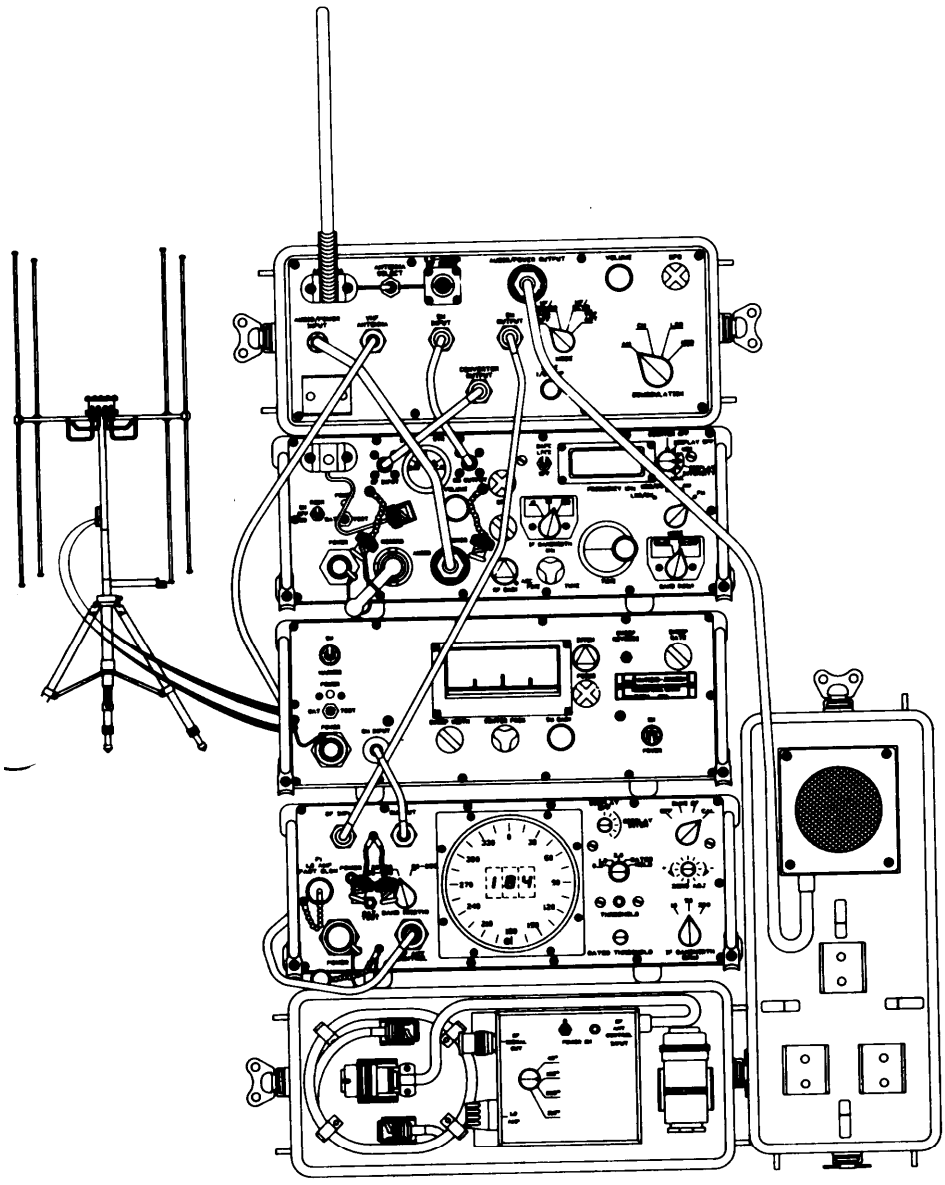
OPERATOR'S AND UNIT MAINTENANCE MANUAL

TM 11-5825-278-12-3



RADIO RECEIVER DIRECTION FINDER SET AN/PRD-11

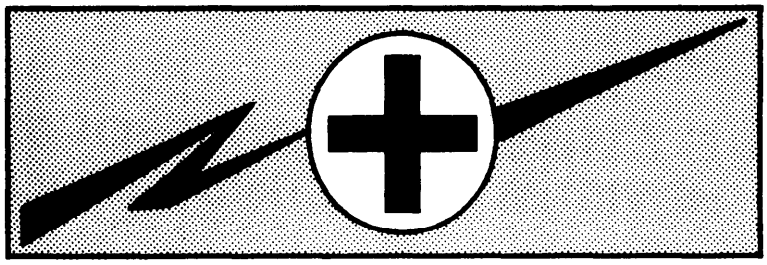
(NSN 5825-01-188-3435)

HEADQUARTERS, DEPARTMENT OF THE ARMY
1 NOVEMBER 1988

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

1. DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL
2. IF POSSIBLE, TURN OFF THE ELECTRICAL POWER
3. IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A DRY WOODEN POLE OR A DRY ROPE OR SOME OTHER INSULATING MATERIAL
4. SEND FOR HELP AS SOON AS POSSIBLE
5. AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION

WARNING



HIGH VOLTAGE

is used in the operation of this equipment

DEATH ON CONTACT

may result if personnel fail to observe safety precautions

Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid. When the technicians are aided by operators, they must be warned about dangerous areas.

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

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

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

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

For Artificial Respiration, refer to FM 21-11.

SAFETY SUMMARY

WARNINGS

High voltage is used in the operation of this equipment. Death on contact may result if personnel fail to observe the following safety precautions (For Artificial Respiration, refer to FM 21-11):

- Remove the batteries to the equipment when radio operation has ceased. Leaving batteries in the equipment when it is not in use can cause leakage or an explosion leading to serious bodily damage.
- When using any kind of batteries, be careful not to crush, puncture, disassemble or otherwise mutilate them in order to avoid possible injury to personnel or damage to the equipment.
- Do not attempt to recharge alkaline or magnesium batteries. When using nickel-cadmium batteries, observe extreme caution when re-charging by ensuring proper electrical connections and keeping the charger away from other equipment that may spark and cause an explosion.
- Seek advice from your supervisor whenever you are in doubt about electrical safety conditions.

To prevent electrical shocks or damage to the equipment, do not operate your direction finder set until you understand the operation and function of all controls, indicators and connectors.

WARNINGS

Battery BA-5598/U used in this equipment is hazardous. It can explode or generate high heat and catch fire during use or storage. This hazard is present even after the battery is discharged and can no longer operate the equipment. Take the following precautions:

- Remove other combustibles from BA-5598/U storage area.
- Do not mishandle the battery (short cells, try to charge, incinerate, take apart, crush case or damage by dropping).
- Protect hands from burns when removing overheated batteries from equipment. Allow equipment to cool off if possible.

- If equipment case becomes hot, immediately shut equipment off.
- Do not discard discharged batteries with combustibles.

Do not remove the protective covers to any of the units. Voltages within these units can cause electrical shock. Turn off all power to the units before replacing any of the fuses.

Brackets and cable guide inside front covers have sharp edges and may cut fingers.

Be careful that you do not catch your fingers as tripod legs close.

CAUTIONS

The df antenna is easily damaged through careless or improper handling. Use care when setting up the df antenna.

The df antenna is easily damaged through careless or improper handling. Use care when tearing down the df antenna.

Do not position the tripod on a slope that is too steep to set all legs securely on ground. Antenna should not lean more than 30 degrees from vertical.

Examine antenna mast cables to ensure they will not catch on thumbscrew.

CAUTIONS

Do not force compass arm assembly into compass mounting plate. Aluminum tip will bend and may not be able to be removed.

If D-cell insert contains batteries:

- Do not remove batteries before removing cardboard tubes.
- Do not use metal tools to remove batteries or you will short them out.

Wrap cables in loose circles sized to fit within the antenna carrying bag. If the cables are too tightly wrapped, they will break.

Before lowering antenna arm be sure antenna mast cables are free of locking thumbscrews.

Ensure the correct single pin cable is connected to correct plug.

Do not overtighten any of the six single pin cables onto their plugs.

Turn off power to the direction finder set before using angle simulator.

Do not pack any unit without first ensuring that the batteries have been removed from the rear covers.

TECHNICAL MANUAL

NO. 11-5825-278-12-3

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, l November 1988

Operator and Unit Maintenance Manual

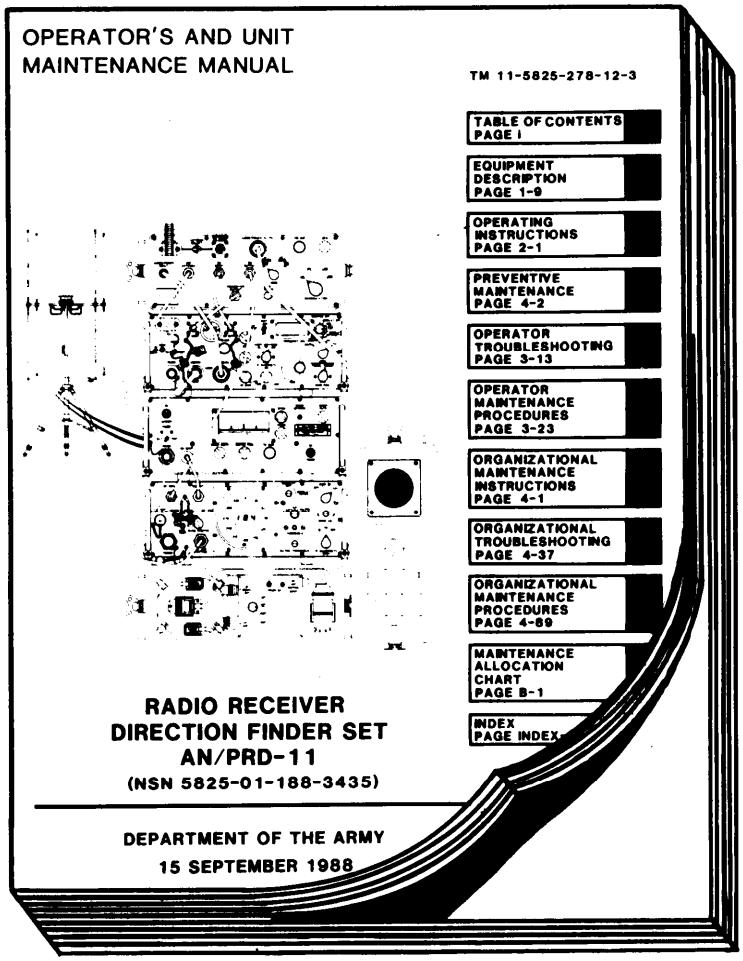
RADIO RECEIVER DIRECTION FINDER SET AN/PRD-11 (NSN 5825-01-188-3435)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

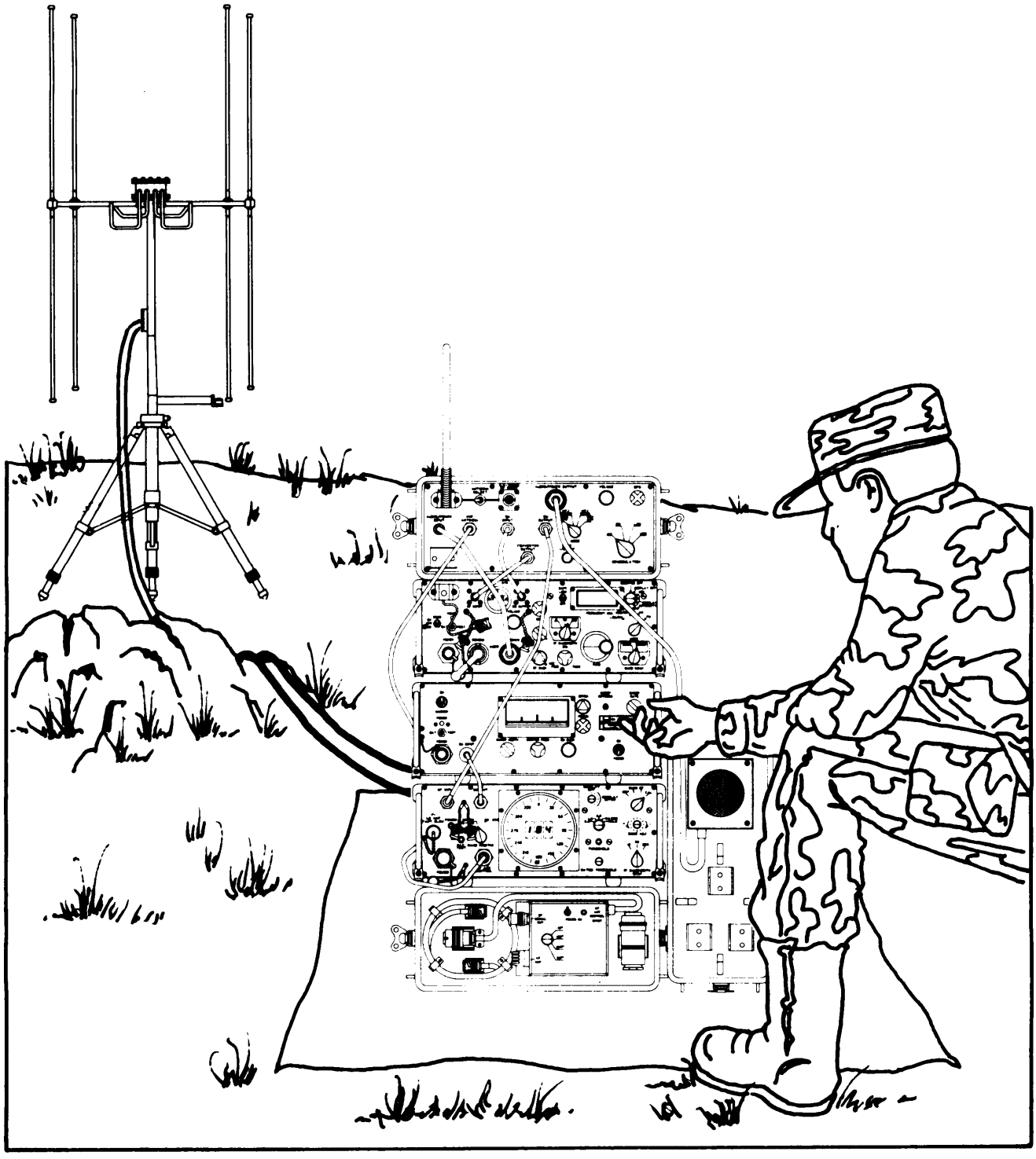
You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-LC-ME-PS, Fort Monmouth, New Jersey 07703-5000. A reply will be furnished direct to you.

HOW TO USE THIS MANUAL

This manual tells about installing, operating and maintaining the AN/PRD-11 Radio Reciever Direction Finder Set at the operator and organizational maintenance level. You will find descriptions and configurations as-well as operator and maintenance instructions in this manual.



Use the front cover locators and marked pages to quickly find the parts of the manual shown on the cover. These portions of the manual were chosen because they are most often used. This manual has been divided into chapters, sections and paragraphs which are numbered sequentially. Each large section begins with a 'Section Contents' which lists each paragraph by title and page number. Each paragraph that contains several different procedures also has an index that lists the page number on which the procedure begins. In addition, you will find a system of captions which will help you quickly find the information you need. These captions name the pieces of equipment and/or procedures that you will be doing. Some of the procedures may actually consist of several smaller procedures. For example, 'Removing' and 'Replacing' are not separate procedures. They are parts of a larger 'Removing' and 'Replacing' maintenance procedure.



RADIO RECEIVER DIRECTION FINDER SET
AN/PRD-11

CHAPTER 1

INTRODUCTION

Section I. GENERAL INFORMATION

SECTION CONTENTS

1-1. SCOPE

a. Type of Manual. This is an Operator's and Unit Maintenance manual.

b. Model Numbers and Equipment Names. The Radio Receiver Direction Finder Set, AN/PRD-11 consists of a Direction Finder Antenna, AS-3732/PRD-11 or AS-3733/PRD-11, a Panoramic Indicator, IP-1355/GRR-8(V), a Receiver (with a WJ-9230 Upconverter/Demodulator), AN/GRR-8(V), and a Processor Display Control, C-11495/PRD-11 (with a WJ-8975/AS Angle Simulator). This group of equipment will be referred to in this manual as the direction finder set. The direction finder antenna will be known as the df antenna, the panoramic indicator as the signal monitor, the receiver as the receiver and the processor display control as the df processor.

c. Purpose of Equipment. The direction finder set detects and displays radio signal frequencies and provides line of bearing information for the location of transmitting antennas.

1-2. CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS

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

1-3. 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 prescribed by DA Pam 738-750 as contained in Maintenance Management Update.

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

Transportation Discrepancy Report (TDR) (SF 361). Fill out and forward Transportation Discrepancy Report (TDR) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR4500.15.

1-4. DESTRUCTION OF ARMY ELECTRONICS MATERIEL

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

1-5. PREPARATION FOR STORAGE OR SHIPMENT

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 paragraphs 4-22, 4-23 and 4-24.

1-6. NOMENCLATURE CROSS--REFERENCE LIST

The list below will help you identify the official nomenclature of the major equipment items used with the direction finder set. It also provides the common name used in the manual when it is different from the official nomenclature. Official nomenclature must be used when completing forms or when looking up technical manuals.

Common Name	Official Nomenclature
Battery	Battery, Dry BA-4386/PRC-25
Battery Charger	Power Supply/BA PP-7566/GRR-8(V)
Df Antenna	Antenna, Direction Finder AS-3732/PRD-11 and Antenna, Direction Finder AS-3733/PRD-11
Df Processor	Control, Processor Display C-11495/PRD-11
Direction Finder Set	Radio Receiver Direction Finder Set AN/PRD-11
D-Cell Battery	Battery BA-30
Headset	Headset H-251/U
Lithium Battery	Battery, non-rechargeable, Lithium $S0_2$, BA-5598/U
Mounting Tray	Mounting Tray WJ-8640/MT
Nicad Battery	Battery, Storage BB-586/U
Receiver	Receiver AN/GRR-8(V)
Signal Monitor	Indicator, Panoramic IP-1355/GRR-8(V)
Tuner Assembly	Tuner, RF TN-586/GRR-8(V) Tuner, RF TN-584/GRR-8(V) Tuner, RF TN-585/GRR-8(V)
HF Upconverter/Demodulator	Converter, Frequency CV-4090/PRD-11
Whip Antenna	Antenna, Whip AT-892/PRC-25

1-7. 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 or performance. Put. it on an SF 368 (Product Quality Deficiency Report). Mail it to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-PA-MA-D, Fort Monmouth, New Jersey 07703-5000. We'll send you a reply.

1-8. WARRANTY INFORMATION

The equipment associated with the direction finder set is warranted by Watkins-Johnson Company for a period of one year following delivery. It starts on the date found in block 23, DA Form 2408-9, in the logbook. This warranty may contain repair restrictions. report all defects in material or workmanship to your supervisor.

1-9. LIST OF ABBREVIATIONS

The list below contains abbreviations used in this manual may be unfamiliar to you.

ADJ	Adjust
AGC	Automatic Gain Control
am.	amplitude modulation
ANT	Antenna
BA	Battery
BC	Battery Charger
BFO	Beat Frequency Oscillator
bne	bayonet connector
CAL	Calibrate
crt	cathode ray tube
cw	continuous wave
DAFC	Digital Automatic Frequency Control
dc	direct current
df	direction finding

1-9. LIST OF ABBREVIATIONS - Continued

ECM	Electronic Countermeasures
fm	frequency modulation
hf	high frequency
if.	intermediate frequency
INTEG	Integration
INTEN	Intensity
kHz	kilohertz
LED	Light Emitting Diode
lob	line of bearing
lsb	lower sideband
mhz	Megahertz
NCE	Net Control Element
nicad	nickel cadmium
rf	radio frequency
SM	Signal Monitor
uhf	ultrahigh frequency
usb	upper sideband
v dc	volts direct current
vhf	very high frequency

1-10. GLOSSARY

The glossary below contains words and phrases used in this manual that may be unfamiliar to you.

Antenna element	The part of the df antenna that detects rf signals.
Automatic Gain Control (AGC)	A circuit which automatically maintains the output volume of receiver regardless of the signal strength.
Bandwidth	The range within the limits of a frequency band.
Cathode ray tube (crt) -	A tube in the signal monitor which produces a visible display of signals.
Continuous wave (cw) -	A continuous flow of identical waves which can be interrupted according to a code or modulated in amplitude or frequency.

1-10. GLOSSARY - Continued

Digital Readout	-	A numerical indication on the df processor and receiver for lob readings.
Df antenna	-	An antenna whose elements can be turned off and on in sequence in order to determine the direction of arrival of a transmitted signal.
Df cut	-	Determining probable location of a target transmitter based on lines of bearing taken by only two direction finding stations.
Df fix	-	A most probable location of a target transmitter based on a line of bearing taken at three or more direction finding stations.
Df flash	-	An order to immediately tune to and obtain a line of bearing on a specific frequency.
Df processor	-	An electronic device which controls the direction finder antenna so as to determine the line of bearing on a transmitted signal.
Df set	-	A group of specific electronic equipment composed of a receiver, df processor, signal monitor and a df antenna.
Direction Finding Station	-	One direction finder set in operation.
Fine tune	-	Adjusting a received signal for maximum reception.
Frequency	-	The number of complete cycles in one second of alternating current.
Frequency Band	-	A continuous and specific range of frequencies.
Hf upconverter/ demodulator	-	An electronic device that can readjusted to a particular frequency and also receives incoming radio signals and converts them to audio form.
High bay	-	The elements of the df antenna that detect rf signals between 150 and 500 mhz.
High frequency (hf)	-	Frequencies in the range of .5 to 30 mhz.
Kilohertz (kHz)	-	1,000 cycles per second.
Line of bearing (lob)	-	The measurement in degrees of the arrival of a radio signal in relationship to north (grid, true or magnetic). May also be called an azimuth or shot.

l-10. GLOSSARY - Continued

Lob display	-	The numerical and circular indication of the line of bearing located on the front panel of the df processor.
Low bay	-	The elements of the df antenna that detect rf signals between 20 to 175 mhz.
Lower sideband (lsb)	-	The lower range of two groups of frequencies.
Megahertz (mhz)	-	1,000,000 cycles per second.
Net Control Element (NCE)	-	The command authority which assigns mission tasks to the operator.
Orientation	-	Aligning the df antenna to a compass point.
Receiver	-	An electronic device that receives incoming radio signals and converts them to audio form.
Radio frequency (rf)	-	Incoming radio signals to a receiver.
Rf gain	-	An increase in the strength of a signal.
Signal	-	An electrical wave that carries information.
Signal monitor	-	An electronic device that displays a signal's waveform. Also called panoramic indicator.
Squelch	-	To quiet a receiver by reducing its gain.
Target transmitter	-	The source of radio transmissions in which a direction finder set is monitoring.
Threshold	-	The point at which a signal is first detected.
Trace	-	The pattern on the screen of a cathode ray tube (CRT).
Tune	-	Adjust to a desired frequency.
Tuner assembly	-	An electronic device which may be adjusted to a particular frequency.
Ultra high frequency (uhf)	-	Frequencies in the range of 300 to 3,000 mhz.
Upper sideband (usb)	-	The higher range of two groups of frequencies.
Very high frequency (vhf)	-	Frequencies in the range of 30 to 300 mhz.
Waveform	-	A visual display of a signal.

Section II. EQUIPMENT DESCRIPTION

SECTION CONTENTS

1-11. EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES

CHARACTERISTICS

- Battery operated.
- Portable, weatherproof and shockproof.
- Usable as a manpack or mounted in a vehicle.

CAPABILITIES AND FEATURES

- Detects radio frequency signals from .5 to 500 mhz.
- Provides digital line of bearing (lob) readings on transmitting antennas from 20-500 mhz with an accuracy of 1 degree under ideal conditions.
- Contains a circular LED dial on the df processor for graphic line of bearing readings.
- Contains an antenna mounted compass for true north orientation.

1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

a. The Radio Receiver Direction Finder Set AN/PRD-11 consists of a signal monitor, a df processor (with an angle simulator), a receiver (with an hf upconverter/demodulator), and adf antenna. All of these units are interconnected by cables and powered by battery packs. During operation, the hf upconverter/demodulator, receiver, df processor, signal monitor, and angle simulator are stacked one on top of the other. The speaker assembly is placed beside the direction finder set. The df antenna can be located up to 44 feet from the equipment.

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

1. DF ANTENNA. Collects vhf/uhf radio signals.

2. RF CABLE. Interconnects the df antenna to the hf upconverter/demodulator.

3. HF WHIP ANTENNA. Collects hf radio signals.

4. HF UPCONVERTER/DEMODULATOR AUDIO/POWER CABLE. Interconnects audio signals and power from the receiver to the hf upconverter/demodulator.

5. RECEIVER BNC CABLE. Interconnects the receiver to the hf upconverter/demodulator.

6. HF UPCONVERTER/DEMODULATOR BNC CABLE. Interconnects the hf upconverter/demodulator to the receiver.

7. HF UPCONVERTER/DEMODULATOR. Provides capability for .5 to 20 mhz hf intercept, and 20-250 mhz vhf intercept and df, without having to change the receiver tuning heads to obtain continuous coverage of both the hf and vhf frequency spectrum.

8. RECEIVER. Receives and provides audio output of am., fm and cw radio signals.

9. SPEAKER CABLE. Interconnects the speaker to the hf upconverter/demodulator.

10. SIGNAL MONITOR. Monitors am., fm and cw radio signals. Provides visual waveform display of signal activity of the tuned frequency. Aids the operator in determining the amplitude of the signal being received.

11. SPEAKER ASSEMBLY. Provides receiver or hf upconverter/demodulator audio output.

12. ANGLE SIMULATOR. Provides the signals necessary to test the accuracy and alignment of the df processor.

13. DF PROCESSOR. Provides switching signals to the antenna and if. input to the signal monitor. Provides a visual line of bearing display and a digital bearing readout for the operator.

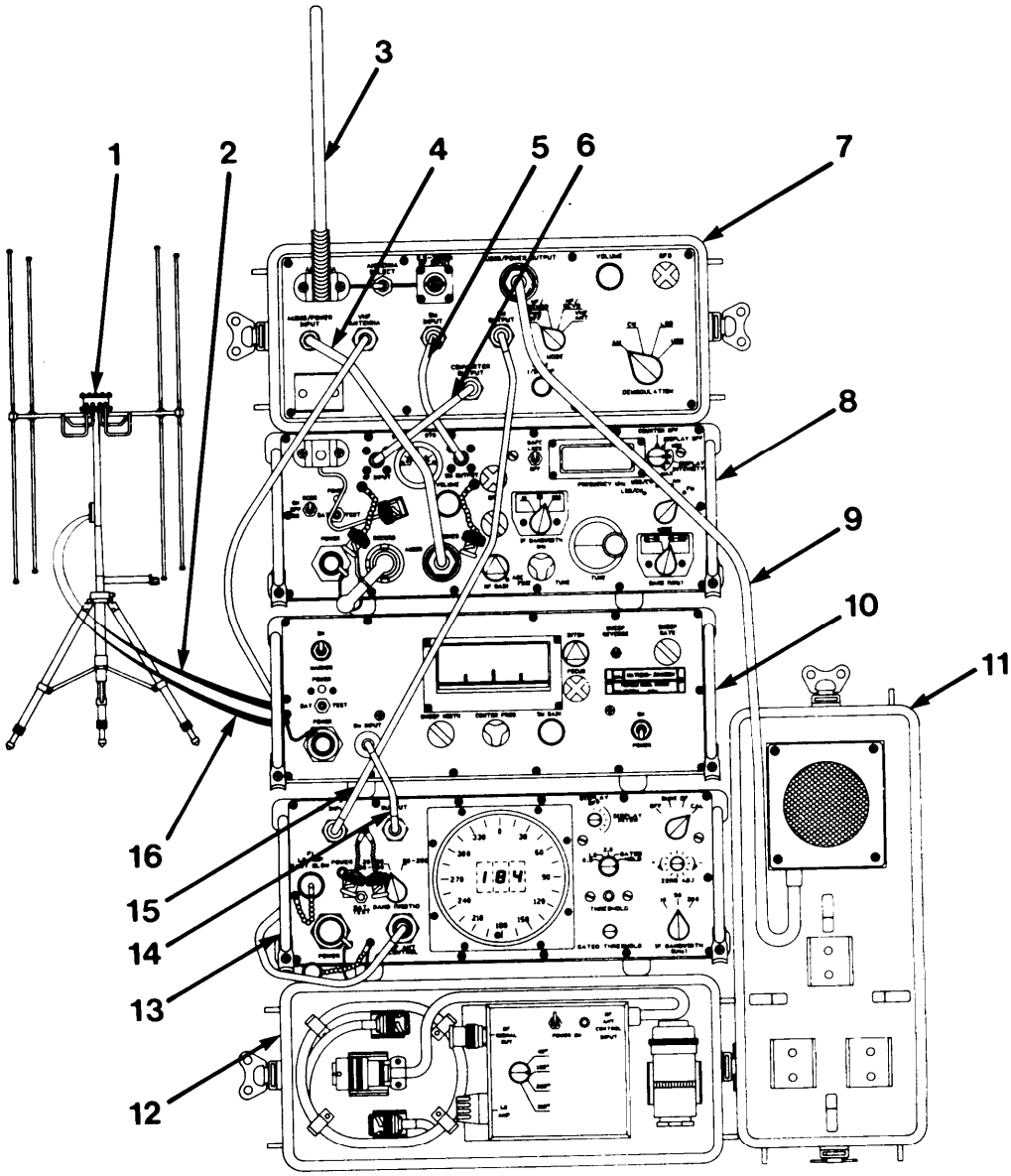
14. SIGNAL MONITOR BNC CABLE. Interconnects the df processor to the signal monitor.

15. DF PROCESSOR BNC CABLE. Interconnects the df processor to the hf upconverter/demodulator.

16. DF CABLE. Interconnects the df processor to the df antenna.

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

MAJOR COMPONENTS



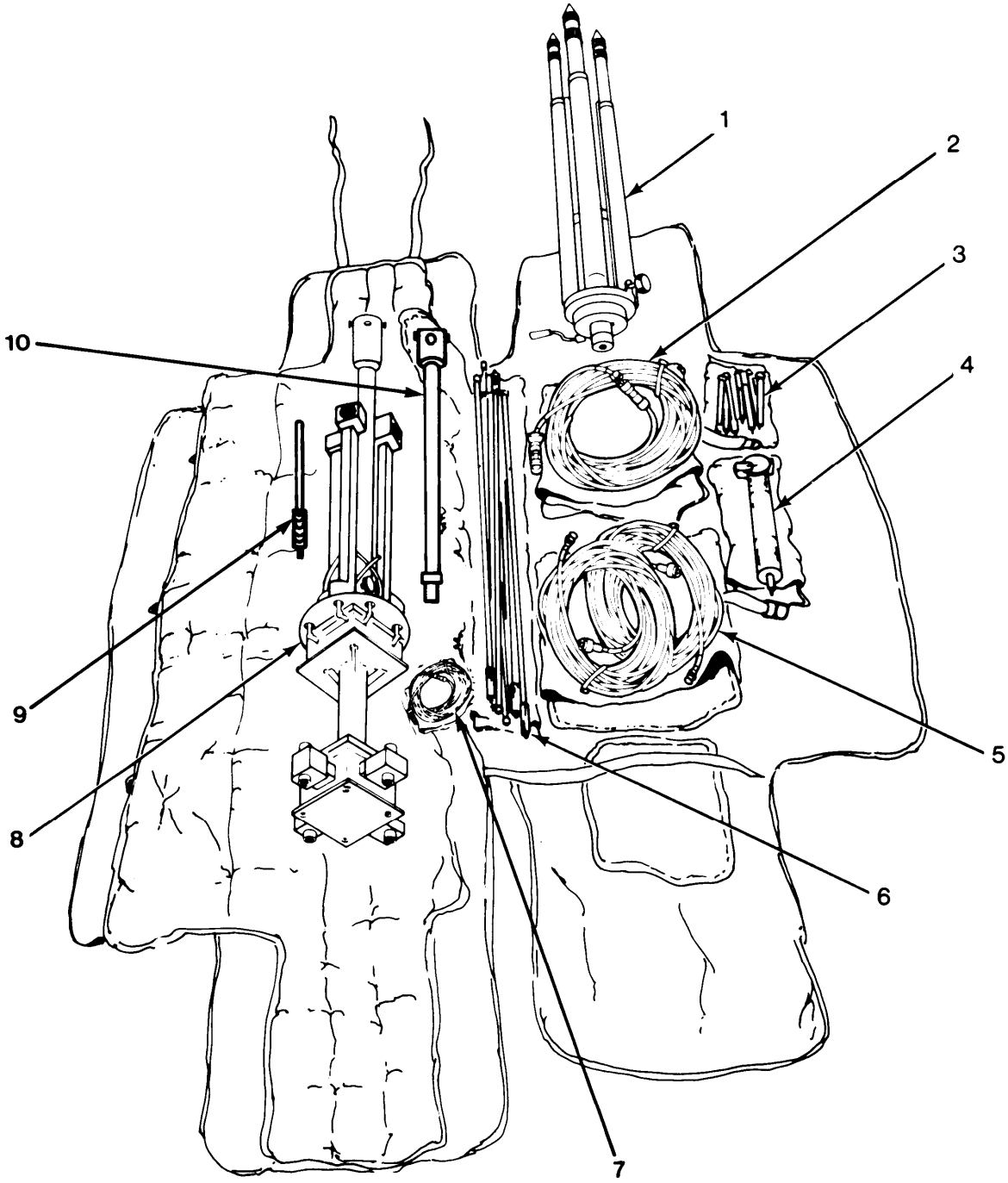
1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

b There are two df antennas that can be used with the direction finder set. They are the AS-3732/PRD-11 and the AS-3733/PRD-11. They are both transported disassembled in similar antenna carrying bags. Each df antenna component is stored in a specific bag as shown here. The carrying bag for the AS-3733/PRD-11 has additional storage areas for the short antenna elements and second rf cable and additional fastening straps.

1. TRIPOD
2. DF CABLE
3. SHORT ELEMENTS (AS-3733/PRD-11 carrying bag only)
4. COMPASS ASSEMBLY
5. RF CABLES
6. LONG ELEMENTS
7. BNC PATCH CABLES
8. MAST
9. HF WHIP ANTENNA
10. MAST EXTENSION

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

MAJOR COMPONENT



1-13. DIFFERENCE BETWEEN MODELS

There are two models of the df antenna which can be used with the direction finder set: AS-3732/PRD-11 and AS-3733/PRD-11. The differences between them are listed below. Because of the additional elements and the upper bay section of the AS-3733/PRD-11, installation procedures for both antennas will differ slightly. There are no differences in models of the receiver, signal monitor or the df processor.

Difference	Antenna Specification	
	AS-3732/PRD-11	AS-3733/PRD-11
Frequency	20-175 mhz	20-850 mhz
Dipole length:		
Lower bay	73 in.	73 in.
Upper bay	nonexistent	14.2 in.
Array diameter:		
Lower bay	43 in.	43 in.
Upper bay	nonexistent	6.7 in.
Number of terminals	2	3
Weight	14 lbs.	17 lbs.

1-14. EQUIPMENT DATA

DIMENSIONS AND WEIGHTS

Dimensions

Receiver	4x11x12 in.
Df processor	4x11x12 in.
Signal monitor	4x11x12 in.
Front panel protective covers (each)	4x11x3 in.
Hf upconverter/demodulator	4x11x5 in.
Df antenna height (including tripod)	
AS-3732/PRD-11 and AS-3733/PRD-11	
Minimum height	103 in.
Maximum height	143.25 in.
Battery pack (depth)	2.5 in.
Cables	
Rf	50 ft.
Df	50 ft.

Weight

Receiver	19 lbs.
Df processor	14 lbs.
Signal monitor	18 lbs.
Df antenna (AS-3732/PRD-11 and AS-3733/PRD-11):	
Tripod	10 lbs.
Antenna	14 lbs.
Case	7 lbs.
Hf upconverter/demodulator	6 lbs.

1-14. EQUIPMENT DATA - Continued

DIMENSIONS AND WEIGHTS (Continued)

Weight

Batteries:	
30 D-cell	16.5 lbs.
3 magnesium	9 lbs.
3 lithium	4.2 lbs.

ENVIRONMENTAL LIMITATONS

Temperature, operating	0 to +50 degrees Celsius
Temperature, storage	-40 to +70 degrees Celsius
Temperature, degradation point	
Upper	30 degrees Celsius
Lower	20 degrees Celsius
Altitude, operating	35,000 ft.
Altitude, nonoperating	50,000 ft.
Humidity	98%
Wind (df antenna, erected and secured)	100 mph
Ice (df antenna only)	1/4 in. radial, maximum

TECHNICAL INFORMATION

Power

Power requirements	14 to 16 v dc
Battery sources	D-cell alkdine BA-30
	D-cell nickel-cadmium BB-586/U
	Lithium SO, BA-5598/U
	Dry Battery BA-4386/PRC-25
	Non-rechargeable Lithium BA-5598/U

Operating Time

Source	Display ON	Display OFF
BA-30	5 to 8 hrs.	5 to 9 hrs.
BB-586/U	6 to 9 hrs.	6 to 10 hrs.
BA-5598/U	6 to 9 hrs.	6 to 10 hrs.
BA-4386/PRC-25	6 to 9 hrs.	6 to 10 hrs.

Reception

Types of reception	am., fm, usb/cw, lsb/cw
Tuner head range:	
TN-586/GRR-8(V)	0.5 to 30 mhz
TN-584/GRR-8(V)	20 to 250 mhz
TN-585/GRR-8(V)	250 to 500 mhz
Main tuning contro.	Approximately 35 turns
If. bandwidths	10 kHz, 50 kHz, 200 kHz
Meter indication	Signal strength
Df processor accuracy (ideal conditions)	1 degree
Hf upconverter/demodulator	0.5 to 20 mhz

1-15. SAFETY, CARE AND HANDLING

Follow the Warnings, Cautions and Notes listed in this manual in order to protect yourself and your equipment from being harmed. In addition, you can ensure effective radio communication through proper care and handling of the direction finder set by observing these precautions:

- Read your technical manual thoroughly.
- Keep the equipment clean and dry when possible.
- Handle the equipment carefully.
- Conduct routine checks and services.

Section III. PRINCIPLES OF OPERATION

SECTION CONTENTS

1-16. TECHNICAL PRINCIPLES OF OPERATION

The direction finder set consists of adf antenna, a signal monitor, a receiver (with a hf upconverter/demodulator)and a df processor (with an angle simulator). This set enables you to detect and monitor hf, vhf and uhf radio signals. In addition, the operator can obtain a line of bearing (lob) on the transmitting antenna of a vhf or uhf signal.

THE DF ANTENNA:

- Provides antenna-mounted compass for true north orientation.
- Intercepts radio frequency (rf) signals between 20 and 175 mhz with the low bay section and between 150 and 500 mhz with the high bay section.
- Receives electrical signals from the df processor which activate the antenna elements in sequence.
- Inputs rf signals to the hf upconverter/demodulator for monitoring.

1-16. TECHNICAL PRINCIPLES OF OPERATION - Continued

THE RECEIVER:

- Receives rf signals in the vhf/uhf frequency spectrum from the df antenna through the hf upconverter/demodulator in the am., fm and cw modes.
- Receives converted signals in the hf frequency spectrum from the hf upconverter/demodulator.
- Provides a digital readout of the tuned frequency.
- Locks in the tuned frequency to within 1 kHz to prevent signal drift.
- Provides audio output to the hf upconverter/demodulator when the hf upconverter is in the HF/RCVR mode.
- Provides an if. output to the hf upconverter/demodulator when the hf upconverter/demodulator is in the HF DEMOD mode.

THE HF UPCONVERTER/DEMODULATOR:

- Provides an input to the signal monitor through the df processor for a visual waveform display of the tuned frequency.
- Provides an if. signal to the df processor for determination of lob.
- Receives rf signals from .5 to 20 mhz from the whip or external antenna.
- Provides an upconverter rf signal to the receiver.
- Accepts receiver audio for processing to a speaker or headset.
- Receives an if. signal from the receiver.

THE DF PROCESSOR:

- Activates the df antenna and controls the switching action of the df antenna elements.
- Receives the signal if. signal from the hf upconverter/demodulator.
- Visually displays compass bearing of a vhf/uhf transmitting antenna.

1-16. TECHNICAL PRINCIPLES OF OPERATION - Continued

THE SIGNAL MONITOR:

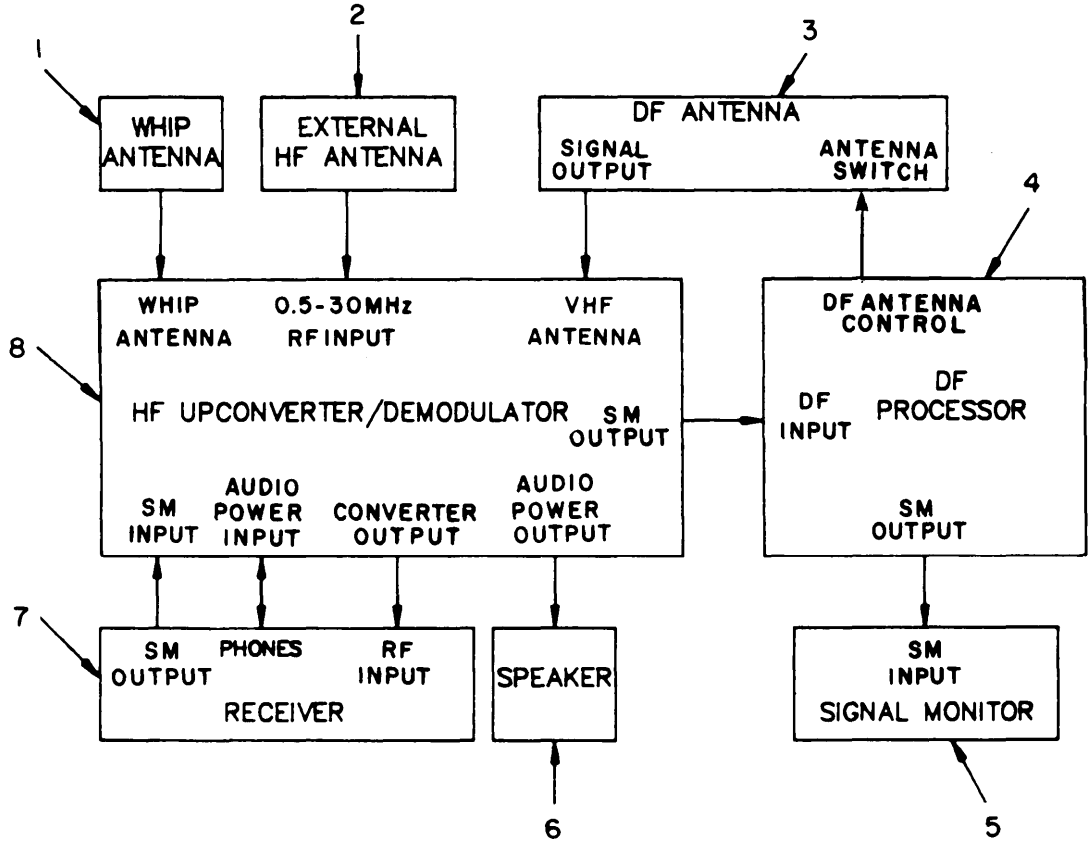
- Receives signal input from the df processor.
- Provides a visual display of signal input for determining the amplitude and type of signal being detected.
- Aids operator in fine tuning signals.

THE ANGLE SIMULATOR:

- Provides a test signal to test the accuracy and alignment of the df processor.

1-17. TYPICAL DATA FLOW

The typical flow of signal data through the direction finder set is described as follows:



1-17. TYPICAL DATA FLOW - Continued

a. VHF/UHF Intercept and DF Operation.

- When power is applied to the units, the df processor (4) sends electrical signals to the df antenna (3) through the antenna control cable. The hf upconverter/demodulator (8) power is turned OFF during vhf/uhf intercept and DF operation.
- The electrical signals from the df processor (4) turn on the df antenna (3) elements in sequence. Rf signals present on each turned on element are sent to the receiver (7) through the rf cable.
- The receiver (7), through operator tuning, indicates the frequency of the rf signal. This signal is converted to an if. signal and passed into the df processor (4) through a bnc cable.
- The df processor (4) determines line of bearing on each tuned signal while passing the signal to the signal monitor (5) through a bnc cable.
- The signal monitor (5) enhances tuning accuracy for the receiver by visually displaying the signal's waveform for adjustment.
- The receiver (7) converts the rf signal to an audio signal and passes the audio signal to the speaker (6) or headphones for operator monitoring of the received signal.

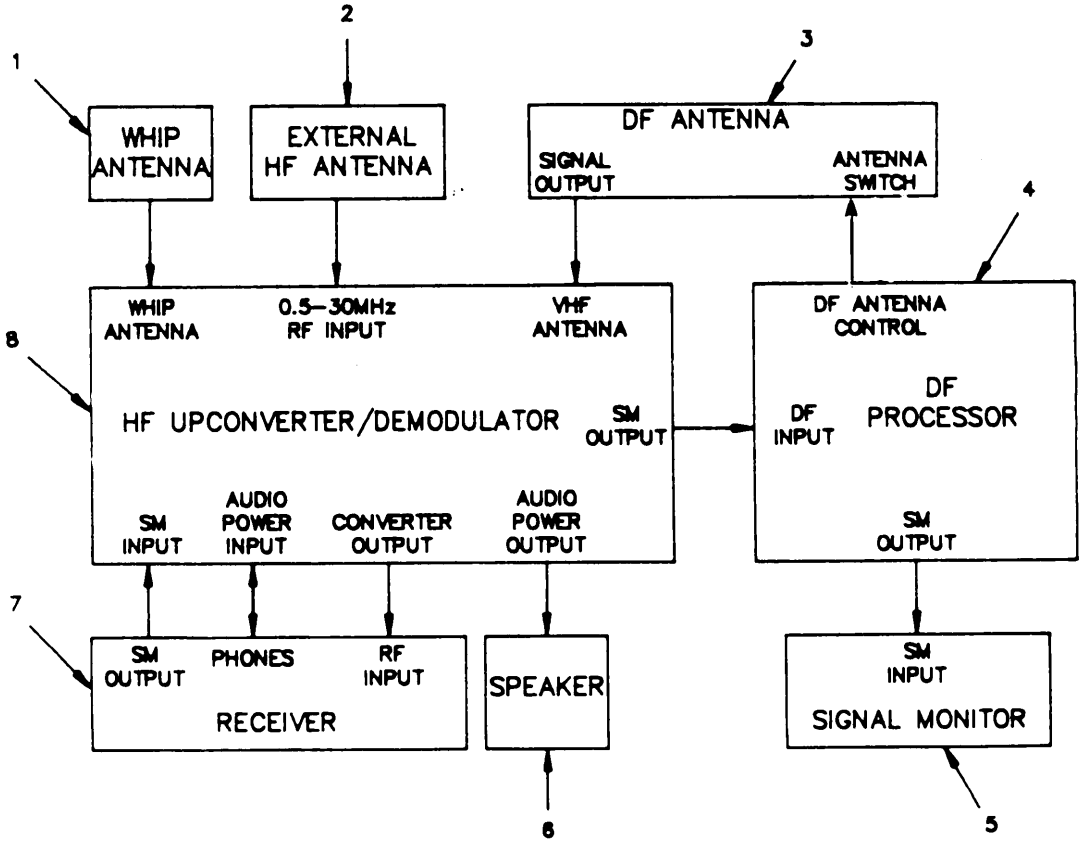
b. HF Intercept (HF Upconverter/Demodulator Set To HF/RCVR Mode).

- When power is applied to the units, the receiver (7) and hf upconverter/demodulator (8) perform hf intercept. Rf signals present on either the whip antenna (l) or and external hf antenna (2) are passed to the hf upconverter/demodulator.
- The hf upconverter/demodulator (8) converts the hf signals (.5 to 20 mhz) to 100.5 mhz to 120 mhz and passes these signals to the receiver (7).
- The receiver (7), through operator tuning from 100.5 to 120 mhz, indicates the frequency of the rf signal.
- The receiver (7) converts the rf signal to an audio signal and passes the audio signal through the hf upconverter/demodulator (8) to the speaker or headphones for operator monitoring of the received signal.

1-17. TYPICAL DATA FLOW - Continued

c. HF Intercept (HF Upconverter/Demodulator Set To HF/DEMOD Mode).

- When power is applied to the units, the receiver (7) and hf up-converter/demodulator (8) perform hf intercept. Rf signals present on either the whip antenna (1) or and external hf antenna (2) are passed to the hf upconverter/demodulator.
- The hf upconverter/demodulator (8) converts the hf signals (.5 to 20 mhz) to 100.5 mhz to 120 mhz and passes these signals to the receiver (7).
- The receiver (7), through operator tuning from 100.5 to 120 mhz, indicates the frequency of the rf signal and converts these signals to an if. signal and passes the if. signal to the hf upconverter/demodulator (8).
- The hf demodulator/upconverter (8) demodulates the if. signals and converts the received signal to an audio signal. The audio signal is then passed to the speaker (6) or headphones for operator monitoring of the received signal.
- The receiver (7) converts the rf signal to an audio signal and passes the audio signal through the hf upconverter/demodulator (8) to the speaker (6) or headphones for operator monitoring of the received signal.

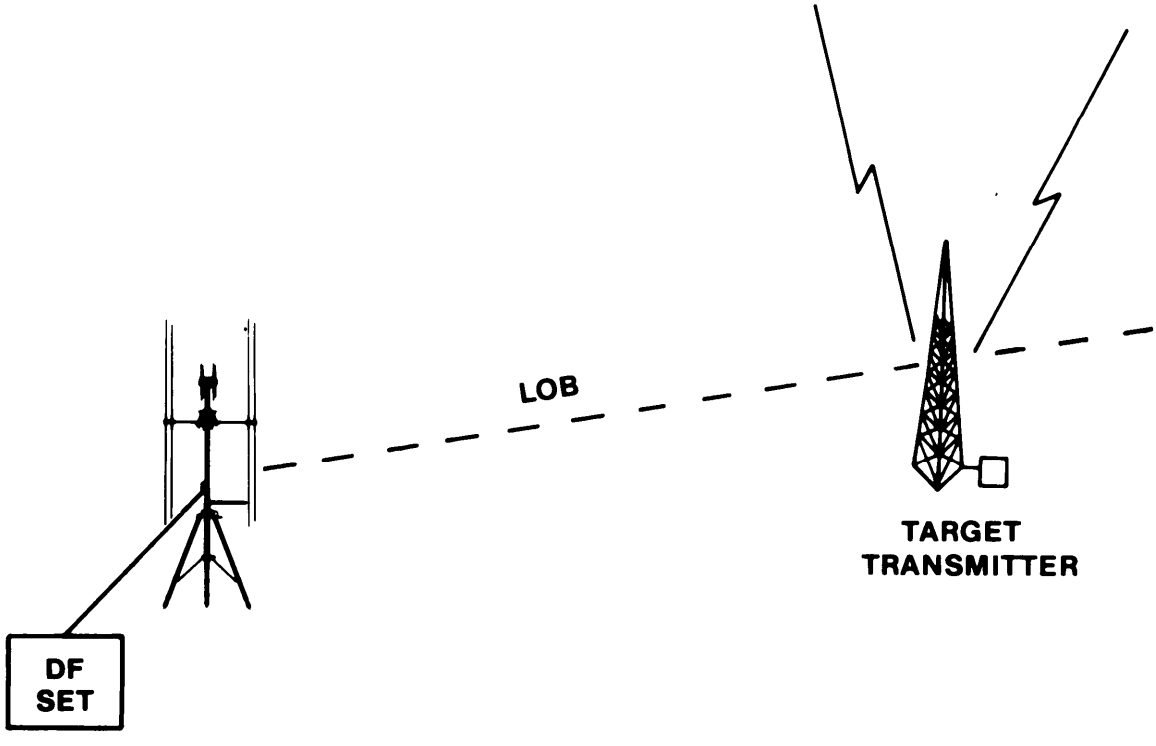


1-18. MODES OF OPERATION

The direction finder set can be used in a stand alone mode or in a netted mode with two or more other sets.

a. Stand Alone Operation. For stand alone operation, only one direction finder set is required. The stand alone mode is used to search and monitor frequency bands. A line of bearing (lob) can be obtained on a transmitting antenna when operating in the vhf/uhf mode. However, the lob will only supply you with direction. You cannot accurately determine distance or location in this mode.

STAND ALONE MODE

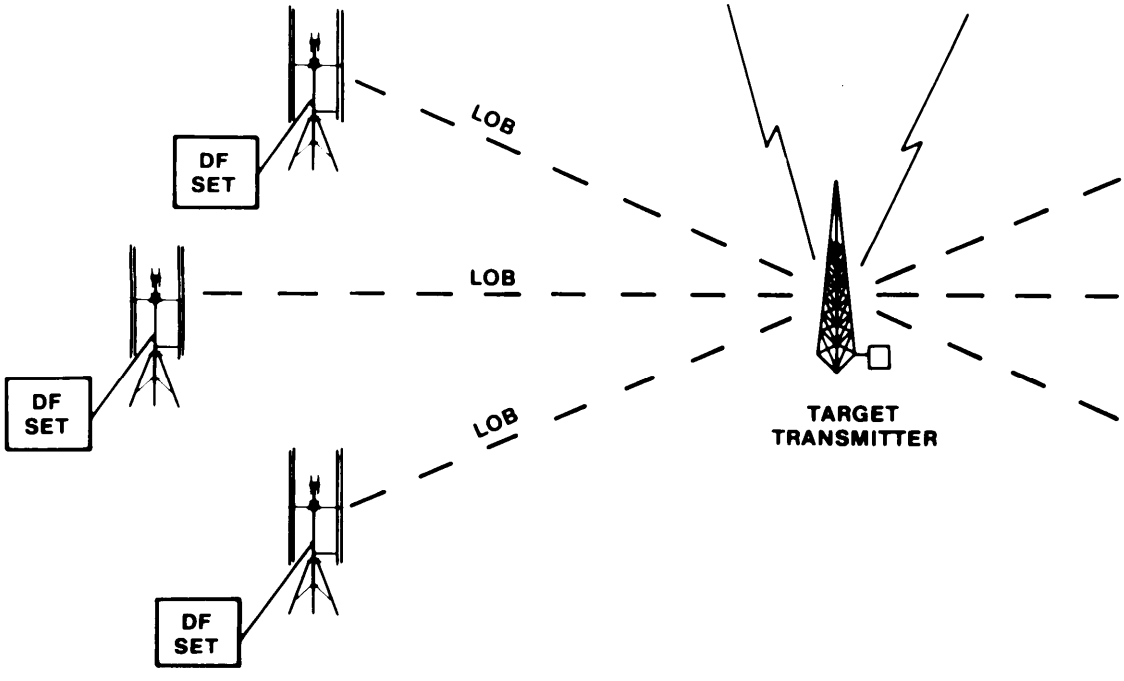


- Detects radio frequency signals between 0.5 and 500 mhz, depending on its installed rf tuner and hf upconverter/ demodulator use.
- Allows monitoring of target area radio transmissions.
- Provides line of bearing information for general direction of transmitting antenna for signals received in the 20 to 500 mhz frequency range.

