNIT'S COMPLETE ADDRESS)
Commander
Stateside Army Depot
ATTN: AMSTA-US
Stateside, N.J. 07703

DATE 10 July 1975

| PUBLICATION NUMBER | DATE | TITLE |
|---|---|---|
| TM 11-5840-340-12 | 23 Jan 74 | Radar Set AN/PPC-76 |

| BE EXACT. . .PIN-POINT WHERE IT IS | | | | IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT: |
|---|---|---|---|---|
| PAGE NO. | PARAGRAPH | FIGURE NO. | TABLE NO. | |
| 2-25 | 2-28 | | | Recommend that the installation antenna alignment procedure be changed throughout to specify a 2° IFF antenna lag rather than 1°.<br><br>REASON: Experience has shown that with only a 1° lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2° without degradation of operation. |
| 3-10 | 3-3 | | 3-1 | Item 5, Function column. Change "2 db" to "3db."<br><br>REASON: The adjustment procedure for the TRANS POWER FAULT indicator calls for a 3 db (500 watts) adjustment to light the TRANS POWER FAULT indicator. |
| 5-6 | 5-8 | | | Add new step f.1 to read, "Replace cover plate removed in step e.1, above."<br><br>REASON: To replace the cover plate. |
| | | F03 | | Zone C 3. On J1-2, change "+24 VDC to "+5 VDC."<br><br>REASON: This is the output line of the 5 VDC power supply. + 24 VDC is the input voltage. |

| TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER | SIGN HERE: |
|---|---|
| SSG I. M. DeSpiritof 999-1776 | SSG I. M. DeSpiritof |

DA FORM 1 AUG 74 2028-2 (TEST)

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR MANUAL "FIND," MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

HISA 1686-75

TEAR ALONG DOTTED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECH...CAL MANUALS

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DATE

| PUBLICATION NUMBER | DATE | TITLE |
|---|---|---|
| | | |

BE EXACT. . .PIN-POINT WHERE IT IS

| PAGE NO. | PARAGRAPH | FIGURE NO. | TABLE NO. |
|---|---|---|---|
| | | | |

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE:

DA FORM 1 AUG 74 2028-2 *(TEST)*

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RECOMMENDED CHANGES TO EQUIPMENT TECH..CAL MANUALS

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DATE

| PUBLICATION NUMBER | DATE | TITLE |
|---|---|---|
| | | |

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