1-18. MODES OF OPERATION -Continued

b. Netted Operation. In a netted operational mode, three or more separately located direction finder sets are used to obtain a df fix on a transmitting antenna in the vhf/uhf frequency range. A Net Control Element (NCE) directs the df stations to tune into the same frequency and report back the line of bearing information displayed on their df processors. The NCE can then plot the location of the target transmission.

NET MODE WITH THREE DF STATIONS



- Each direction finder station detects radio frequency signals between .5 and 500 mhz, depending on its installed rf tuner and hf upconverter/demodulator use.
- Each direction finder station systematically monitors and reports radio signals to the NCE and, when directed to do so, locks onto a specific frequency.
- Each direction finder station in return obtains and reports line of bearing information on the specific frequency in the vhf/uhf frequency range to the NCE.
- The NCE calculates the most probable location of the transmitter through the lobs reported by the direction finder stations.

1-19. OPERATIONAL CONFIGURATION

The AN/PRD-11 units should reconfigured as follows for transport or transit:

Receiver	-	Battery cover or D-cell insert mounted to the rear of the receiver.
	-	Hf upconverter/demodulator mounted to the front of the receiver.
Df processor	-	Battery cover or D-cell insert mounted to the rear of the df processor. Angle simulator mounted to the front of the df processor.
Signal monitor	-	Battery cover or D-cell insert mounted to the rear of the signal monitor.
	-	Receiver speaker panel mounted to the front of the signal monitor.
Antenna bag	-	All antenna components packed in antenna bag.
	-	All interconnecting bnc patch cables for cabling between the hf upconverter/demodulator, receiver, signal monitor, df processor, and angle simulator packed in antenna bag.

The standard receiver and hf upconverter/demodulator configurations as follows:

Install the 20-250 mhz rf tuner (Tuner, RF TN-584/GRR-8(V)) in the receiver and connect the hf upconverter/demodulator to the receiver. This will allow .5 mhz to 250 mhz intercept capability and 20 to 250 mhz direction finding capability.

For 250 mhz to 500 mhz intercept and df coverage, the 250-500 mhz tuner (Tuner, Rf TN-585/GRR-8(V)) must be installed in the receiver and there is no capability to interceptor perform direction finding from .5 to 250 mhz.

> NOTE
>
> AN/PRD-11 systems that have the hf upconverter/demodulator as an integral component of the system have no requirement to use the .5 to 30 mhz Tuner, RF TN-586/GRR-8(V), in the current AN/PRD-11 configuration.

1-19. OPERATIONAL CONFIGURATION - Continued

To accommodate units that have a mission primarily in the 20 to 80 mhz frequency range an extra set of lower bay df antenna elements is provided. These elements are designed for optimum reception in the 20 to 100 mhz frequency range. Each AN/PRD-11 system will have a set of 20-175 mhz df antenna single element dipole antenna elements (approximately three feet in length) and a set of double element dipole antenna elements (each element consists of a section approximately three feet in length that screw together to make one element that is approximately six feet in length). Consequently the possible df antennas (depending on lower bay antenna elements installed) are as follows:

Antenna	Lower Bay Elements Installed	RF Frequency Range
AS-3732/PRD-11	Single Elements	20-175 mhz
AS-3732/PRD-11	Double Elements	20-100 mhz
AS-3733/PRD-11	Single Elements	20-500 mhz
AS-3733/PRD-11	Double Elements	20-100 mhz and 150-500 mhz

NOTE

DO NOT attempt to mix the single elements and the inner elements of the double element antenna element on the same df antenna. This will cause an inbalance electrically within the df antenna and will introduce serious errors in lines of bearings displayed on the df processor.

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. DESCRIPTION AND USE OF OPERATOR CONTROLS, INDICATORS AND CONNECTORS

SECTION CONTENTS

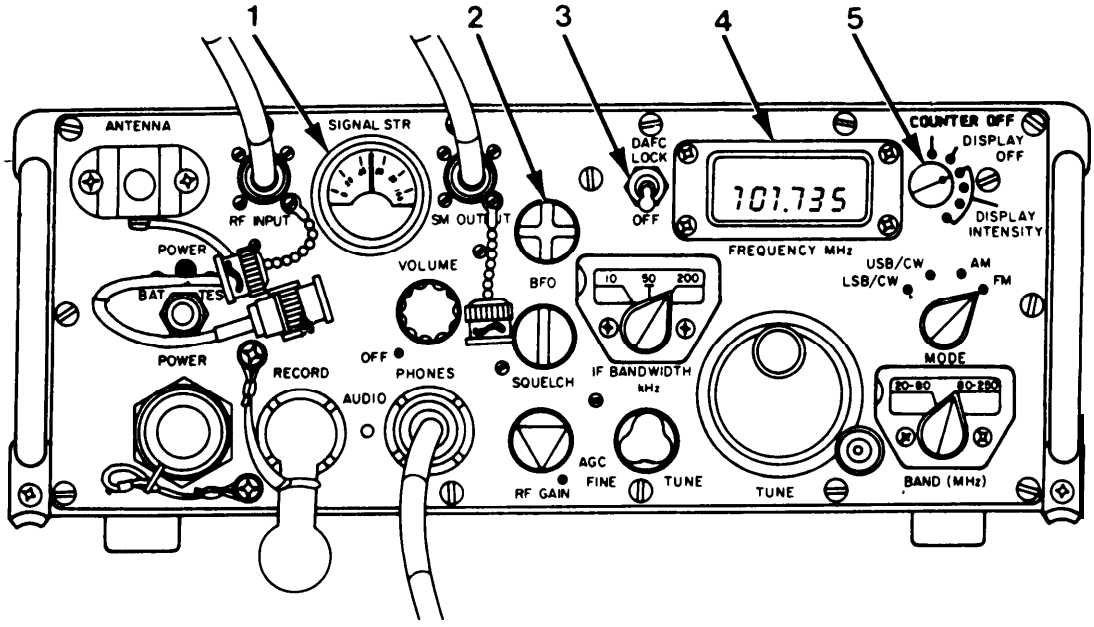
2-1. GENERAL

Before attempting to operate the direction finder set, be sure you are familiar with the location and operation of all controls and indicators.

WARNING

To prevent electrical shocks or damage to the equipment, do not operate your direction finder set until you understand the operation and function of all controls, indicators and connectors.

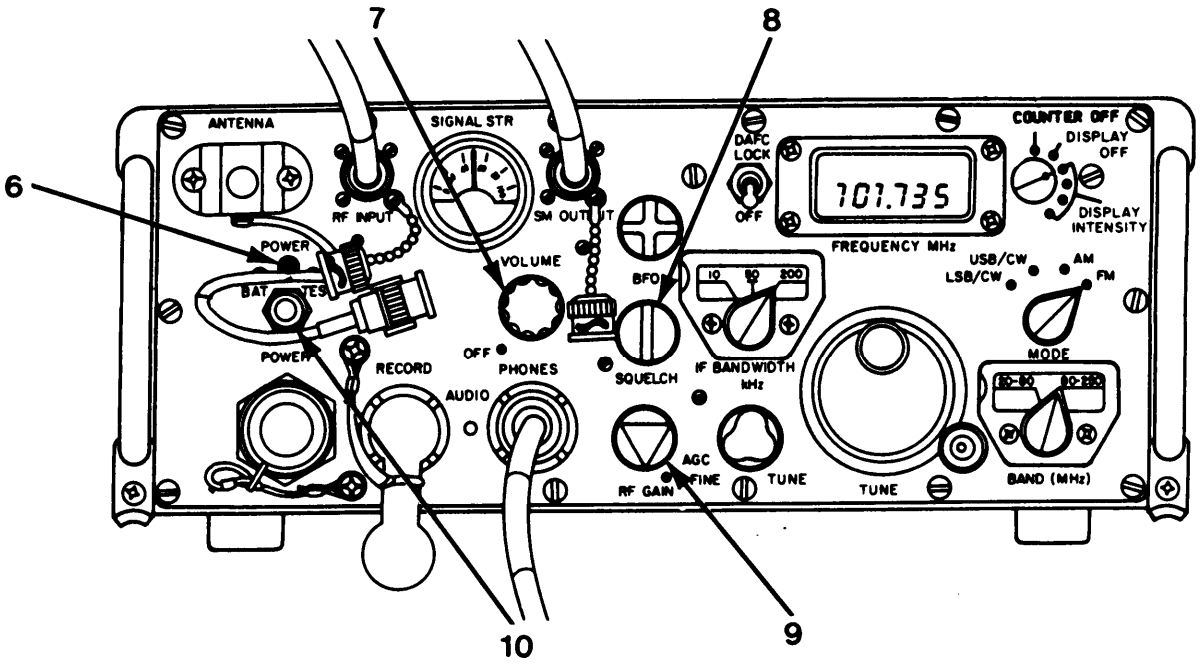
RECEIVER FRONT PANEL



Key	Control, Indicator or Connector	Function
1	SIGNAL STR	Indicates rf signal strength.
2	BFO	Tunes cw signals for clearer reception.
3	DAFC LOCK	Locks or unlocks frequency for signal stability.
4	FREQUENCY MHz	Displays tuned frequency.
5	COUNTER OFF/ DISPLAY OFF/ DISPLAY INTENSITY	Adjusts brilliance of frequency display and turns display off for battery conservation.

2-2. RECEIVER CONTROLS, INDICATORS AND CONNECTORS - Continued

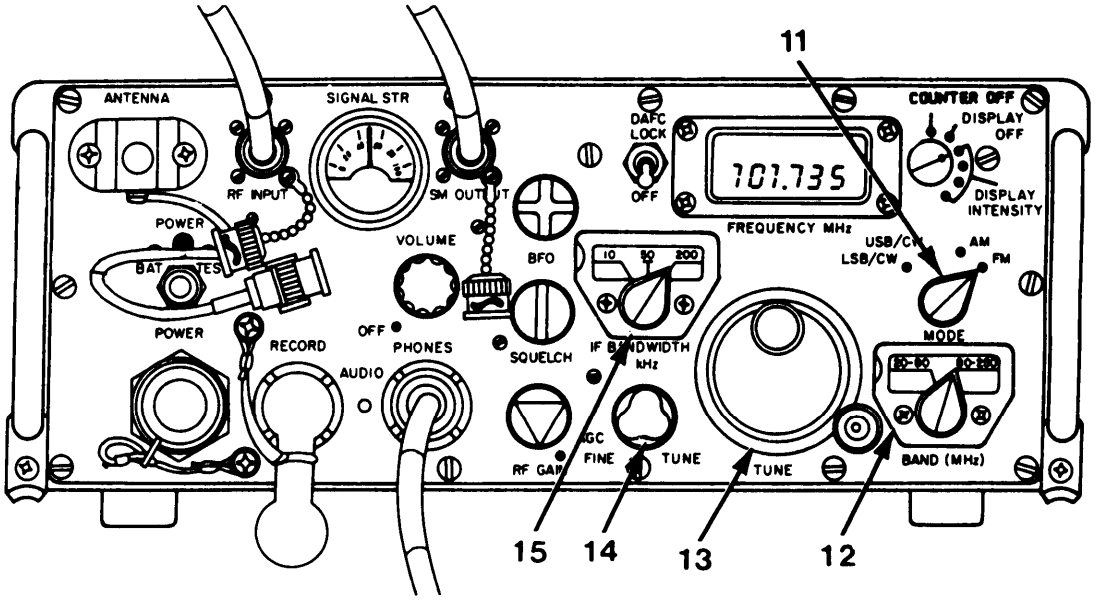
RECEIVER FRONT PANEL



Key	Control, Indicator or Connector	Function
6	POWER	Indicates power on. Indicates condition of battery power when BAT TEST pushbutton (10) is depressed.
7	VOLUME	Turns on receiver power. Adjusts audio volume for speaker headset.
8	SQUELCH/COR	Adjusts level of static between transmitting signals.
9	RF GAIN/AGC	Amplifies signal for maximum reception strength. Activates automatic gain control (AGC) circuitry.
10	BAT TEST	Allows testing of battery power.

2-2. RECIEVER CONTROLS, INDICATORS AND CONNECTORS - Continued

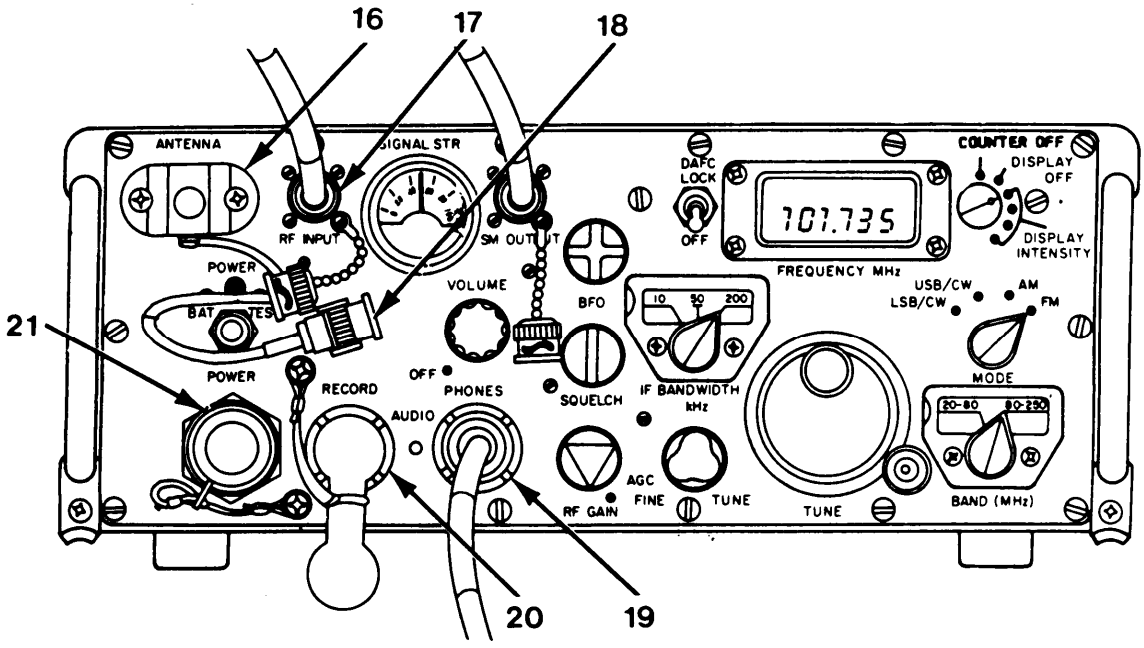
RECEIVER FRONT PANEL



Key	Control, Indicator or Connector	Function
11	MODE	Sets receiver mode to accept desired type of signal.
12	BAND (MHz)	Selects band range of frequencies to be received.
13	TUNE	Provides selection of frequencies.
14	FINE TUNE	Allows fine tuning of frequencies.
15	IF BANDWIDTH kHz	Selects bandwidth of if. signals.

2-2. RECEIVER CONTROLS, INDICATORS AND CONNECTORS - Continued

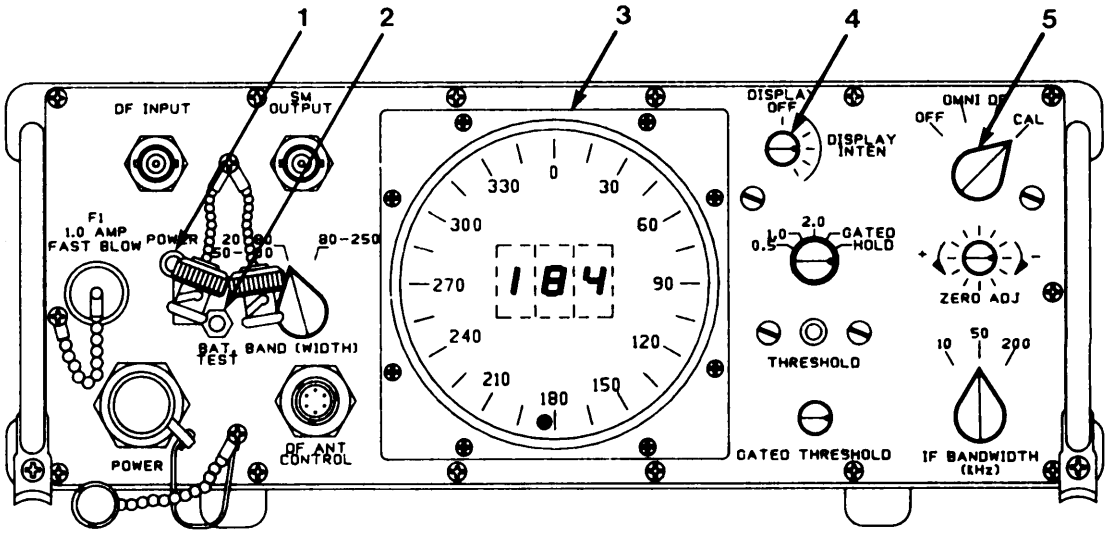
RECEIVER FRONT PANEL



Key	Control, Indicator or Connector	Function
16	ANTENNA	Provides connection to a whip antenna.
17	RF INPUT	Provides connection to the df antenna.
18	Whip Antenna bnc connector	Connects to RF INPUT when using a whip antenna.
19	AUDIO PHONES	Provides connection to speaker assembly or headset.
20	AUDIO RECORD	Provides connection to a recording or monitoring device.
21	POWER	Provides connection to an external power source.

2-3. DF PROCESSOR CONTROLS, INDICATORS AND CONNECTORS

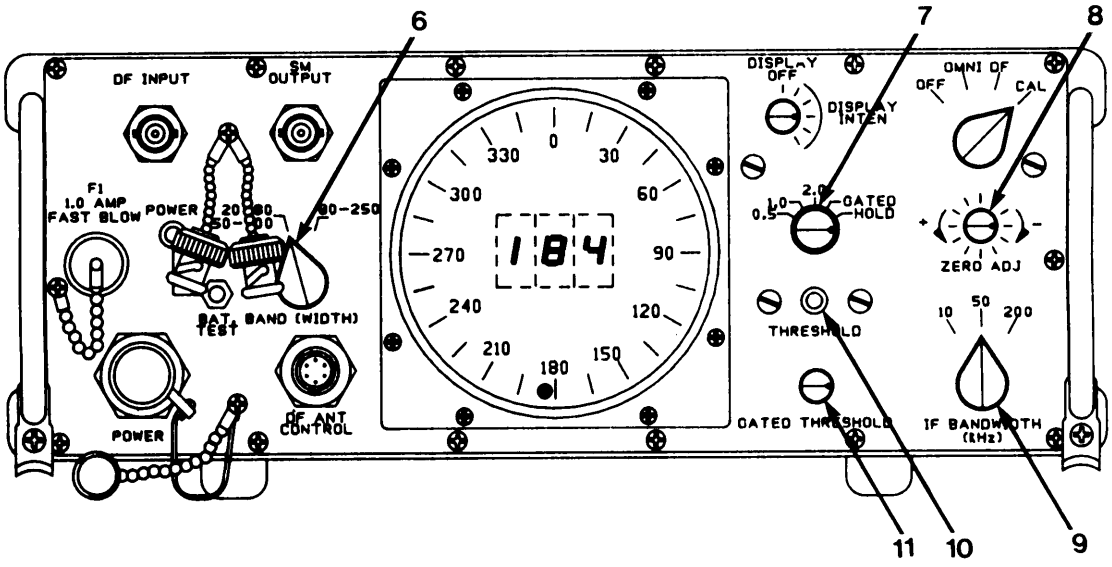
DF PROCESSOR FRONT PANEL



Key	Control, Indicator or Connector	Function
1	POWER	Indicates power on. Indicates condition of battery power when BAT TEST (2) push-button is depressed.
2	BAT TEST	Allows testing of battery power.
3	Line of bearing display/ lob display	Contains numerical and circular led display of line of bearing. • Circular led - Provides compass like representation of numerical lob readout. • Numerical lob display - Provides numerical readout of line of bearing.
4	DISPLAY OFF/ DISPLAY INTEN	Adjusts brilliance of display.
5	OFF/OMNI/DF/CAL	Turns on power. Selects function.

2-3. DF PROCESSOR CONTROLS, INDICATORS AND CONNECTORS - Continued

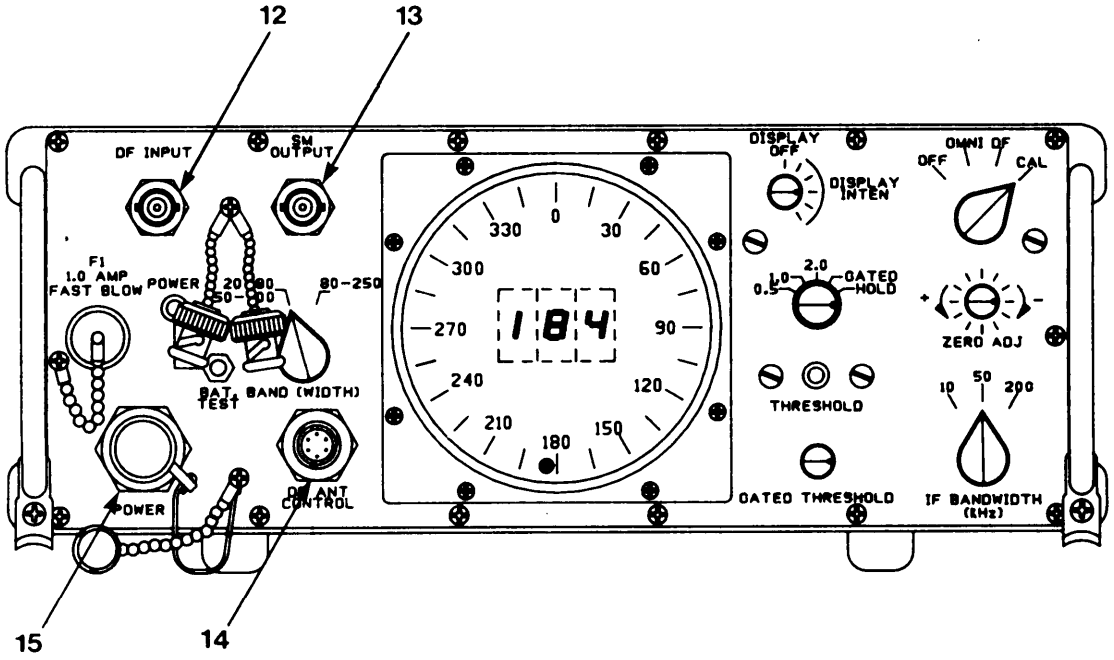
DF PROCESSOR FRONT PANEL



Key	Control, Indicator or Connector	Function
6	BANDWIDTH (MHz)	Selects band of frequencies to be processed.
7	INTEG TIME (SEC)	Selects bearing integration time. Provides GATED and HOLD features.
8	ZERO ADJ	Allows calibration of df processor when OFF/OMNI/ DF/CAL switch (5) is in CAL position.
9	IF BANDWIDTH (kHz)	Selects if. bandwidth.
10	THRESHOLD	Indicates when signal exceeds threshold.
11	GATED THRESHOLD	Adjusts threshold level which signal must exceed for detection and df processor response.

2-3. DF PROCESSOR CONTROLS, INDICATORS AND CONNECTORS - Continued

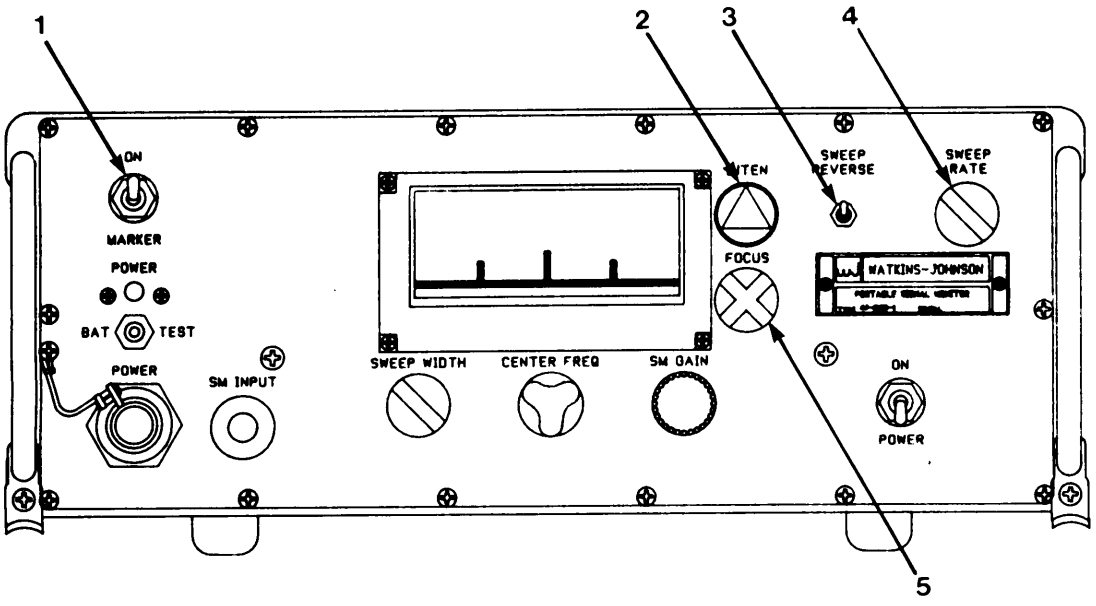
DF PROCESSOR FRONT PANEL



Key	Control, Indicator or Connector	Function
12	DF INPUT	Provides if. connection to receiver.
13	SM OUTPUT	Provides connection to signal monitor.
14	DF ANT. CONTROL	Provides connection to df antenna.
15	POWER	Provides connection to external power source.

2-4. SIGNAL MONITOR CONTROLS, INDICATORS AND CONNECTORS

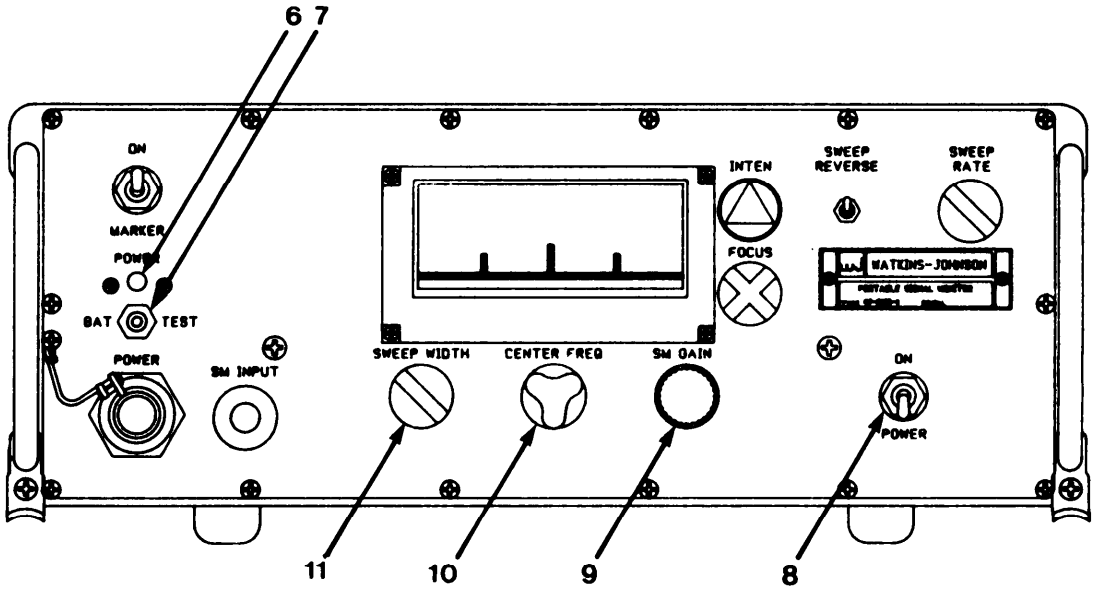
SIGNAL MONITOR FRONT PANEL



Key	Control, Indicator or Connector	Function
1	MARKER	Allows placement of a center frequency marker on signal monitor screen to indicate center position of if. bandpass.
2	INTEN	Adjusts brilliance of trace on signal monitor screen.
3	SWEEP REVERSE	Reverses direction of signal sweep during tuning of receiver.
4	SWEEP RATE	Varies rate of speed at which signal monitor trace sweeps across screen.
5	FOCUS	Provides means of obtaining a sharp trace on signal monitor screen.

2-4. SIGNAL MONITOR CONTROLS, INDICATORS, AND CONNECTORS - Continued

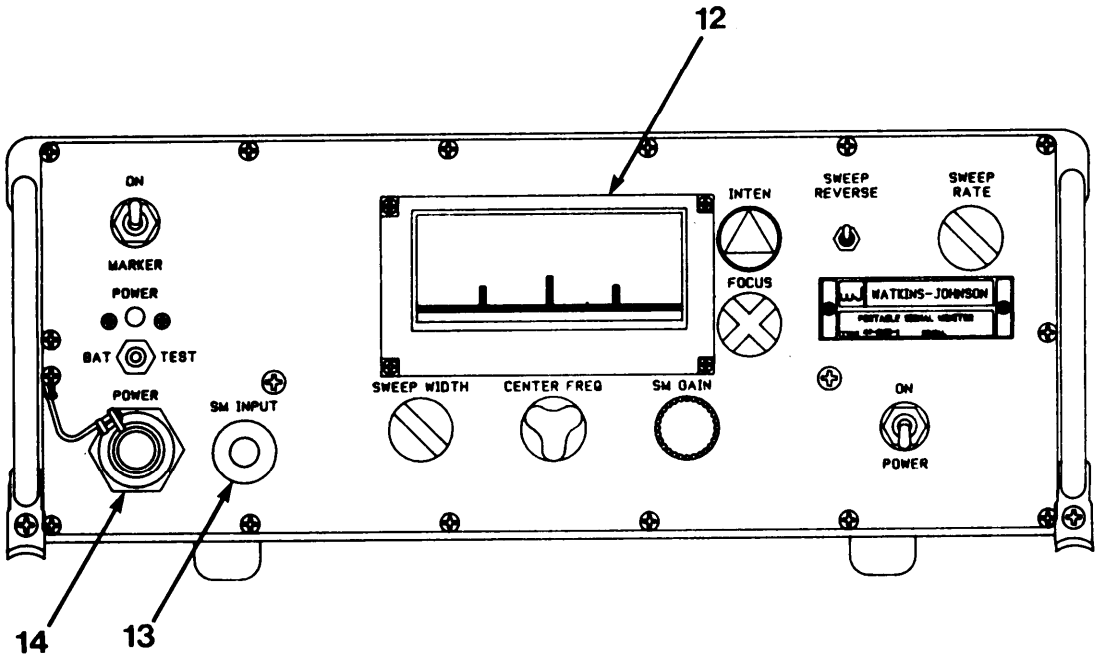
SIGNAL MONITOR FRONT PANEL



Key	Control, Indicator or Connector	Function
6	POWER	Indicates power on. Indicates condition of battery power when BAT TEST pushbutton is depressed.
7	BAT TEST	Allows testing of battery power.
8	POWER	Turns on power to signal monitor.
9	SM GAIN	Varies height of signal spikes displayed on signal monitor screen.
10	CENTER FREQ	Changes the horizontal position of signal spikes on signal monitor screen.
11	SWEEP WIDTH	Varies width of frequency spectrum being viewed on signal monitor screen.

2-4. SIGNAL MONITOR CONTROLS, INDICATORS AND CONNECTORS - Continued

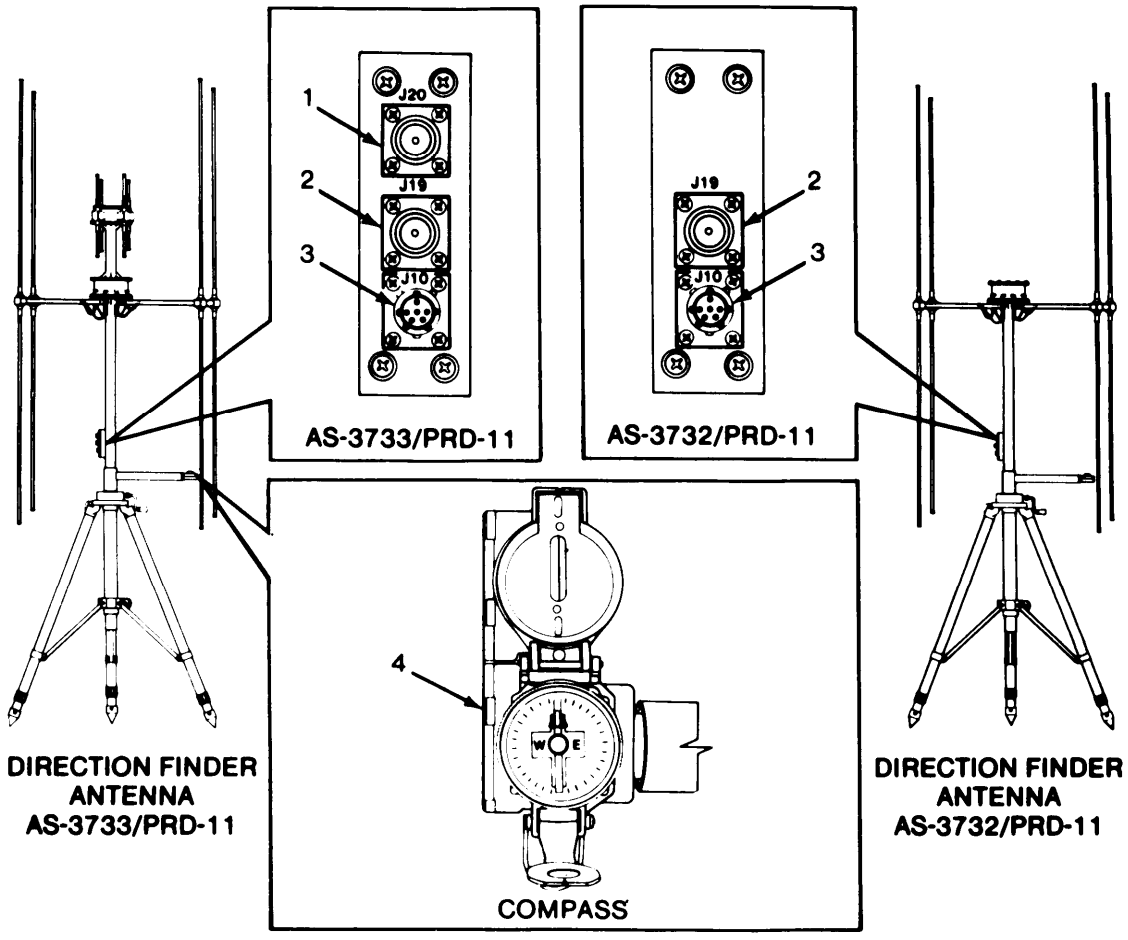
SIGNAL MONITOR FRONT PANEL



Key	Control, Indicator or Connector	Function
12	Signal monitor screen (crt)	Provides display of signal activity.
13	SM INPUT	Provides connection to df processor.
14	POWER	Provides connection to an external power source.

2-5. ANTENNA CONNECTORS AND INDICATOR

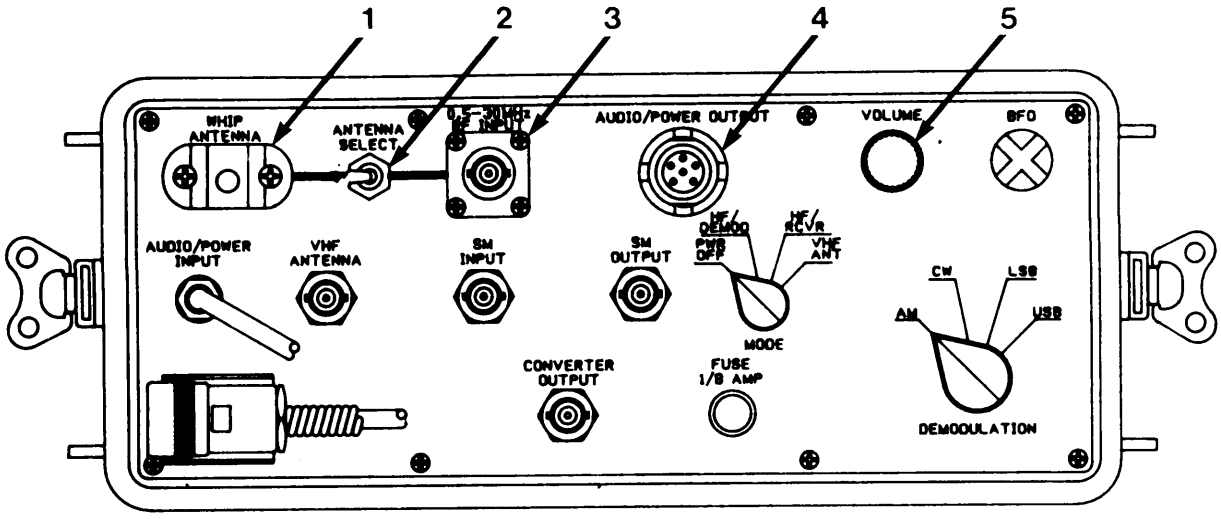
ANTENNA CONNECTOR BOX AND COMPASS



Key	Control, Indicator or Connector	Function
1	J20	Provides 150 to 850 mhz rf signals to receiver.
2	J19	Provides 20 to 175 mhz rf signals to receiver.
3	J10	Accepts signals from df processor for dipole switching action.
4	Compass	Indicates magnetic direction.

HF UPCONVERTER/DEMODULATORS INDICATORS AND CONNECTORS

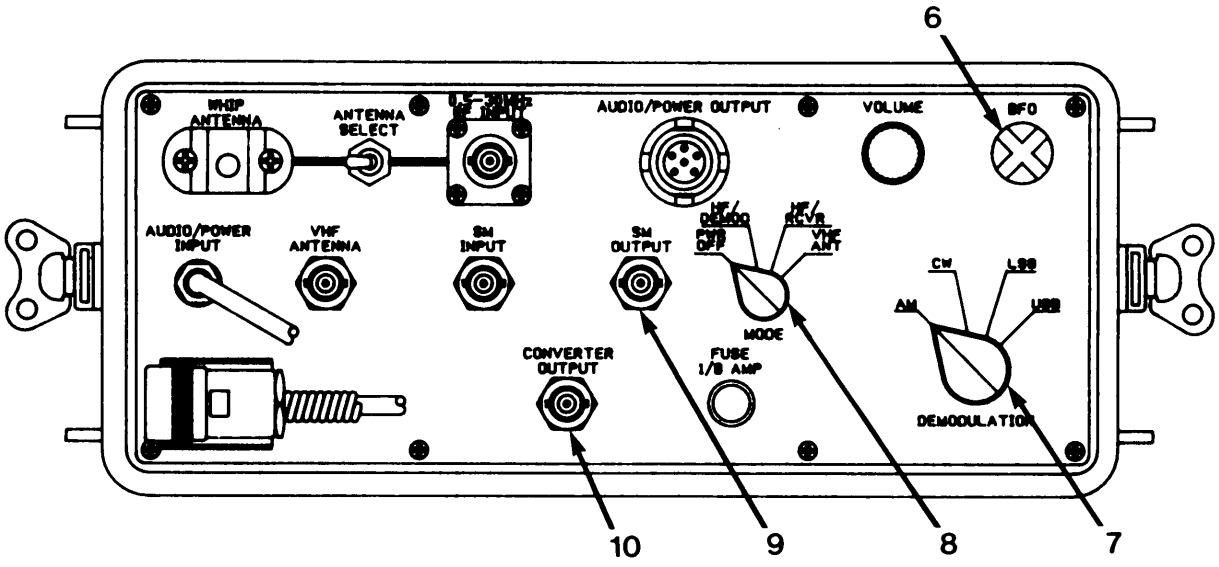
HF UPCONVERTER/DEMODULATOR FRONT PANEL



Key	Control, Indicator or Connector	Function
1	WHIP ANTENNA	Provides hf rf signal input connection to whip antenna.
2	ANTENNA SELECT	Selects whip antenna or an external hf antenna.
3	0.5-30 MHz RF INPUT	Provides hf rf signal input connection to external hf antenna.
4	AUDIO/ POWER OUTPUT	Provides power and audio signals to headset or speaker.
5	VOLUME	Adjust audio volume for speaker or headset.

2-6. HF UPCONVERTER/DEMODULATOR, INDICATORS AND CONNECTORS - Continued

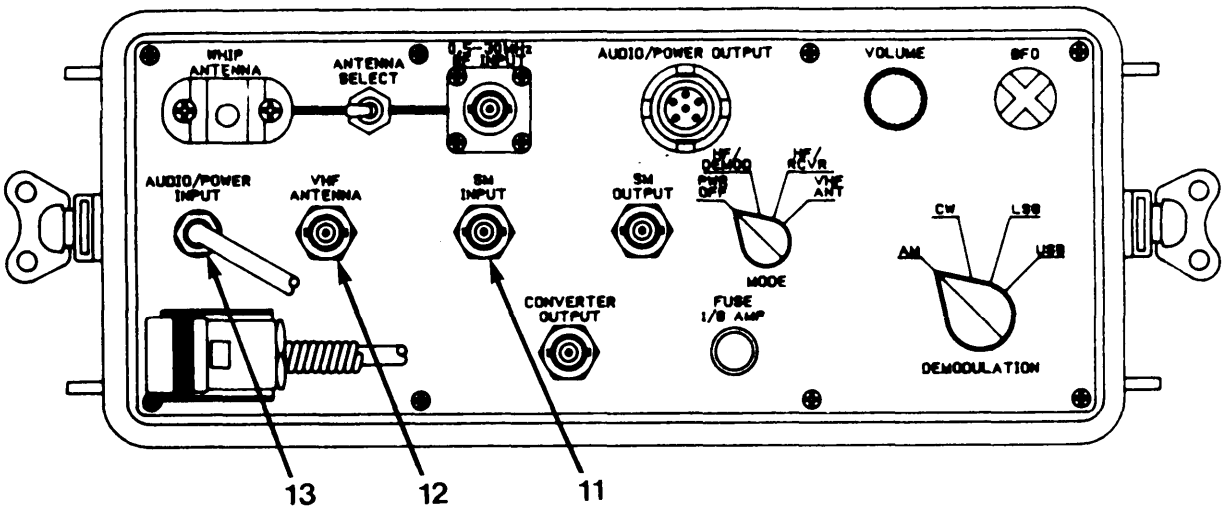
HF UPCONVERTER/DEMODULATOR FRONT PANEL



Key	Control, Indicator or Connector	Function
6	BFO	Tunes cw signal for clearer reception.
7	DEMODULATION	Selects demodulation mode.
8	MODE	Turns on hf upconverter/demodulator power. Selects operating mode.
9	SM OUTPUT	Provides connection to df processor.
10	CONVERTER OUTPUT	Provides converted hf signals to receiver.

2-6. HF UPCONVERTER/DEMODULATOR, INDICATORS AND CONNECTORS - Continued

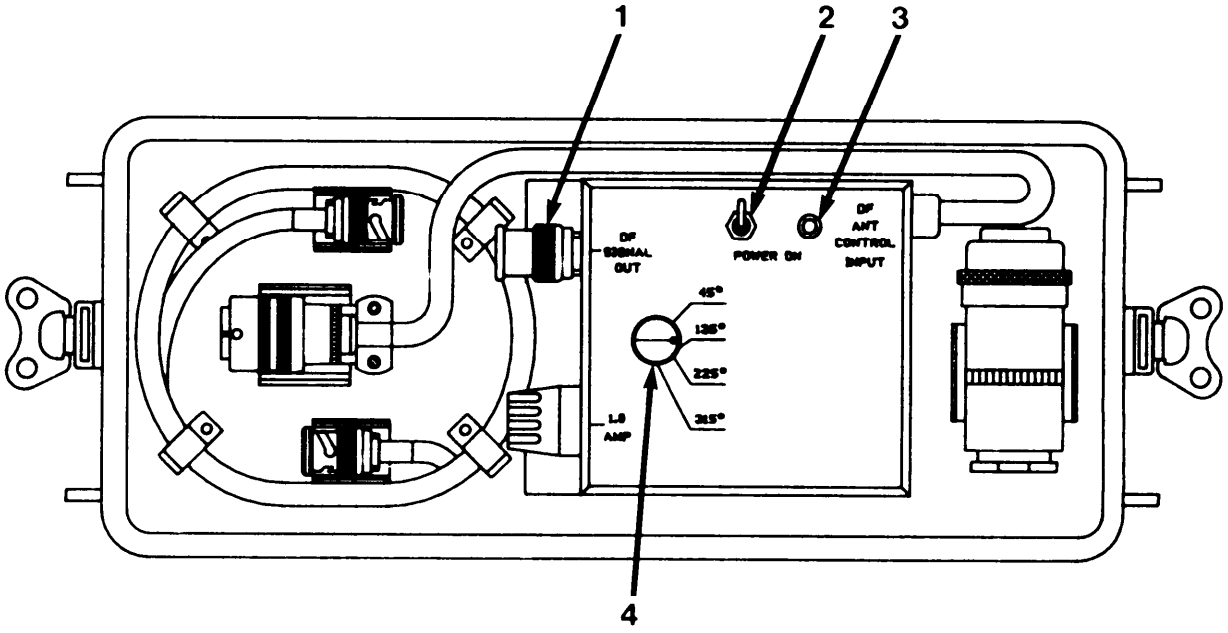
HF UPCONVERTER/DEMODULATOR FRONT PANEL



Key	Control, Indicator or Connector	Function
11	SM OUTPUT	Accepts if. signal from receiver.
12	VHF ANTENNA	Provides vhf/uhf rf signal to df antenna.
13	AUDIO/POWER INPUT	Accepts power and audio signals from receiver.

2-6. ANGLE SIMULATOR CONTROLS, CONNECTORS AND INDICATORS

ANGLE SIMULATOR FRONT PANEL



Key	Control, Indicator or Connector	Function
1	DF SIGNAL OUT	Provides test signals to df processor.
2	POWER	Indicates power on.
3	DF ANTENNA CONTROL INPUT	Accepts df antenna switching signals from df processor.
4	DEGREE SELECT	Selects test signal (45, 135, 225, or 315) for df processor.

Section II. OPERATOR PREVENTIVE MAINTENANCE CHECK AND SERVICES

SECTION CONTENTS

2-8. GENERAL

a. Operator routine checks and services and preventive maintenance checks and services (PMCS) are the required inspections for the care of the equipment. Both services are necessary in order to keep the direction finder set in good operating condition.

b. Always keep in mind the warnings and cautions pertaining to the direction finder set. Perform your Before (B) PMCS before the direction finder set issued on a mission.

c. If anv portion of the direction finder set fails to operate, refer to paragraph 3-3 and paragraph 3-4. Record any malfunctions or suspected faults on DA Form 2404 (refer to DA Pam 738-750).

2-9. ROUTINE CHECKS AND SERVICES

a. Routine services are a collection of checks and observations performed by the operator at all times. Routine services are not listed in the preventive maintenance checks and services table.

b. No tools or equipment are required for routine servicing of your direction finder set. The following cleaning materials will be useful to you:

- Lint-free cloths
- Soft bristle paint brush

c. You should perform these routine checks prior cooperating the equipment:

- Check for completeness of equipment. Ensure all equipment pieces to the direction finder set are accounted for.
- Clean and dust the direction finder set units with a soft cloth and dry paintbrush.
- Check for cuts or fraying on all cables.
- Check for dented, chipped, bent or broken cases and covers.
- Check for rust.
- Check control switches and knobs for smooth operation.
- Ensure switches point to the proper setting or indication.
- Check for bent or broken SIGNAL STR meter needle.
- Check for loose screws.
- Ensure wing fasteners are not damaged.

2-9. ROUTINE CHECKS AND SERVICES - Continued

- Check cable connectors.
- Check that cables are securely attached to their connectors.
- Ensure the df antenna tripod legs extend freely and lock.
- Check the df antenna for bent antenna elements and for damage to threads on short elements.
- Check the batteries for corrosion or damage.
- Check for canvas rips or mildew on the antenna carrying bag.
- Check to see that items not in use are properly stored.
- Check the technical manual and current changes to publications for completeness.
- Check connectors for uncleanliness or damage.

d. Contact organizational maintenance if any component on the direction finder set is damaged.

2-10. PMCS PROCEDURES

The PMCS table will guide you in the performance of the direction finder sets required scheduled services. An explanation of each column in the table is as follows:

a. Item Number Column. Use this column as the source of item numbers for the "TM Item Number" column on DA Form 2404 in recording the results of your PMCS.

b. Interval Column. This column tells you when PMCS should be performed:

B (Before) Do your B (Before) PMCS to ensure the equipment is functioning properly before a mission.

c. Item To Be Inspected/Procedure Column. This column indicates the portion of equipment that requires PMCS. It also contains a description of the procedure by which PMCS is to be performed.

d. Equipment 1s Not Ready/Available If: Column. This column identifies the condition under which the equipment cannot perform the assigned mission requirements.

2-10. PMCS PROCEDURES - Continued

B - Before			
Item Number	Interval B	Item to be Inspected/ Procedure	Equipment Is Not Ready/Available If:
1	•	Direction finder set. • Perform the routine checks and services listed in para 2-9c. • Emplace and operate the equipment as described in Chapter 2, Section III of this manual.	• Antenna is damaged or will not erect properly. • Any unit will not power up. • Visual readouts on any unit do not power up. • Switches or knobs on any unit do not function properly.

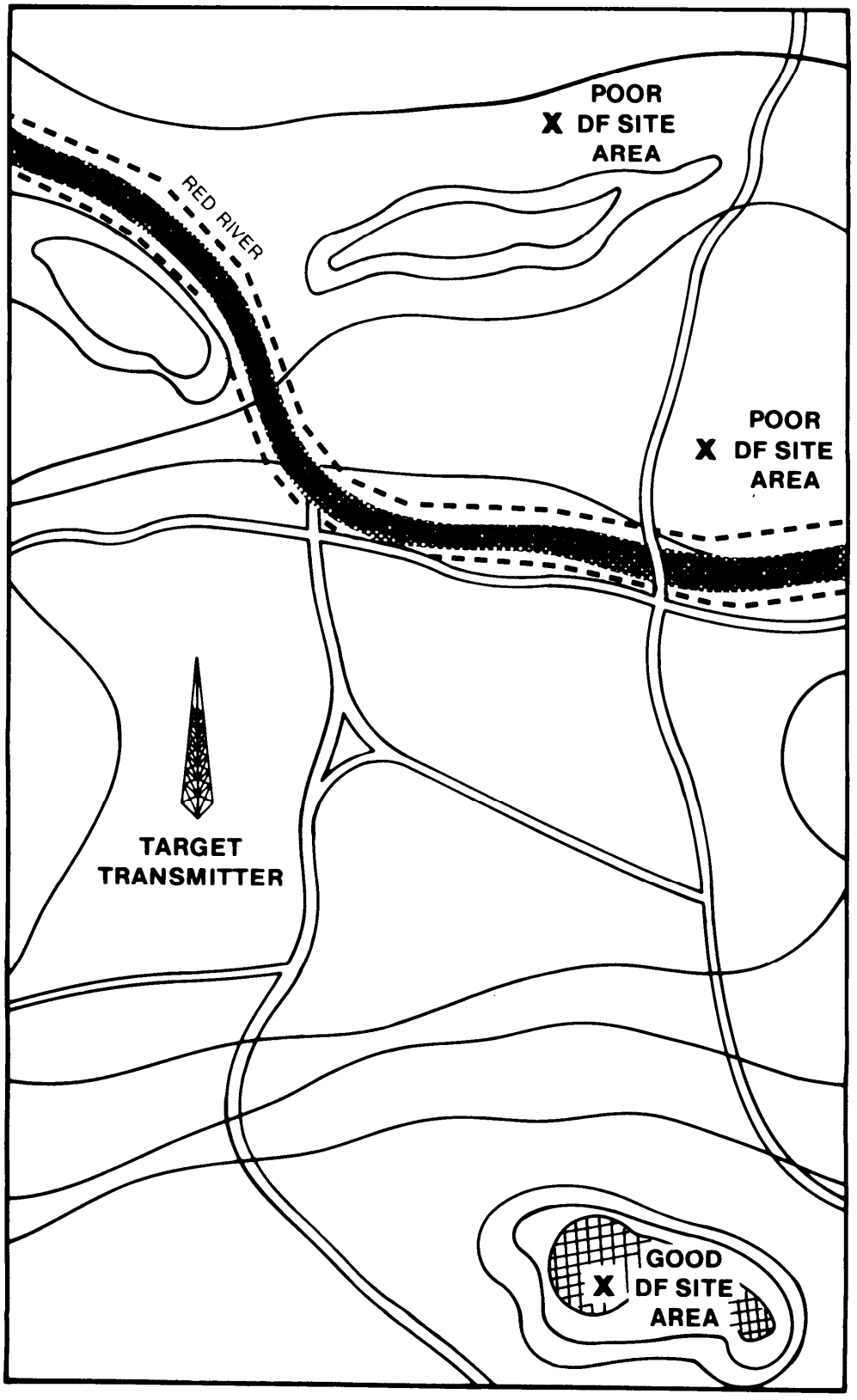
Section III. OPERATION UNDER USUAL CONDITIONS

SECTION CONTENTS

2-11. SITE SELECTION

Selection of adf site is dependent on both tactical and technical considerations. A combination of problems may occur during site selection. Sites that are best suited technically may not be tactically desirable. When selecting a site, follow the technical guidelines listed in this section. They will help you eliminate serious direction finding errors caused by poor siting.

2-11. SITE SELECTION - Continued

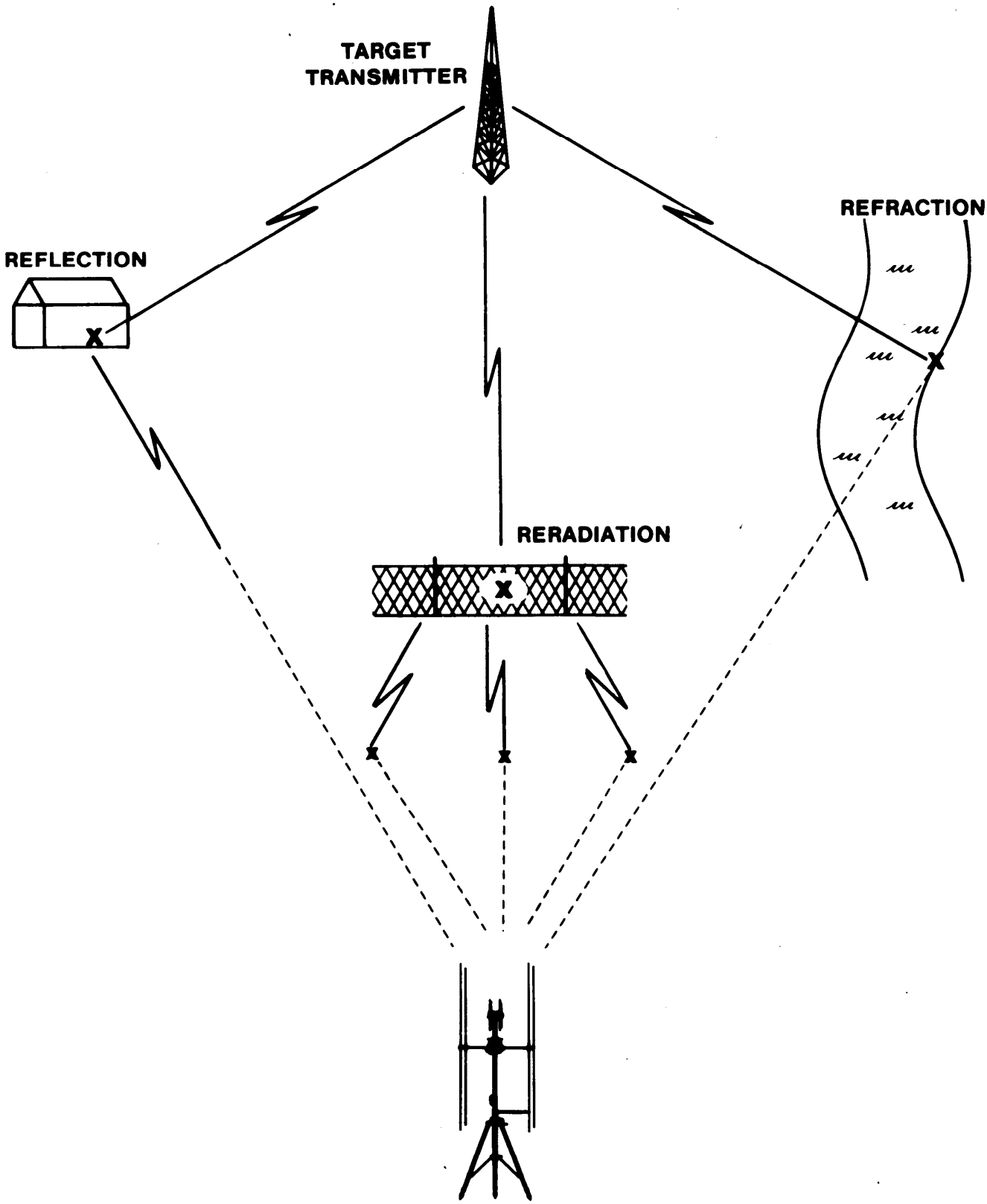


2-11. SITE SELECTION - Continued

a. Terrain Considerations. The terrain on which the direction finder set and the target area are located is an important factor in operations. Observing these procedures will help you choose the most practical site:

- Choose the highest level of ground in the area.
- Choose an area that is flat for at least 90 meters surrounding the df antenna.
- Choose an area as far as possible from bodies of water.
- Choose an area away from objects that reflect, refract, or reradiate such as buildings, wire fences, and water towers.

2-11. SITE SELECTION - Continued



2-11. SITE SELECTION - Continued

b. Signal Path Considerations. The path of the signal being transmitted from the target area may change direction before being received by your df antenna. This can result in an erroneous line of bearing reading. Keep the following conditions in mind when establishing adf site:

- Radio waves can be reflected off buildings, mountains or metal objects. Position a direction finder set away from such reflectors.
- Metal objects, such as fences or armored vehicles, can act as transmitters when some radio waves pass through them. Avoid metal objects that can cause reradiation. Site vehicles should be in quadrant of least interest.
- Radio waves can be bent as they pass from one atmospheric condition to another. This happens when signals pass through the moist air over water to the dry air overland.
- Do not position a direction finder set near a shoreline.

c. Target Transmitter Location Considerations. The location of the target transmitter may contain conditions that will cause an erroneous reading on your direction finder set. However, if the target transmitter is more than 15 kilometers away, the chance of error is greatly reduced.

2-11. SITE SELECTION - Continued

IMPROPER SITE LOCATIONS
• Valleys • Jungles • Mountainous or hilly country • Shore lines • Rocky or sandy soil area • Cliffs • Cities • Near railroad tracks • Near chimney stacks or water towers • Near wire fences

PREFERRED DISTANCES FROM OBSTACLES	
Obstacles	Distance to be Maintained
Scattered trees and vegetation	185 meters
Mountains or hills	5 kilometers
Shorelines	550 meters
Cliffs	1.6 kilometers
Scattered small buildings	185 meters
Railroad tracks	450 meters
Chimney stacks or water towers	450 meters
Wire fences	275 meters

2-12. ASSEMBLY AND PREPARATION FOR USE

Assembly and preparation for use consists of the tasks that must be performed to prepare for a df mission. The tasks and procedures for performing them are given in the following paragraphs. Assembly and preparation for use includes:

a. Antenna Set Up. Antenna set up consists of the procedures that must be performed to prepare a df antenna for operation. Two crew members are normally needed to perform these procedures. Under certain circumstances, the antenna can be set up by one crew member.

CAUTION

The df antenna is easily damaged through careless or improper handling. Use care when setting up the df antenna.

NOTE

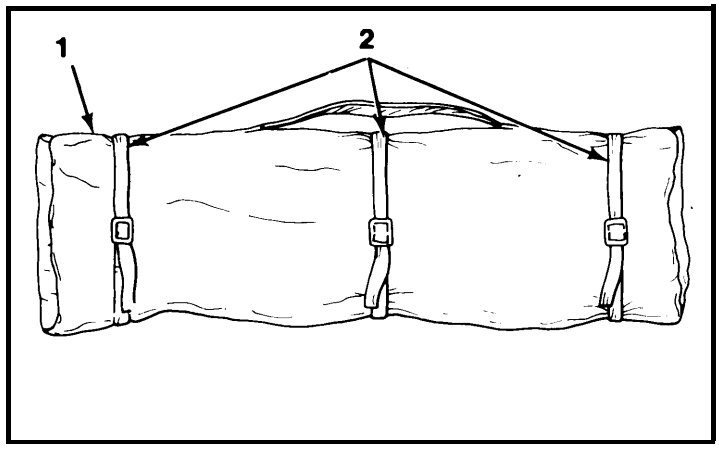
The direction finder set can use two different df antennas. The procedures for setting up each antenna are the same.

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

SETTING UP TRIPOD (SHEET 1 OF 3)

The tripod is stored in the center of the antenna carrying bag. Setting up the tripod requires two crew members. The first crew member will perform the procedures listed in this section. The second crew member will assist the first when adjusting the length of the tripod legs. To access and set up the tripod, follow these steps.

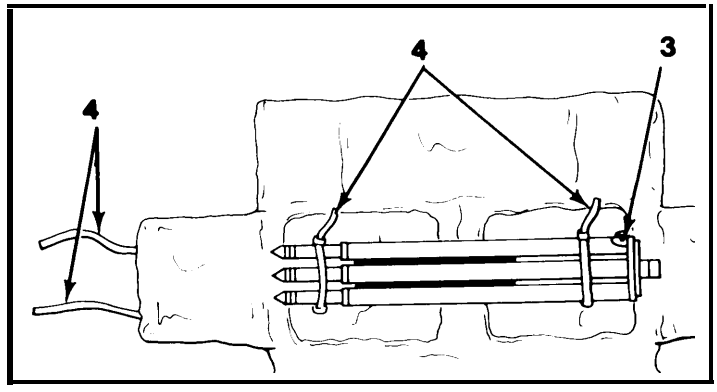
1. Open antenna carrying bag (1) by unbuckling three fastening straps (2) and unrolling bag. (l).



NOTE
The AS-3733/PRD-11 antenna carrying bag has four fastening straps which must be unbuckled.

2. Free tripod (3) by pulling four quick release straps (4).

3. Remove tripod (3) from antenna carrying bag (1) and move to selected site.



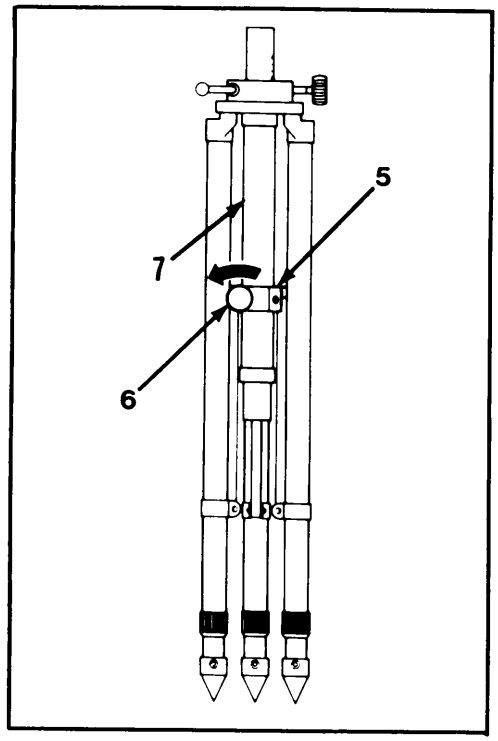
NOTE
Tripod must be located within 44 feet of the df site to allow the cables to extend up and connect to the antenna mast.

GO ON TO SHEET 2

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

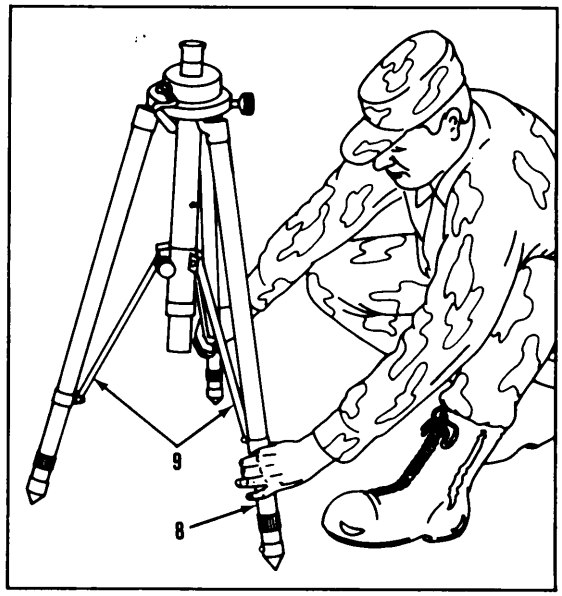
SETTING UP TRIPOD (SHEET 2 OF 3)

4. Loosen center tension knob (6) on sliding collar (5) of tripod center column (7) by turning counterclockwise.



5. Grasp tripod legs (8) below stabilizing arms (9) and pull legs open.

6. Push down on stabilizing arms (9).



GO ON TO SHEET 3

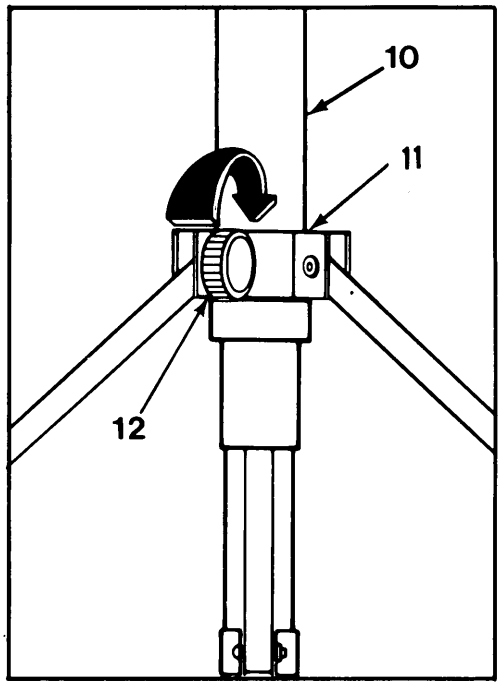
2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

SETTING UP TRIPOD (SHEET 3 OF 3)

7. Hand tighten center tension knob (12) on sliding collar (11) of tripod center column (10) by turning clockwise.

NOTE
The second crew member will perform 8 below while the first crew member completes the remaining steps.

8. Lift and hold tripod off ground.



CAUTION
Do not position the tripod on a slope that is too steep to set all legs securely on ground. Antenna should not lean more than 30 degrees from vertical.

NOTE
Extend the legs to maximum length when possible to obtain best reception.

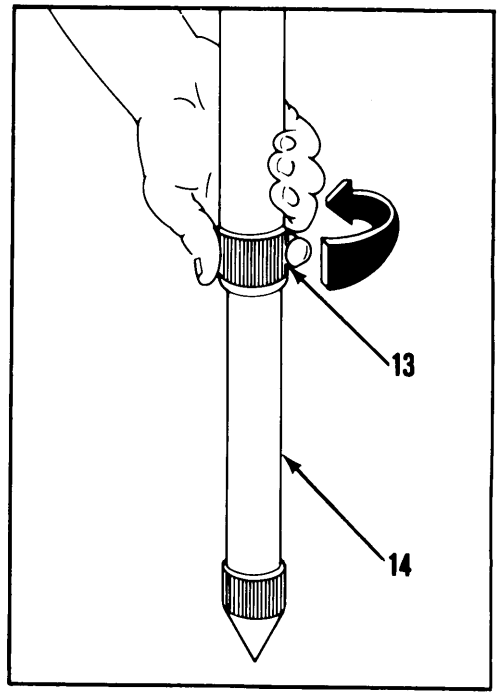
9. Loosen collar (13) at base of tripod leg (14)

10. Pull tripod leg (14) out to appropriate length.

11. Hand tighten collar (13) by turning clockwise.

12. Repeat 9, 10 and 11 above to extend the other two legs of tripod.

13. Push down on tripod center column (10) to stabilize tripod.



2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

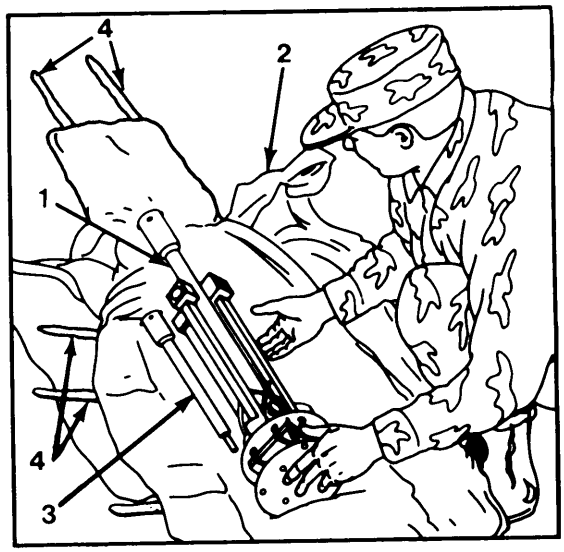
INSTALLING DF ANTENNA MAST AND ELEMENTS (SHEET 1 OF 6)

NOTE
Perform these procedures only after the tripod is set up and antenna bag is carried to antenna site.

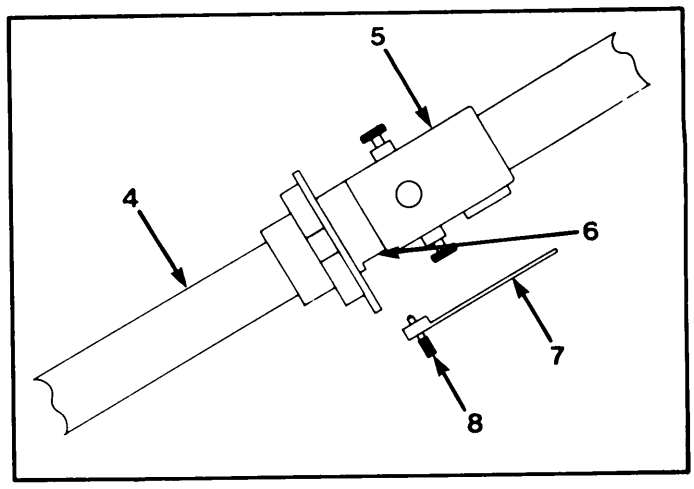
The antenna mast and elements are stored in the antenna carrying bag. If a second crew member is present, he or she will assist the first by performing procedures indicated below:

1. Free antenna mast (1) by pulling five quick release straps (4) on antenna carrying bag (2).

NOTE
The AS-3733/PRD-11 antenna has six quick release straps which must be unfastened before removing antenna mast.



2. Remove antenna mast (1) and mast extension (3) from antenna carrying bag (2).



3. Insert mast extension (4) into antenna mast (5).

4. Place plate (7) in slot (6) and tighten screw (8).

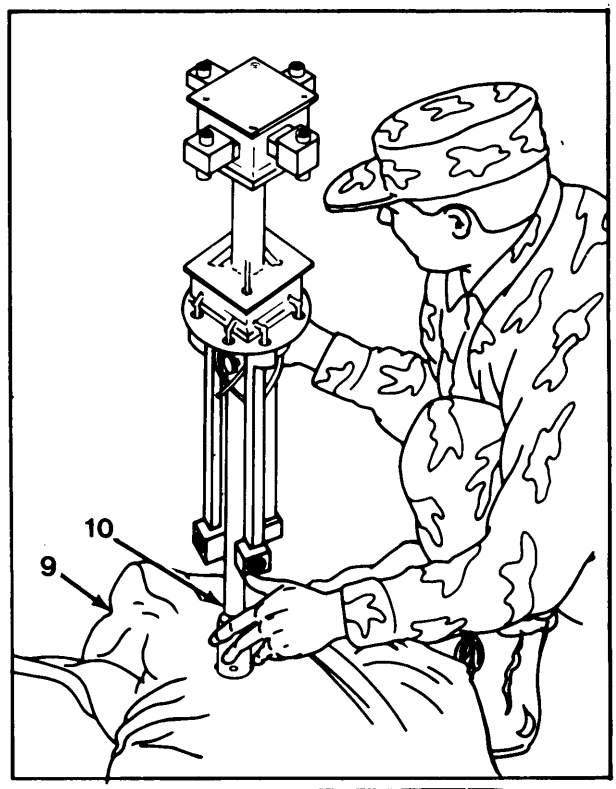
GO ON TO SHEET 2

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

INSTALLING DF ANTENNA MAST AND ELEMENTS (SHEET 2 OF 6)

NOTE
Perform 5 through 8 below only when using the AS-3733/ PRD-11 antenna.

5. Place base of antenna mast and mast extension (10) on edge of antenna carrying bag (9) and hold antenna mast (10) upright.

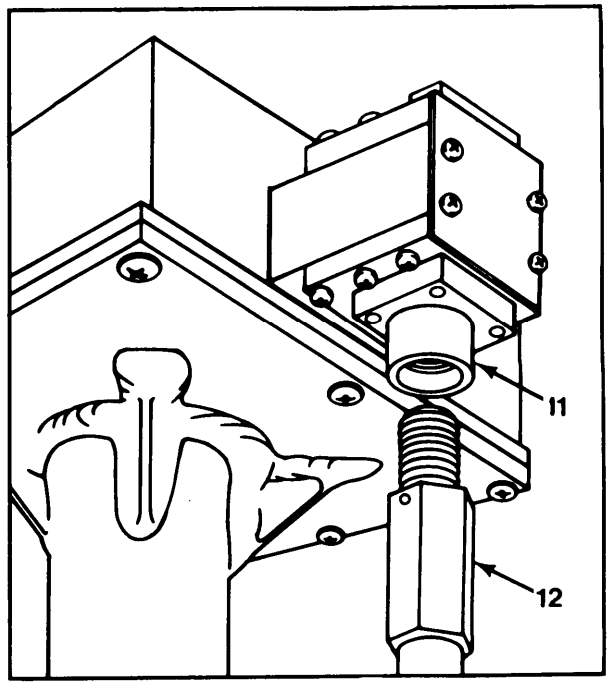


NOTE
Second crew member will perform 6 below.
Both crew members will perform 7 and 8 below.

6. Remove eight short elements from antenna carrying bag.

7. Insert short elements (12) into upper bay element boxes (11) and screw clockwise until tight.

8. Repeat step 7 above for remaining seven elements.



GO ON TO SHEET 3

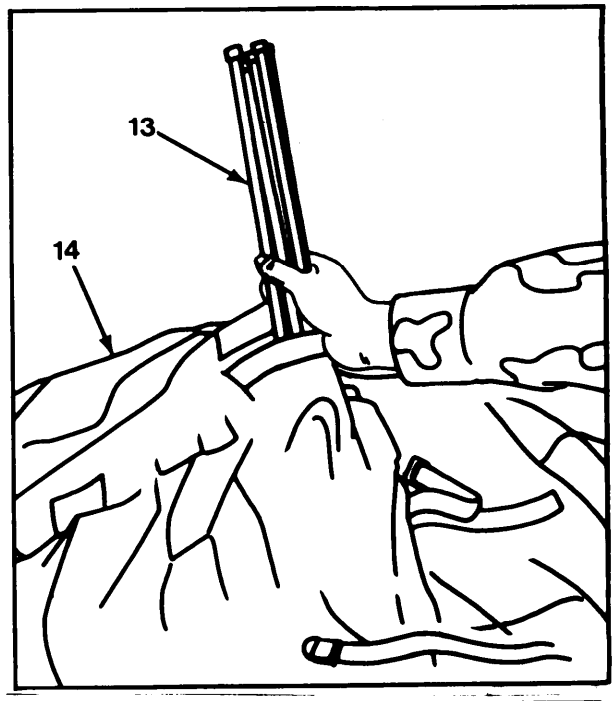
2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

INSTALLING DF ANTENNA MAST AND ELEMENTS (SHEET 3 OF 6)

9. Remove eight long elements (13) from antenna carrying bag (14).

   OR

   If dual element lower bay antenna elements are to be used, remove sixteen long elements (13) from antenna carrying bag (14) and screw elements (13) together to form eight (dual element) long elements.



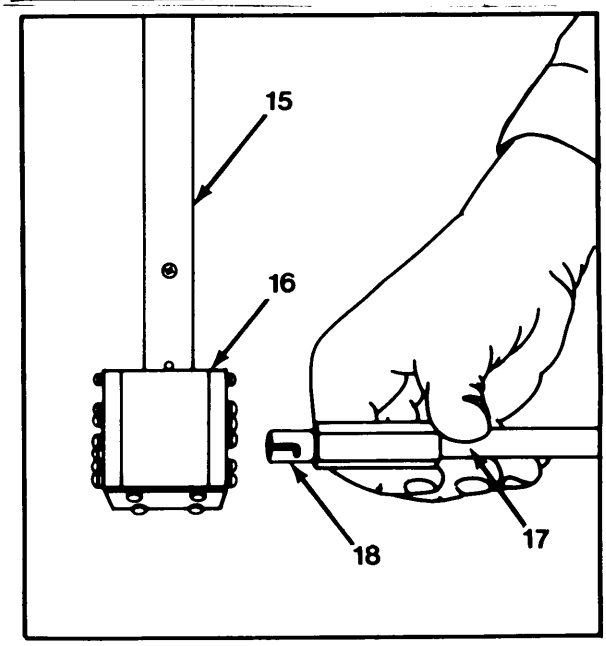
NOTE
Second crew member will hold the antenna mast and antenna extension at a 45 degree angle while the first crew member attaches the antenna elements.

CAUTION
Do not force element into antenna box. Aluminum tip will bend and may not be able to be removed.

10. Holding each end of element (17), insert twist lock connector end of element box (18) on folded arm of antenna (15).

11. Turn element (17) clockwise until flush with element box (16).

12. Continue turning element (17) 1/4 turn clockwise to lock in place.



GO ON TO SHEET 4

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

INSTALLING DF ANTENNA MAST AND ELEMENTS (SHEET 4 Of 6)

NOTE
Element will click when locked into place.

13. Unlock antenna arm (19) by pulling locking thumbscrew (18) out.

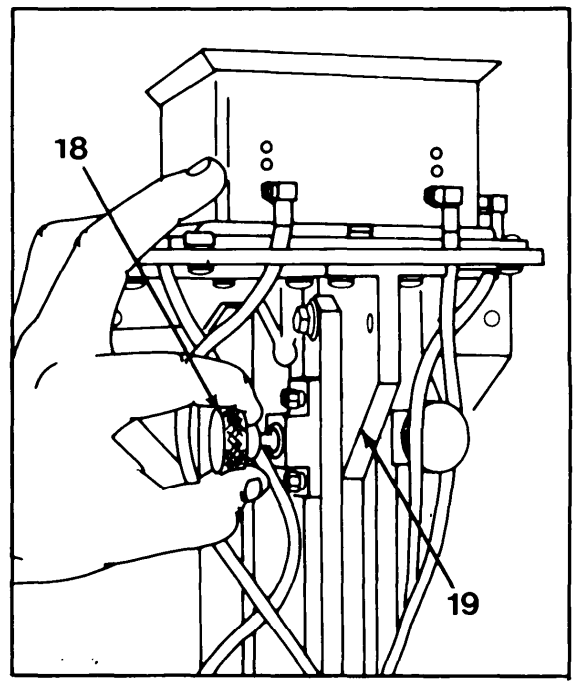
CAUTION
Examine antenna mast cables to ensure they will not catch on thumbscrew.

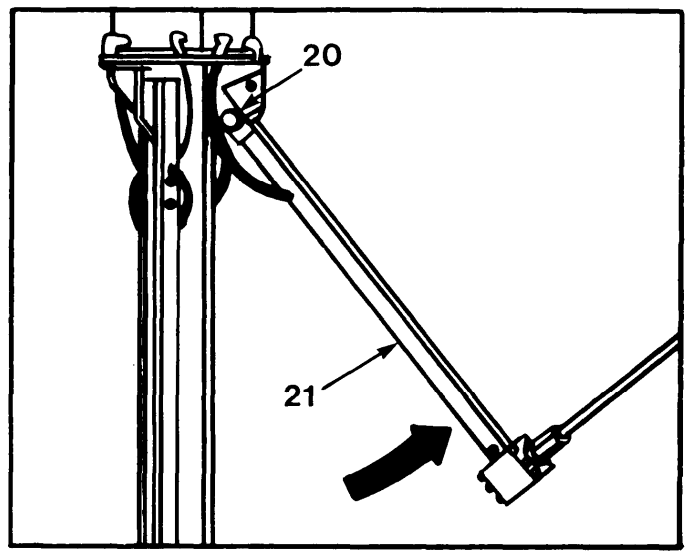
14. Release thumbscrew (20) while raising antenna arm (21) until thumbscrew (20) clicks into place.

NOTE
Thumbscrew will be locked into place on mounting plate when antenna arms are fully extended. If thumbscrew is not flush against the antenna arm, ensure thumbscrew is aligned with top hole on mounting plate and turn thumbscrew clockwise until it snaps into place.

15. Repeat 10 thru 14 above for remaining three antenna arms.

NOTE
Examine three remaining locking thumbscrews to ensure each is locked in place on antenna arm mounting plate.



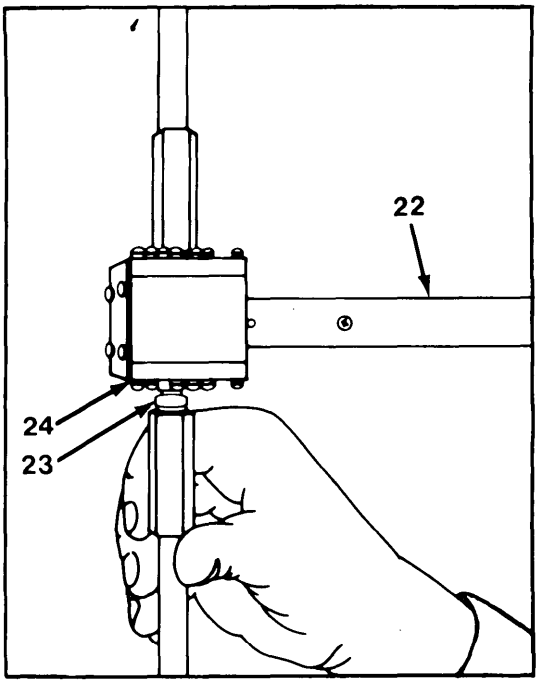


GO ON TO SHEET 5

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

INSTALLING DF ANTENNA MAST AND ELEMENTS (SHEET 5 OF 6)

16. Holding antenna arm (22), insert antenna element (23) into lower section of antenna element box (24) on extended arm (22).

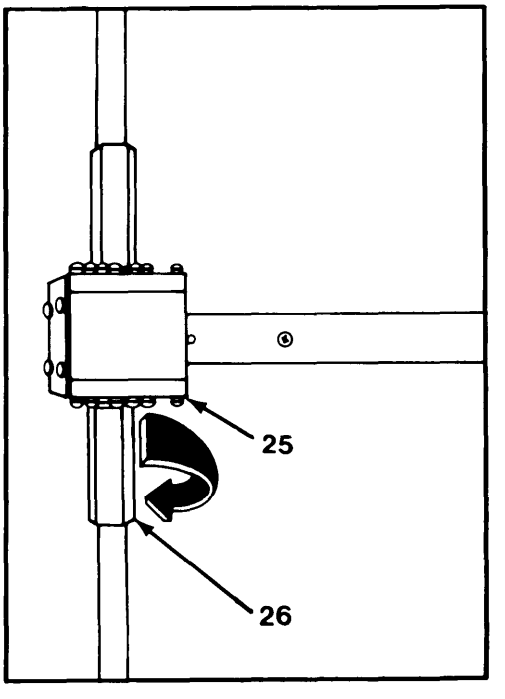


17. Turn element (26) clockwise until flush with antenna element box (25).

18. Continue turning element (26) 1/4 turn clockwise to lock into place.

NOTE
Element will click when locked into place.

19. Repeat 16, 17, and 18 above for remaining three element.

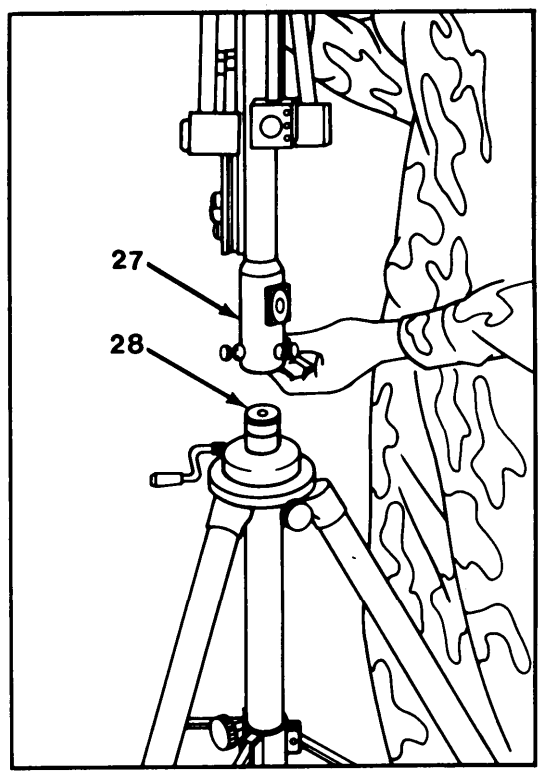


GO ON TO SHEET 6

2-12. ASSEMBLY AND PREPARATON FOR USE - Continued

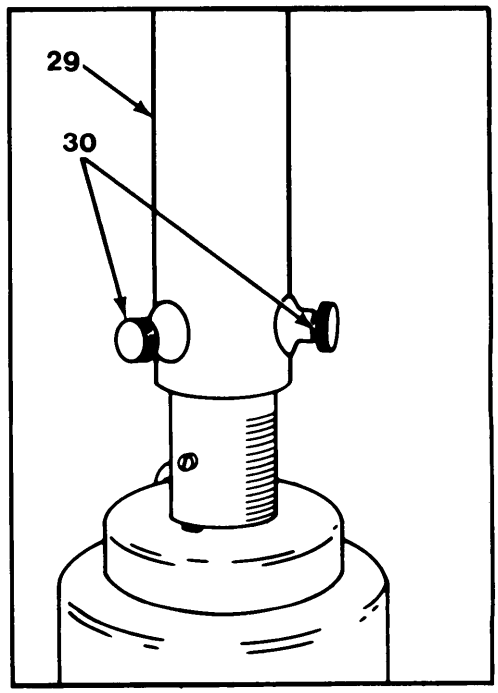
INSTALLING DF ANTENNA MAST AND ELEMENTS (SHEET 6 Of 6)

20. Lift antenna mast (27) and slide onto tripod mount (28).



21. Handtighten three locking screws (30) at base of antenna mast (29) by turning clockwise.

NOTE
Locking screws will not be flush with antenna column.

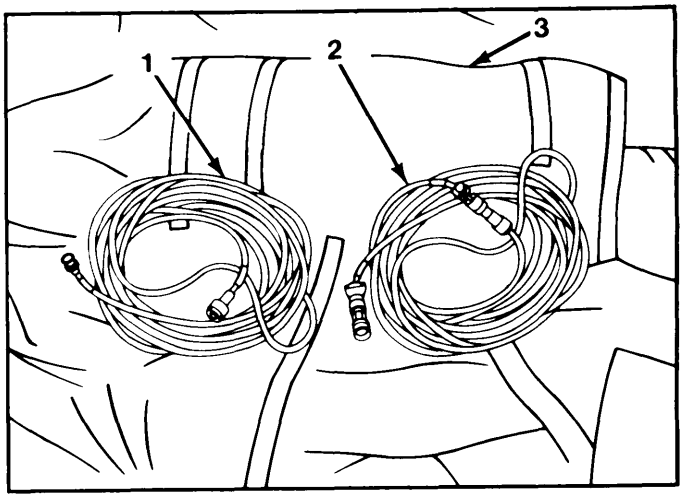


2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

CABLING ANTENNA (SHEET 1 OF 5)

Cabling the df antenna is performed after the tripod and the antenna are set up. One crew member is sufficient to do the cabling. The second crew member can roll out the cables and carry them to the df station. This should be done before the cables are connected to the antenna.

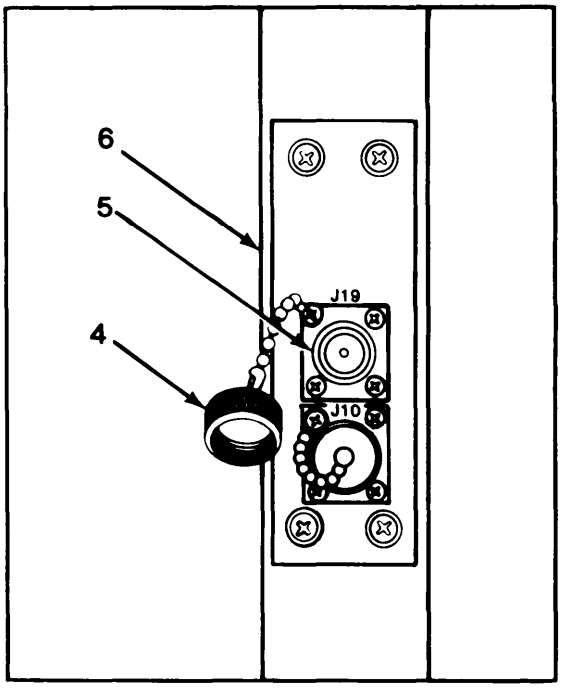
1. Remove df (2) and rf (l) cables from antenna carrying bag (3).



NOTE
AS-3732/PRD-11 has two cables and AS-3733/PRD-11 antenna has three cables.
Bnc connector on end of rf cable goes to receiver. Df cable N connector without blue band goes to df processor.

NOTE
Perform 2, 3 and 4 below only when using the AS-3732/PRD-11. If using the AS-3733/PRD-11, go to step 5.

2. Unscrew protective cap (4) from connector J19 (5) on antenna mast column (6).

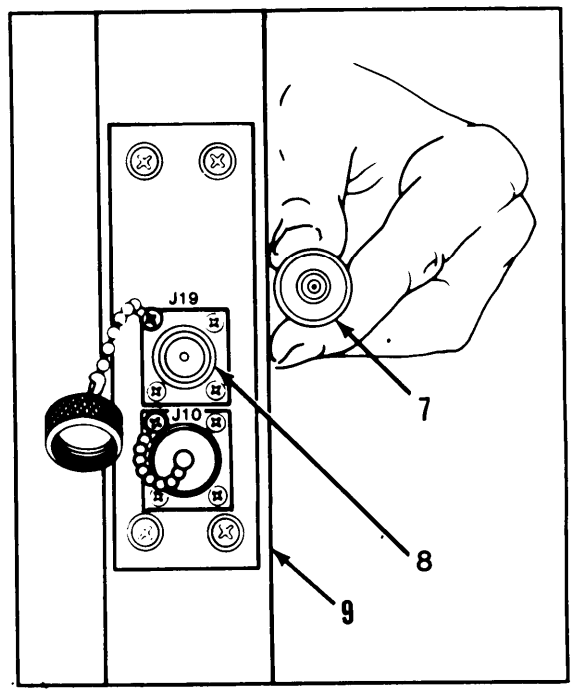


GO ONTO SHEET 2

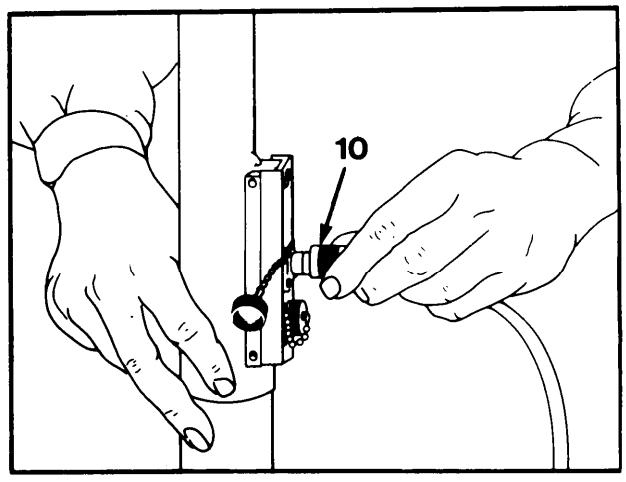
2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

CABLING ANTENNA (SHEET 2 OF 5)

3. Align rf cable connector (7) with connector J19 (8) on antenna mast column (9).



4. Push in on cable collar (10) and turn clockwise to screw in place.



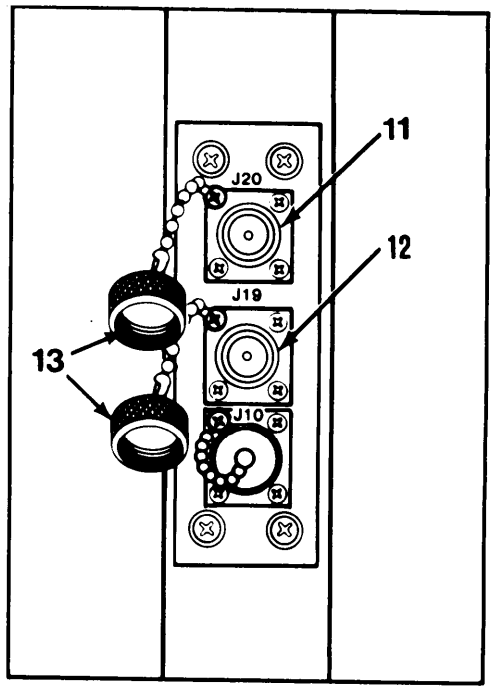
GO ON TO SHEET 3

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

CABLING ANTENNA (SHEET 3 OF 5)

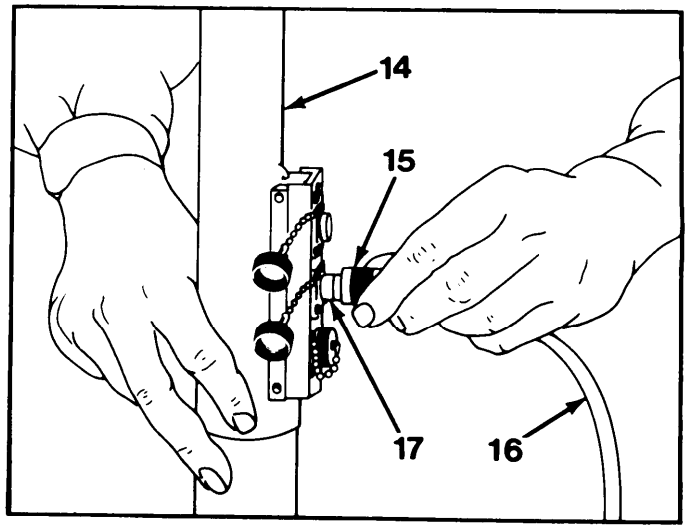
NOTE
Perform 5 thru 9 below only when using the AS-3733/ PRD11.

5. Remove protective caps (13) from connector J19 (12) and connector J20 (11) by unscrewing counterclockwise.



6. Align first rf cable (16) with connector J19 (17) on antenna mast column (14).

7. Push in on cable collar (15) and turn clockwise to screw in place.



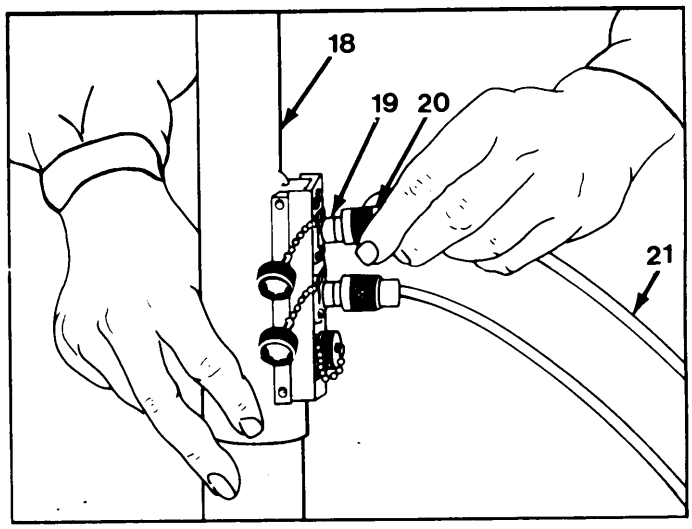
GO ON TO SHEET 4

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

CABLING ANTENNA (SHEET 4 OF 5)

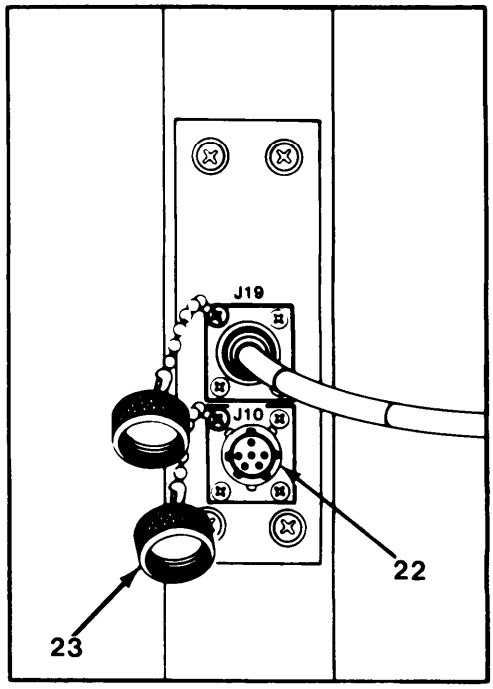
8. Align second rf cable (21) with connector J20 (19) on antenna mast column (18).

9. Push in on cable collar (20) and turn clockwise to screw in place.



NOTE
Perform 10, 11, and 12 below when using either antenna.

10. Remove protective cap (23) from connector J10 (22) by pushing in and turning 1/4 turn counterclockwise.



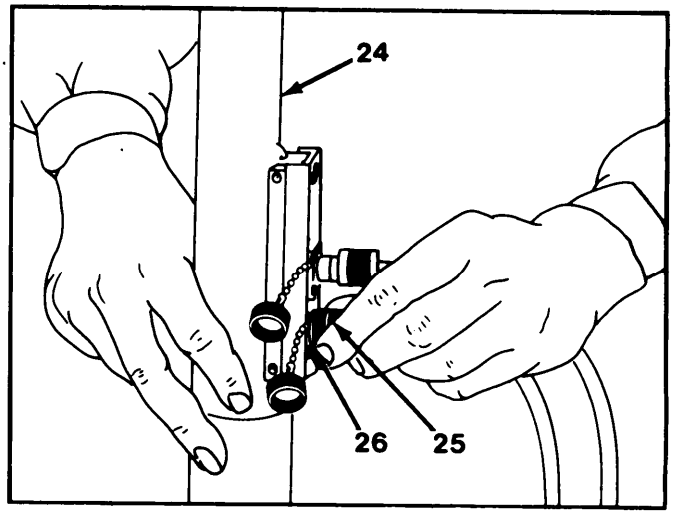
GO ON TO SHEET 5

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

CABLING ANTENNA (SHEET 5 OF 5)

11. Align df cable connector J10 keys to connector J10 (26) on antenna mast column (24).

12. Push in on cable collar (25) and turn clockwise to screw in place.



2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

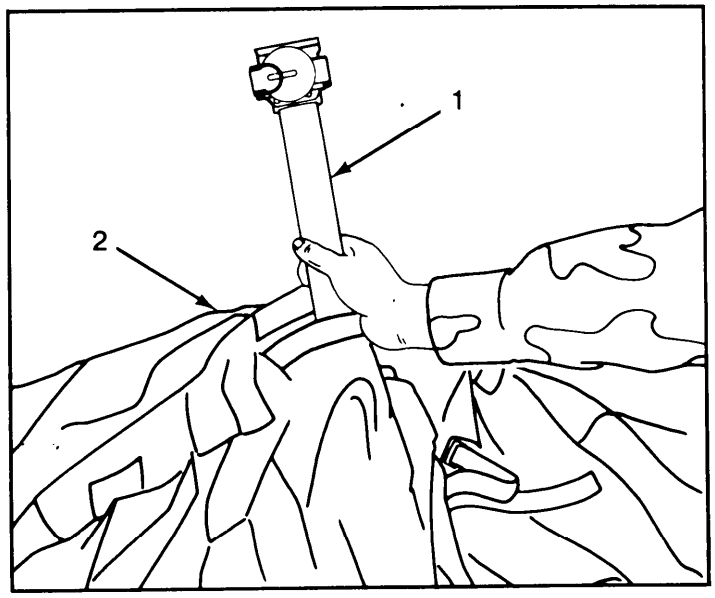
ORIENTING AND RAISING ANTENNA (SHEET 1 OF 7)

NOTE

Perform these procedures only after the tripod, antenna and antenna cables are installed.

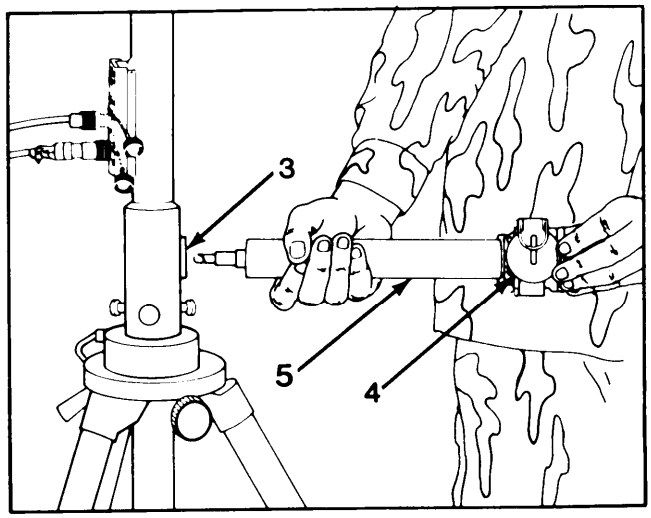
Orienting the antenna is necessary for proper reception of signals and for obtaining accurate lines of bearing. Only one crew member is necessary to orient and raise the antenna.

1. Remove compass arm assembly (1) from antenna carrying bag (2).



2. Stand facing compass mounting plate on antenna (3) while holding compass arm assembly (5) with both hands so that compass top cover (4) is up.

3. Turn compass arm assembly (5) so that compass top cover (4) faces to the left.

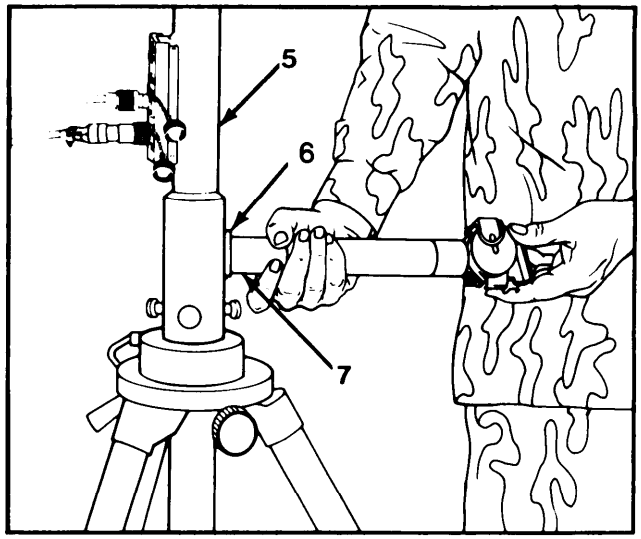


GO ON TO SHEET 2

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

ORIENTING AND RAISING ANTENNA (SHEET 2 OF 7)

CAUTION
Do not force compass arm assembly into compass mounting plate. Aluminum tip will bend and may not be able to be removed.



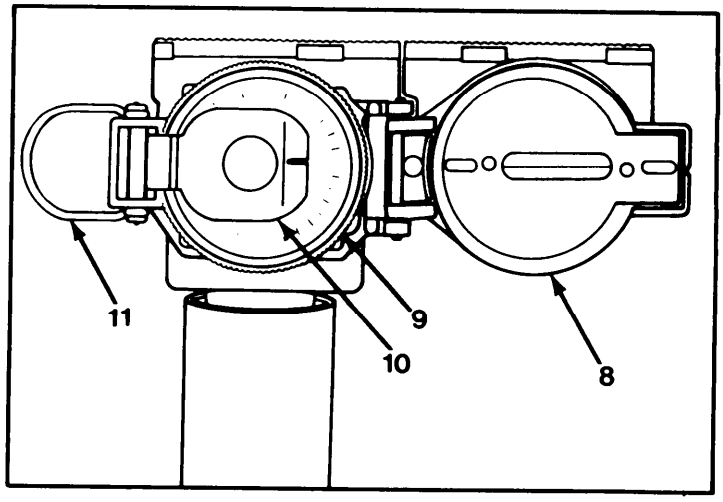
4. Insert compass arm assembly (7) into mounting plate (6) and twist slightly until it slides flush to antenna column (5).

5. Turn compass arm assembly (7) 1/4 turn clockwise until it locks in place.

NOTE
Compass top cover will face upward.

6. Open compass (9) by pulling back on compass wire lever (11).

7. Open compass top cover (8) fully to expose compass magnifying eyepiece (10).

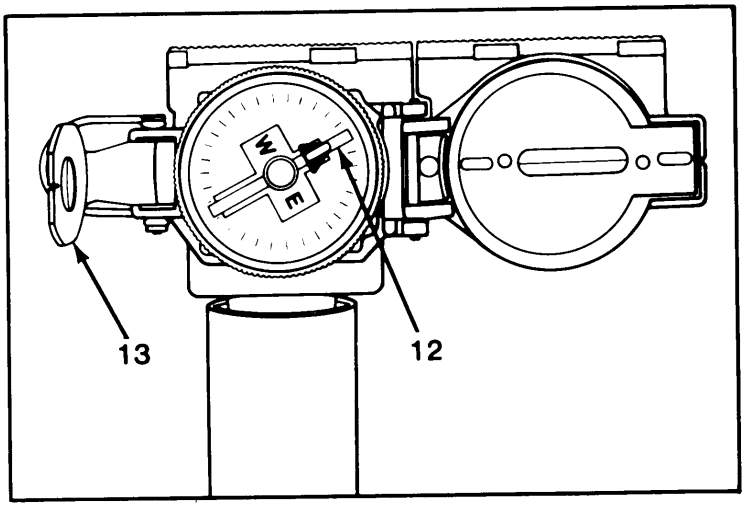


GO ON TO SHEET 3

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

ORIENTING AND RAISING ANTENNA (SHEET 3 OF 7)

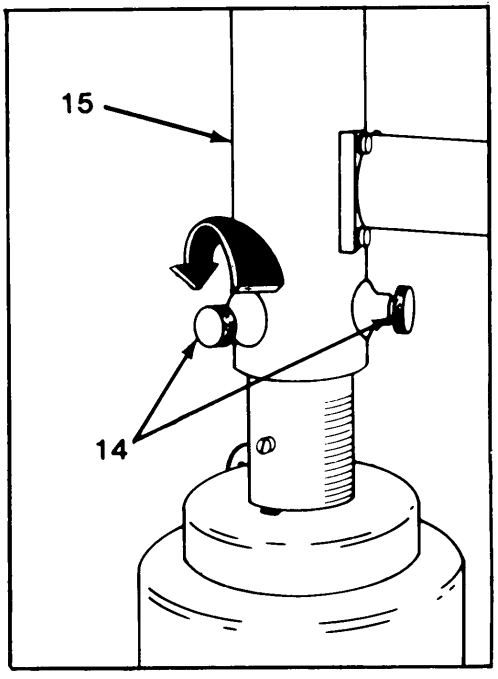
8. Free compass needle (12) by pulling up on magnifying eyepiece (13).



NOTE
Tripod legs may need adjusting to allow compass needle to swing freely.

9. Loosen three locking thumb screws (14) on base of antenna mast (15) by turning counterclockwise.

10. Rotate antenna mast (15) until compass arrow indicates 0 (zero) degrees.



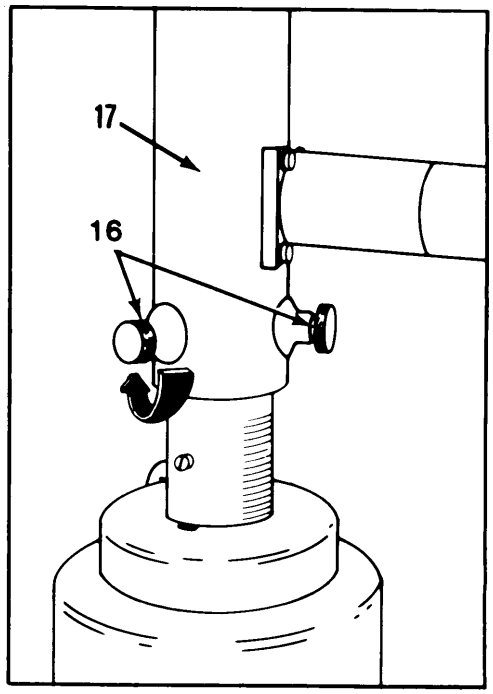
NOTE
Antenna may need further orienting to allow for variance between magnetic north and true north or grid north.

GO ON TO SHEET 4

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

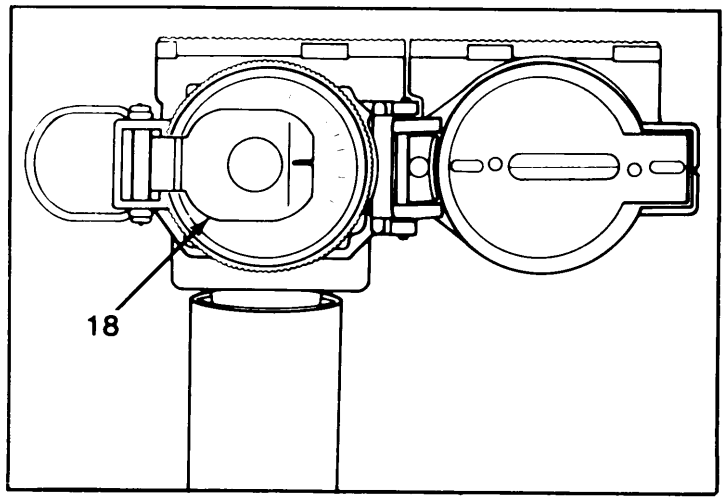
ORIENTING AND RAISING ANTENNA (SHEET 4 OF 7)

11. Handtighten three locking thumb screws (16) on antenna mast base (17) by turning clockwise.



NOTE
Recheck compass reading to ensure tightening procedures did not change orientation.

12. Lock compass needle by pushing down on magnifying eyepiece (18).



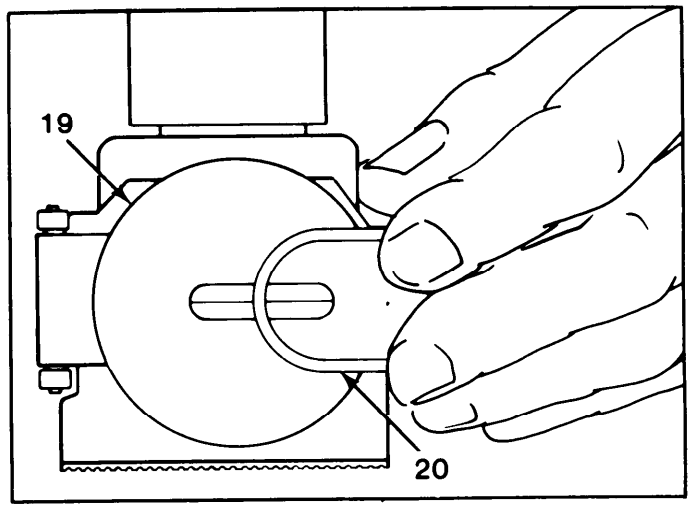
GO ON TO SHEET 5

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

ORIENTING AND RAISING ANTENNA (SHEET 5 OF 7)

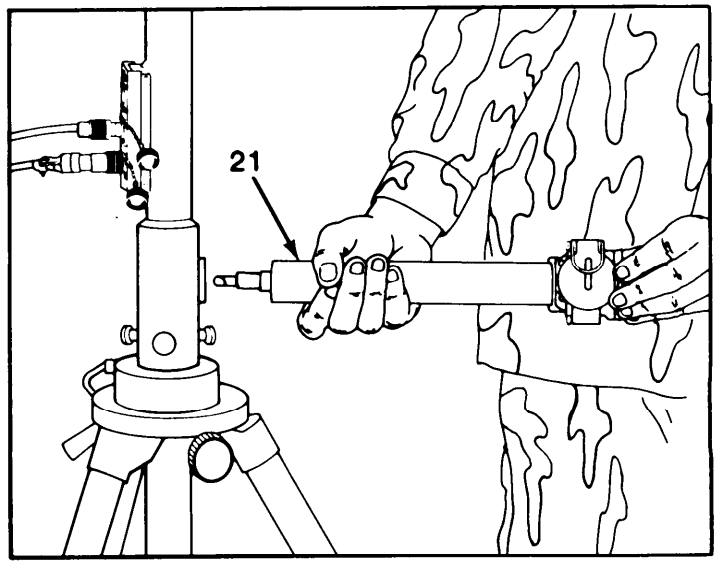
13. Close compass top cover (19).

14. Pull up wire lever (20) and push it down over top cover (19).



15. Remove compass arm assembly (21) by turning 1/4 turn counter-clockwise and pulling out.

16. Return compass arm assembly (21) to antenna carrying bag.

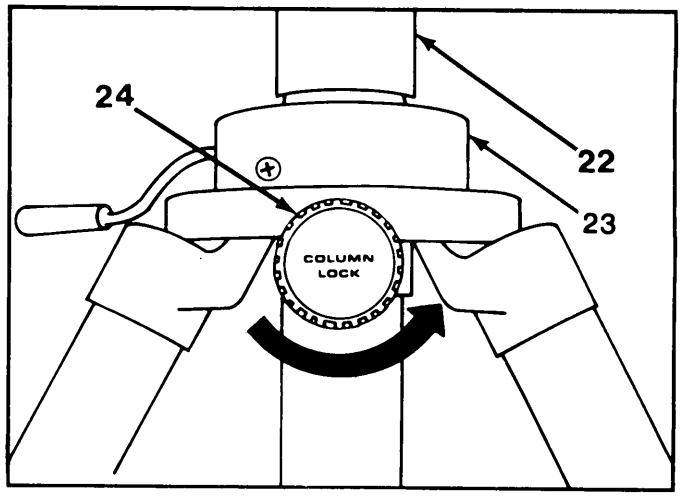


GO ON TO SHEET 6

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

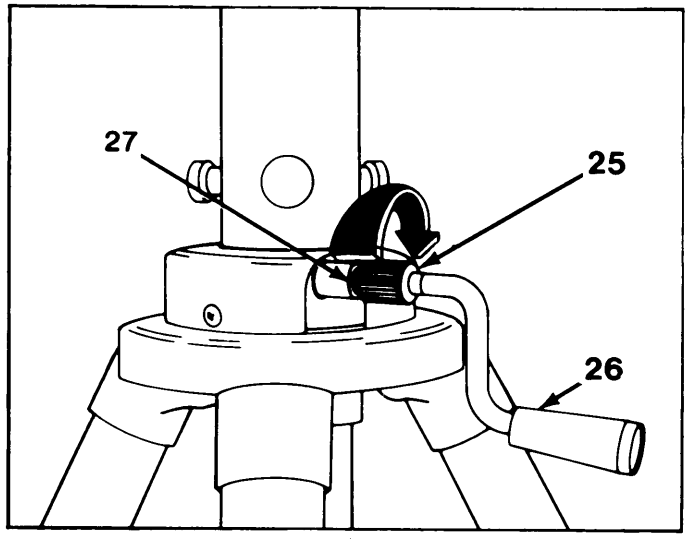
ORIENTING AND RAISING ANTENNA (SHEET 6 OF 7)

17. Loosen COLUMN LOCK knob (24) on antenna crank assembly (23) by turning counterclockwise until mast (22) is free.



18. Lift crank handle (26), slide collar (25) over screw (27) and turn collar (25) clockwise until tight.

NOTE
Crank handle will be positioned to rotate antenna upward.



GO ON TO SHEET 7

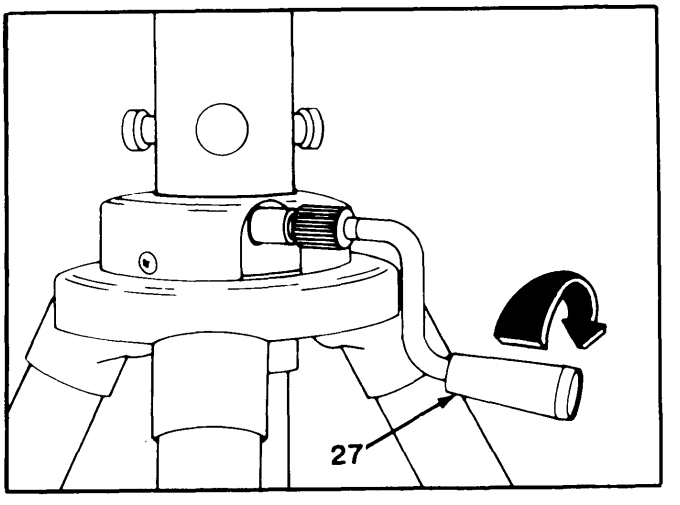
2-12 **ASSEMBLY AND PREPARATION FOR USE - Continued**

ORIENTING AND RAISING ANTENNA (SHEET 7 OF 7)

CAUTION
Ensure antenna cables are free of crank assembly.

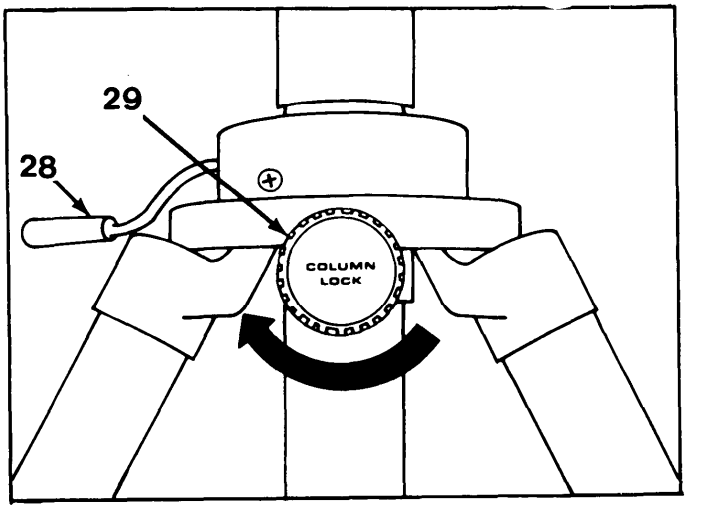
19. Rotate crank (27) clockwise until antenna reaches maximum height.

NOTE
Crank will no longer turn when antenna reaches maximum height.



20. Holding crank handle (28), handtighten COLUMN LOCK knob (29) by turning clockwise.

NOTE
Place antenna carrying bag near df units for ease of finding bag during darkness and use under unusual conditions.



2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

b. Battery Installation. Battery installation consists of the procedures that must be performed to supply the direction finder units with power. Only one crew member is needed to perform these procedures:

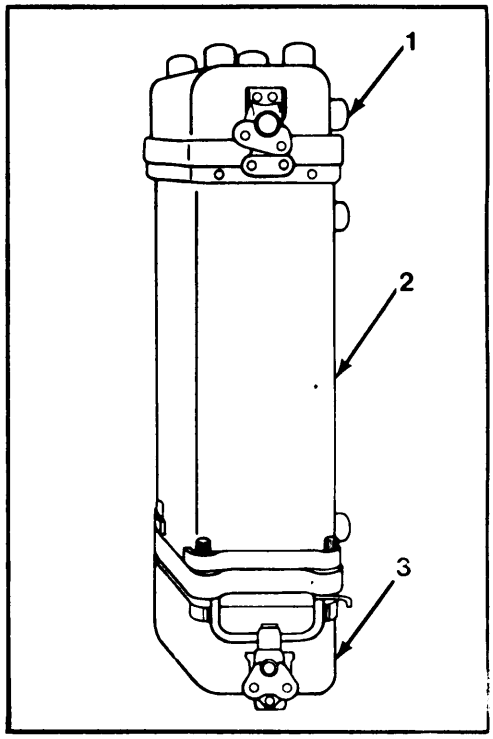
> NOTE
>
> Remove receiver, df processor and signal monitor from rucksacks before performing battery installation procedures.

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

BA-4386/PRC-25 BATTERY PACK INSTALLATION (SHEET 1 OF 3)

1. Stand receiver (2) up on a flat surface so it rests on its front panel cover (3).

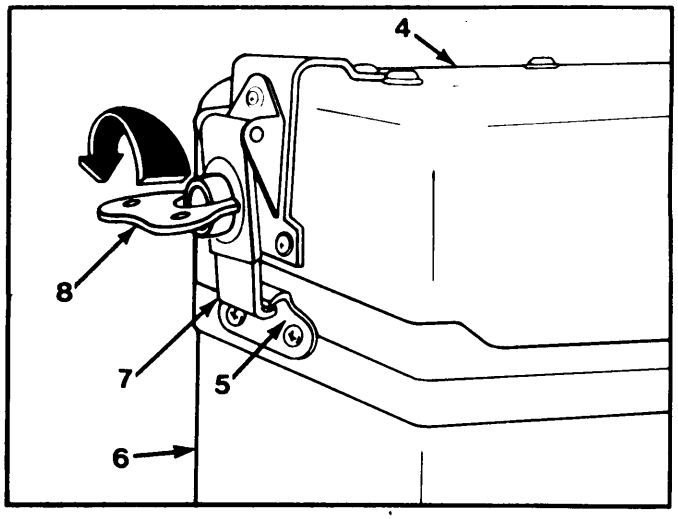
NOTE
- Bottom of receiver (battery cover) (1) will be in up position.
- When replacing batteries during operation, stand receiver up so it rests on handles that extend from the front panel.



2. Lift up on wing fasteners (8) at each side of battery rear cover (4).

3. Turn wing fasteners (8) counterclockwise until clamps (7) are free of receiver clips (5).

4. Lift off battery cover (4) from receiver (6) and set aside.



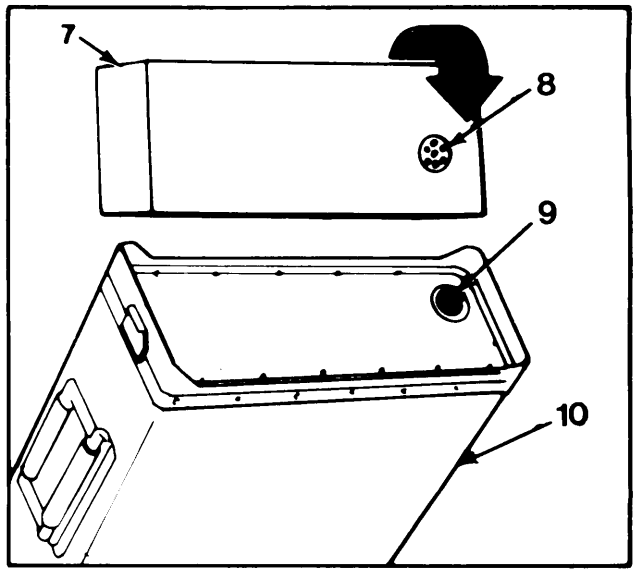
GO ON TO SHEET 2

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

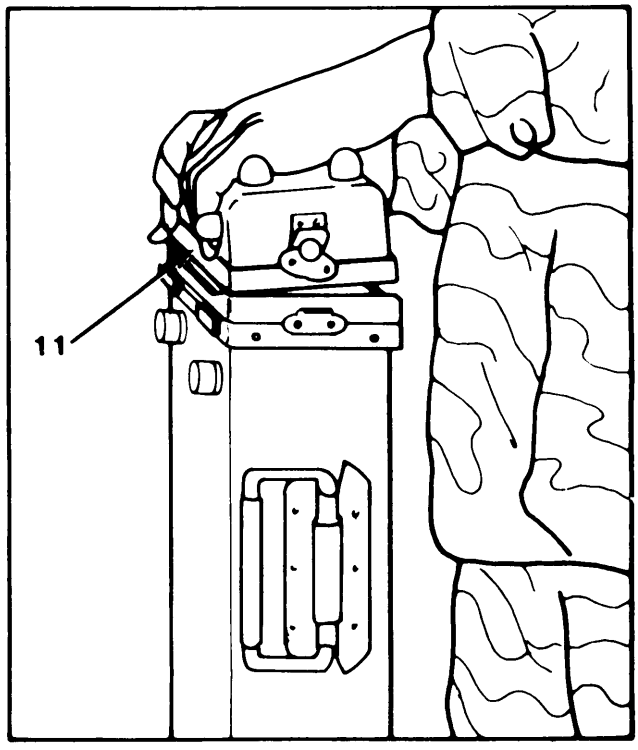
BA-4386/PRC-25 BATTERY PACK INSTALLATION (SHEET 1 OF 3)

5. Place battery (7) on bottom of receiver (10) making sure slots on battery (8) match prongs on bottom of receiver (9).

6. Press battery (7) into place.



7. Replace battery cover (11).



GO ON TO SHEET 3

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

BA-4386/PRC-25 BATTERY PACK INSTALLATION (SHEET 3 OF 3)

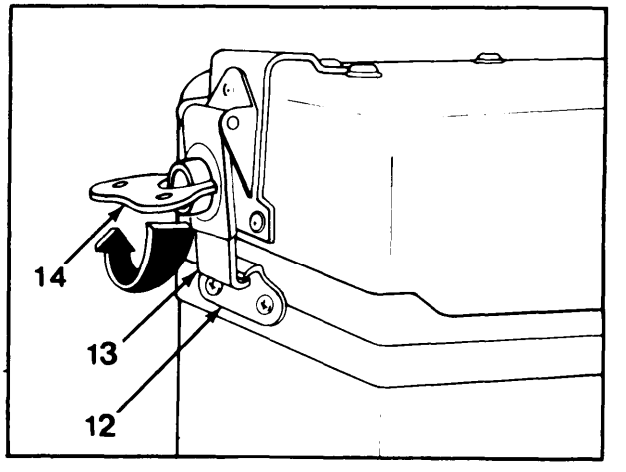
8. Push each clamp (13) against receiver clip (12) and lift up on wing fasteners (14).

9. Turn wing fasteners (14) clockwise until clamps (13) are locked in receiver clips (12).

10. Push wing fasteners (14) down until flat against receiver sides.

11. Repeat 1 through 10 above for df processor battery installation.

12. Repeat 1 through 10 above for signal monitor battery installation.

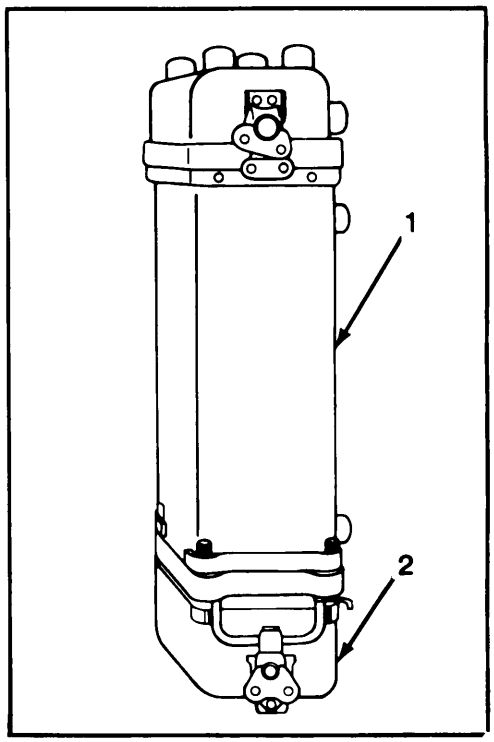


2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

D-CELL BATTERY INSTALLATION (SHEET 1 OF 4)

1. Stand receiver (1) up on a flat surface so it rests on its front panel cover (2).

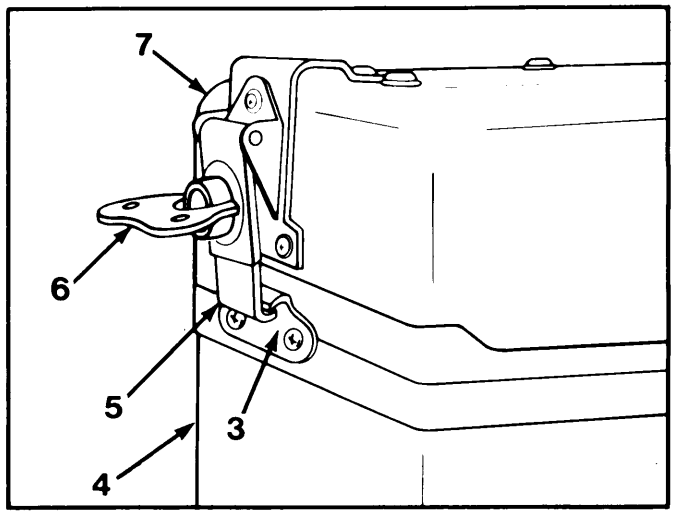
NOTE
- Bottom of receiver (battery cover) will be in up position.
- When replacing batteries during operation, stand receiver up so it rests on handles that extend from the front panel.



2. Lift up on wing fasteners (6) at each side of battery rear cover (7).

3. Turn wing fasteners (6) counterclockwise until clamps (5) are free of receiver clips (3).

4. Lift off battery cover (7) from receiver (4) and set aside.

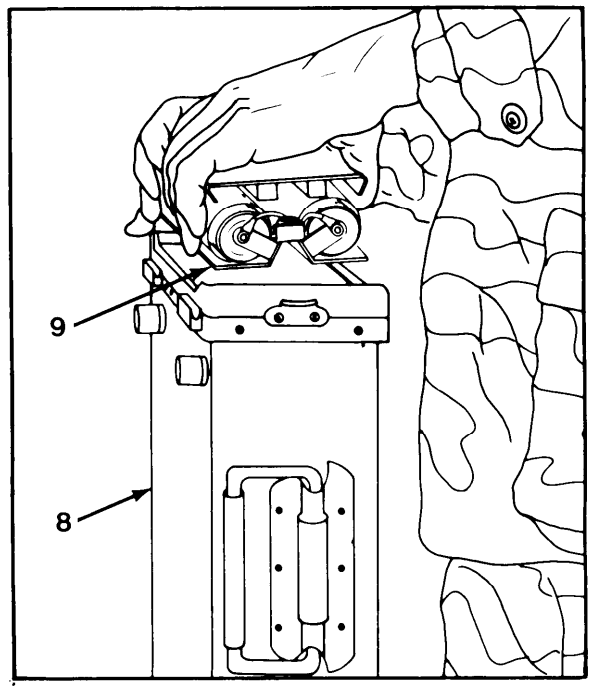


GO ON TO SHEET 2

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

D-CELL BATTERY INSTALLATION (SHEET 2 OF 4)

5. Remove D-Cell insert (9) from receiver (8) by lifting it up off receiver (8).

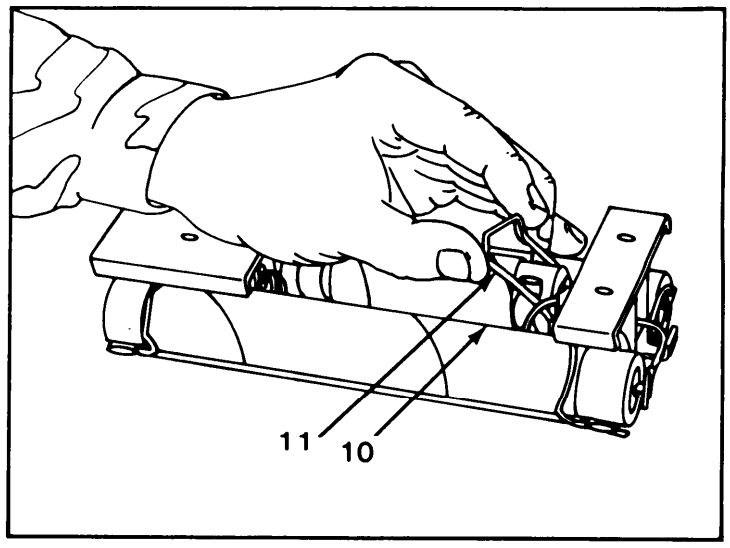


CAUTION

If D-Cell insert contains batteries:

- Do not remove batteries before removing cardboard tubes.
- Do not use metal tools to remove batteries or you will short them out.

6. Unclip six battery retaining clips (11) from cardboard tubes (10).



GO ON TO SHEET 3

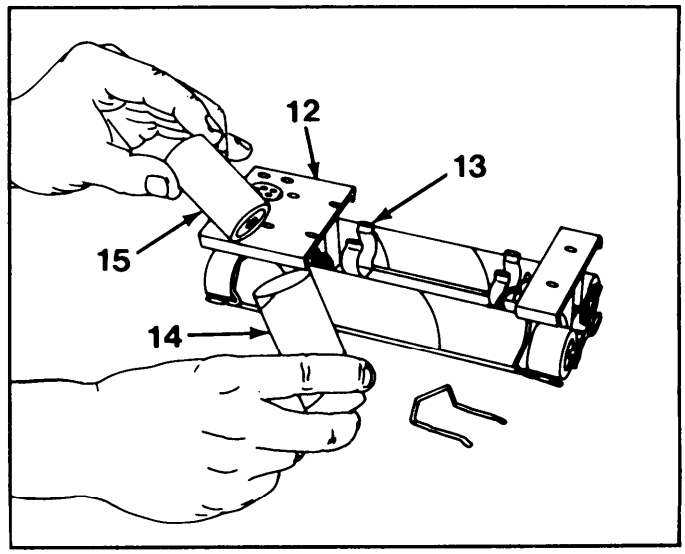
2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

D-CELL BATTERY INSTALLATION (SHEET 3 OF 4)

7. Lift cardboard tubes (14) out from D-Cell insert holder (13) with your hands.

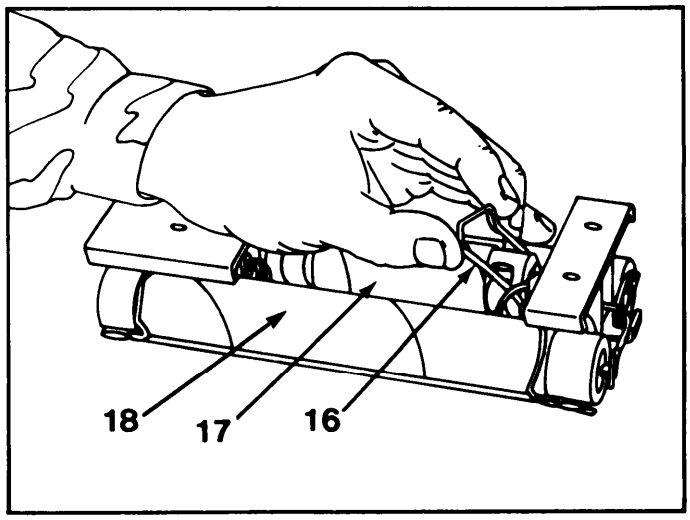
8. If D-Cell insert (12) contains batteries, slide old D-Cells (15) out from cardboard tubes (14).

9. Slide new D-Cells (15) into cardboard tubes (14) making sure cells are stacked positive to negative ends.



10. Clip cardboard tubes (18) with inserted D-Cells back into their holders (17) and replace retaining clips (16).

NOTE
Ensure cells face in direction indicated on each holder.



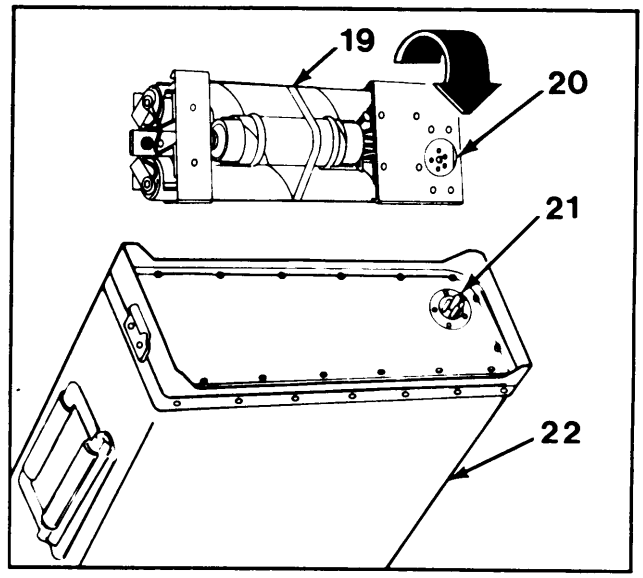
GO ON TO SHEET 4

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

D-CELL BATTERY INSTALLATION (SHEET 4 OF 4)

11. Replace D-Cell insert (19) onto rear of receiver (22) making sure plug slots on D-Cell insert (20) align with jack prongs on bottom of receiver (21).

12. Press D-Cell insert (19) into place.



13. Place rear cover (23) on bottom of receiver (24).

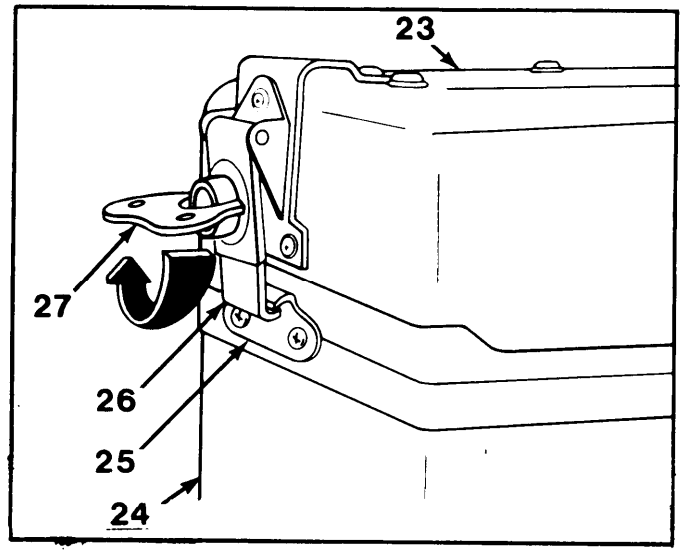
14. Push each clamp (26) against receiver clip (25) and lift up on wing fasteners (27).

15. Turn wing fasteners (27) clockwise until clamps (26) are locked in receiver clips (25).

16. Push wing fasteners (27) flat against sides of receiver (24).

17. Repeat 1 through 16 above for df processor battery installation.

18. Repeat 1 through 16 above for signal monitor battery installation.



2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

c. Unit Set Up. Unit set up consists of the procedures that must be performed to complete the preparation necessary for operation of the direction finder set. Only one crew member is needed to perform these procedures:

NOTE

Perform unit set-up procedures after installing the unit's batteries. Df units must be located within 44 feet of the antenna site to allow the cables to extend up and connect to the antenna mast.

NOTE

With the addition of the angle simulator and the hf upconverter/demodulator to the basic AN/PRD-11 system. The units should be configured as follows far transport/transit:

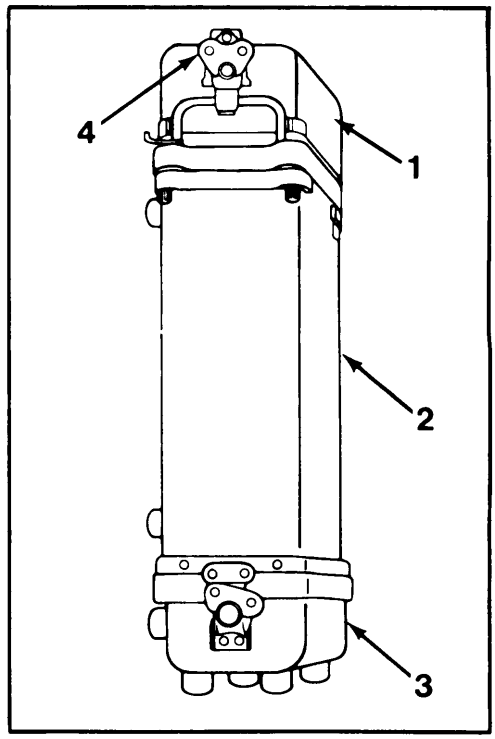
Receiver -	Battery cover or D-Cell insert mounted to the rear of the receiver. Hf upconverter/demodulator mounted to the front of the receiver.
Df processor -	Battery cover or D-Cell insert mounted to the rear of the df processor. Angle Simulator mounted to the front of the df processor.
Signal monitor -	Battery cover or D-Cell insert mounted to the rear of the signal monitor. Receiver speaker panel mounted to the front of the signal monitor.
Antenna bag -	All antenna components packed in antenna bag. All interconnecting bnc patch cables for cabling between the hf upconverter/demodulator, receiver, signal monitor, df processors and angle simulator packed in antenna bag.

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

STACKING UNITS (SHEET 1 OF 4)

1. Stand df processor (2) up on a flat surface so it rests on its battery cover (3).

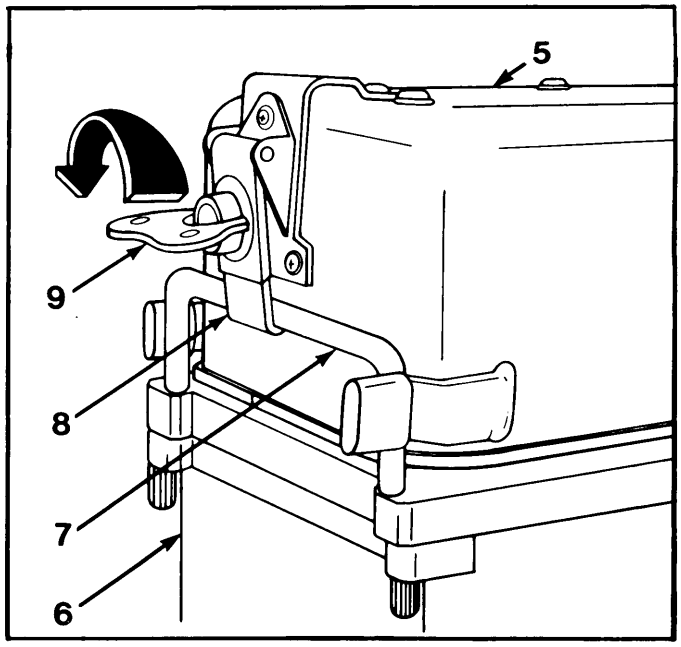
2. Lift upon wing fasteners (4) at each side of df processor front panel cover (angle simulator) (l).



3. Turn wing fasteners (9) counterclockwise until clamps (8) are free of df processor handles (7).

4. Lift off front panel cover (angle simulator) (5) from df processor (6).

5. Repeat 1, 2 and 3 above to remove receiver front panel cover (hf upconverter/ demodulator) and the signal monitor front panel cover (speaker).



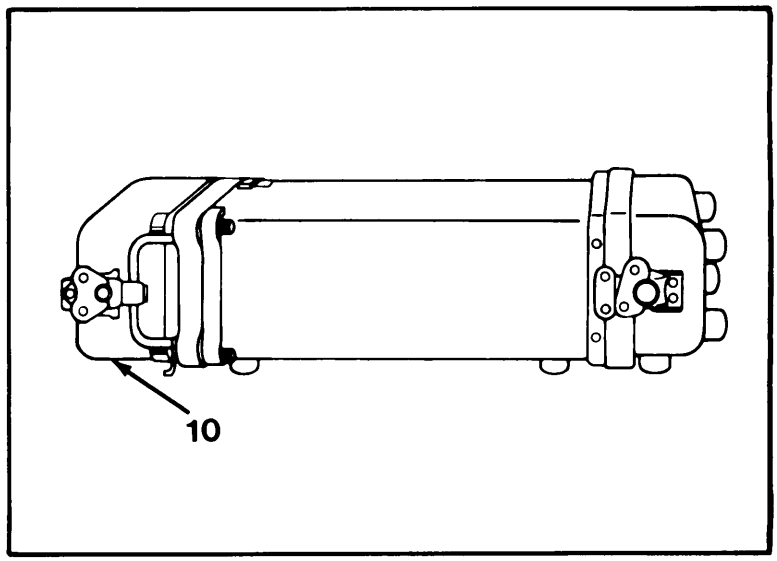
GO ON TO SHEET 2

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

STACKING UNITS (SHEET 2 OF 4)

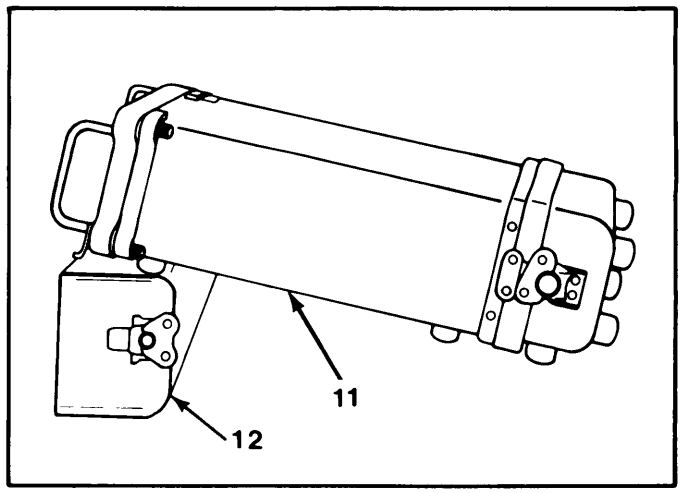
6. Place angle simulator (10) where units are to be set up.

NOTE
- The df processor front panel cover (10) contains the angle simulator.
- This front panel cover (10) is used to support the stacked direction finder units and tilt them upwards.



7. Place df processor (11) on top of front panel cover (angle simulator) (12).

NOTE
Df processor (11) will tilt upward.

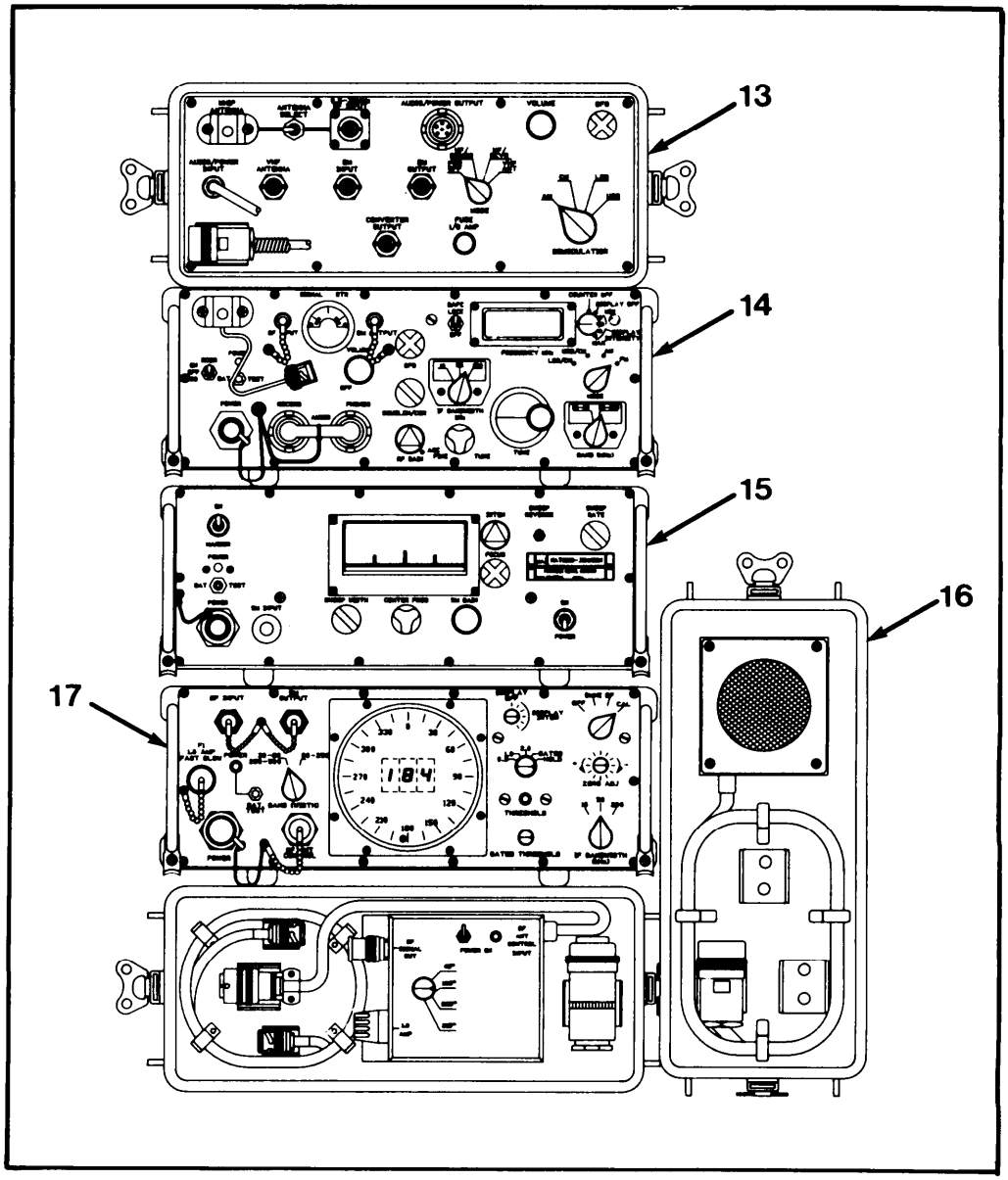


GO ON TO SHEET 3

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

STACKING UNITS (SHEET 3 OF 4)

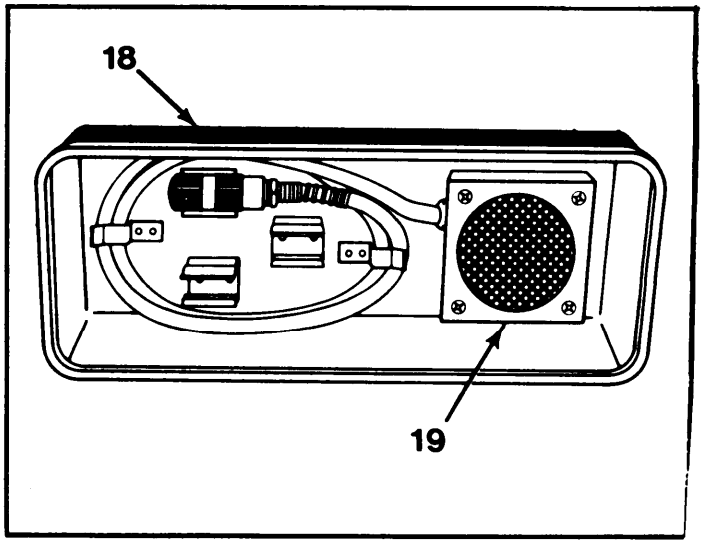
8. Place signal monitor (15) on top of df processor (17).
9. Place receiver (14) on top of signal monitor (15).
10. Place hf upconverter/demodulator (13) on top of receiver (14).
11. Place speaker assembly (16) on its end beside the system.



2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

STACKING UNITS (SHEET 4 OF 4)

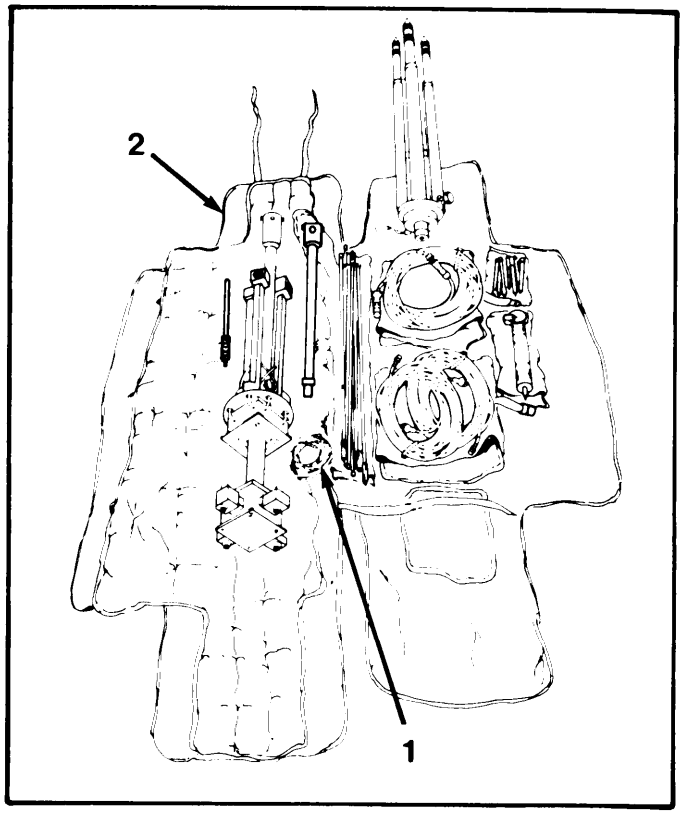
NOTE
- The signal monitor front cover (18) contains the speaker assembly (19).
- Speaker assembly (19) should face forward.



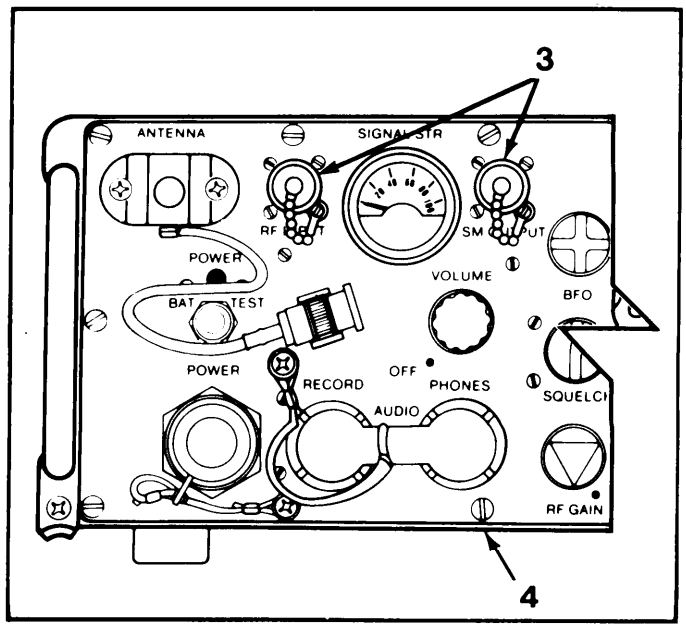
2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

CABLING UNITS (SHEET 1 OF 9)

1. Remove five bnc patch cables (1) from the df antenna bag (2).



2. Remove protective caps from SM OUTPUT and RF INPUT (3) on receiver (4) by pushing in and turning 1/4 turn counterclockwise.

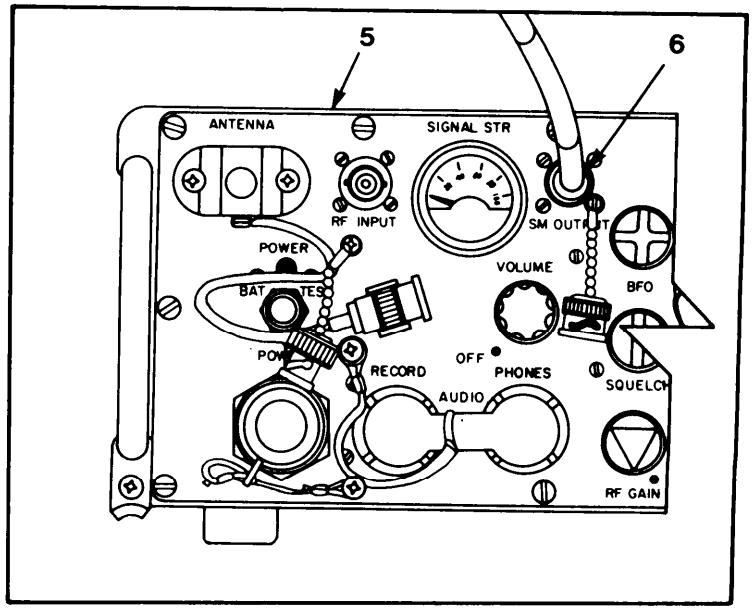


GO ONTO SHEET 2

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

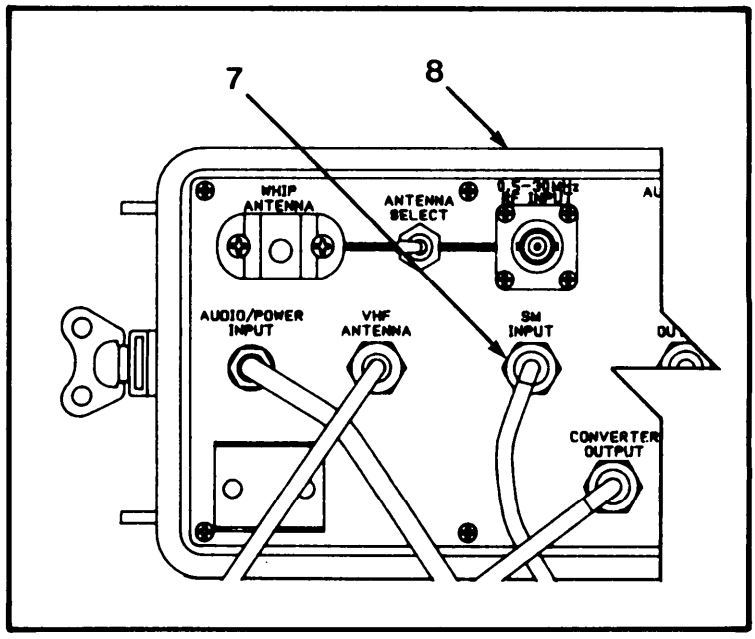
CABLING UNITS (SHEET 2 OF 9)

3. Select a bnc patch cable and connect one bnc connector to SM OUTPUT (6) on receiver (5) by pushing in on bnc connector while turning 1/4 turn clockwise until connector locks in place.



NOTE
Unclip hf upconverter/ demodulator AUDIO/POWER INPUT cable to allow convenient access to other bnc connectors.

4. Remove all protective caps from bnc connectors on hf upconverter/demodulator. Connect bnc connector on other end of bnc patch cable to SM INPUT (7) on hf upconverter/demodulator (8) by pushing in on bnc connector while turning 1/4 turn clockwise until connector locks in place.

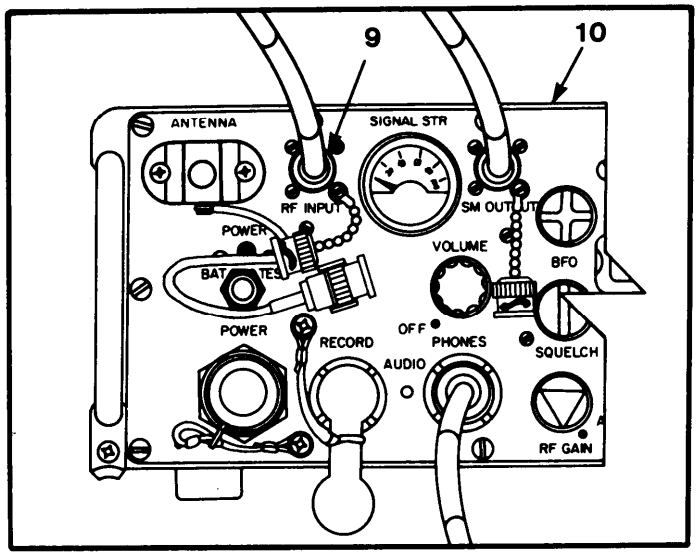


GO ON TO SHEET 3

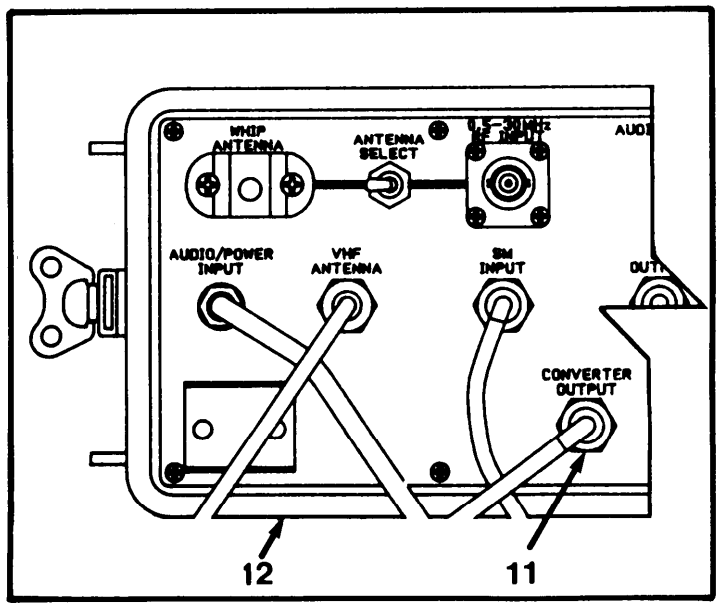
2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

CABLING UNITS (SHEET 3 OF 9)

5. Select a bnc patch cable and connect one bnc connector to RF INPUT (9) on receiver (10) by pushing in on bnc connector while turning 1/4 turn clockwise until connector locks in place.



6. Connect bnc connector on other end of bnc cable to CONVERTER OUTPUT (11) on hf upconverter/ demodulator (12) by pushing in on bnc connector while turning 1/4 turn clockwise until connector locks in place.

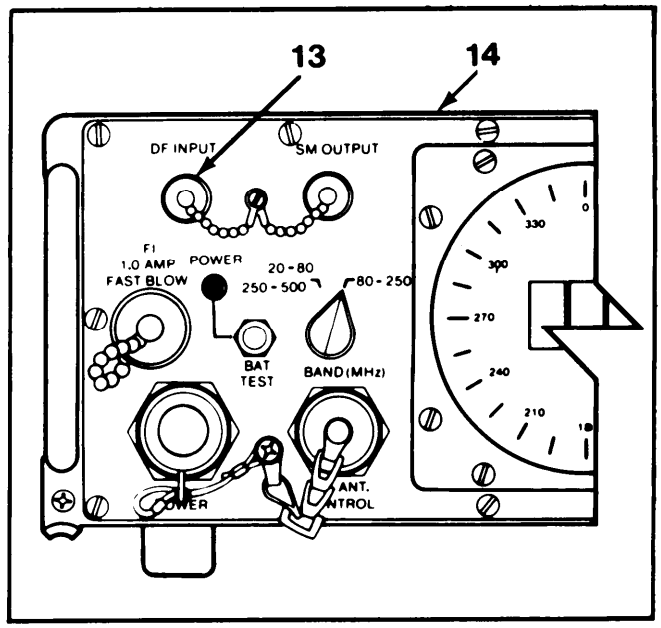


GO ON TO SHEET 4

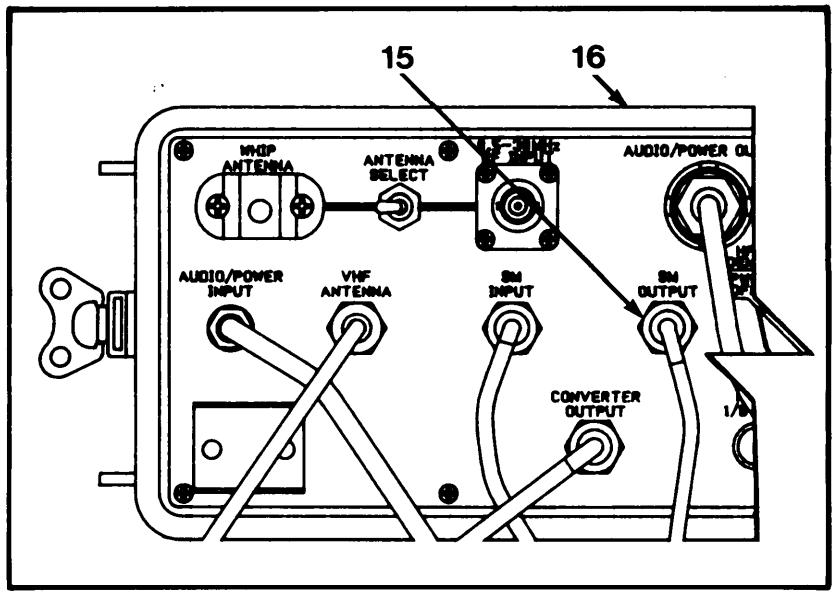
2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

CABLING UNITS (SHEET 4 OF 9)

7. Remove protective cap from DF INPUT (13) on df processor (14) by pushing in and turning 1/4 turn counterclockwise.



8. Select a bnc patch cable and connect one bnc connector to SM OUTPUT (15) on hf upconverter/ demodulator (16) by pushing in on bnc connector while turning 1/4 turn clockwise until connector locks in place.

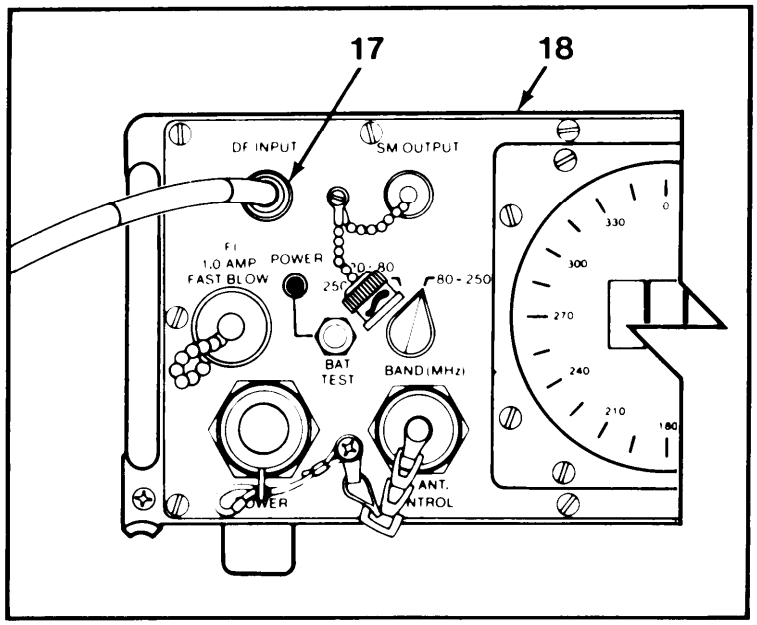


GO ON TO SHEET 5

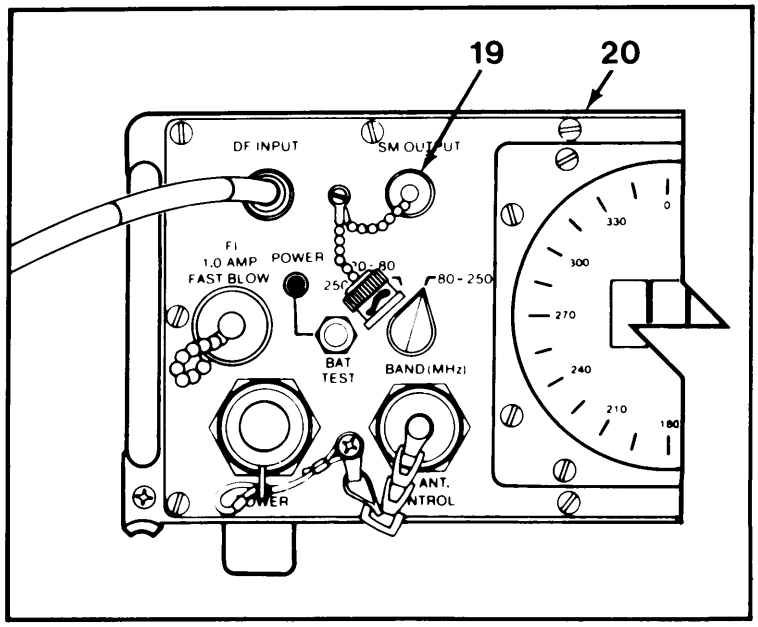
2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

CABLING UNITS (SHEET 5 OF 9)

9. Connect bnc connector at other end of bnc patch cable to DF INPUT (17) on df processor (18) by pushing in on bnc connector while turning l/4 turn clockwise until connector locks in place.



10. Remove protective cap from SM OUTPUT (19) on df processor (20) by pushing in and turning 1/4 turn counterclock wise.

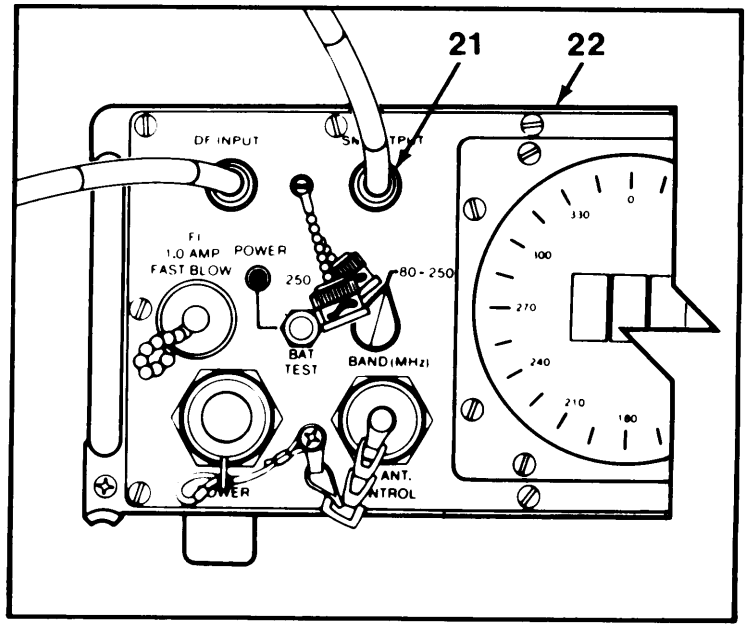


GO ON TO SHEET 6

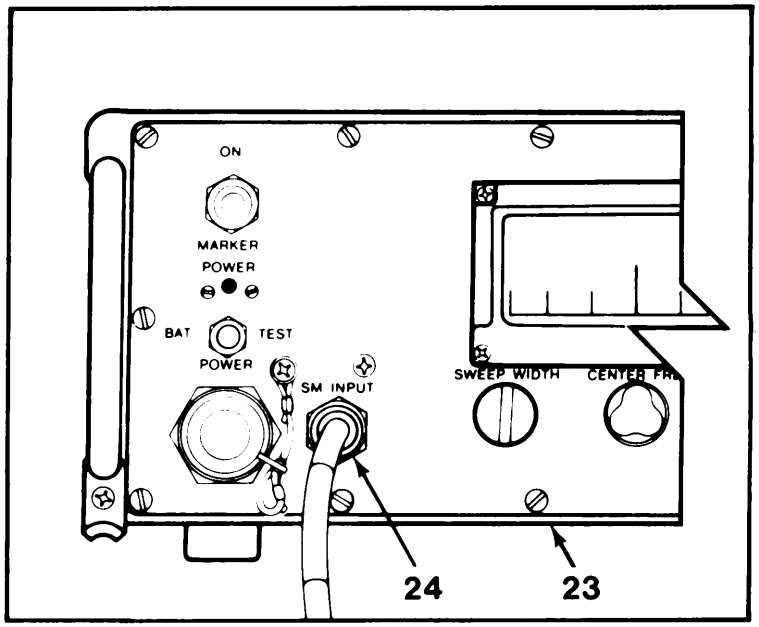
2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

CABLING UNITS (SHEET 6 OF 9)

11. Select a bnc patch cable and connect one bnc connector to SM OUTPUT (21) on df processor (22) by pushing in on bnc connector while turning 1/4 turn clockwise until connector locks in place.



12. Connect connector at other end of bnc patch cable to SM INPUT (24) on signal monitor (23) by pushing in on bnc connector while turning 1/4 turn clockwise until bnc connector locks in place.

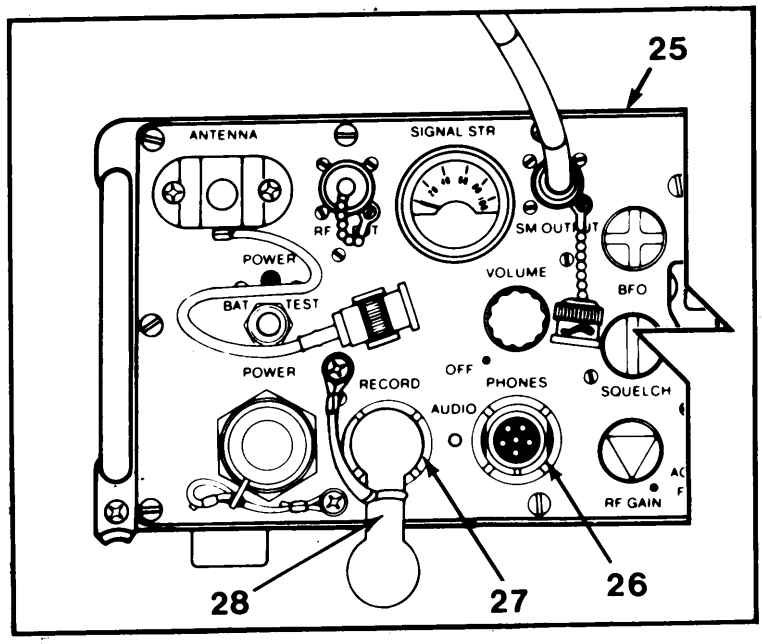


GO ON TO SHEET 7

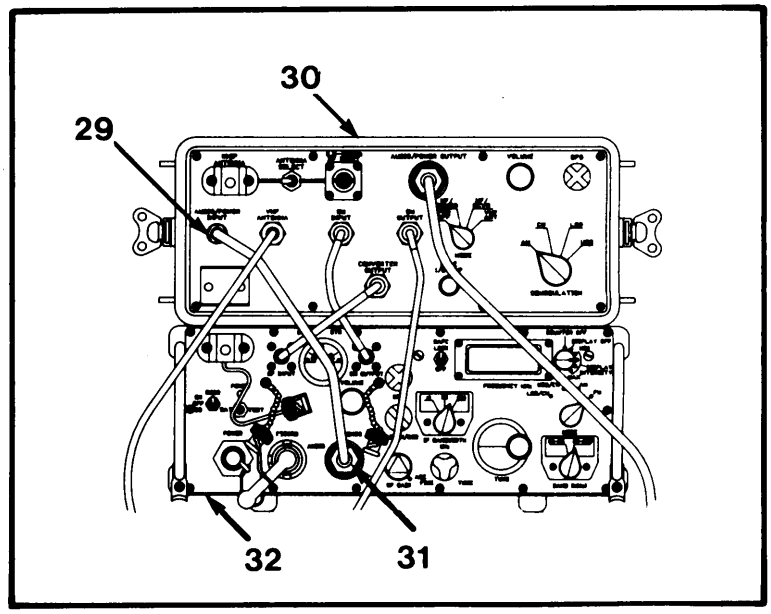
2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

CABLING UNITS (SHEET 7 OF 9)

13. Remove protective rubber cap (28) from PHONES connector (26) on receiver (25) by pressing against RECORD connector (27) while lifting off protective rubber cap (28) and turning rubber cap downward from RECORD connector (27).



14. Select the AUDIO/POWER INPUT connector (29) from the hf upconverter/ demodulator (30) and connect to PHONES connector (31) on the receiver (32) by pushing in connector and simultaneously turning clockwise 1/4 turn until connector locks in place.

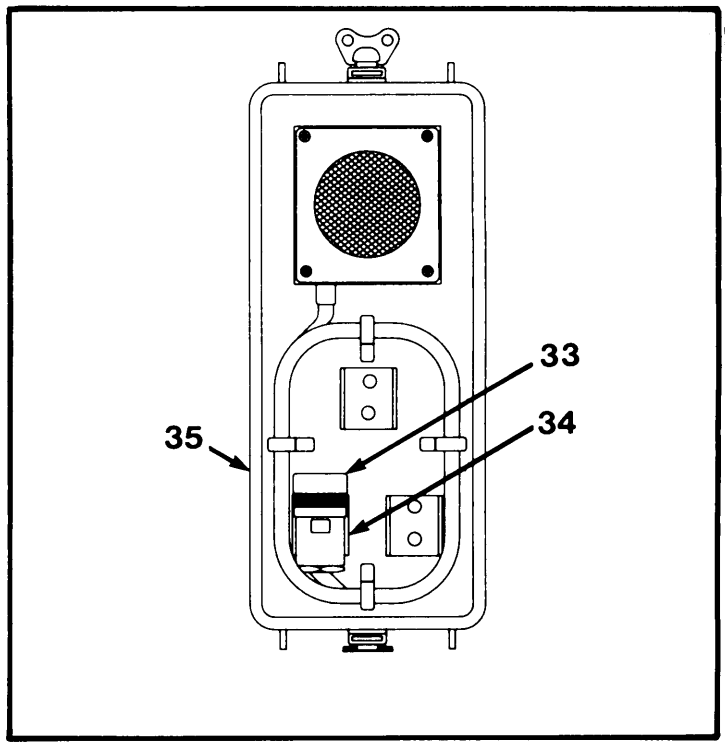


GO ON TO SHEET 8

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

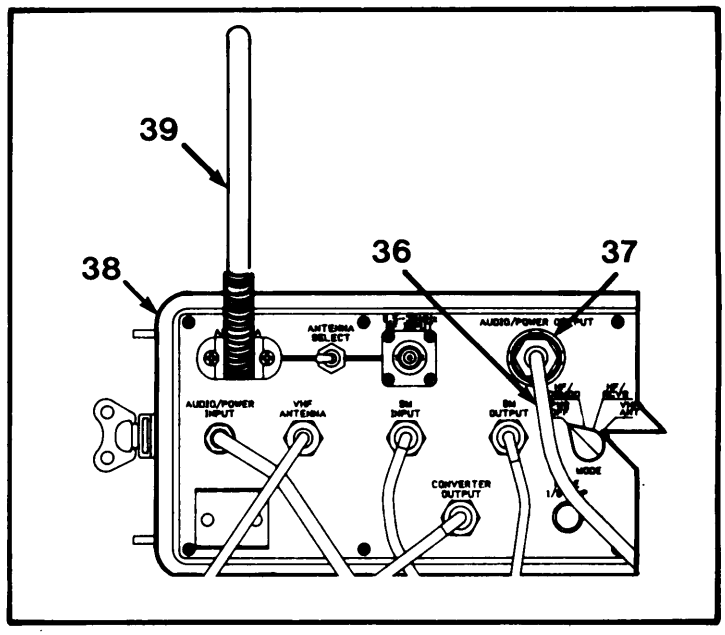
CABLING UNITS (SHEET 8 OF 9)

15. Unclip audio connector of speaker cable (33) from holding bracket (34) inside speaker assembly cover (35) and extend cable.



16. Connect speaker cable (36) to AUDIO/POWER OUTPUT (37) on hf upconverter/ demodulator (38) by pushing in connector while simultaneously turning 1/4 turn clockwise until connector locks in place.

17. Connect the hf whip antenna with base (39) to the hf upconverter/demodulator (38) by screwing the whip antenna (39) in a clockwise direction until it is firmly seated in the screw-in connector.



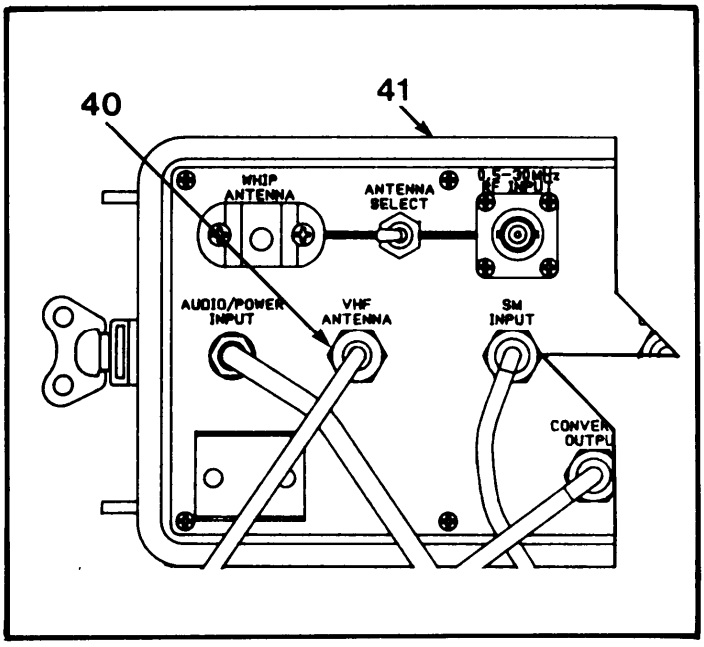
GO ON TO SHEET 9

2-12. ASSEMBLY AND PREPARATION FOR USE - Continued

CABLING UNITS (SHEET 9 OF 9)

NOTE
- If the AN-3733/PRD-11 is used, the rf cable from J19 on the antenna will be connected for frequencies of 20-175 mhz. The rf cable from J20 will be connected for frequencies of 150-500 mhz.
- The AN-3732/PRD-11 has only one rf cable.

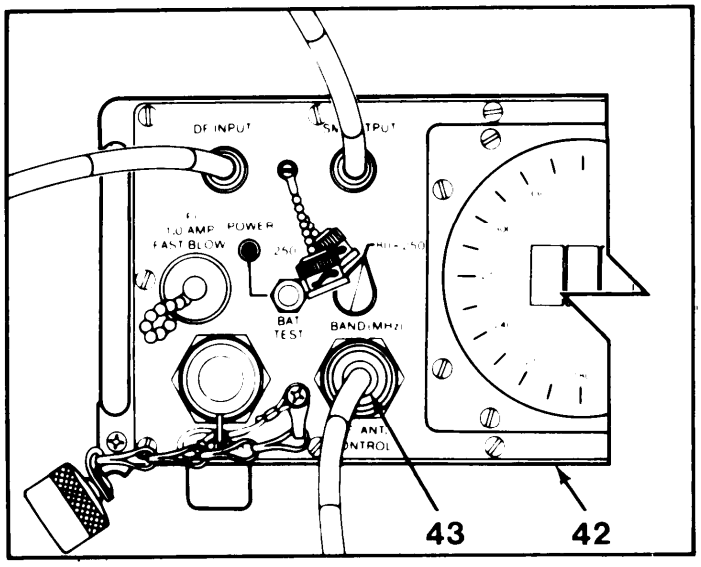
17. Connect rf cable bnc connector to VHF ANTENNA connector (40) on hf upconverter/demodulator (41) by pushing in on collar of connector while simultaneously turning 1/4 turn clockwise until bnc connector locks in place.



18. Remove protective cap from DF ANT. CONTROL (43) on df processor (42) by turning counterclockwise.

19. Connect df cable connector (J4) to DF ANT. CONTROL (43) by matching large key on df cable connector to slot on DF ANT. CONTROL (43).

20. Push df cable connector into DF ANT. CONTROL (43) and turn 1/4 turn clockwise until connector locks in place.



2-13. INITIAL ADJUSTMENTS

Initial adjustments consist of the tasks that must be performed to power up and set the controls of the direction finder units. Only one crew member is required to do initial adjustments. Perform these procedures after the units are stacked and all cables are connected. The tasks and procedures for performing them are given in the following paragraphs. Initial adjustments include:

a. Power Up Procedures. Power up procedures consist of those steps necessary to apply power to a direction finder unit in order for it to operate. Each unit requires different steps.

2-13. INITIAL ADJUSTMENTS - Continued

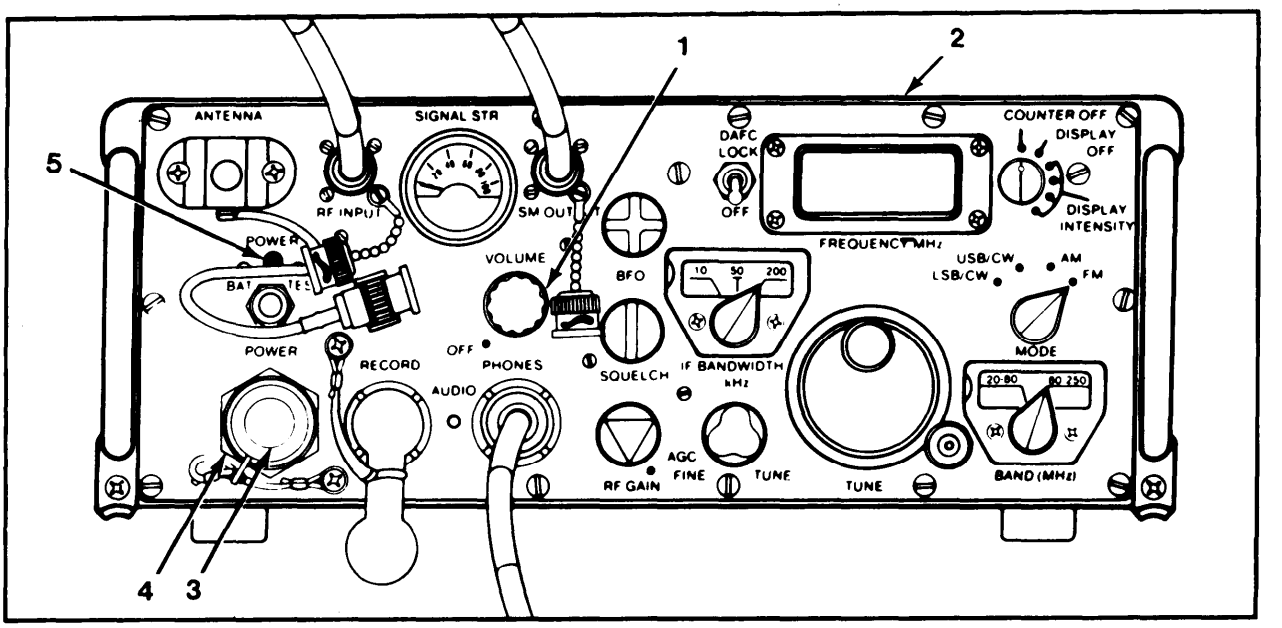
POWERING UP RECEIVER (SHEET 1 OF 2)

1. Check POWER terminal (4) to make sure protective cap (3) is in place.

> NOTE
> If terminal cap is not secured in place, unit will not function.

2. Turn red VOLUME switch (1) clockwise to turn on receiver (2) and set to midrange.

3. Observe that POWER lamp (5) is lit.



GO ON TO SHEET 2

2-13. INITIAL ADJUSTMENTS - Continued

POWERING UP RECEIVER (SHEET 2 OF 2)

4. Set COUNTER OFF/DISPLAY OFF/DISPLAY INTENSITY switch (7) to lowest intensity by turning to first position after DISPLAY OFF (8).

NOTE
COUNTER OFF/DISPLAY OFF/DISPLAY INTENSITY switch may need to be set to higher intensity depending on light conditions.

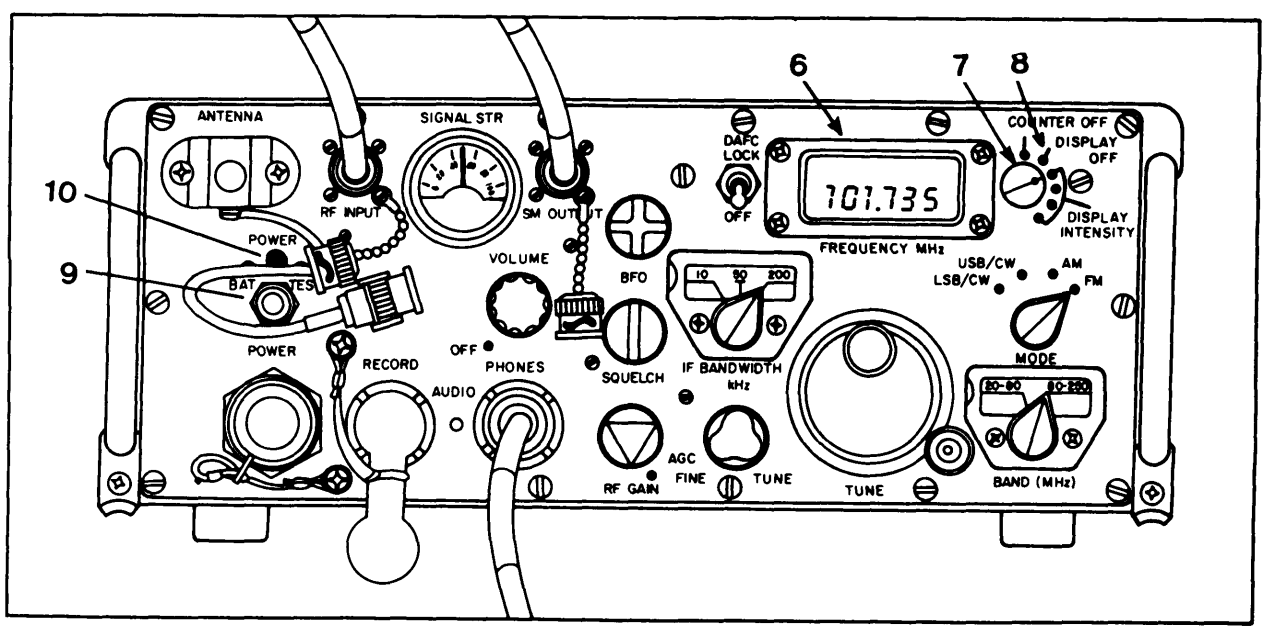
5. Observe FREQUENCY MHz display (6) and ensure frequency appears.

NOTE
Allow units 2 or 3 minutes to warm up before performing 6 below.

6. Press and release BAT TEST pushbutton (9) to check battery.

7. Observe red POWER lamp (10) above pushbutton (9) and ensure it is lit.

NOTE
Batteries must be replaced if POWER lamp goes out after pressing BAT TEST pushbutton (9).



2-13. INITIAL ADJUSTMENTS - Continued

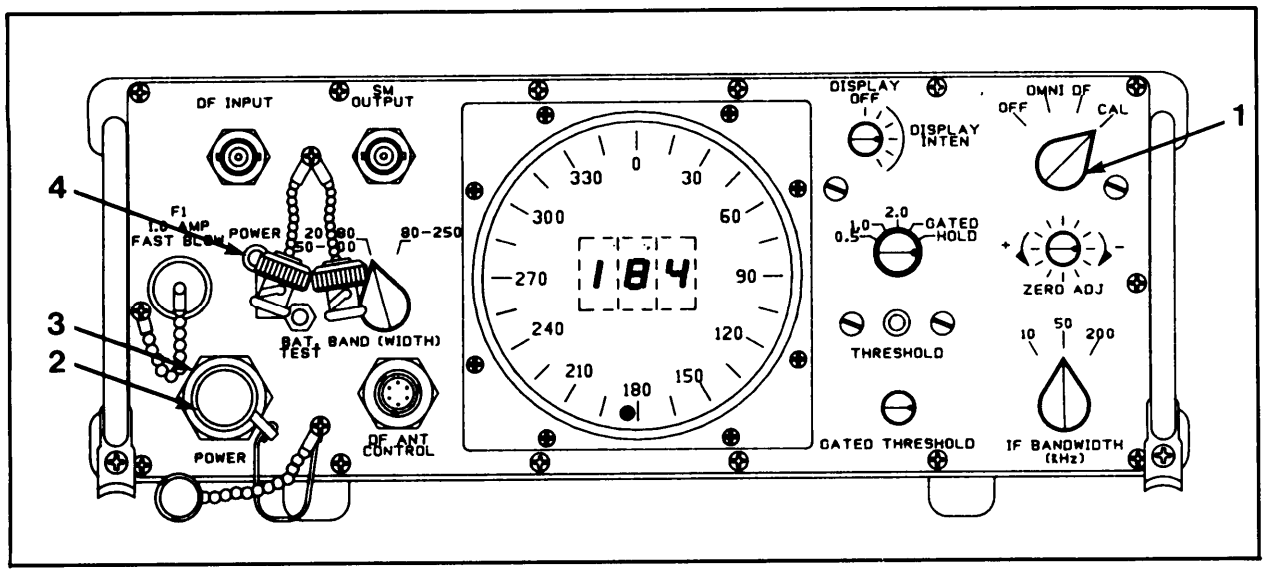
POWERING UP DF PROCESSOR (SHEET 1 OF 2)

1. Check POWER terminal (3) to make sure protective cap (2) is in

> NOTE
> If terminal cap is not secured in place, unit will not function.

2. Set OFF/OMNI/DF/CAL switch (1) to DF.

3. Observe red POWER lamp (4) is lit.



GO ON TO SHEET 2

2-13. INITIAL ADJUSTMENTS - Continued

POWERING UP DF PROCESSOR (SHEET 2 OF 2)

4. Set DISPLAY OFF/DISPLAY INTEN switch (9) to lowest intensity by turning to first position after DISPLAY OFF.

NOTE
DISPLAY OFF/DISPLAY INTEN switch (9) may need to be set to higher intensity depending on light conditions.

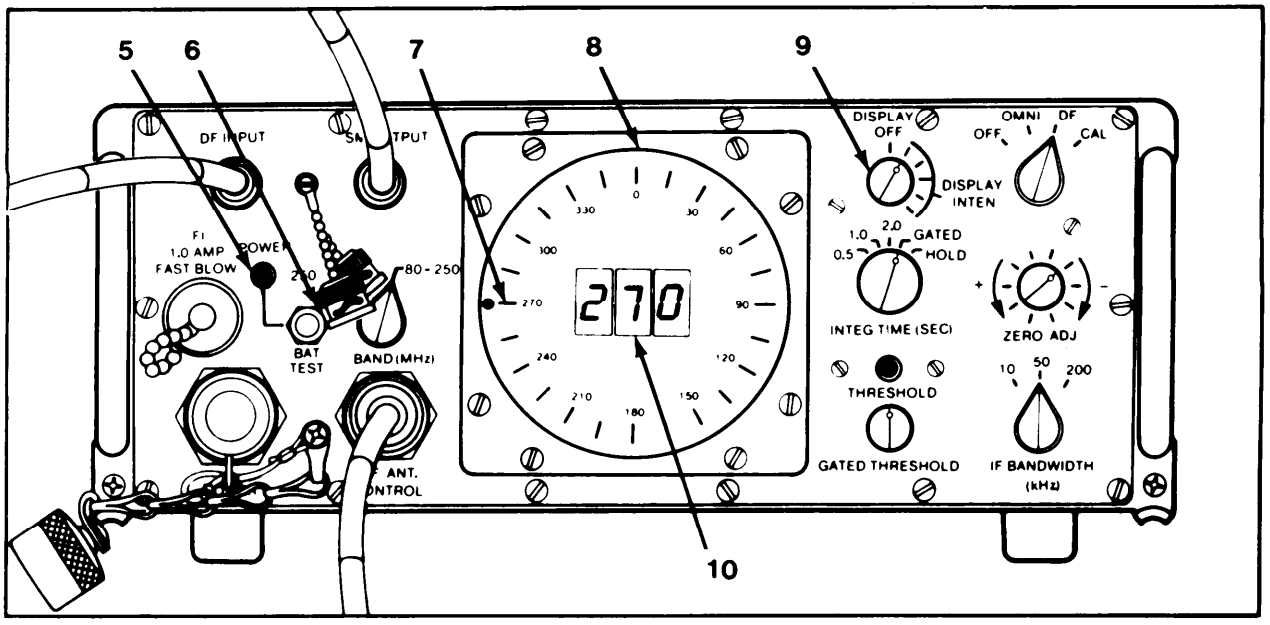
5. Observe df processor display (8) and ensure random line of bearing numbers (10) and red circular LED indicator (7) appear.

NOTE
Allow units 2 or 3 minutes to warm up before performing 6 below.

6. Press and release BAT TEST pushbutton (6) to check battery.

7. Observe red POWER lamp (5) above pushbutton (6) and ensure it is lit.

NOTE
Batteries must be replaced if POWER lamp (5) goes out after pressing BAT TEST pushbutton (6).



2-13. INITIAL ADJUSTMENTS - Continued

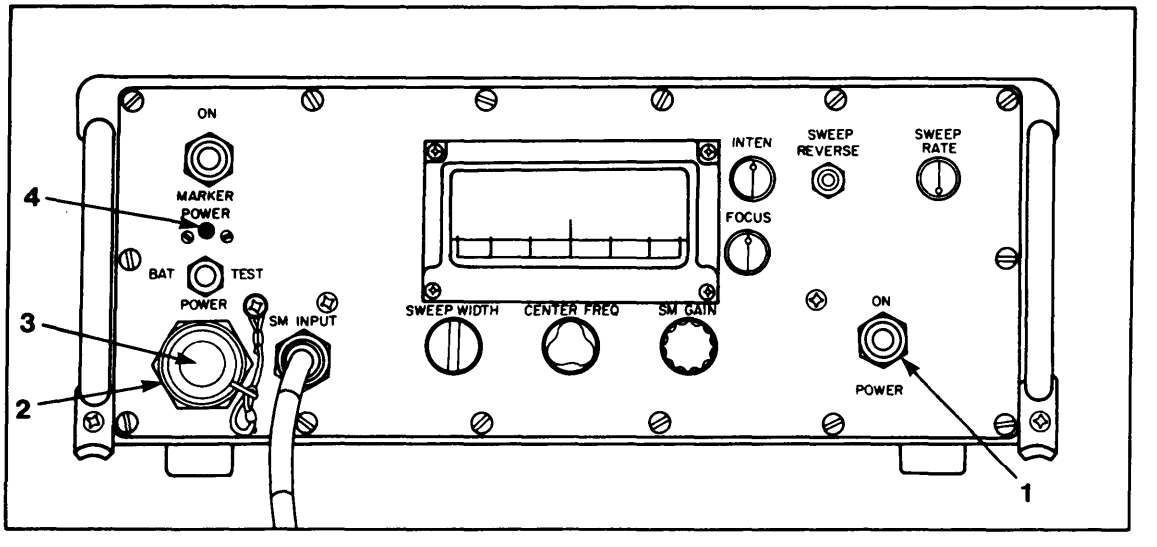
POWERING UP SIGNAL MONITOR (SHEET 1 OF 2)

1. Check POWER terminal (2) to make sure protective cap (3) is in place.

> NOTE
> If terminal cap is not secured in place, unit will not function.

2. Set ON/POWER toggle switch (1) to ON.

3. Observe POWER lamp (4) is lit.



GO ON TO SHEET 2

2-13. INITIAL ADJUSTMENTS - Continued

POWERING UP SIGNAL MONITOR (SHEET 2 OF 2)

4. Turn INTEN knob (6) clockwise to adjust signal monitor display (5) to a low but visible level.

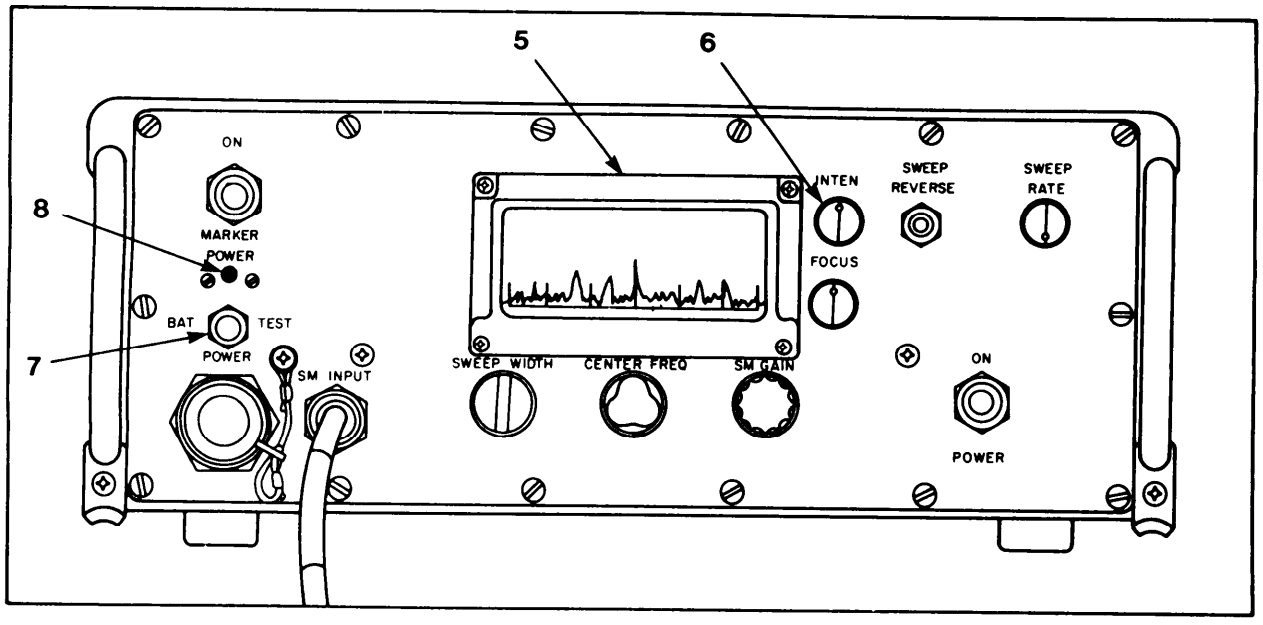
5. Observe signal monitor display (5) and ensure that baseline is present.

> NOTE
> Allow units 2 or 3 minutes to warm up before performing 6 below.

6. Press and release BAT TEST pushbutton (7) to check battery.

7. Observe red POWER lamp (8) above pushbutton (7) and ensure it is lit.

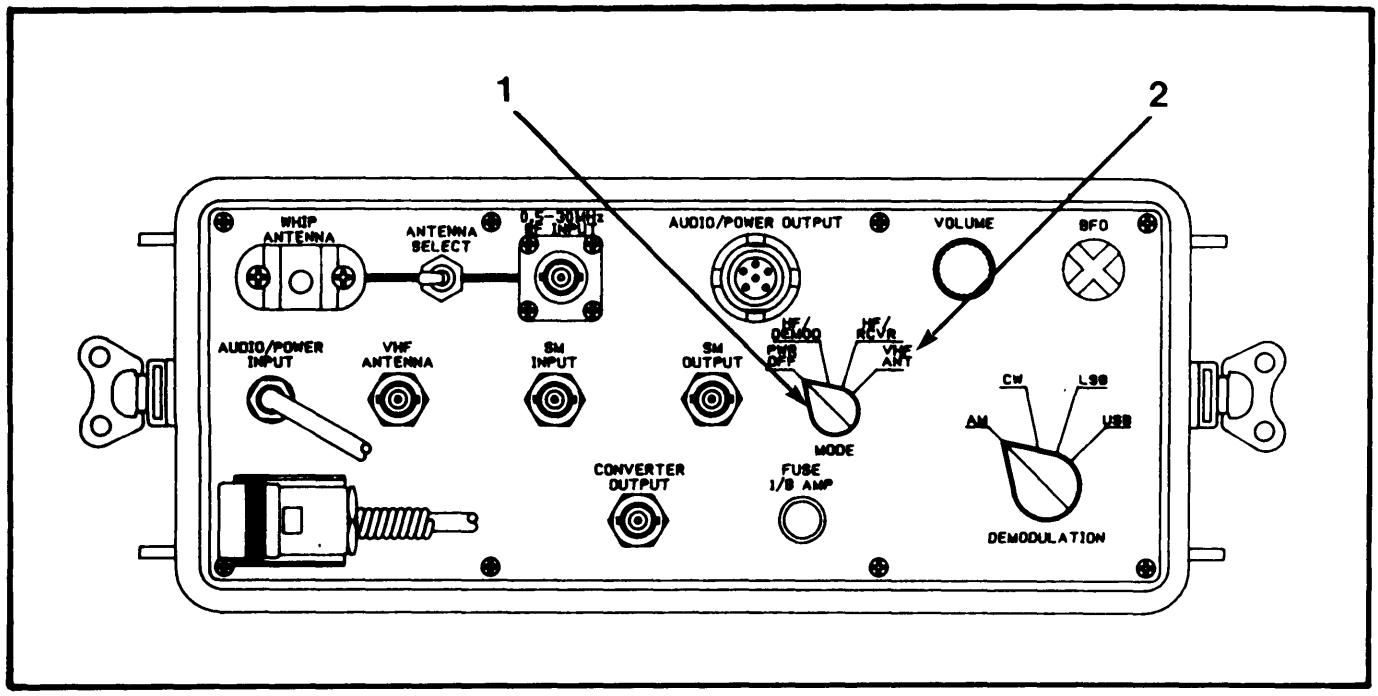
> NOTE
> Batteries must be replaced if POWER lamp (8) goes out after pressing BAT TEST pushbutton (7).



2-13. INITIAL ADJUSTMENTS - Continued

POWERING UP HF UPCONVERTER/DEMODULATOR

1. Set MODE switch (1) to VHF ANT (2).



2-13. INITIAL ADJUSTMENTS - Continued

b. Unit Control Settings (vhf/uhf operation). Unit control settings consist of the final procedures necessary to prepare the direction finder set for vhf/uhf operation. Perform these procedures only after power has been applied to each unit. Each unit requires different settings.

NOTE

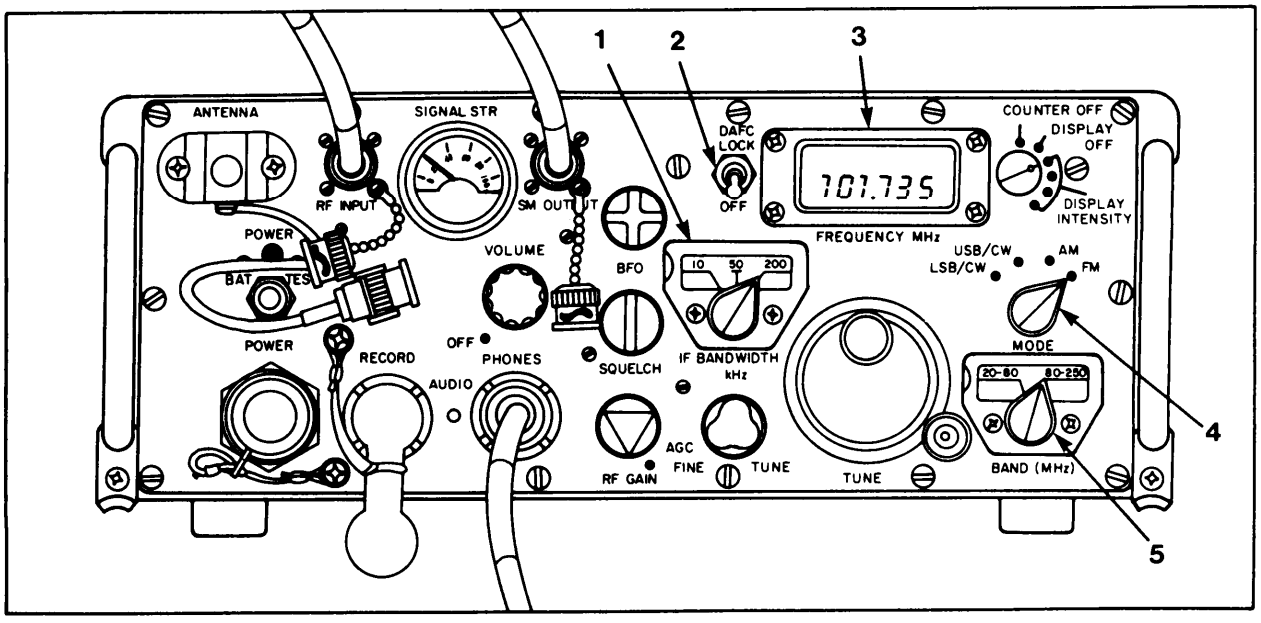
- Receiver should contain tuner assembly appropriate to mission. Installed tuner frequency ranges are displayed with the BAND mhz switch. If different tuner is required for mission, crew member should notify organizational maintenance for replacement assembly.
- The 20-250 mhz tuner must always be installed in the receiver when the hf upconverter/demodulator is used.

2-13. INITIAL ADJUSTMENTS - Continued

RECEIVER CONTROL SETTINGS (SHEET 1 OF 5)

1. Set BAND mhz switch (5) to required band.
2. Set MODE switch (4) to LSB/CW, USB/CW, AM or FM setting as directed by the Net Control Element (NCE).
3. Set DAFC LOCK switch (2) to OFF.
4. Observe FREQUENCY MHz display (3) and note that last digits fluctuate.
5. Set IF BANDWIDTH (kHz) switch (1) to 10, 50 or 200 setting as directed by the NCE.

NOTE
- When IF BANDWIDTH is unknown, set at 50.
- A greater number of signals can be received at a higher bandwidth setting.



GO ON TO SHEET 2

2-13. INITIAL ADJUSTMENTS - Continued

RECEIVER CONTROL SETTINGS (SHEET 2 OF 5)

6. Set RF GAIN switch (9) to AGC by turning fully clockwise.

NOTE
Switch will click into AGC position.

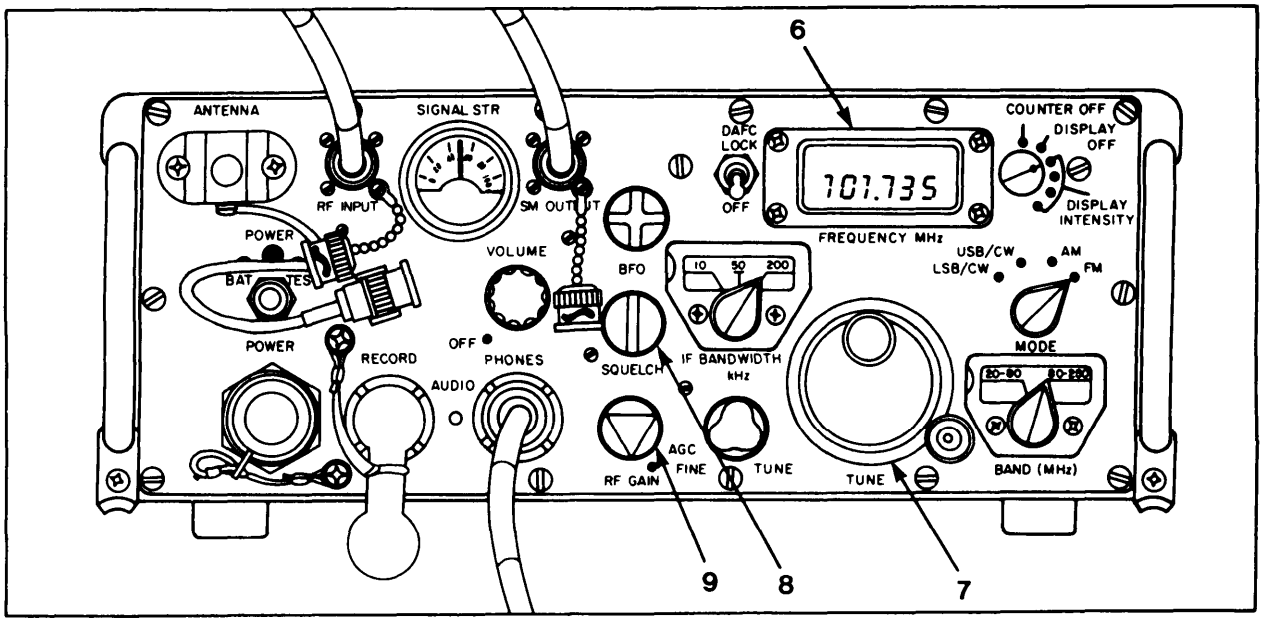
7. Rotate TUNE knob (7) clockwise and observe FREQUENCY MHz display (6) to ensure frequency increases with knob movement.

NOTE
Ensure knob rotates freely and does not bind.

8. Rotate TUNE knob (7) counterclockwise and observe FREQUENCY MHz display (6) to ensure frequency decreases with knob movement.

9. Rotate SQUELCH knob (8) fully clockwise and then fully counterclockwise until noise static is no longer heard.

10. Rotate TUNE knob (7) to a known transmitting frequency.



GO ON TO SHEET 3

2-13. INITIAL ADJUSTMENTS - Continued

RECEIVER CONTROL SETTINGS (SHEET 3 OF 5)

NOTE
Perform 11 through 16 below only when receiver MODE switch (11) is set to AM or FM.

11. Set FINE TUNE knob (12) to midrange by turning it fully counterclockwise, then fully clockwise, and then counterclockwise to center of turning range.

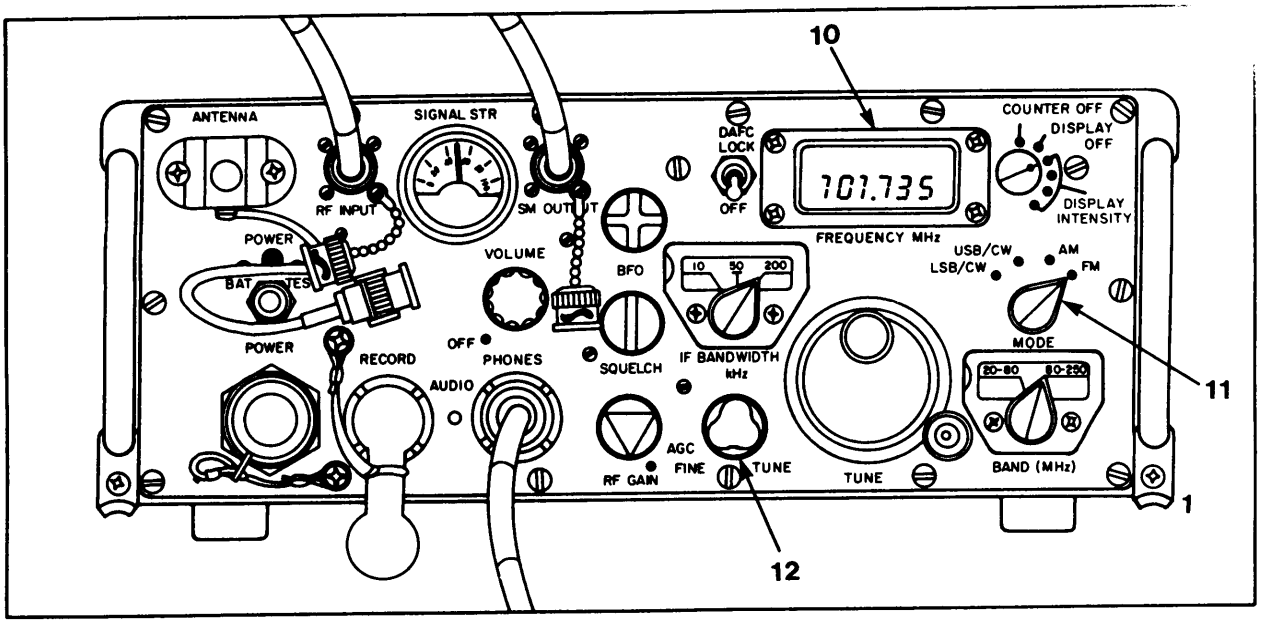
12. Rotate FINE TUNE knob (12) clockwise while observing FREQUENCY MHz display (l0).

13. Observe that frequency increases with FINE TUNE knob (12) movements.

14. Rotate FINE TUNE knob (12) counterclockwise while observing FREQUENCY MHz display (10).

15. Observe that frequency decreases with FINE TUNE knob (12) movements.

16. Reset FINE TUNE knob (12) to midrange by repeating 11 above.



GO ON TO SHEET 4

2-13. INITIAL ADJUSTMENTS - Continued

RECEIVER CONTROL SETTINGS (SHEET 4 OF 5)

NOTE
Perform 17 through 22 below only when receiver MODE switch (15) is set to LSB/CW or USB/CW.

17. Set BFO knob (13) to midrange by turning it fully counterclockwise, then fully clockwise, and then counterclockwise to center of turning range.

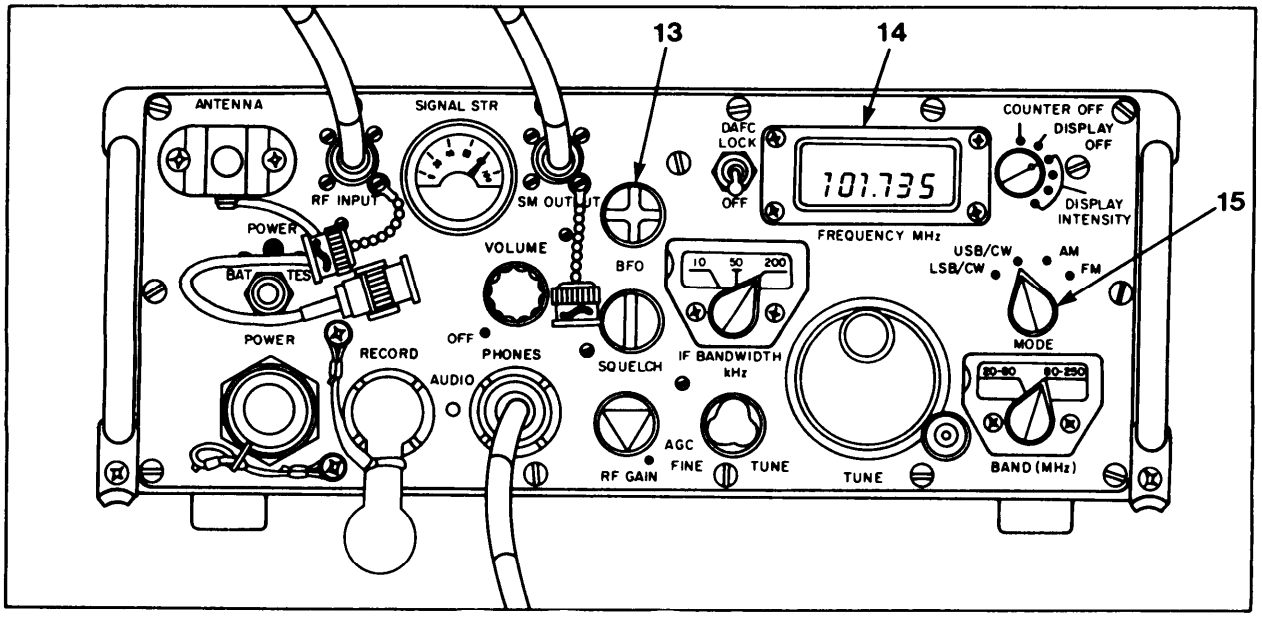
18. Rotate BFO knob (13) clockwise while observing FREQUENCY MHz display (14).

19. Observe that frequency increases with BFO knob (13) movements.

20. Rotate BFO knob (13) counterclockwise while observing FREQUENCY MHz display (14).

21. Observe that frequency decreases with BFO knob (13) movements.

22. Reset BFO knob (13) to midrange by repeating 17 above.



GO ON TO SHEET 5

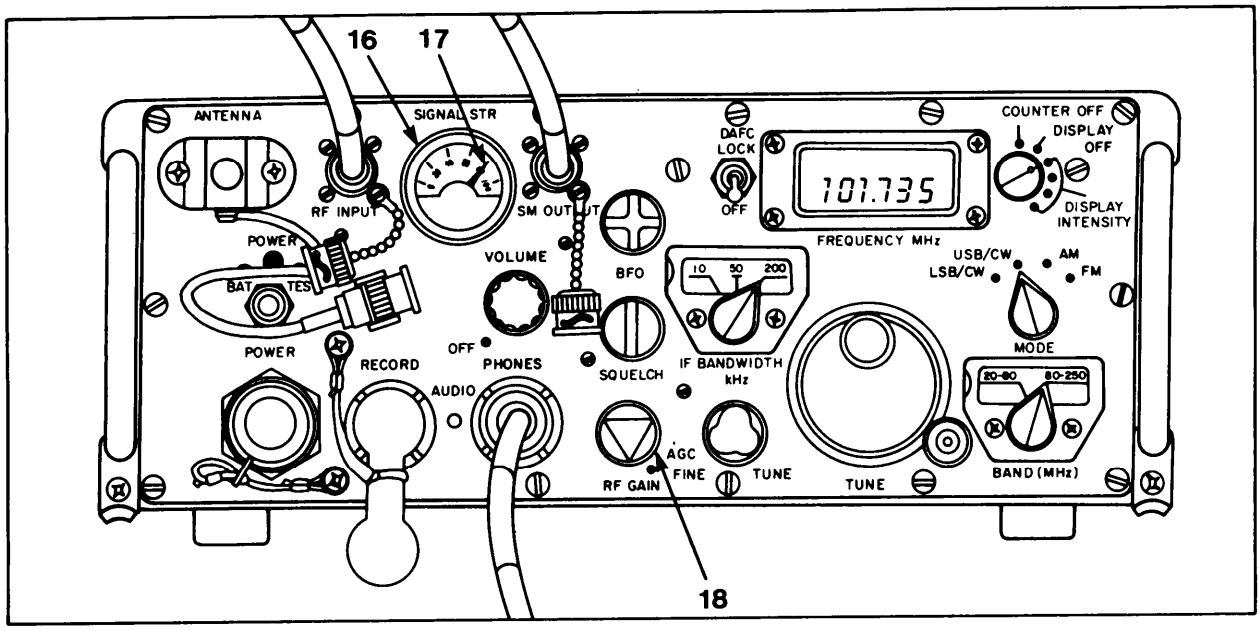
2-13. INITIAL ADJUSTMENTS - Continued

RECEIVER CONTROL SETTINGS (SHEET 5 OF 5)

23. Rotate blue RF GAIN switch (18) fully counterclockwise and then rotate RF GAIN switch (18) clockwise while observing SIGNAL STR meter (16).

24. Observe that SIGNAL STR needle (17) moves to right in meter display as the strength of signal increases.

25. Reset blue RF GAIN switch (18) to AGC by turning fully clockwise.



2-13. INITIAL ADJUSTMENTS - Continued

DF PROCESSOR CONTROL SETTINGS (SHEET 1 OF 3)

NOTE
Perform 1 through 6 below to calibrate df processor.

1. Set OFF/OMNI/DF/CAL switch (4) to CAL.

NOTE
- Df processor will not calibrate if INTEG TIME switch (3) is set to GATED or HOLD.
- Perform 2 below if INTEG TIME switch (3) is set to GATED or HOLD.

2. Set INTEG TIME switch (3) to 0.5, 1.0 or 2.0.

3. Set BAND (WIDTH) switch (1) to same frequency range as set on receiver BAND mhz switch (6).

NOTE
- If BAND (WIDTH) switch (1) is set to 80-250, readout in lob display (2) will be 000 ±5 degrees.
- If BAND (WIDTH) switch (1) is set to 20-80/250-500 readout on lob display (2) will be 180 ±5 degrees.

4. Observe lob display (2) and ensure readout is 000 or 180 (plus or minus 5 degrees).

NOTE
Perform 5 below only when BAND (WIDTH) switch (1) is set to 80-250 and 000 readout is not present on lob display.

5. Adjust to 000 by turning ZERO ADJ switch (5).

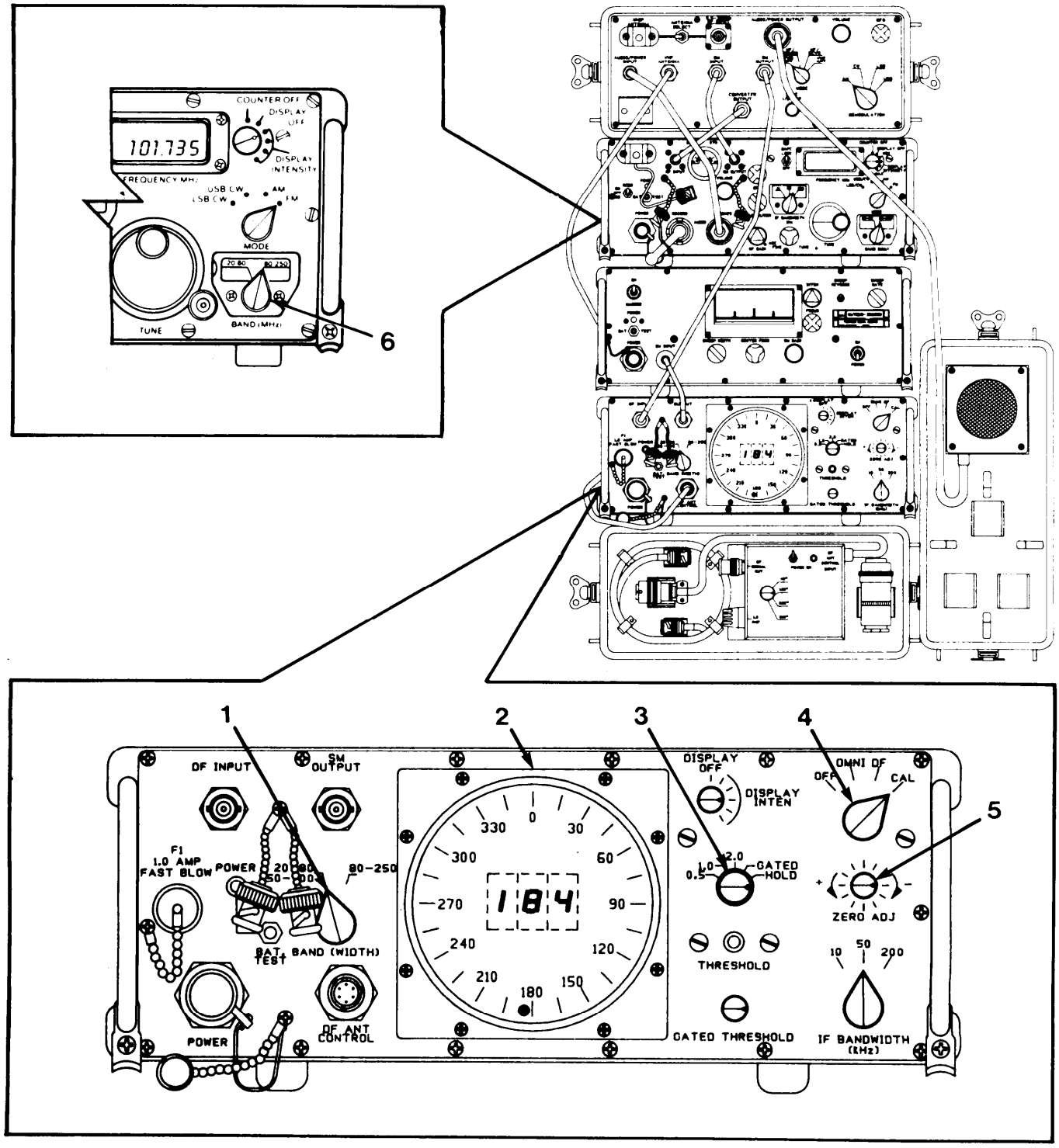
NOTE
Perform 6 below only when BAND (WIDTH) switch (1) is set to 20-80/250-500 and 180 readout is not present on lob display.

6. Adjust to 180 by turning ZERO ADJ switch (5).

GO ON TO SHEET 2

2-13. INITIAL ADJUSTMENTS - Continued

DF PROCESSOR CONTROL SETTINGS (SHEET 2 OF 3)



GO ON TO SHEET 3

2-13. INITIAL ADJUSTMENTS - Continued

DF PROCESSOR CONTROL SETTINGS (SHEET 3 OF 3)

7. Set OFF/OMNI/DF/CAL switch (10) to DF.

8. Set IF BANDWIDTH (kHz) switch (14) to same setting as set on receiver IF BANDWIDTH (kHz) switch (12).

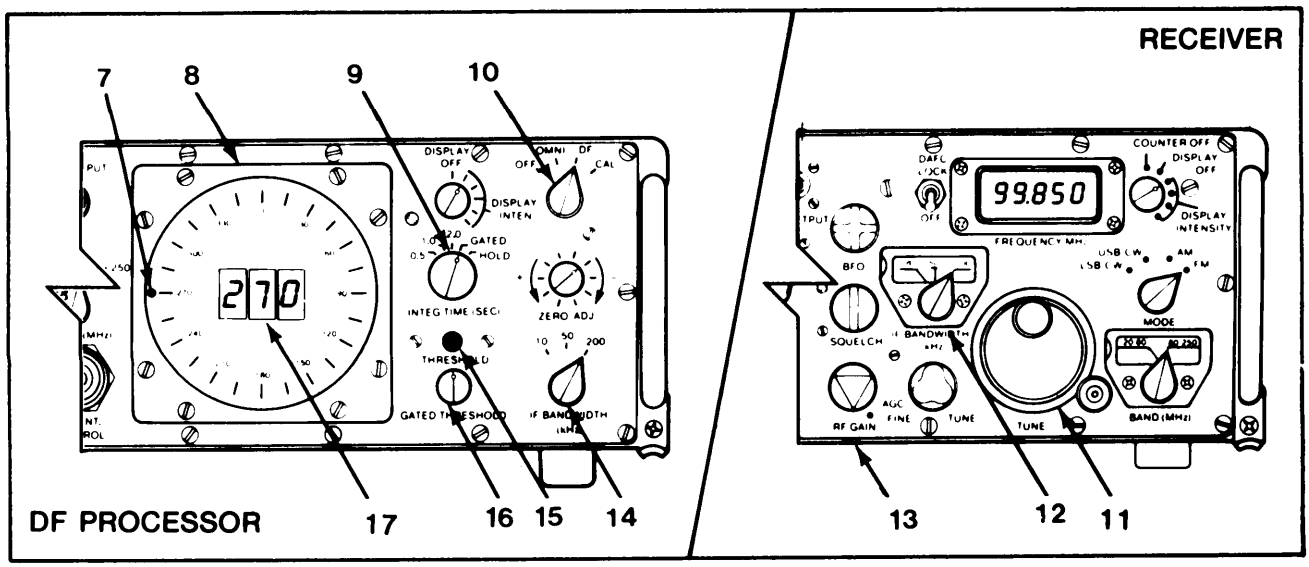
9. Set INTEG TIME switch (9) fully clockwise, then back one click to GATED position.

10. Rotate TUNE knob (11) on receiver (13) to frequency with no transmission.

11. Rotate GATE THRESHOLD knob (16) fully clockwise then turn knob counter-clockwise just until THRESHOLD lamp (15) goes off.

NOTE

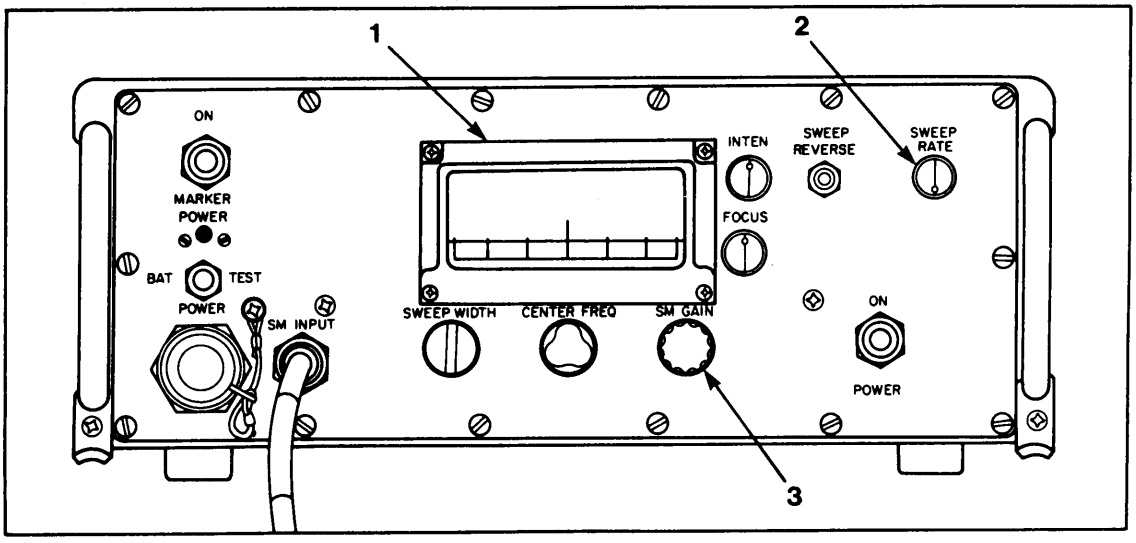
Circular LED (7) on df processor lob display (8) goes off and numerical lob display (17) remains fixed when df processor threshold level is higher than the incoming signal level.



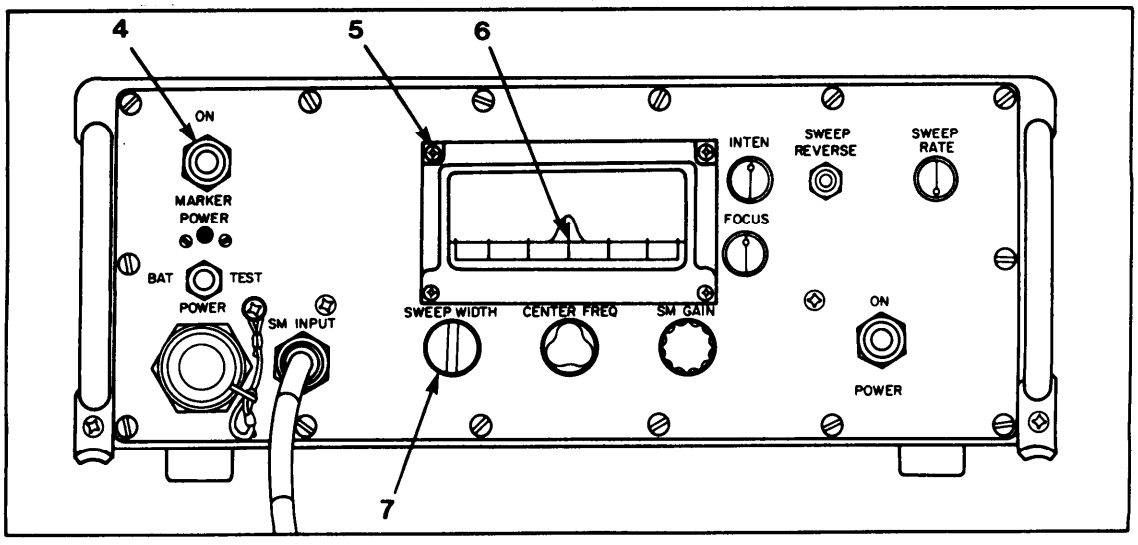
2-13. INITIAL ADJUSTMENTS - Continued

SIGNAL MONITOR CONTROL SETTINGS (SHEET 1 OF 4)

1. Rotate SWEEP RATE knob (2) fully clockwise.
2. Rotate SM GAIN knob (3) fully counterclockwise.
3. Observe signal monitor screen (1) and ensure background noise is absent.



4. Rotate SWEEP WIDTH knob (7) fully clockwise.
5. Set MARKER switch (4) to ON position.
6. Observe signal monitor screen (5) and ensure marker (6) is present.



GO ON TO SHEET 2

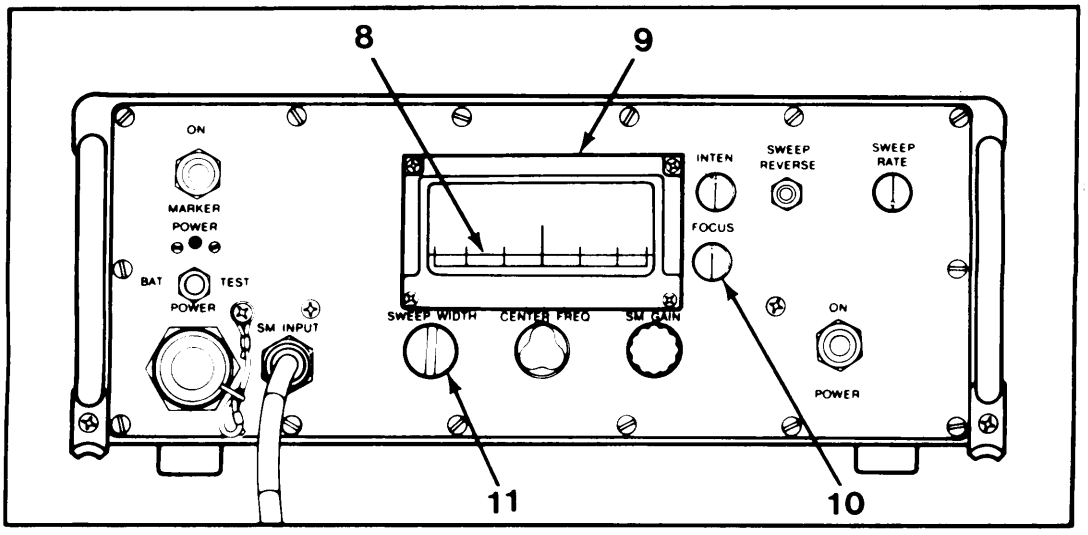
2-13. INITIAL ADJUSTMENTS - Continued

SIGNAL MONITOR CONTROL SETTINGS (SHEET 2 OF 4)

7. Rotate FOCUS knob (10) to adjust display until baseline and marker can be seen clearly and sharply.

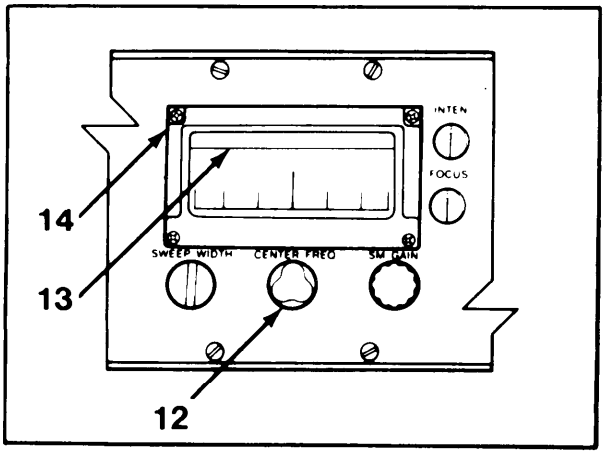
8. Rotate SWEEP WIDTH knob (11) fully counterclockwise while observing signal monitor screen (9).

9. Observe that marker (8) widens out until it becomes a straight line.



10. Rotate CENTER FREQ knob (12) until line (13) on signal monitor screen (14) reaches maximum height.

NOTE
Line (13) display may move off top of screen as it reaches maximum height.



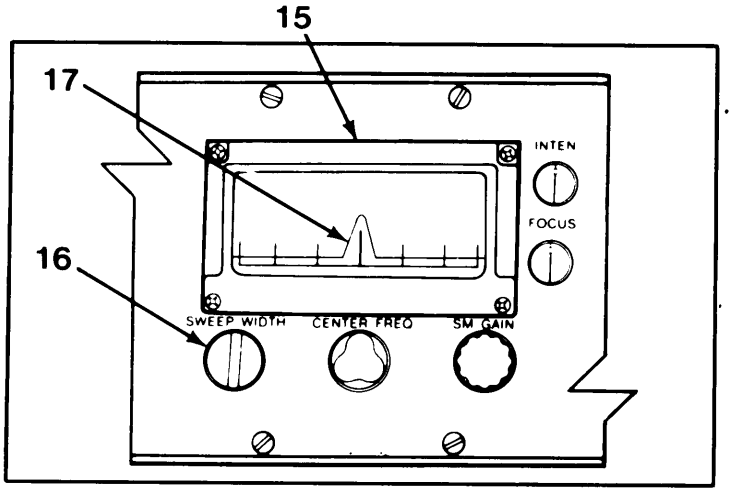
GO ON TO SHEET 3

2-13. INITIAL ADJUSTMENTS - Continued

SIGNAL MONITOR CONTROL SETTINGS (SHEET 3 OF 4)

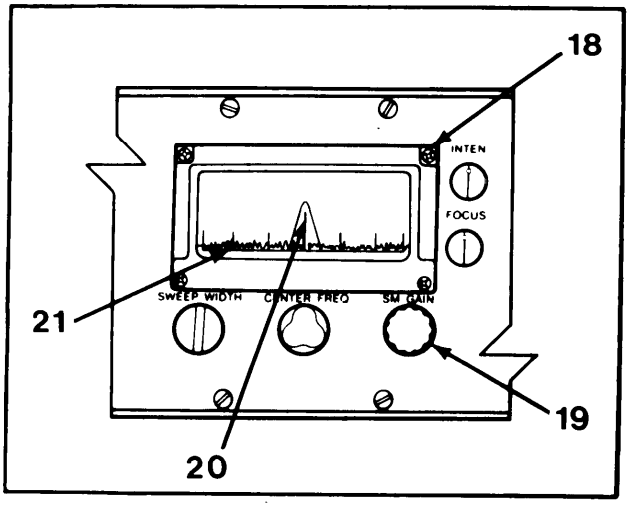
11. Rotate SWEEP WIDTH knob (16) fully clockwise and then 1/4 turn counterclockwise while observing signal monitor screen (15).

12. Observe that marker (17) returns to a narrow spike.



13. Rotate SM GAIN knob (19) clockwise until a baseline of small noise spikes (21) appear on the signal monitor screen (18).

NOTE
SM GAIN (19) should be adjusted so that marker (20) is distinguishable from noise baseline (21).



GO ON TO SHEET 4

2-13. INITIAL ADJUSTMENTS - Continued

SIGNAL MONITOR CONTROL SETTINGS (SHEET 4 OF 4)

NOTE

Perform 14 through 17 below to do the following

- To make sure left-to-right movement of noise baseline (26) follows clockwise rotation of tuning knob (24) on receiver (25).
- To make sure right to left movement of noise baseline (26) follows counterclockwise rotation of tuning knob (24) on receiver (25).

14. Rotate TUNE knob (24) on receiver (25) clockwise while observing signal monitor screen (22).

15. Observe that signal on screen moves from left to right with TUNE knob (24) movements.

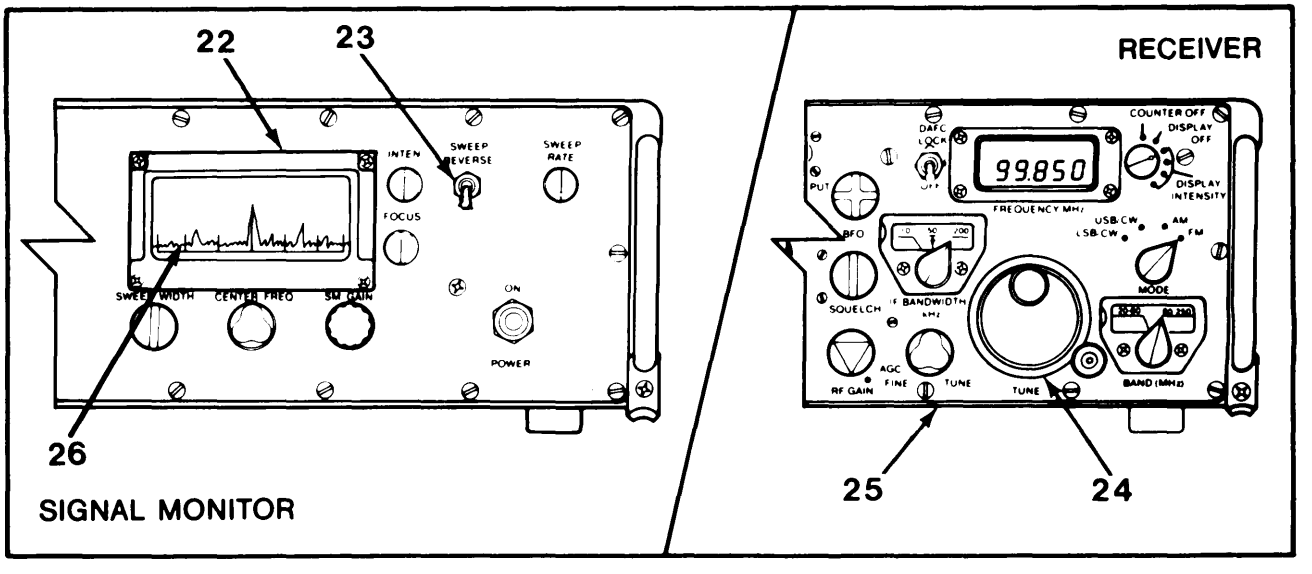
16. Rotate TUNE knob (24) on receiver (25) counterclockwise while observing signal monitor screen (22).

17. Observe that signal on screen moves from right-to-left with TUNE knob (24) movements.

NOTE

Perform 18 below only when signals on signal monitor screen do not track as described in 14 through 17 above.

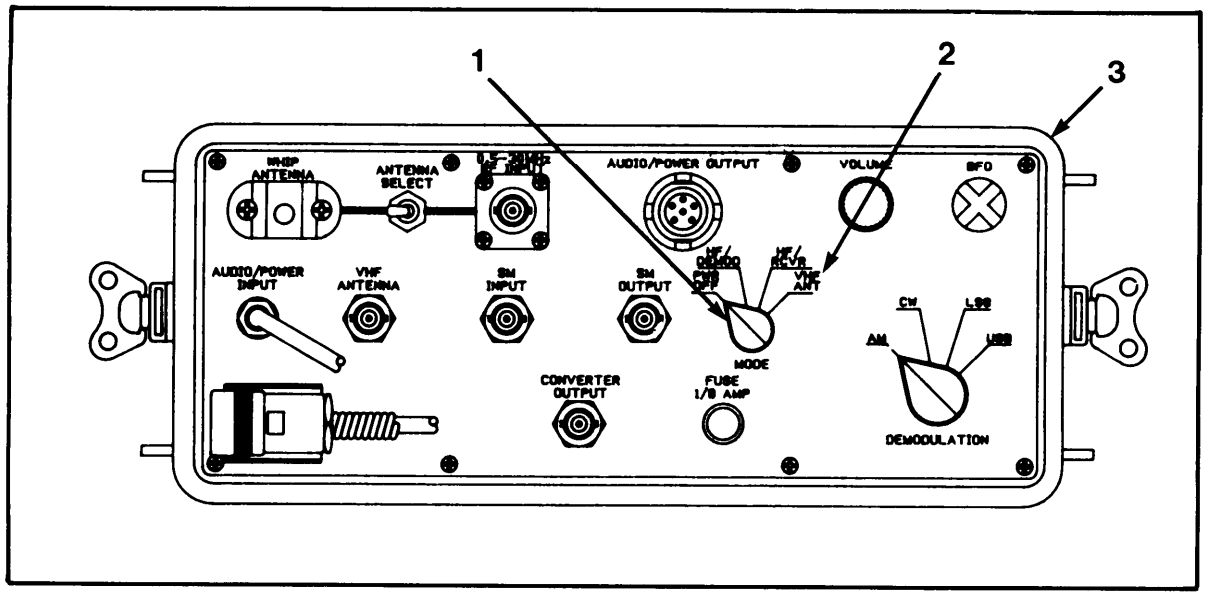
18. Set SWEEP REVERSE toggle switch (23) to opposite position to reverse direction of signal movement.



2-13. INITIAL ADJUSTMENTS - Continued

HF UPCONVERTER/DEMODULATOR CONTROL SETTINGS

1. Ensure the MODE switch (1) is set to VHF ANT (2) on the hf upconverter/ demodulator (3).



2-13. INITIAL ADJUSTMENTS - Continued

ANGLE SIMULATOR TEST (SHEET 1 OF 3)

NOTE
Turn off power to the direction finder set before using angle simulator.

NOTE

The angle simulator is used to verify that the df processor is calibrated for accurate line of bearing readings. It acts as a df antenna that is receiving a transmission at 45, 135, 225, or 315 degrees. Procedures for using the simulator include preparing the df processor for the angle simulator test, and testing the df processor with the simulator. Use the illustration and steps that follow to conduct the angle simulator test.

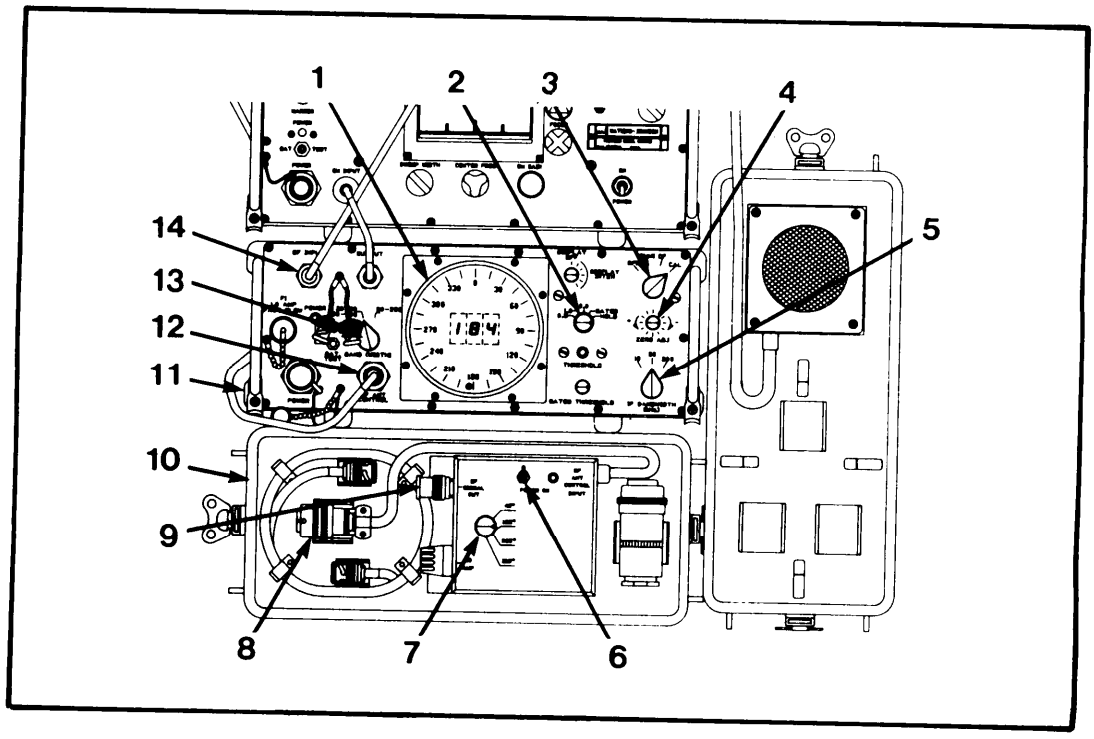
GO ON TO SHEET 2

2-13. INITIAL ADJUSTMENTS - Continued

ANGLE SIMULATOR TEST (SHEET 2 OF 3)

PREPARING DF PROCESSOR FOR TESTING:

1. Connect cable from DF ANT. CONTROL INPUT (8) on angle simulator (10) to DF ANT. CONTROL (12) on df processor (11).
2. Connect bnc cable from DF SIGNAL OUT (9) on angle simulator (10) to DF INPUT (14) on df processor (11).
3. Set OFF/OMNI/DF/CAL switch (3) on df processor (11) to CAL.
4. Rotate ZERO ADJ knob (4) on df processor (11) until 000 or 180 appears on the DF display (l).
5. Set OFF/OMNI/DF/CAL switch (3) on df processor (11) to DF.
6. Set IF BANDWIDTH (kHz) switch (5) on df processor (11) to 10.
7. Set INTEG TIME switch (2) on df processor (11) to 0.5.
8. Set BAND (WIDTH) switch (13) on df processor (11) to right (80-250) position.



2-13. INITIAL ADJUSTMENTS - Continued

ANGLE SIMULATOR TEST (SHEET 3 OF 3)

TESTING DF PROCESSOR USING ANGLE SIMULATOR

1. Set POWER/ON switch (6) on angle simulator (10) to up position.
2. Set angle simulator switch (7) to 45 degrees.
3. Observe df processor display (1) for reading of 45 degrees, ± 3 degrees.
4. Set angle simulator switch (7) to 135 degrees.
5. Observe df processor display (1) for reading of 135 degrees, ± 3 degrees.
6. Set angle simulator switch (7) to 225 degrees.
7. Observe df processor display (1) for reading of 225 degrees, ± 3 degrees.
8. Set angle simulator switch (7) to 315 degrees.
9. Observe df processor display (1) for reading of 315 degrees, ± 3 degrees.
10. Set IF BANDWIDTH (kHz) switch (5) on df processor (11) to 50.
11. Repeat previous steps 2 through 9.
12. Set IF BANDWIDTH (kHz) switch (10) on df processor (11) to 200.
13. Repeat previous steps 2 through 9 to complete testing procedures.

NOTE

Upon completion of the angle simulator test, disconnect the angle simulator cables from the df processor and reconnect the df antenna control cable to the DF ANT CONTROL connector on the df processor and reconnect the hf upconverter/demodulator SM OUTPUT to the DF INPUT on the df processor as previously illustrated in the system cabling procedures.

2-13. INITIAL ADJUSTMENTS - Continued

c. Unit Control Settings (hf operation). Unit control settings consist of the final procedures necessary to prepare the direction finder set for hf operation. Perform these procedures only after power has been applied to each unit Each unit requires different settings.

2-13. lNITIAL ADJUSTMENTS - Continued

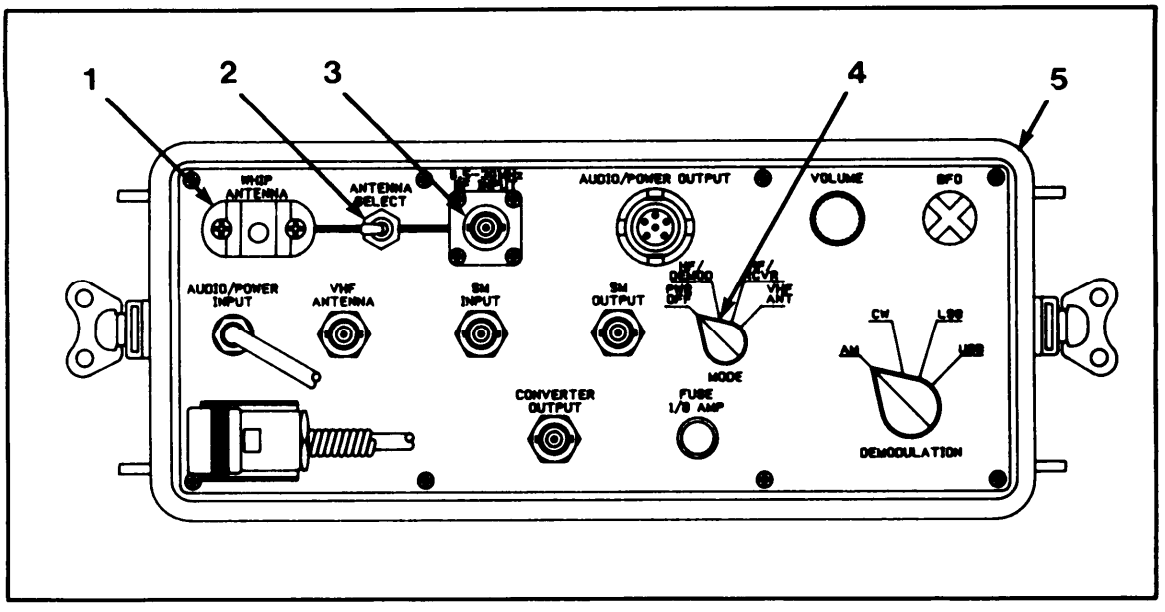
HF UPCONVERTER/DEMODULATOR CONTROL SETTINGS (HF/DEMOD MODE)

1. Set MODE switch (4) on the hf upconverter/demodulator (5) to the HF/DEMOD position.

2. Set ANTENNA SELECT switch (2) on the hf upconverter/demodulator (5) to select the whip antenna connected to the WHIP ANTENNA connector (1) by pulling out on the switch arm and pushing to the left, or to select an external hf antenna connected to the 0.5-30 MHz RF INPUT connector (3) by pulling out on the switch arm and pushing to the right.

NOTE

In the HF/DEMOD mode, the hf upconverter provides a .5 to 20 mhz signal to the receiver. The frequency is read on the receiver frequency display as 100.5 to 120 mhz. Mental suppression of the first digit of the display is required and is easily accomplished with frequent usage. The receiver then provides a 10 mhz if. signal back to the hf upconverter/demodulator and the operator selects the detection mode and preset bandwidths with the DEMODULATION control on the hf upconverter/demodulator. The hf upconverter/demodulator then provides an audio signal to the speaker or headset.



2-13. INITIAL ADJUSTMENTS - Continued

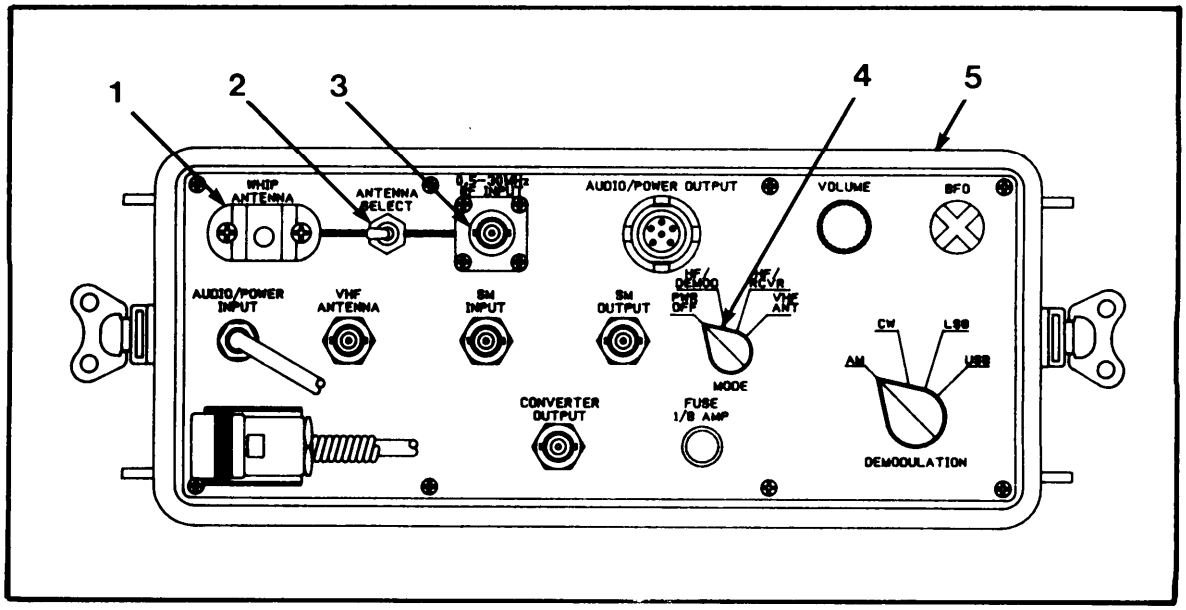
HF UPCONVERTER/DEMODULATOR CONTROL SETTINGS (HF/RCVR MODE)

1. Set MODE switch (4) on the hf upconverter/demodulator (5) to the HF/RCVR position.

2. Set ANTENNA SELECT switch (2) on the hf upconverter/demodulator (5) to select the whip antenna connected to the WHIP ANTENNA connector (1) by pulling out on the switch arm and pushing to the left, or to select an external hf antenna connected to the 0.5-30 MHz RF INPUT connector (3) by pulling out on the switch arm and pushing to the right.

NOTE

In the HF/RCVR mode, the hf upconverter provides a .5 to 20 mhz signal to the receiver. The frequency is read on the receiver frequency display as 100.5 to 120 mhz. Mental suppression of the first digit of the display is required and is easily accomplished with frequent usage. The operator selects the detection mode and bandwidths available on the receiver by using the receiver MODE and IF BANDWIDTH (kHz) controls. The receiver then passes the audio signal back to the hf upconverter/demodulator. The hf upconverter/demodulator then provides an audio signal to the speaker or headset.



2-14. OPERATING PROCEDURES

Five operational tasks may be performed with your direction finder set. The Net Control Element (NCE) will tell you which task you are to perform during your mission.

a. Monitoring a Vhf/Uhf Frequency. Your NCE may direct you to monitor a specific transmitter. His instructions will include the frequency and mode to which you must set your receiver. He may also specify the bandwidth at which you are to monitor the transmissions, the call sign of the target transmitter (if known), and the length of time you are to monitor the frequency. Performing your job will involve:

The procedures for monitoring specified frequency can be performed only after the direction finder units have been properly installed and initial adjustments made.

NOTE

Keep in mind:

- Target transmitters may be in a fixed position or mobile.
- Transmissions maybe invoice or digital signals.

2-14. OPERATING PROCEDURES - (Continued)

TUNING TO A FREQUENCY (SHEET 1 OF 8)

1. Rotate black TUNE knob (4) on receiver (5) until specified frequency shows on FREQUENCY MHz display (2).

2. Listen for transmissions and observe signal monitor screen (7) for signal spikes (6).

NOTE

When transmission is detected:

- Audible voice or digital information will be heard through the speaker.
- Signal spikes (6) will appear on signal monitor screen above noise/static baseline.

If signal monitor screen (7) indicates a signal spike (6) is present, but audio is garbled and unclear, perform 3 below.

3. Rotate MODE switch (3) to each switch setting until audio is clearest.

NOTE

Perform 4 below:

- If after performing 3 above, audio is still garbled and unclear.
- If signal monitor screen (7) indicates a continuous signal is present and audio transmission is unclear and broken.

4. Rotate IF BANDWIDTH (kHz) switch (l) on receiver (5) to each switch setting until audio is clear and unbroken.

5. Rotate IF BANDWIDTH (kHz) switch (l0) on df processor (11) to same setting as IF BANDWIDTH kHz (1) on receiver (5).

NOTE

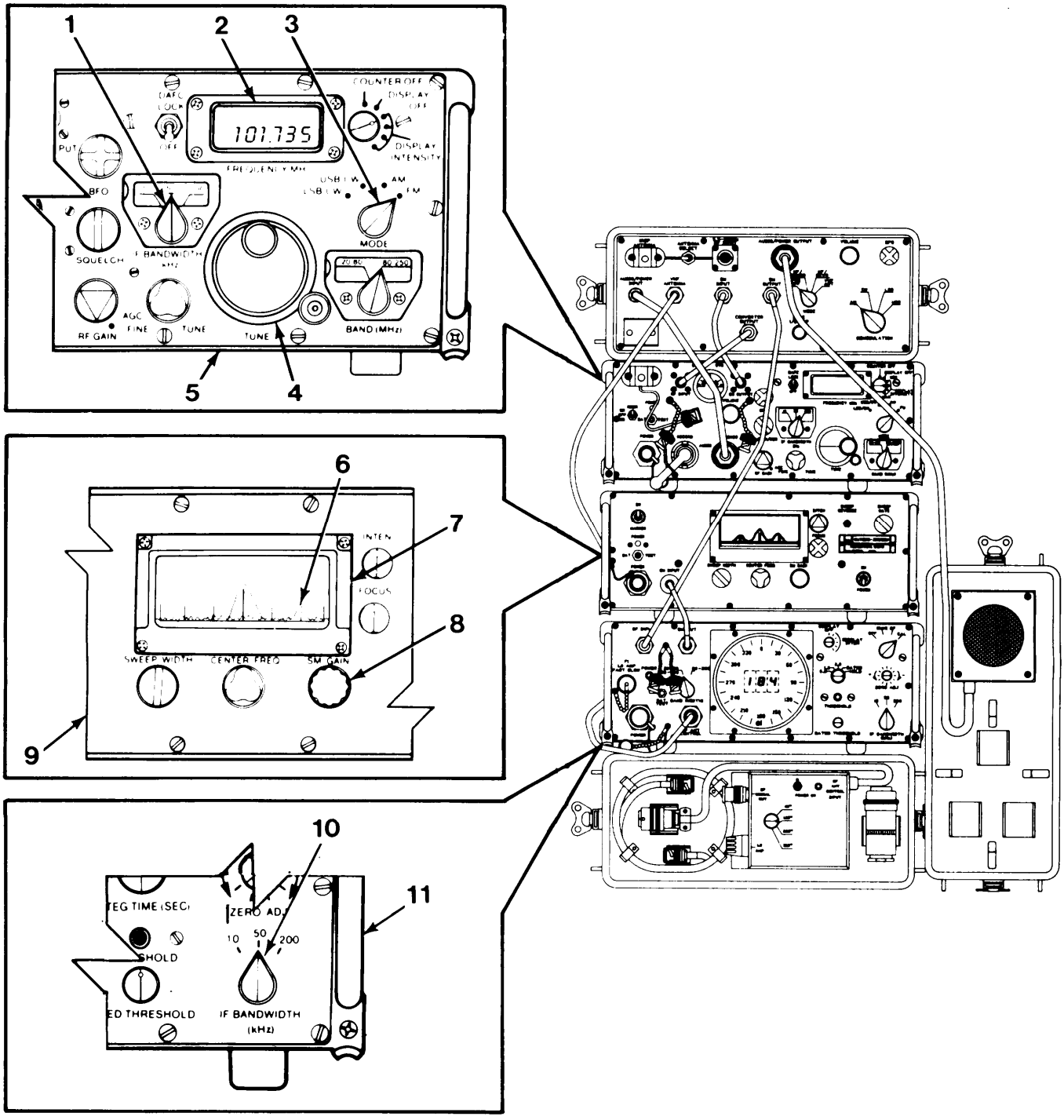
Perform 6 below while simultaneously observing signal monitor screen (7).

6. Rotate SM GAIN knob (8) on signal monitor (9) either clockwise or counterclockwise until signal (6) stands out clearly from noise/static baseline.

GO ON TO SHEET 2

2-14. OPERATING PROCEDURES - (Continued)

TUNING TO A FREQUENCY (SHEET 2 OF 8)



GO ON TO SHEET 3

2-14. OPERATING PROCEDURES - (Continued)

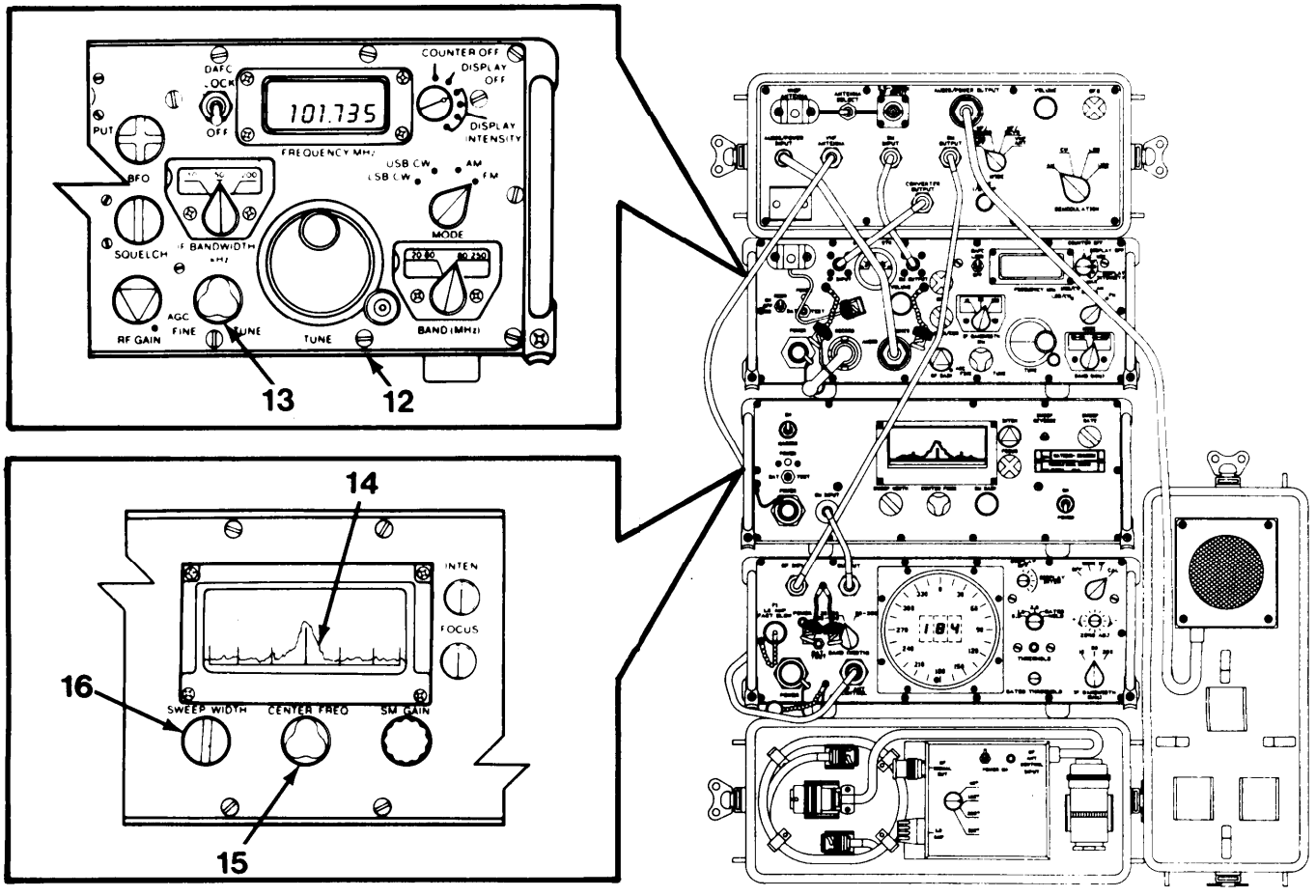
TUNING TO A FREQUENCY (SHEET 3 OF 8)

7. Rotate signal monitor SWEEP WIDTH knob (16) either clockwise or counterclockwise to widen out signal for best presentation and to locate center of signal (14).

8. Rotate FINE TUNE knob (13) on receiver (12) until center of detected signal is aligned with marker (14) as closely as possible.

NOTE

- Signal is aligned on marker (14) when signal is on top of marker (14) and both are fluctuating up and down.
- Overheating of the signal monitor may cause marker to drift slightly off center. Marker (14) must be checked often to be sure it is centered. Rotate orange CENTER FREQ knob (15) to recenter marker (14).



GO ON TO SHEET 4

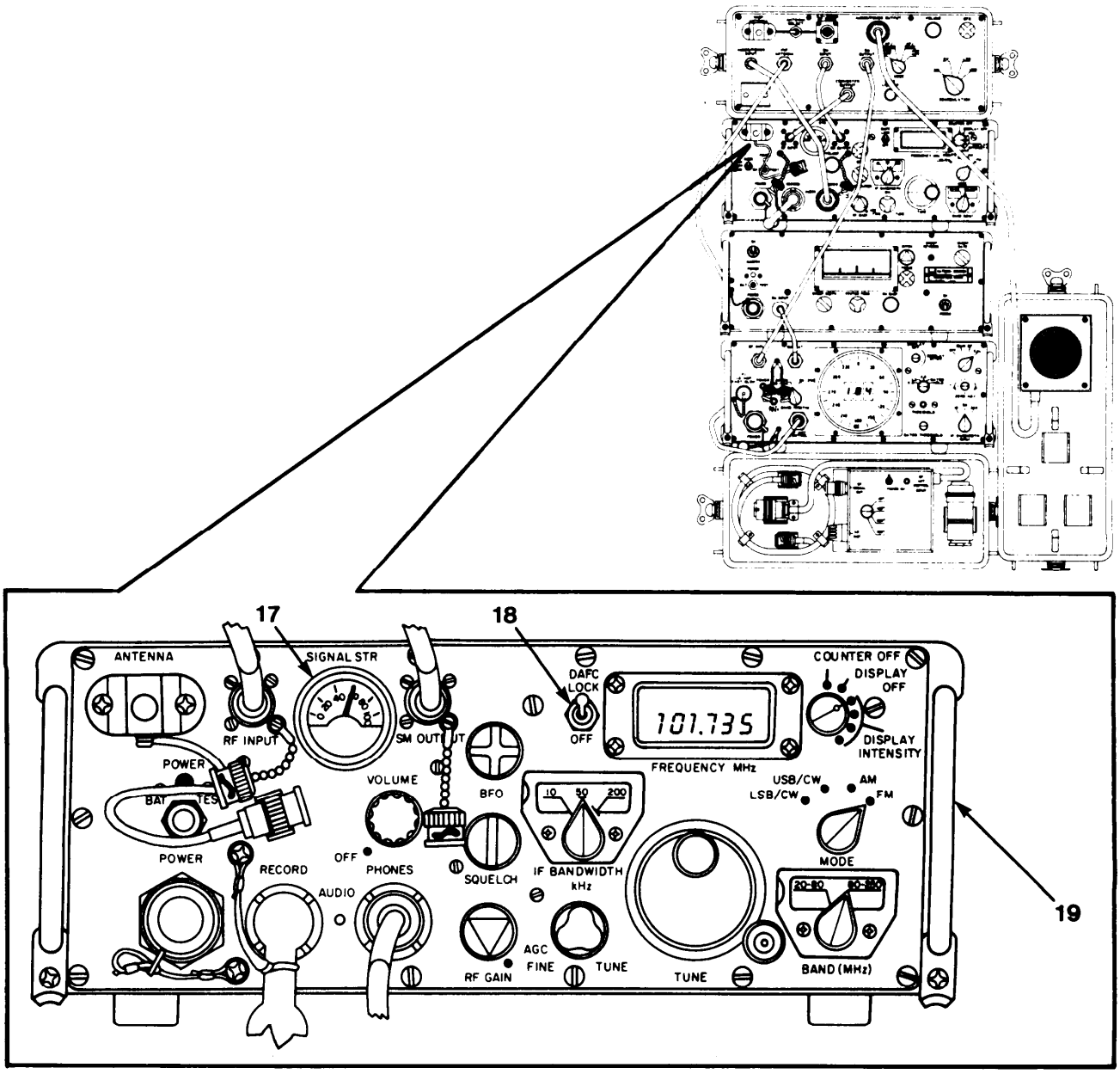
2-14. OPERATING PROCEDURES - (Continued)

TUNING TO A FREQUENCY (SHEET 4 OF 8)

9. Set DAFC LOCK toggle switch (18) on receiver (19) to LOCK.

NOTE
This action locks the frequency to prevent signal drift.

10. Observe SIGNAL STR meter (17) and ensure signal registers at least 60.



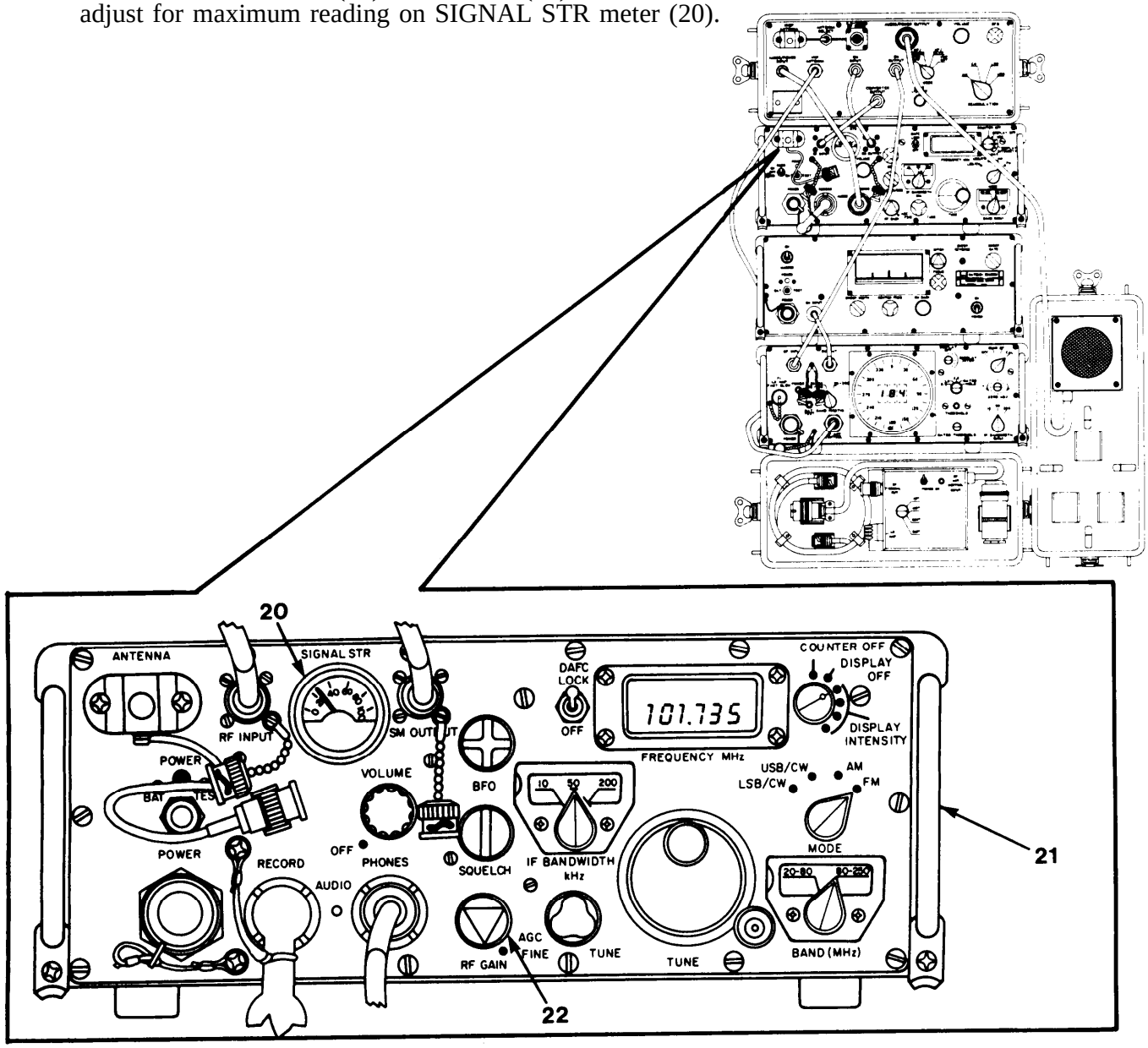
GO ON TO SHEET 5

2-14. OPERATING PROCEDURES - (Continued)

TUNING TO A FREQUENCY (SHEET 5 OF 8)

NOTE
Perform 11 below only if SIGNAL STR meter registers less than 60 or lobs on df processor show a variance of more than ± 3 degrees.

11. Turn RF GAIN switch (22) on receiver (21) counterclockwise out of AGC mode and adjust for maximum reading on SIGNAL STR meter (20).



GO ON TO SHEET 6

2-14. OPERATING PROCEDURES - (Continued)

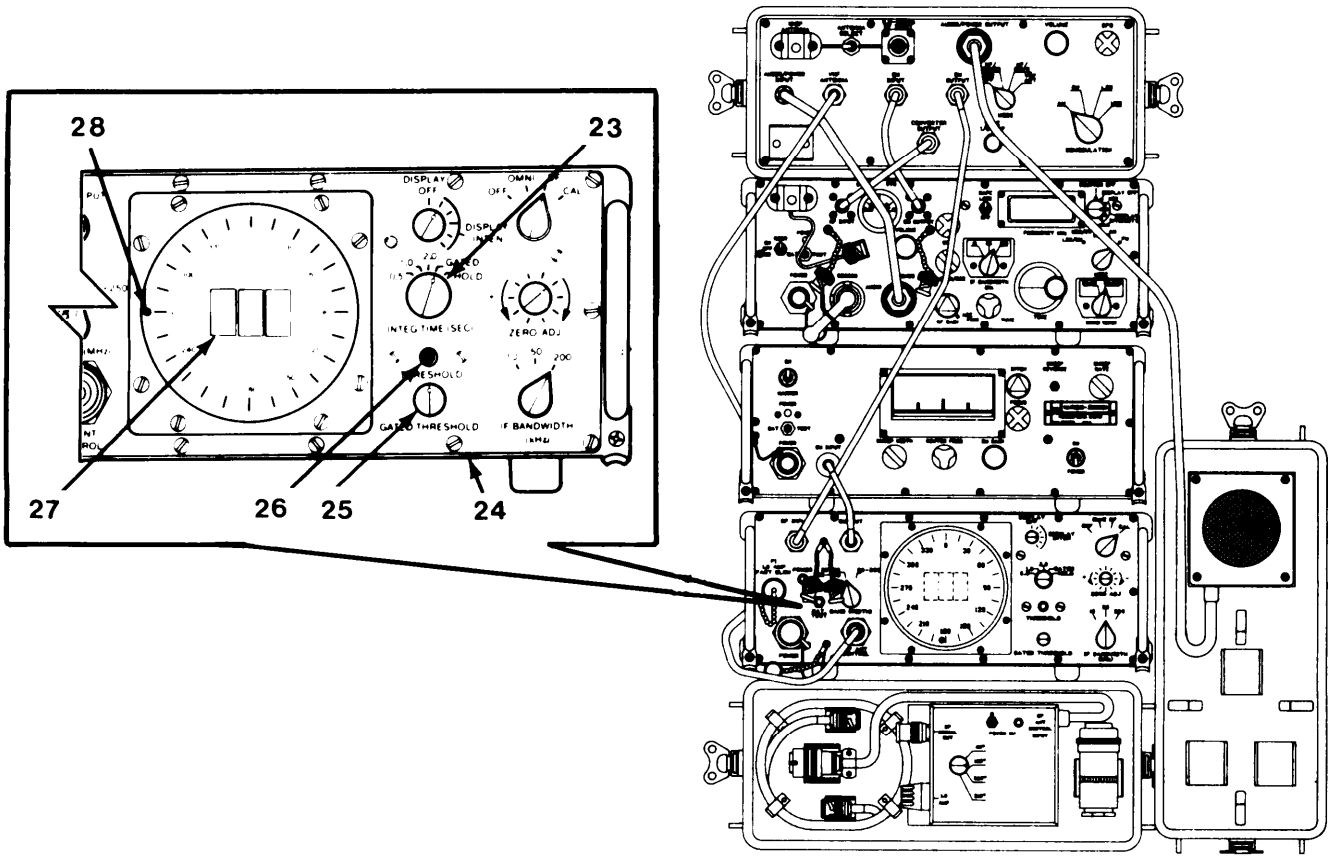
TUNING TO A FREQUENCY (SHEET 6 OF 8)

12. Observe yellow THRESHOLD lamp (26) on df processor (24) to ensure it is lit.

NOTE

- The THRESHOLD lamp (26) is difficult to see. If you have difficulty observing the THRESHOLD lamp (26), check to see that circular LEDs (28) are visible and numerical lob display (27) fluctuates slightly and then becomes stable within ± 3 degrees.
- If circular LEDs (28) are not visible and numerical lob display remains fixed, ensure INTEG TIME (SEC) switch (23) is set to GATED and perform 13 below.

13. Rotate GATED THRESHOLD knob (25) on df processor (24) clockwise until yellow THRESHOLD lamp (26) lights, circular LEDs (28) become visible and numerical lob (27) fluctuates slightly and then becomes stable within ± 3 degrees.



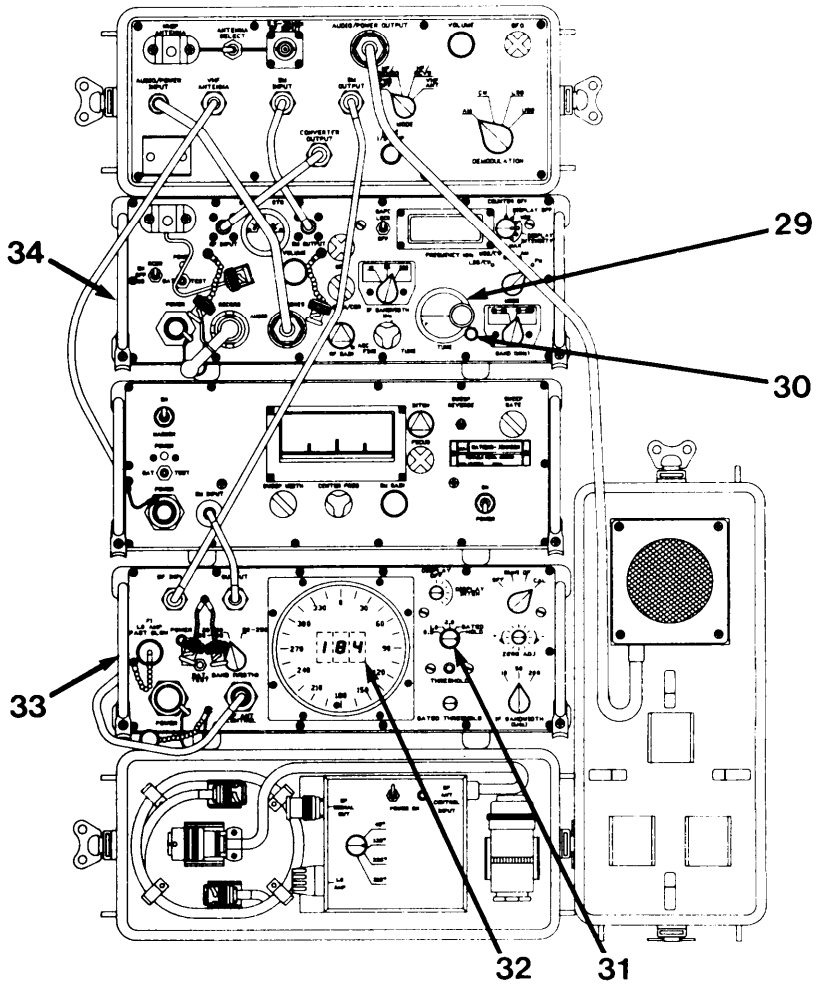
GO ON TO SHEET 7

2-14. OPERATING PROCEDURES - (Continued)

TUNING TO A FREQUENCY (SHEET 7 OF 8)

14. If a transmission ceases, observe numerical lob display (32) on df processor (33) and record.

NOTE
When transmission ceases, the GATED function holds the last processed lob in numerical lob display for that last transmission.



GO ON TO SHEET 8

2-14. OPERATING PROCEDURES - (Continued)

TUNING TO A FREQUENCY (SHEET 8 OF 8)

15. If a transmission continues, set INTEG TIME (SEC) switch (31) to 2.0.

NOTE

- The INTEG TIME (SEC) switch (31) selects the length of time in which the df processor (33) must integrate bearing data on the incoming signal. By resetting the INTEG TIME (SEC) switch (31) to 2.0, the df processor (33) has longer to process the incoming signal and average out excessive fm modulation before establishing a lob.
- If lob variance is greater than ± 3 degrees, when clear audio and a strong signal (greater than 60 on the signal strength meter) are present and when the signal is aligned with the marker, then either the target is not within line of sight, or reflection or re-radiation or refraction is occurring between df site and target.

16. Handtighten locking screw (30) on TUNE knob (29) of receiver (34) by turning clockwise.

NOTE

Tightening the locking screw (30) will prevent accidental change in frequency.

2-14. OPERATING PROCEDURES - (Continued)

MONITORING THE SIGNAL AND REPORTING TRANSMISSION DATA (SHEET 1 OF 2)

1. Listen to transmission, determine if target is of interest and identify call sign.

2. Observe numerical lob display (2) readout and circular LED (1) on df processor (3).

> NOTE
> During two way transmissions, the df processor will display lobs for each transmitter. In this situation, you will identify the call sign of each transmitter and determine lob of each.

3. If possible, record up to five consecutive numerical lob display (2) readouts for the target transmitter.

> NOTE
> Due to short transmissions, it may not be possible to record five consecutive numerical lob display readings. In these cases, record as many lobs as displayed.

4. Determine average lob by totaling five lobs and then dividing by five.

> NOTE
> If lobs indicate a near true north reading, the readings may fluctuate on each side of 000. This fluctuation will not allow you to average the lobs according to 4 above. In these cases:
>
> - Record five consecutive numerical lob display readings.
> - Add 360 to each lob with small degree numbers such as 001, 002, etc.
> - Total all five lob readings and divide by five to determine the average lob.
>
> If the resulting average is greater than 360, subtract 360 from the average to determine the average lob.

5. Record:

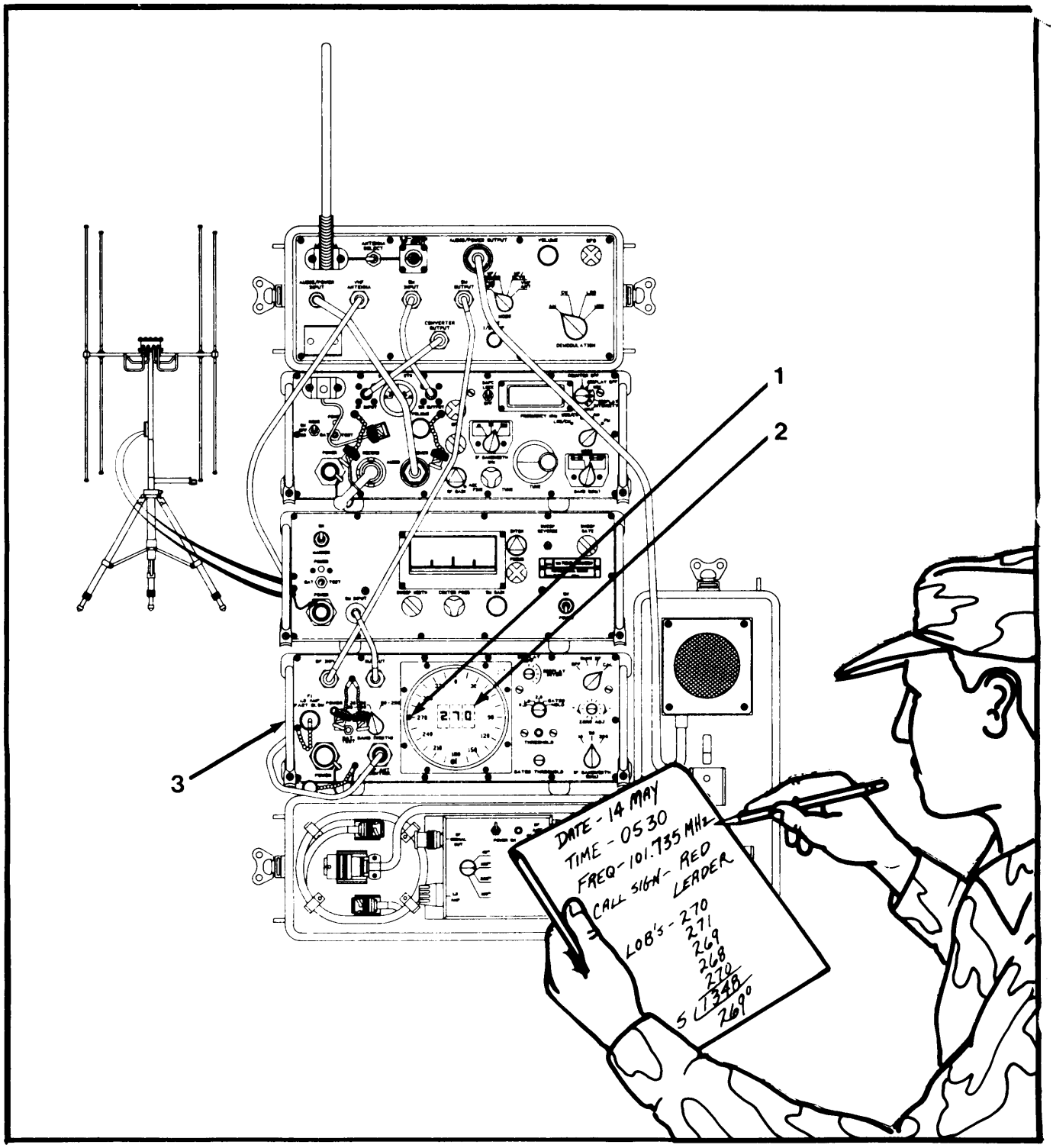
   - Time and date.
   - Frequency of each target transmitter.
   - Call signs of each transmitter.
   - Brief summary of each transmission.

6. Report intercept data to NCE.

7. Resume monitoring assigned frequency until asked to do otherwise.

2-14. OPERATING PROCEDURES - (Continued)

MONITORING THE SIGNAL AND REPORTING TRANSMISSION DATA (SHEET 2 0F 2)



2-14. OPERATING PROCEDURES - (Continued)

b. Searching a Vhf/Uhf Frequency Range. You will be directed to search a specified frequency range by the NCE. This involves:

- Searching and tuning in on a signal.
- Reporting transmission data.
- Resuming search.

(1) NCE instructions will include the lowest and highest frequencies of the range you are to search, the mode of transmission and the length of time you are to perform the search task.

(2) NCE may also specify priority frequencies within your frequency range. When the priority frequency is reached, it is recommended that it be monitored for at least 2 minutes before continuing your searching task. The cycle of searching and monitoring priority frequencies will be continuously repeated. Not all priority frequencies have signal activity, but each one must be regularly monitored in case it becomes active.

NOTE
The procedures for searching a frequency range can be performed only after the direction finder units have been properly installed and initial adjustments made.

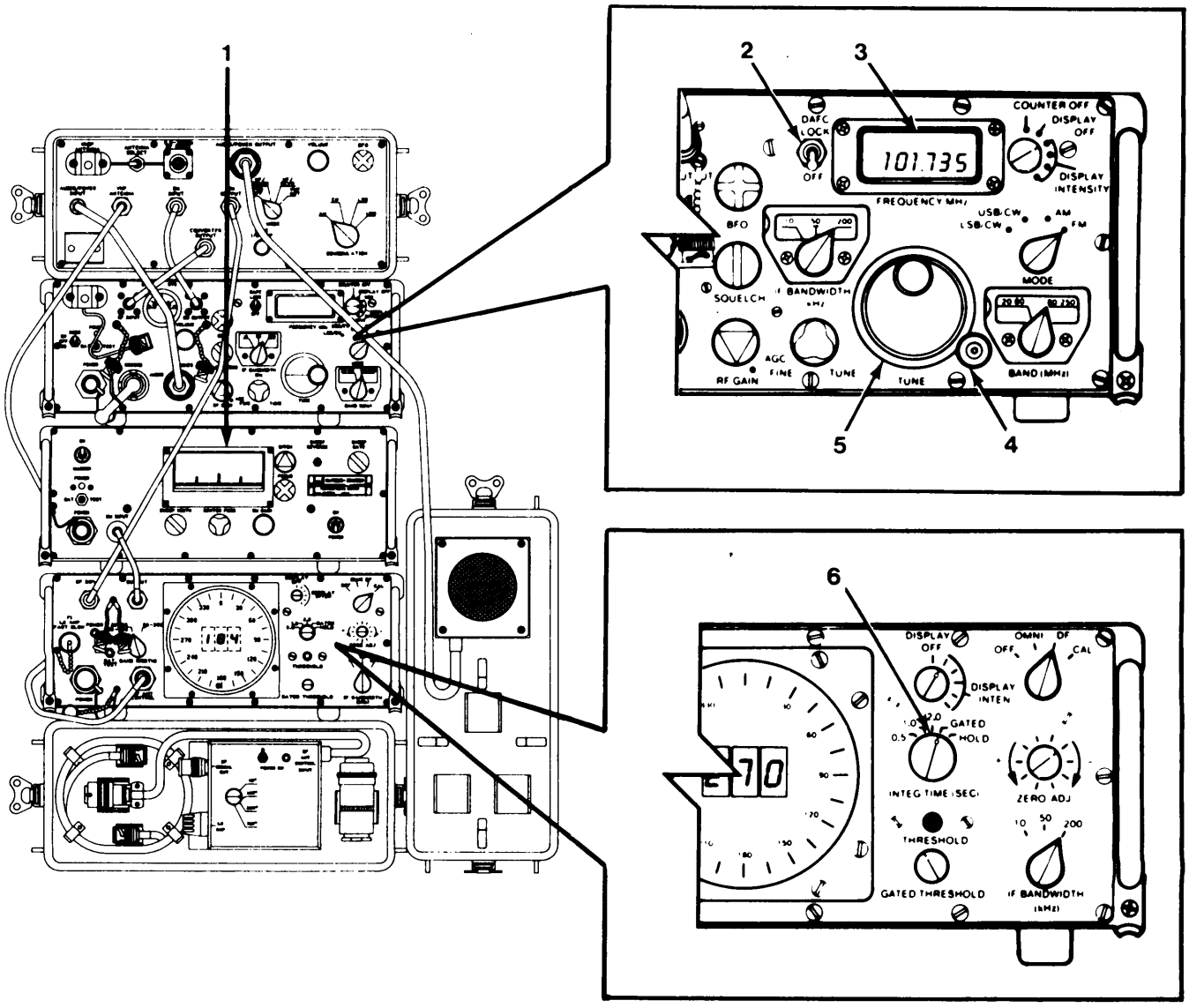
2-14. OPERATING PROCEDURES - (Continued)

SEARCHING A FREQUENCY RANGE (SHEET 1 OF 2)

1. Rotate TUNE knob (5) on receiver until FREQUENCY MHz display (3) shows lowest frequency of assigned range.

2. Rotate TUNE knob (5) on receiver clockwise to begin upward search of assigned frequency range.

3. Listen for signals while observing signal monitor screen (1) on signal monitor for activity.



GO ON TO SHEET 2

2-14. OPERATING PROCEDURES - (Continued)

SEARCHING A FREQUENCY RANGE (SHEET 2 OF 2)

4. Stop rotating TUNE knob (5) on receiver when first priority frequency appears on FREQUENCY MHZ display (3).

5. Listen for signal and watch for signal activity on signal monitor screen (1) for the required time.

6. If no signal is detected, continue to slowly tune through frequency range while listening for signal.

7. As each priority frequency appears on FREQUENCY MHz display (3), repeat 5 and 6 above.

NOTE
If a signal is detected on an unknown frequency through searching, perform 8 below.

8. Rotate TUNE knob (6) on receiver so that signal is centered on marker.

NOTE
If a signal is detected on a priority frequency or an unknown frequency through searching, perform 9 below.

9. Perform procedures for tuning to a frequency in paragraph 2-14a beginning with step 2.

10. Set DAFC LOCK switch (2) on receiver to OFF.

11. Set INTEG TIME (SEC) switch (6) on df processor to GATED.

12. Loosen locking screw (4) at lower edge of TUNE knob (5) on receiver by turning counterclockwise.

13. Continue to slowly tune through frequency range.

14. When upward limit of assigned frequency range is reached, rotate TUNE knob (5) on receiver counterclockwise to lower limit and repeat 2 through 13 above.

2-14. OPERATING PROCEDURES - (Continued)

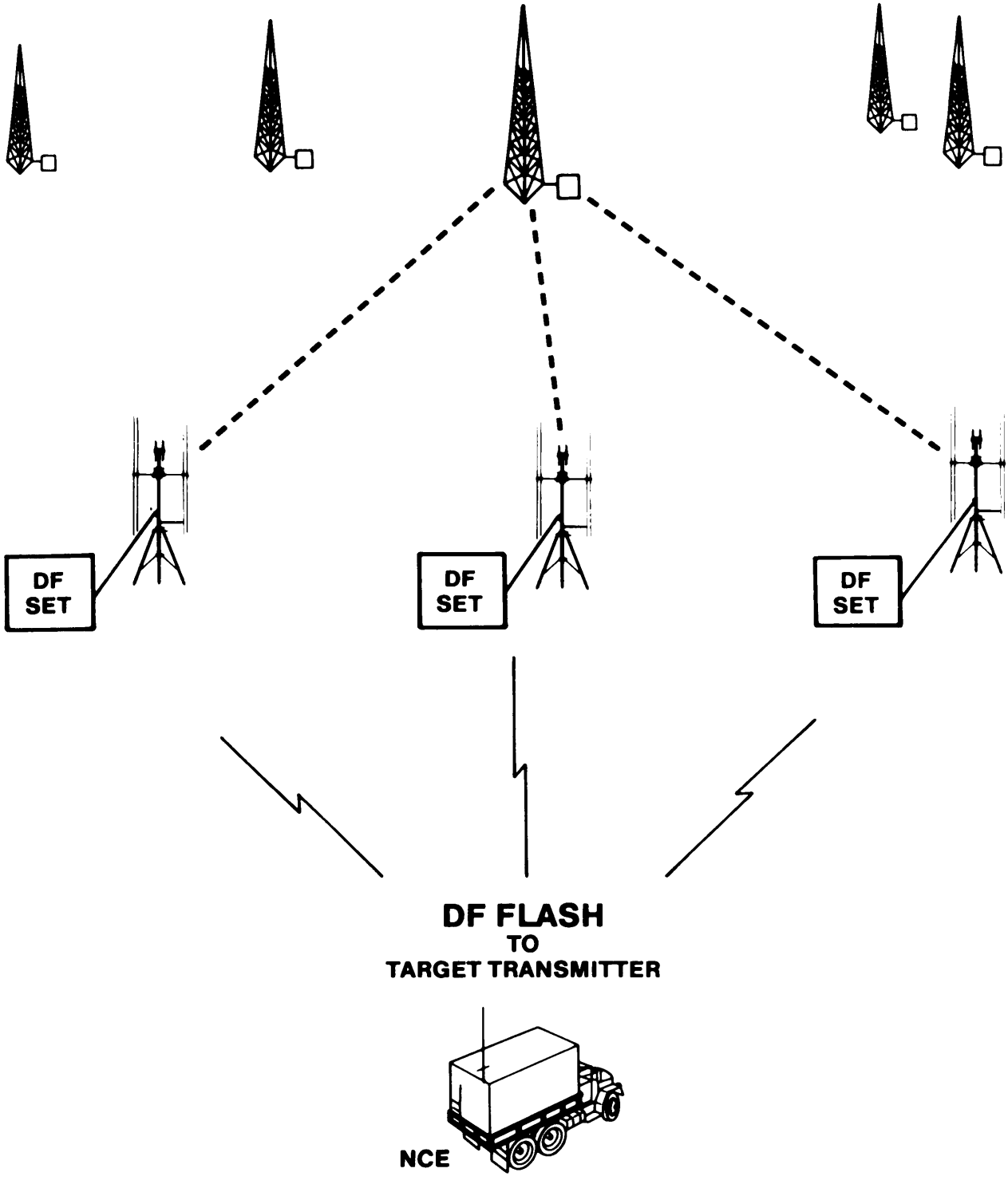
c. Responding To A Vhf/Uhf Df Flash. At any point in your monitoring or searching mission, NCE may send out a df flash. A df flash is a net command that requires each direction finder station to immediately:

- Stop searching or monitoring assigned frequency.
- Tune to and monitor a specific frequency.
- Obtain and report a lob of the specific frequency.

Lobs from each direction finder station will be processed at NCE station to obtain a df fix on target transmitter.

2-14. OPERATING PROCEDURES - (Continued)

RESPONDING TO A DF FLASH (SHEET 1 OF 3)

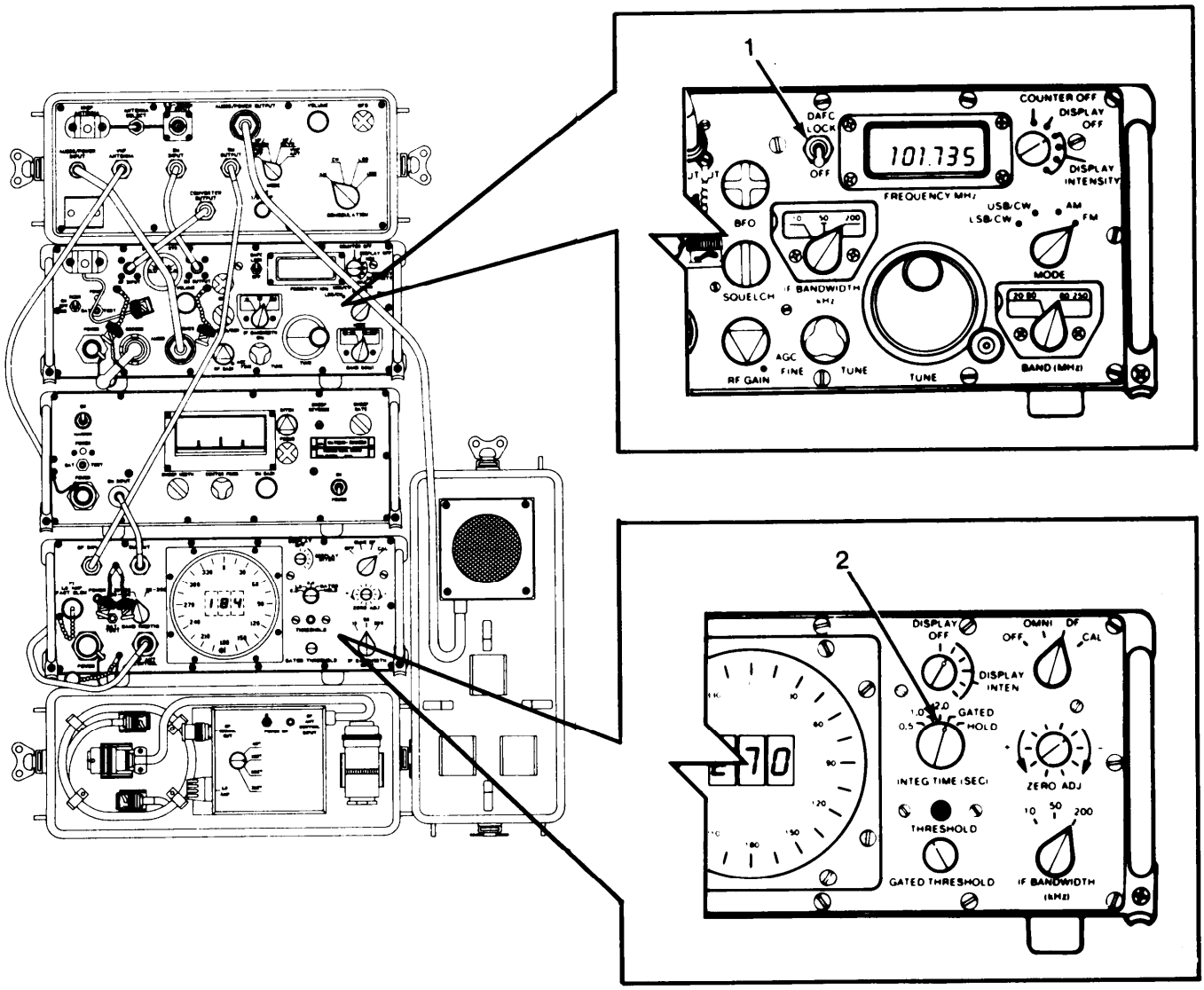


GO ON TO SHEET 2

2-14. OPERATING PROCEDURES - (Continued)

RESPONDING TO A DF FLASH (SHEET 2 OF 3)

1. Set DAFC LOCK switch (1) on receiver to OFF.
2. Set INTEG TIME (SEC) switch (2) on df processor to GATED.



3. Tune to specified frequency by following procedures listed in Paragraph 14a.

GO ON TO SHEET 3

2-14. OPERATING PROCEDURES - (Continued)

RESPONDING TO A DF FLASH (SHEET 3 OF 3)

4. When locked onto specified frequency, listen for call sign.

5. Record five consecutive numerical lob display (4) readouts.

6. Determine average lob by totaling five lobs and then dividing by five.

NOTE

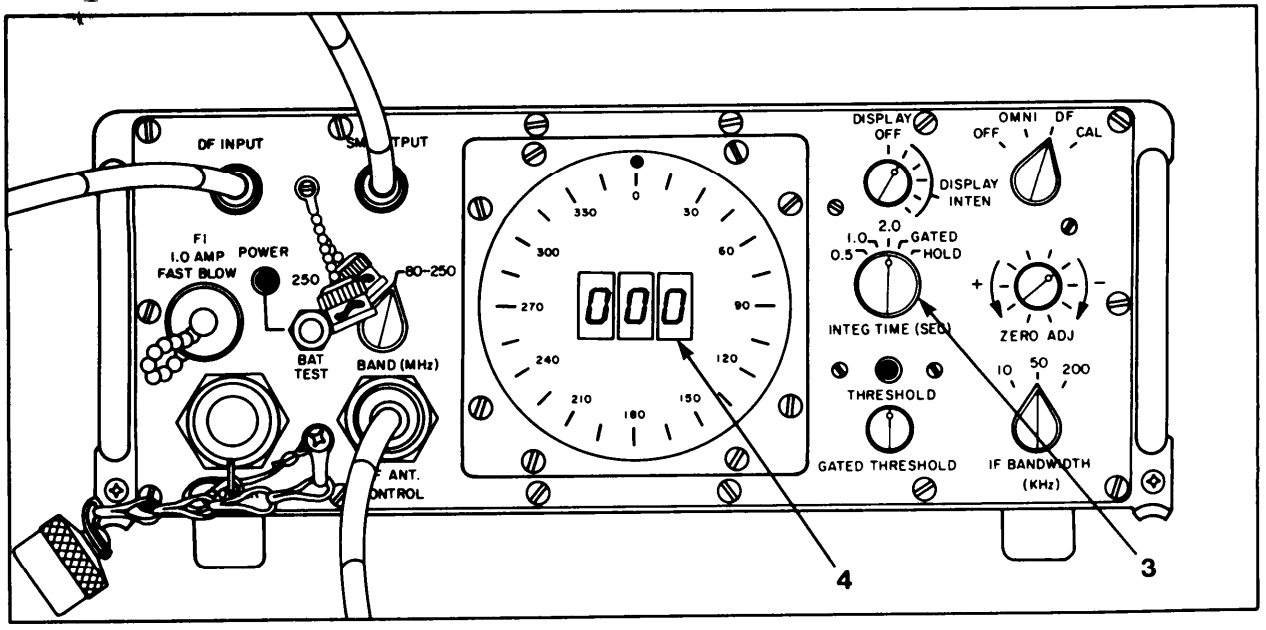
If lobs indicate a near true north reading, the readings may fluctuate on each side of 000. This fluctuation will not allow you to average the lobs according to 6 above. in these cases:

- Record five consecutive lob readings.
- Add 360 to each lob with small degree numbers such as 00l, 002, etc.
- Total all five lob readings and divide by 5 to determine the average lob.

If the resulting average is greater than 360, subtract 360 from the average to determine the average lob.

7. If time permits, set INTEG TIME (SEC) switch (3) on df processor to 2.0 and repeat 5 and 6 above.

8. Report call sign and lob to NCE.



2-14. OPERATING PROCEDURES - (Continued)

d. Monitoring a Hf Frequency. Monitoring a hf frequency may be accomplished In either the HF/RCVR mode or the HF/DEMOD mode. The procedures for monitoring the signal, reporting transmission data, and searching hf frequency range are identical to those procedures discussed in the preceding paragraphs and will not be covered again in this section of the technical manual. You will not be required to respond to a df flash in the hf frequency spectrum, since the AN/PRD-11 hf frequency capability is limited to intercept operations only. Monitoring a hf frequency will involve:

The procedures for monitoring a specified hf frequency can be performed only after the direction finder units have been properly installed and initial adjustments for hf operation have been made.

2-14. OPERATING PROCEDURES - (Continued)

TUNING TO A FREQUENCY (HF/RCVR MODE) - (SHEET 1 OF 6)

NOTE
- In the HF/RCVR mode, the hf upconverter provides a .5 to 20 mhz signal to the receiver. The frequency is read on the receiver frequency display as 100.5 to 120 mhz. Mental suppression of the first digit of the display is required and is easily accomplished with frequent usage. The operator selects the detection mode and bandwidth available on the receiver by using the receiver MODE and IF BANDWIDTH kHz controls. The receiver then passes the audio signal back to the hf upconverter/demodulator. The hf upconverter/ demodulator then provides an audio signaI to the speaker or headset.
- Remember to set the hf upconverter/demodulator MODE switch to the HF/RCVR mode during the initial control settings

1. Rotate black TUNE knob (4) on receiver (10) until specified frequency shows on FREQUENCY MHZ display (1).

2. Listen for transmissions and observe signal monitor screen (9) for signal spikes (8).

NOTE
When transmission is detected:
- Audible voice or digital information will be heard through the speaker.
- Signal spikes will appear on signal monitor screen above noise/static baseline.

If signal monitor screen (9) indicates a signal spike is present, but audio is garbled and unclear, perform 3 below.

3. Rotate receiver MODE switch (3) to each switch setting until audio is clearest.

NOTE
Perform 4 below:
- If after performing 3 above, audio is still garbled and unclear.
- If signal monitor screen (9) indicates a continuous signal is present and audio transmission is unclear and broken.

GO ON TO SHEET 2

2-14. OPERATING PROCEDURES - (Continued)

TUNING TO A FREQUENCY (HF/RCVR MODE) - (SHEET 2 OF 6)

4. Rotate IF BANDWIDTH (kHz) switch (2) on receiver (10) to each switch setting until audio is clear and unbroken.

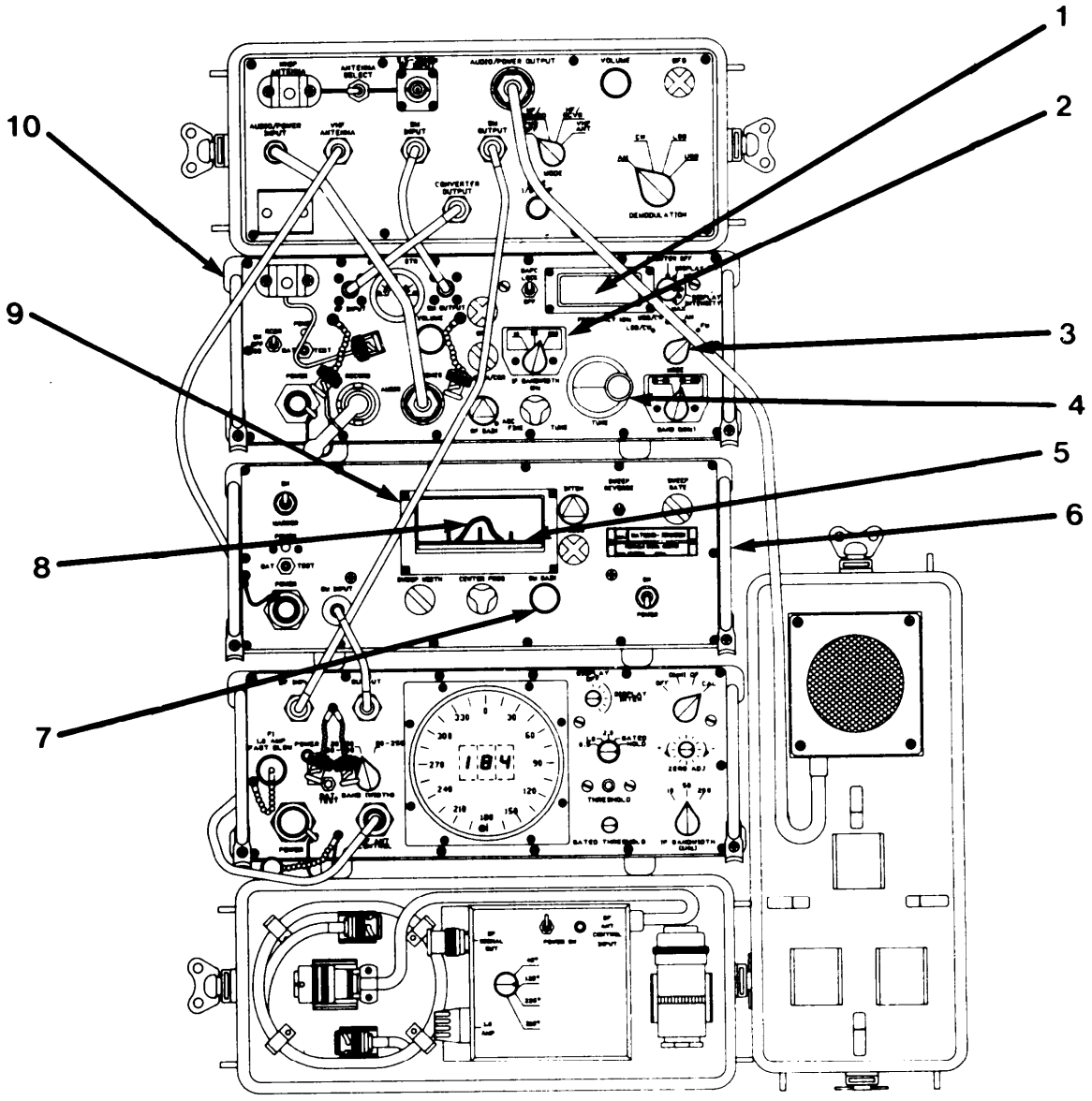
NOTE
Perform 5 below while simultaneously observing signal monitor screen (9).

5. Rotate SM GAIN knob (7) on signal monitor (6) either clockwise or counterclockwise until signal (8) stands out clearly from noise/static baseline (5).

GO ON TO SHEET 3

2-14. OPERATING PROCEDURES - (Continued)

TUNING TO A FREQUENCY (HF/RCVR MODE) - (SHEET 3 OF 6)



GO ON TO SHEET 4

2-14. OPERATING PROCEDURES - (Continued)

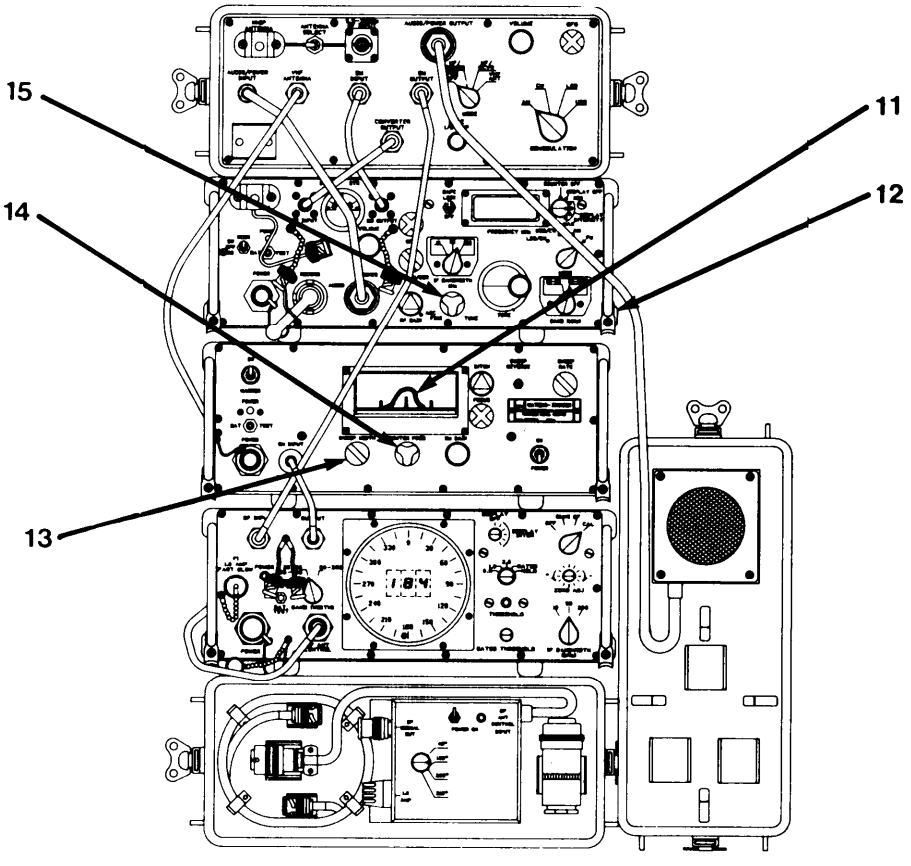
TUNING TO A FREQUENCY (HF/RCVR MODE) - (SHEET 4 OF 6)

6. Rotate SWEEP WIDTH knob (13) either clockwise or counterclockwise to widen out signal for best presentation and to locate center of signal.

7. Rotate FINE TUNE knob (15) on receiver (12) until center of detected signal is aligned with marker (11) as closely as possible.

NOTE

- Signal is aligned on marker (11) when signal is on top of marker (11) and both are fluctuating up and down.
- Overheating of the signal monitor may cause marker to drift slightly off center. Marker (11) must be checked often to be sure it is centered. Rotate orange CENTER FREQ knob (14) to recenter marker (11).



GO ON TO SHEET 5

2-14. OPERATING PROCEDURES - (Continued)

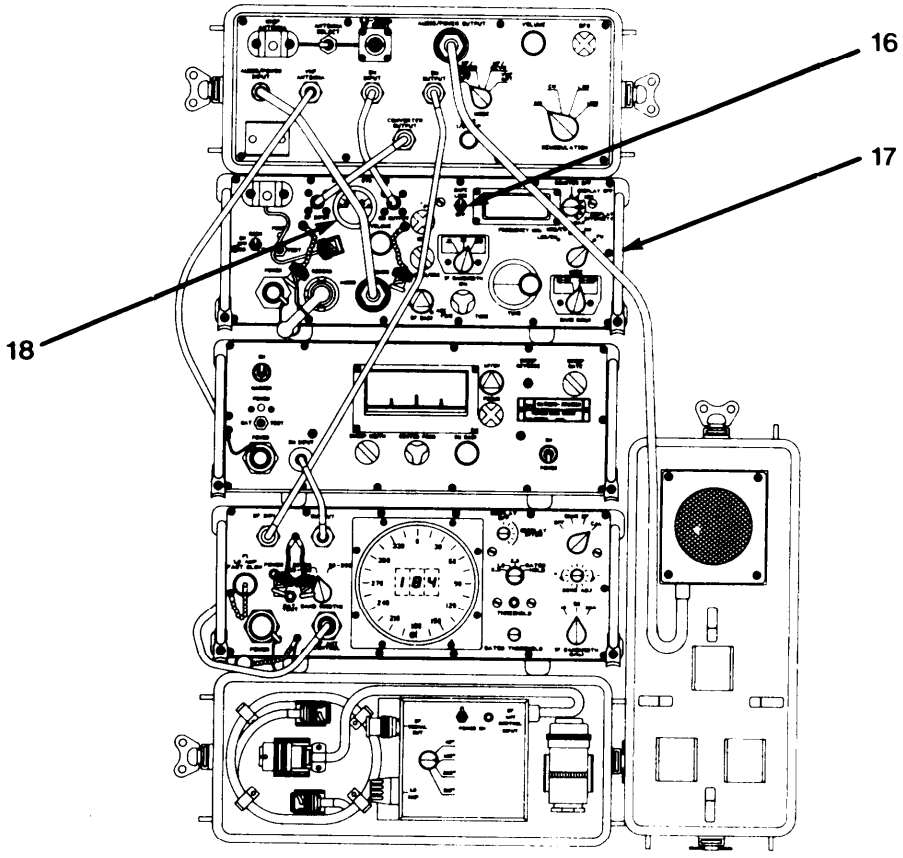
TUNING TO A FREQUENCY (HF/RCVR MODE) - (SHEET 5 OF 6)

8. Set DAFC LOCK toggle switch (16) on receiver (17) to LOCK.

NOTE

This action locks the frequency to prevent signal drift.

9. Observe SIGNAL STR meter (18) and ensure signal registers at least 60.



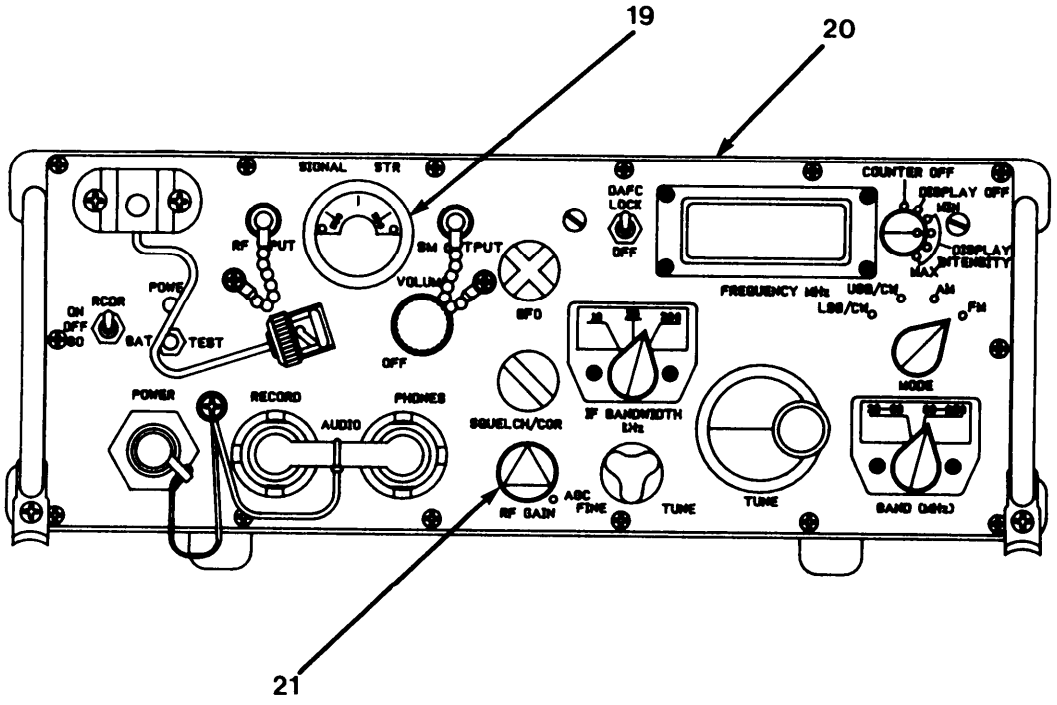
GO ON TO SHEET 6

2-14. OPERATING PROCEDURES - (Continued)

TUNING TO A FREQUENCY (HF/RCVR MODE) - (SHEET 6 OF 6)

NOTE
Perform 10 below only if SIGNAL STR meter registers less than 60.

10. Turn RF GAIN switch (21) on receiver (20) counterclockwise out of AGC mode and adjust for maximum reading on SIGNAL STR meter (19).



2-14. OPERATING PROCEDURES - (Continued)

TUNING TO A FREQUENCY (HF/DEMOD MODE) - (SHEET 1 OF 5)

NOTE

- In the HF/DEMOD mode, the hf upconverter provides a .5 to 20 mhz signal to the receiver. The frequency is read on the receiver frequency display as 100.5 to 120 mhz. Mental suppression of the first digit of the display is required and is easily accomplished with frequent usage. The receiver then providesa 10 mhz if. signal back to the hf upconverter/demodulator and the operator selects the detection mode and preset bandwidths with the DEMODULATION control on the hf upconverter/demodulator. The hf upconverter/ demodulator then provides an audio signal to the speaker or headset.
- Remember to set the hf upconverter/demodulator MODE switch to the HF/DEMOD mode during the initial control settings

1. Rotate black TUNE knob (4) on receiver (9) until specified frequency shows on FREQUENCY MHZ display (3).

2. Listen for transmissions and observe signal monitor screen (8) for signal spikes (8).

NOTE

When transmission is detected:

- Audible voice or digital information will be heard through the speaker.
- Signal spikes will appear on signal monitor screen above noise/static baseline.

If signal monitor screen (8) indicates a signal spike is present, but audio is garbled and unclear, perform 3 below.

3. Rotate MODE switch (2) on hf upconverter/demodulator (1) to each switch setting until audio is clearest.

NOTE

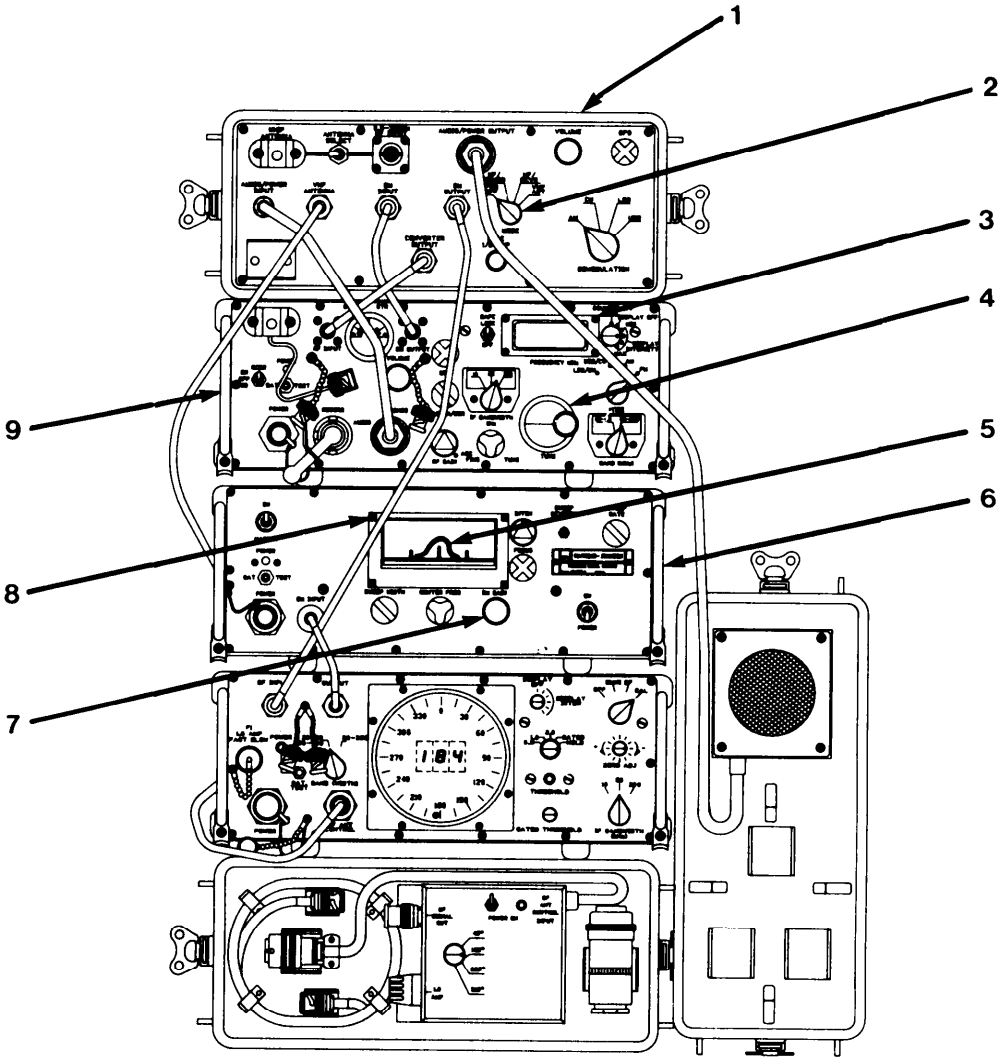
Perform 4 below while simultaneously observing signal monitor screen (8).

4. Rotate SM GAIN knob (7) on signal monitor (6) either clockwise or counterclockwise until signal (5) stands out clearly from noise/static baseline.

GO ONTO SHEET 2

2-14. OPERATING PROCEDURES - (Continued)

TUNING TO A FREQUENCY (HF/DEMOD MODE) - (SHEET 2 OF 5)



GO ON TO SHEET 3

2-14. OPERATING PROCEDURES - (Continued)

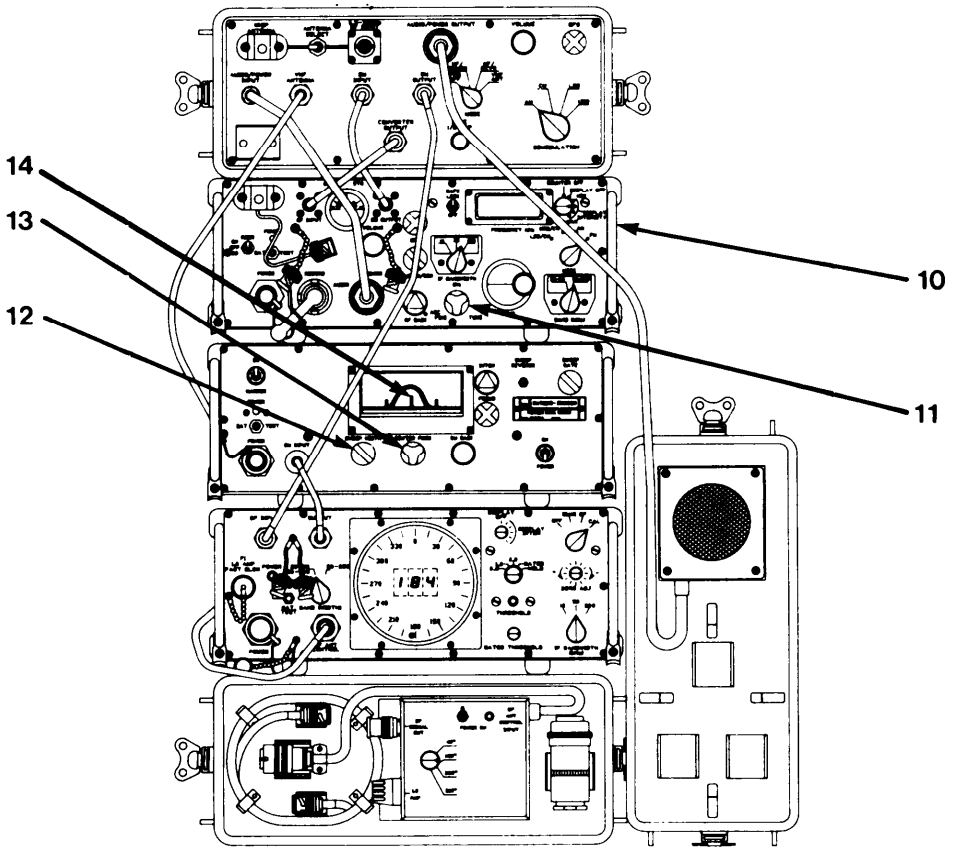
TUNING TO A FREQUENCY (HF/DEMOD MODE) - (SHEET 3 OF 5)

5. Rotate SWEEP WIDTH knob (12) either clockwise or counterclockwise to widen out signal for best presentation and to locate center of signal.

6. Rotate FINE TUNE knob (11) on receiver (10) until center of detected signal is aligned with marker (14) as closely as possible.

NOTE

- Signal is aligned on marker (14) when signal is on top of marker (14) and both are fluctuating up and down.
- Overheating of the signal monitor may cause marker to drift slightly off center. Marker (14) must be checked often to be sure it is centered. Rotate orange CENTER FREQ knob (13) to recenter marker (14).



GO ON TO SHEET 4

2-14. OPERATING PROCEDURES - (Continued)

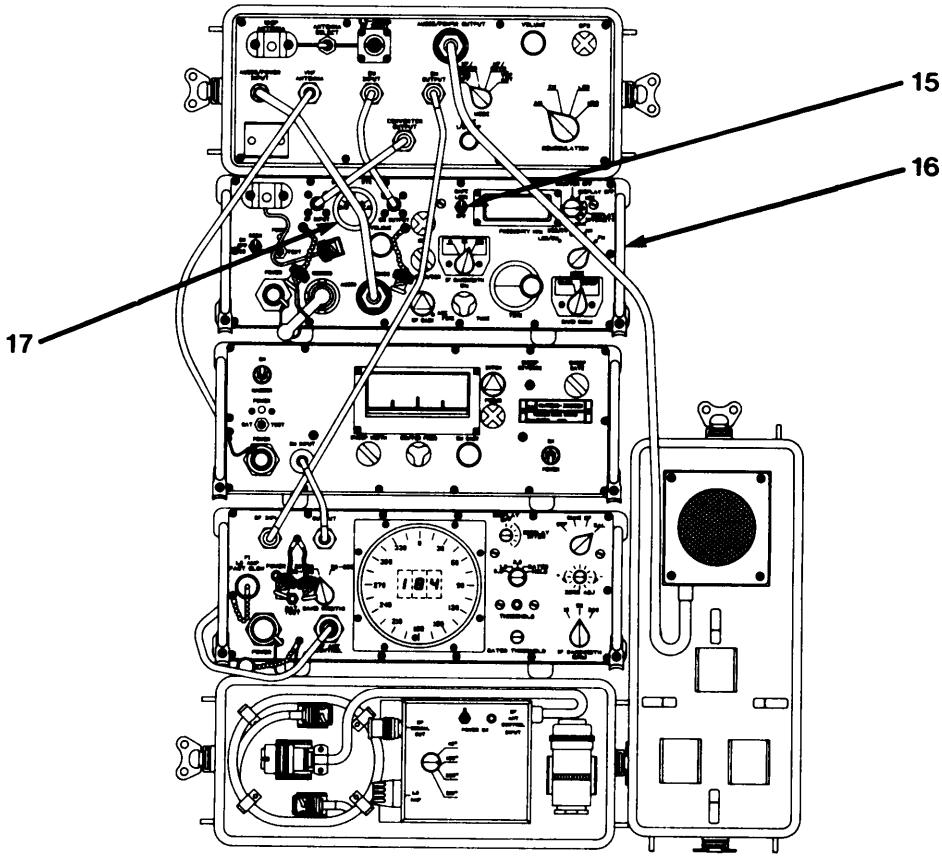
TUNING TO A FREQUENCY (HF/DEMOD MODE) - (SHEET 4 OF 5)

7. Set DAFC LOCK toggle switch (15) on receiver (16) to LOCK.

NOTE

This action locks the frequency to prevent signal drift.

8. Observe SIGNAL STR meter (17) and ensure signal registers at least 60.



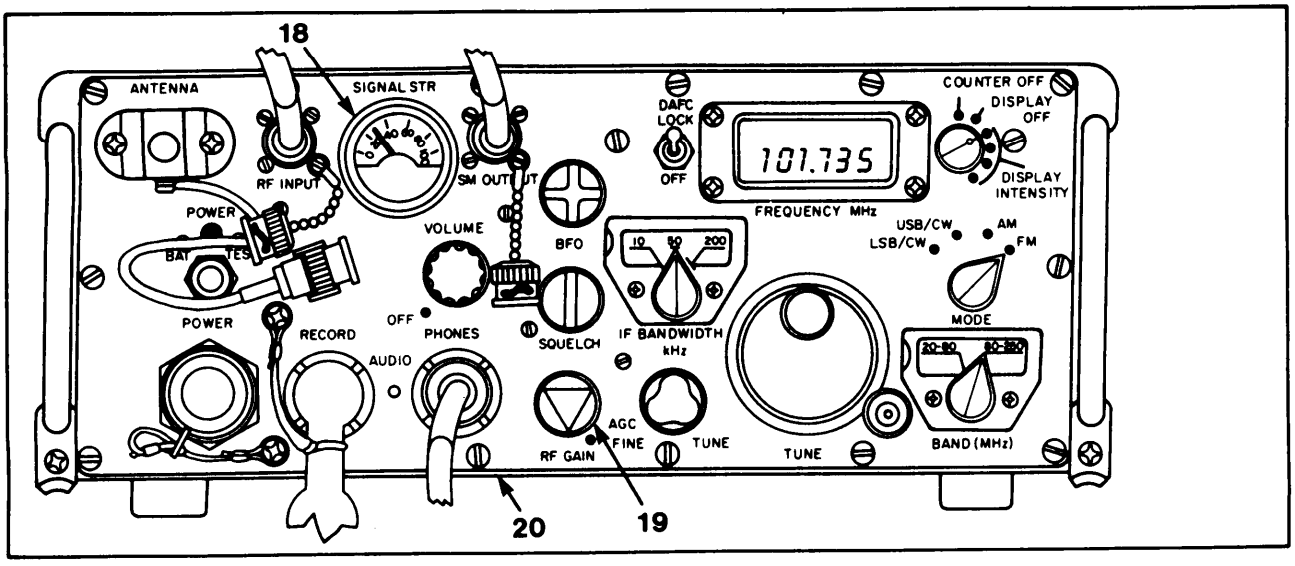
GO ON TO SHEET 5

2-14. OPERATING PROCEDURES - (Continued)

TUNING TO A FREQUENCY HF/DEMOD MODE) - (SHEET 5 OF 5)

NOTE
Perform 9 below only if SIGNAL STR meter registers less than 60.

9. Turn RF GAIN switch (19) on receiver (20) counterclockwise out of AGC mode and adjust for maximum reading on SIGNAL STR meter (18).



2-15. PREPARATION FOR MOVEMENT

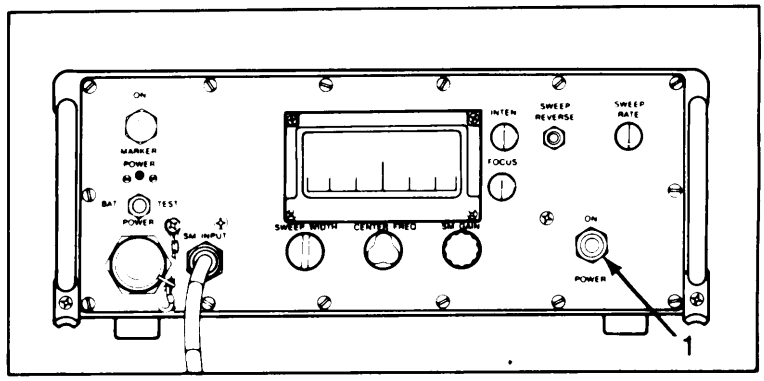
Preparation for movement consists of the tear down procedures used when you df location is to be changed or when the df mission is over. You will perform these procedures only after receiving a directive to do so from the NCE. Preparation for movement includes:

a. Displacing Units. Displacing units includes the procedures which must be performed to prepare the receiver, df processor and signal monitor for movement. Only one crew member is required to tear the units down. These procedures include:

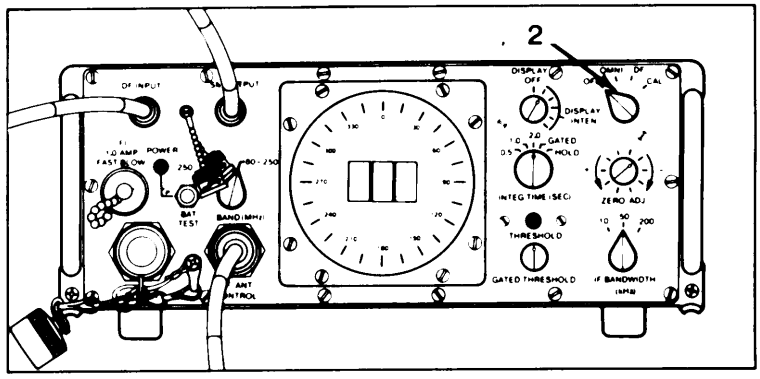
2-15. PREPARATION FOR MOVEMENT - Continued

POWERING DOWN UNITS (SHEET 1 OF 2)

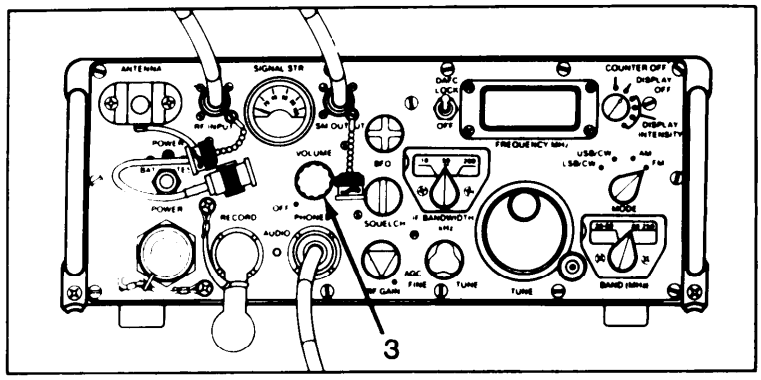
1. Set ON/POWER switch (1) on signal monitor to OFF position.



2. Rotate OFF/OMNI/DF/CAL switch (2) on df processor to OFF.



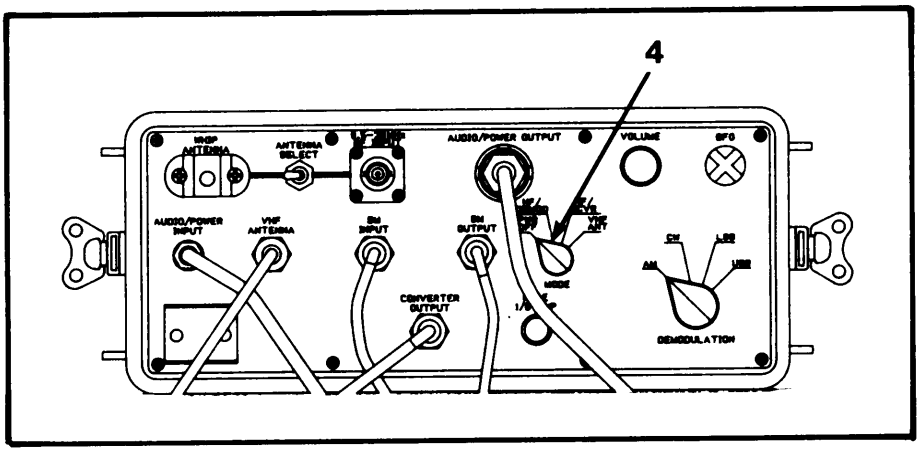
3. Rotate red VOLUME switch (3) on receiver fully counterclockwise until it clicks.



2-15. PREPARATION FOR MOVEMENT - Continued

POWERING DOWN UNITS (SHEET 2 OF 2)

4. Set MODE switch (4) on hf upconverter/ demodulator to PWR OFF position.



2-15. PREPARATION FOR MOVEMENT - Continued

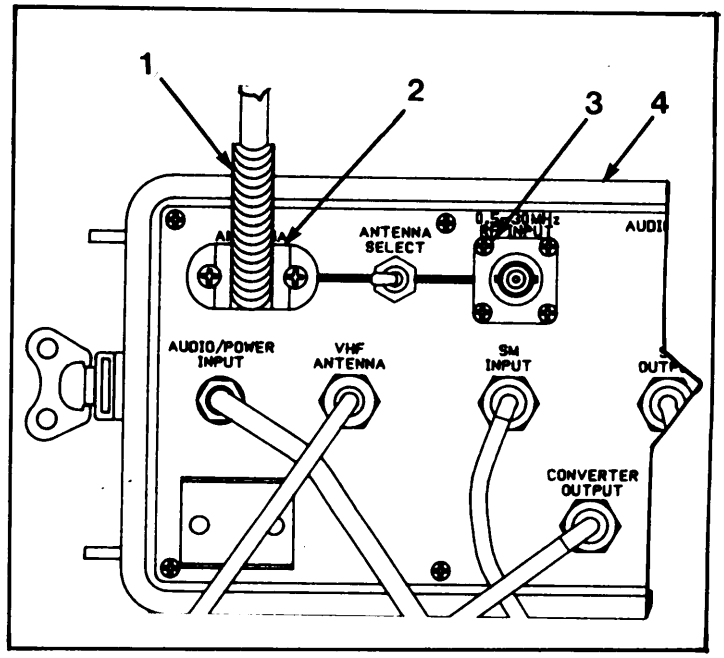
DISCONNECTING CABLES (SHEET 1 OF 7)

1. Remove hf whip antenna (1) from WHIP ANTENNA connector (2) on hf upconverter/demodulator (4) by turning counterclockwise and set whip antenna aside to be placed in the antenna bag later.

   AND/OR

   Loosen bnc connector at 0.5 to 30 MHz RF INPUT (3) on hf upconverter/demodulator (4) by turning connector collar 1/4 turn counterclockwise.

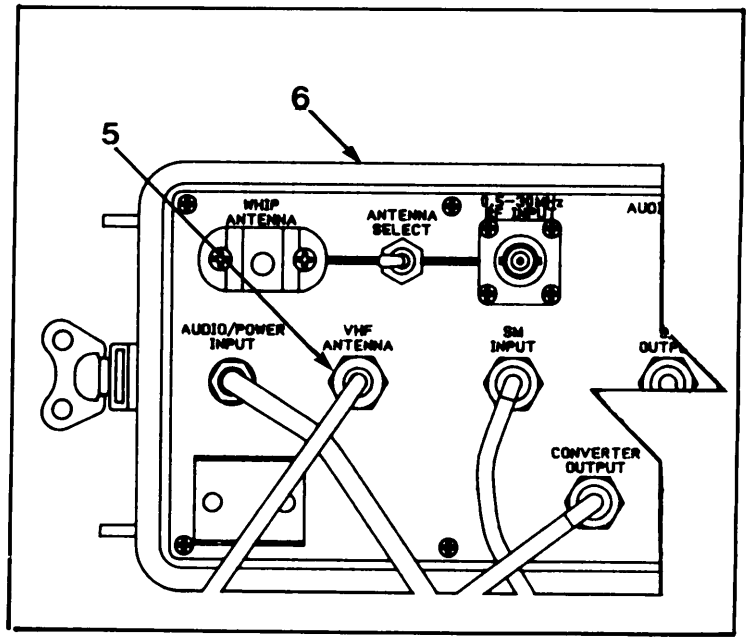
   Pull bnc connector off of 0.5 to 30 MHz RF INPUT (3).



NOTE
Disconnect cables only after direction finder units have been powered down.

2. Loosen rf cable bnc connector at VHF ANTENNA (5) on hf upconverter/demodulator (6) by turning connector collar 1/4 turn counterclockwise.

3. Pull connector off of VHF ANTENNA (5).



GO TO SHEET 2

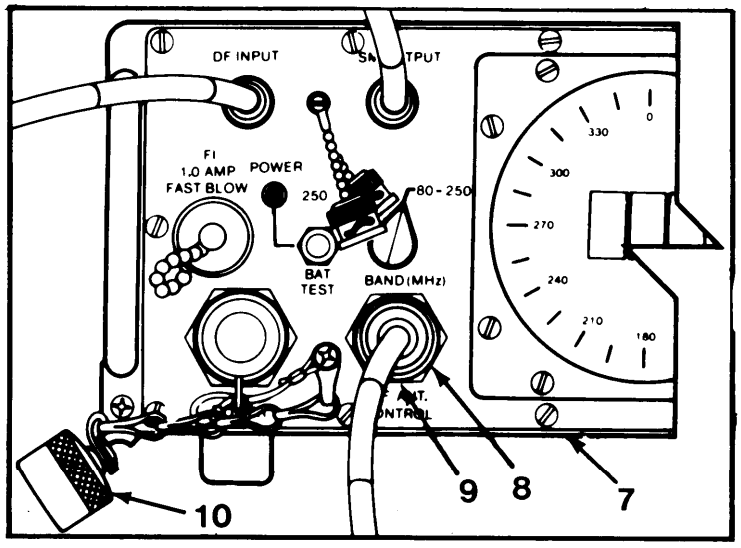
2-15. PREPARATION FOR MOVEMENT - Continued

DISCONNECTING CABLES (SHEET 2 OF 7)

4. Loosen df cable connector at DF ANT. CONTROL (9) on df processor (7) by turning connector collar 1/4 turn counterclockwise.

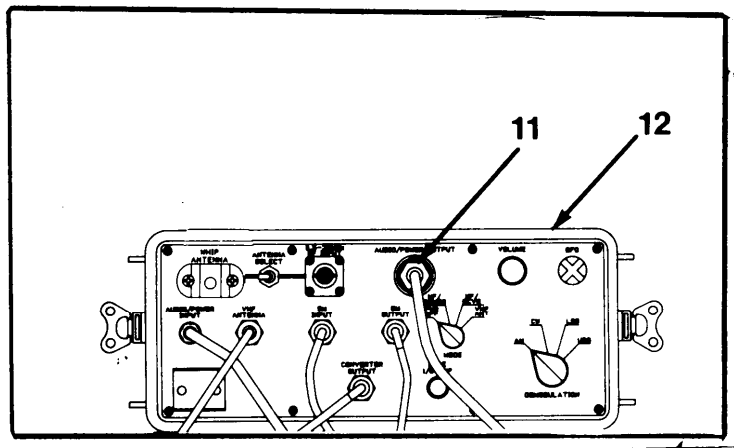
5. Pull connector off of DF ANT. CONTROL (8).

6. Replace protective cap (10) on DF ANT. CONTROL (8) on df processor (7) by pushing in and turning 1/4 turn clockwise.



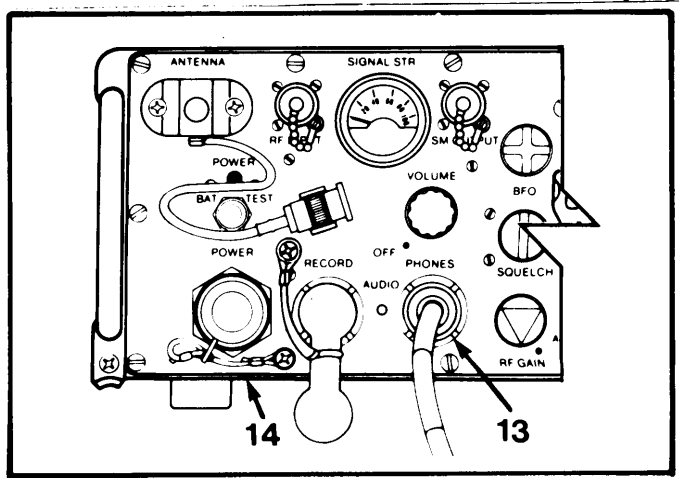
7. Loosen connector at AUDIO/POWER OUTPUT connector (l1) on hf upconverter/demodulator (12) turning connector collar 1/4 turn counterclockwise.

8. Pull connector off of AUDIO/POWER INPUT (11) connector on hf upconverter/demodulator (12) and place cable inside speaker assembly front cover.



9. Loosen AUDIO/POWER INPUT connector at PHONES connector (13) on receiver (14) by turning l/4 turn counterclockwise.

10. Pull connector off of PHONES (13) jack.



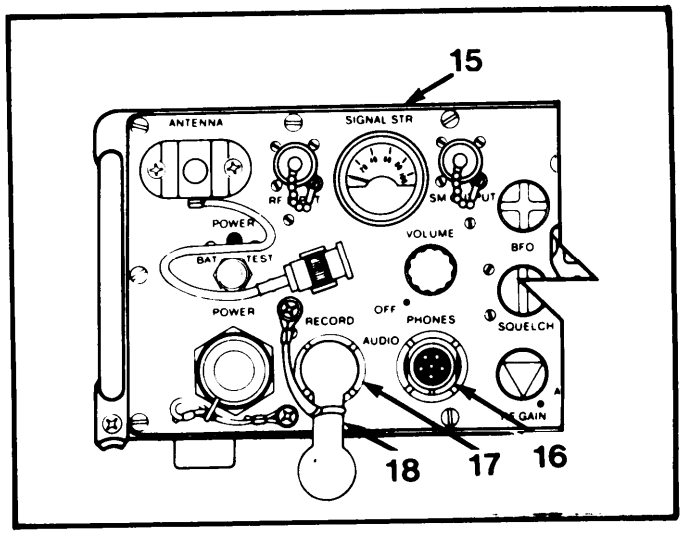
GO TO SHEET 3

2-15. PREPARATION FOR MOVEMENT - Continued

DISCONNECTING CABLES (SHEET 3 OF 7)

11. Remove rubber protective cap (18) from RECORD connector (17) on receiver (15).

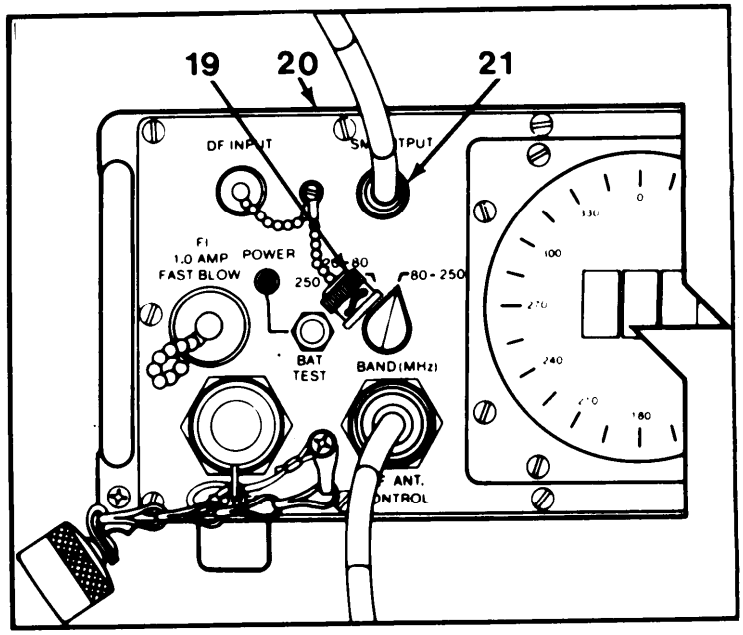
12. Replace protective cap (18) on PHONES connector (16) and RECORD connector (17) by pressing in place.



13. Loosen bnc connector at SM OUTPUT (21) on df processor (20) by turning connector collar 1/4 turn counterclockwise.

14. Pull bnc connector off of SM OUTPUT (21).

15. Replace protective cap (19) on SM OUTPUT (21) on df processor (20) by pushing in and turning 1/4 turn clockwise.



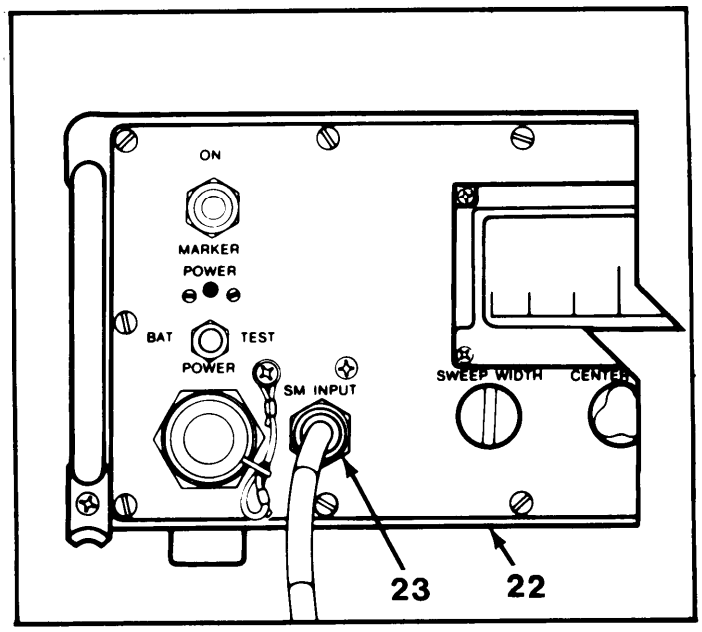
GO TO SHEET 4

2-15. PREPARATION FOR MOVEMENT - Continued

DISCONNECTING CABLES (SHEET 4 OF 7)

16. Loosen bnc connector at SM INPUT (23) on signal monitor (22) by turning connector collar 1/4 turn counterclockwise.

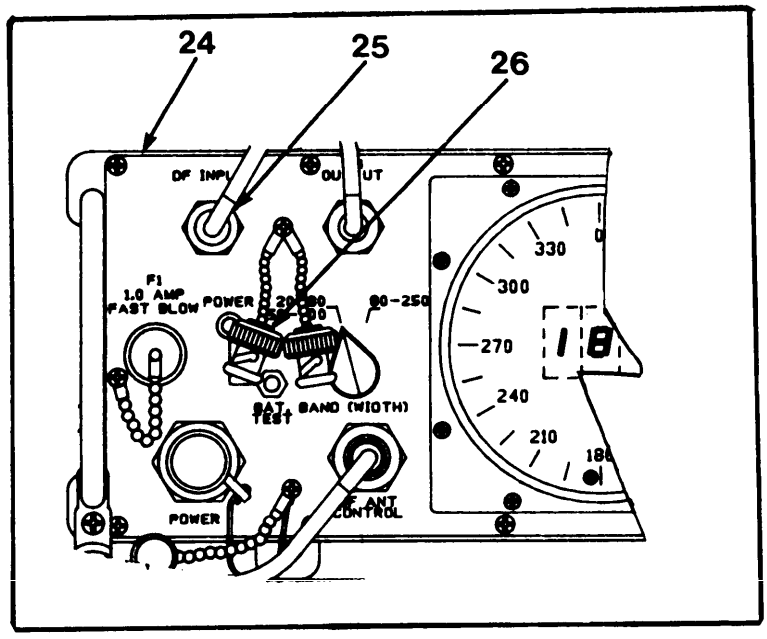
17. Pull bnc connector off of SM INPUT (23) and set cable aside to be placed in the antenna bag later.



18. Loosen bnc connector at DF INPUT (25) on df processor (24) by turning connector collar 1/4 turn counterclockwise.

19. Pull connector off of DF INPUT (25).

20. Replace protective cap (26) on DF INPUT (25) on df processor (24) by pushing in and turning 1/4 turn clockwise.



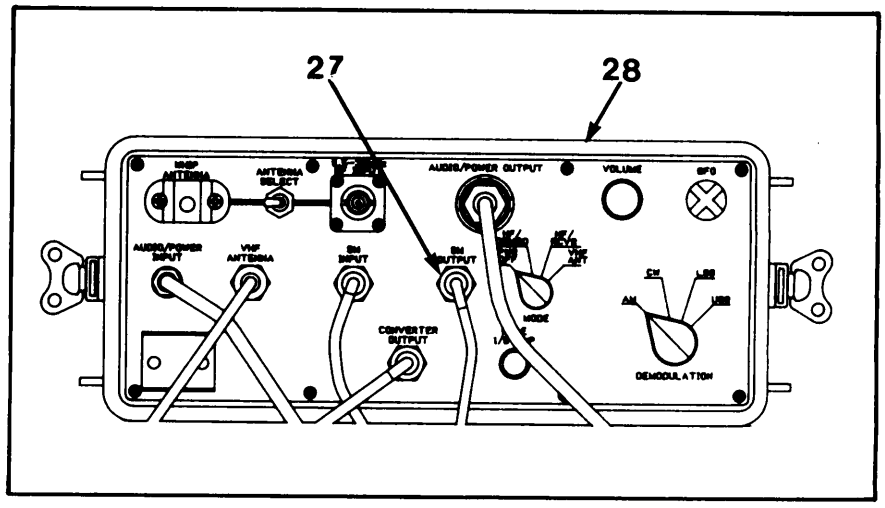
GO ON TO SHEET 5

2-15. PREPARATION FOR MOVEMENT - Continued

DISCONNECTING CABLES (SHEET 5 OF 7)

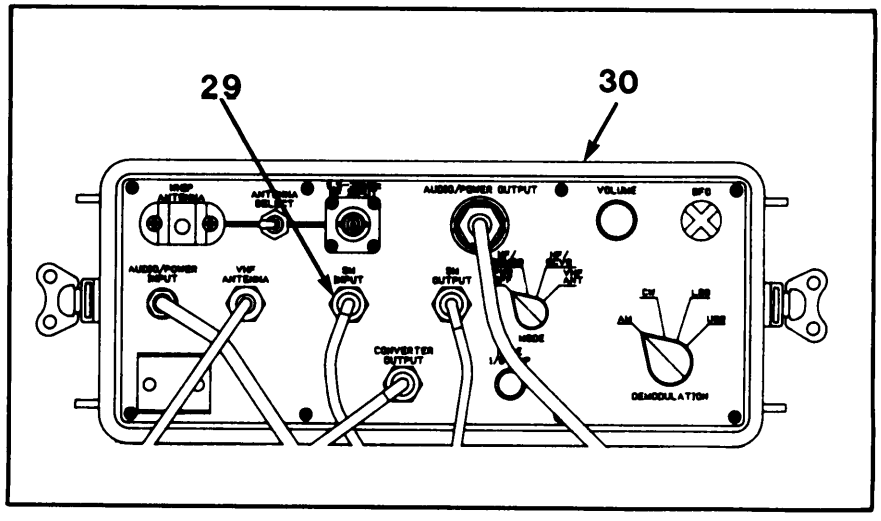
21. Loosen bnc connector at SM OUTPUT (27) on hf upconverter/ demodulator (28) by turning connector collar 1/4 turn counterclockwise.

22. Pull bnc connector off of SM OUTPUT (27) and set aside to be placed in the antenna bag later.



23. Loosen bnc connector at SM INPUT (29) on hf upconverter/ demodulator (30) by turning connector collar 1/4 turn counterclockwise.

24. Pull bnc connector off of SM INPUT (29).



GO ONTO SHEET 6

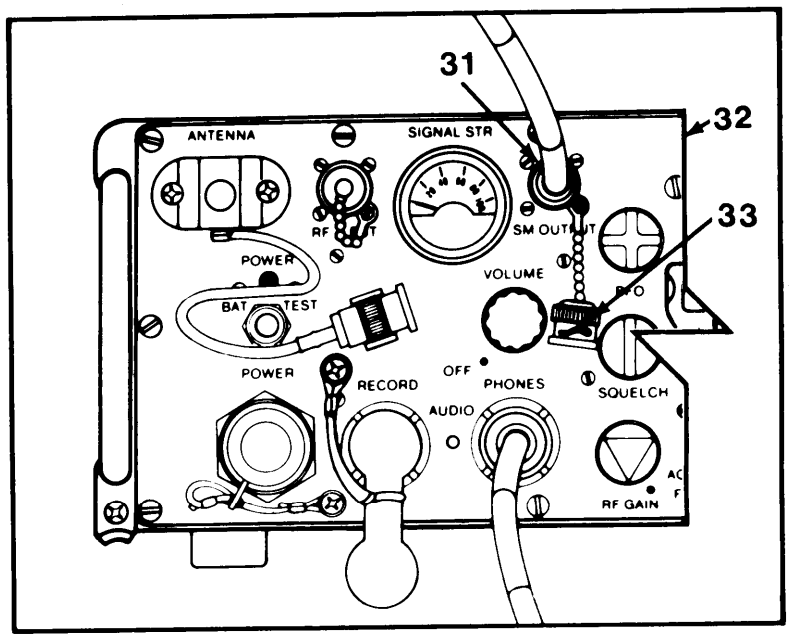
2-15. PREPARATION FOR MOVEMENT - Continued

DISCONNECTING CABLES (SHEET 6 OF 7)

25. Loosen bnc connector at SM OUTPUT (31) on receiver (32) by turning connector collar 1/4 turn counterclockwise.

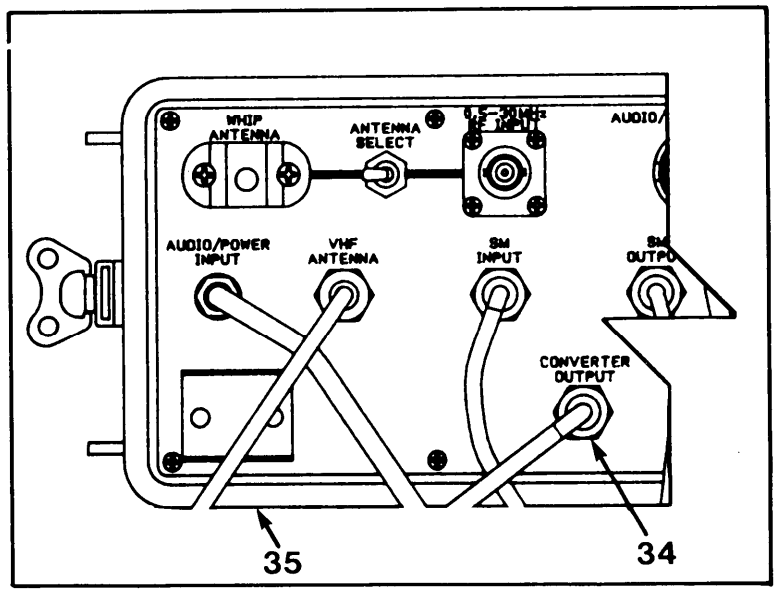
26. Pull bnc connector off of SM OUTPUT (31) and set aside to be placed in the antenna bag later.

27. Replace protective cap (33) on SM OUTPUT (31) on receiver (32) by pushing in and turning 1/4 turn clockwise.



28. Loosen rf cable bnc connector at CONVERTER OUTPUT (34) on hf upconverter/ demodulator (35) by turning connector collar 1/4 turn counterclockwise.

29. Pull connector off of CONVERTER OUTPUT (34).

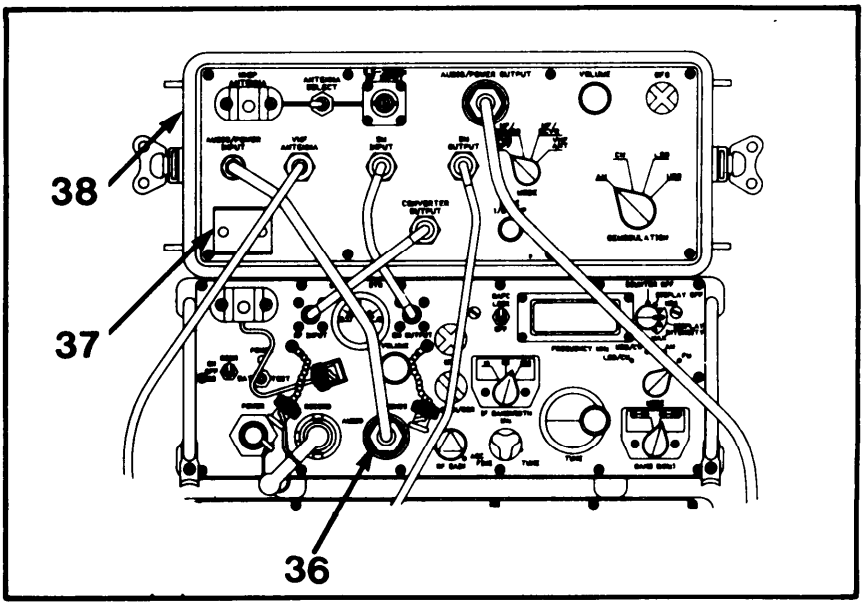


GO ON TO SHEET 7

2-15. PREPARATION FOR MOVEMENT - Continued

DISCONNECTING CABLES (SHEET 7 OF 7)

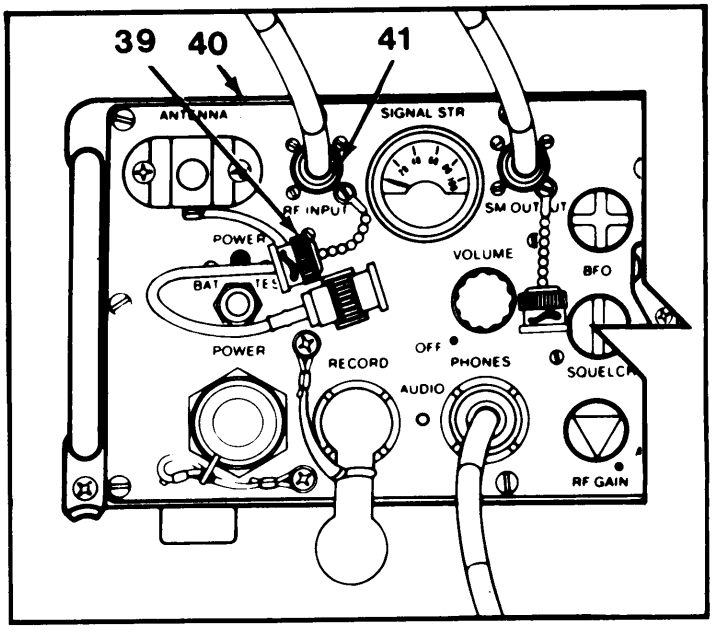
30. Replace AUDIO/POWER INPUT connector (36) in clip (37) on the hf upconverter/demodulator (38) front panel.



31. Loosen bnc connector at RF INPUT (41) on receiver (40) by turning connector collar 1/4 turn counterclockwise.

32. Pull bnc connector off of RF INPUT (41) and set aside to be placed in the antenna bag later.

33. Replace protective cap (39) on RF INPUT (41) on receiver (40) by pushing in and turning 1/4 turn clockwise.

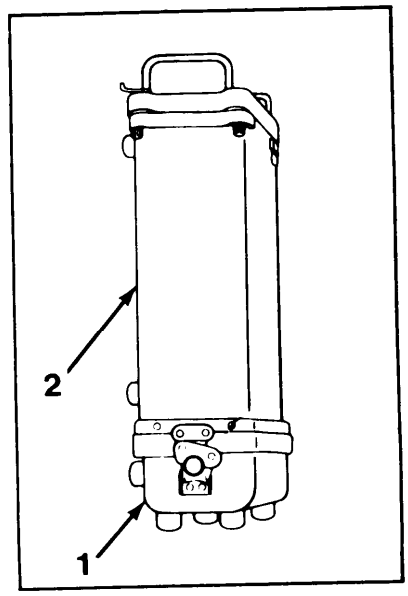


NOTE
Complete step 33 above if hf intercept antenna or whip antenna has been used.

2-15. PREPARATION FOR MOVEMENT - Continued

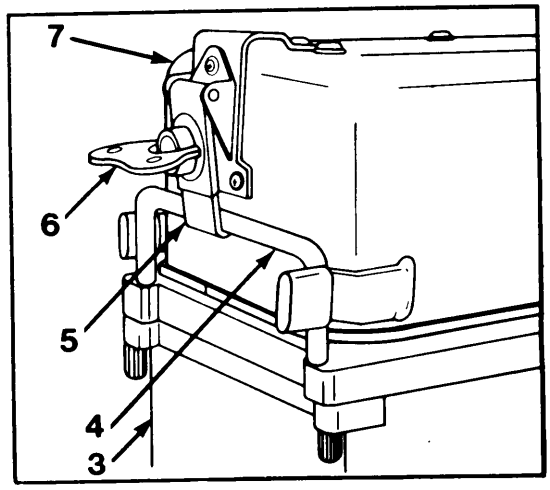
TEARING DOWN UNITS (SHEET 1 OF 3)

1. Lift hf upconverter/ demodulator from top of receiver and set aside.
2. Lift receiver from top of signal monitor.
3. Stand unit (2) up so that it rests on its battery cover (l).



WARNING
Brackets and cable guide inside front covers have sharp edges and may cut fingers.

4. Replace hf upconverter/ demodulator (7) on front of receiver (3).
5. Push wing fastener clamps (5) against receiver front panel handles (4) and lift up on wing fasteners (6).
6. Turn wing fasteners (6) clockwise until clamps (5) are locked on receiver front panel handles (4).
7. Push wing fasteners (6) down until flat against sides of receiver (3).



GO ON TO SHEET 2

2-15. PREPARATION FOR MOVEMENT - Continued

TEARING DOWN UNITS (SHEET 2 OF 3)

8. Stand receiver (9) up on flat surface so that it rests on front cover (8).

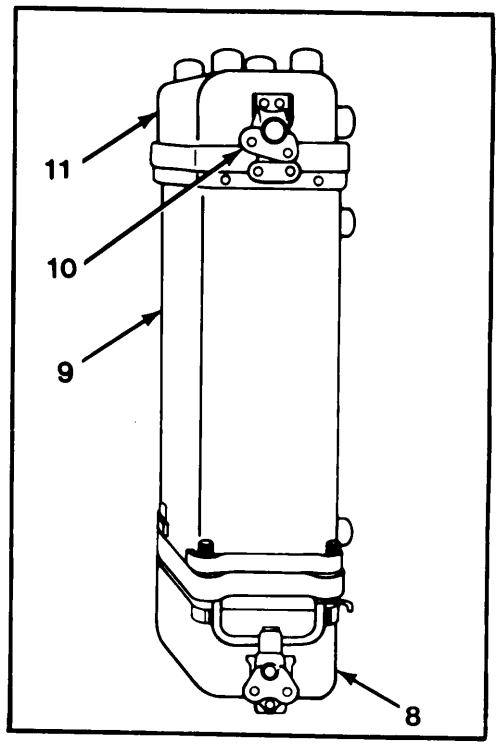
9. Lift up on wing fasteners (10) at each side of battery cover (11) of receiver (9).

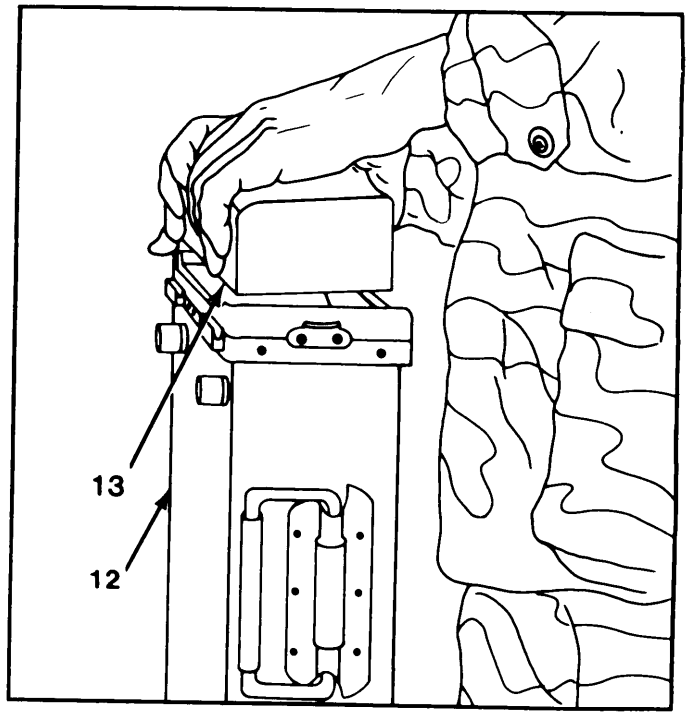
10. Turn wing fasteners (10) counterclockwise until clamps are free of signal monitor clips.

11. Lift off battery cover (11) from receiver (12) and set aside.

12. Remove battery or D-Cell insert (13) by lifting it up off receiver (12).

NOTE
When using the D-Cell insert, the entire insert is removed.





GO ON TO SHEET 3

2-15. PREPARATION FOR MOVEMENT - Continued

TEARING DOWN UNITS (SHEET 3 OF 3)

13. Replace receiver battery cover (18).

14. Push each clamp (16) against receiver clip (15) and lift upon wing fasteners (17).

15. Turn wing fasteners (17) clockwise until clamps (16) are locked in receiver clips (15).

16. Push wing fasteners (17) down until flat against sides of receiver (14).

17. Lift signal monitor off df processor and set aside.

18. Lift df processor off angle simulator.

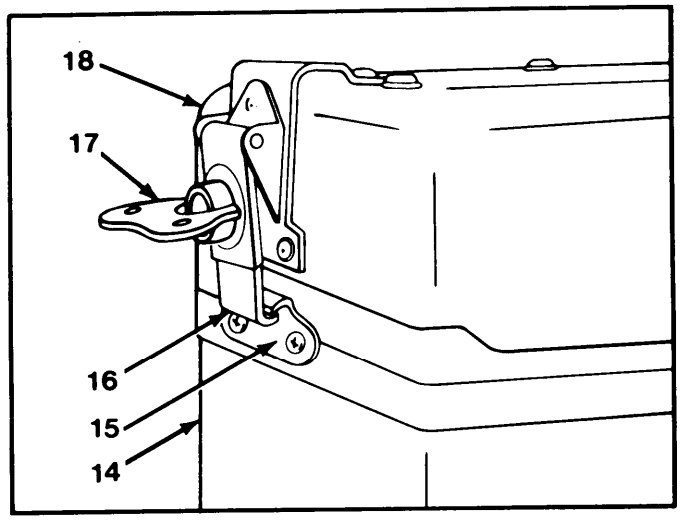
19. Repeat 3 through 16 above for df processor, except place the angle simulator on the front panel of the df processor.

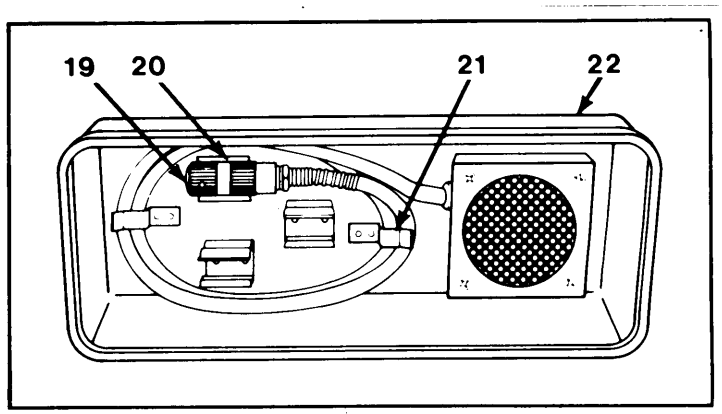
20. Repeat 3 through 16 above for signal monitor, except place speaker cover aside.

21. Wrap speaker cable around brackets (20) and under green clips (21) inside speaker assembly cover (22) and press speaker cable connector (19) into bracket (20).

22. Replace speaker assembly (22) on front panel of the signal monitor.

23. Return df units to applicable storage container.





2-15. PREPARATION FOR MOVEMENT - Continued

b. Tearing Down Df Antenna. Two crew members will perform the df antenna tear down procedures while the third crew member is tearing down the receiver, df processor and signal monitor. The first crew member will tear down the antenna while the second crew member assists the first by storing components and helping when necessary. Tearing down df antenna includes:

Perform df antenna tear down steps only after power has been turned off to the equipment.

CAUTION
The df antenna is easily damaged through careless or improper handling. Use care when tearing down the df antenna.

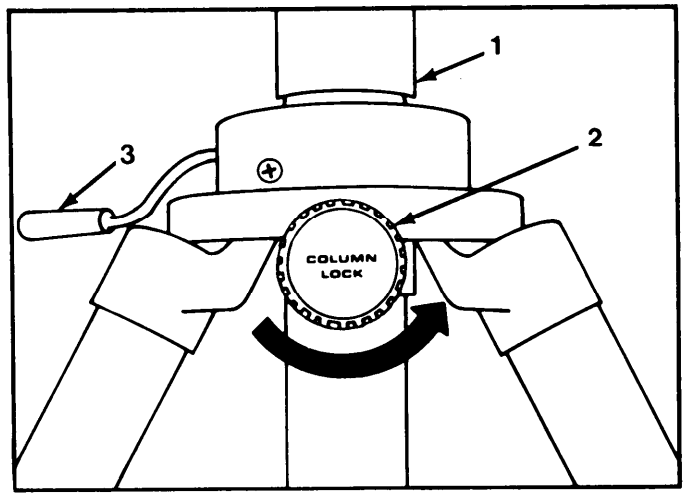
NOTE
The direction finder set can use two different df antennas. The procedures for tearing down each antenna are the same.

2-15. PREPARATION FOR MOVEMENT - Continued

LOWERING DF ANTENNA

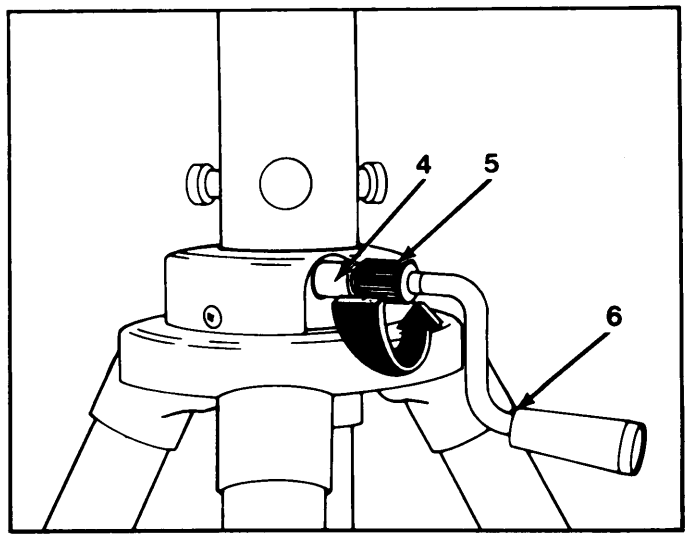
1. Holding antenna crank handle (3), unlock antenna mast column (1) by turning COLUMN LOCK knob (2) on antenna crank assembly two or three turns counter-clockwise.

2. Rotate antenna crank handle (3) counterclock-wise until antenna is in its lowest position and tighten COLUMN LOCK knob (2) by turning clockwise.



3. Loosen crank handle (6) by turning collar (5) counterclockwise.

4. Slide collar (5) off screw (4) and let handle (6) fall loose.

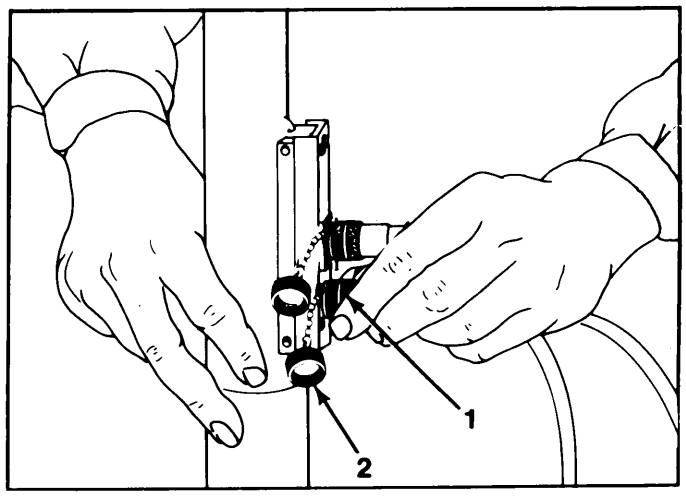


2-15. PREPARATION FOR MOVEMENT - Continued

DISCONNECTING DF ANTENNA CABLES (SHEET 1 OF 3)

NOTE
Perform 1, 2 and 3 below when using either antenna.

1. Loosen df cable connector at J10 (1) by turning connector collar 1/4 turn counterclockwise.
2. Pull connector off of J10 (l).
3. Replace protective jack cap (2) at J10 (1) by pushing in and turning 1/4 turn clockwise.

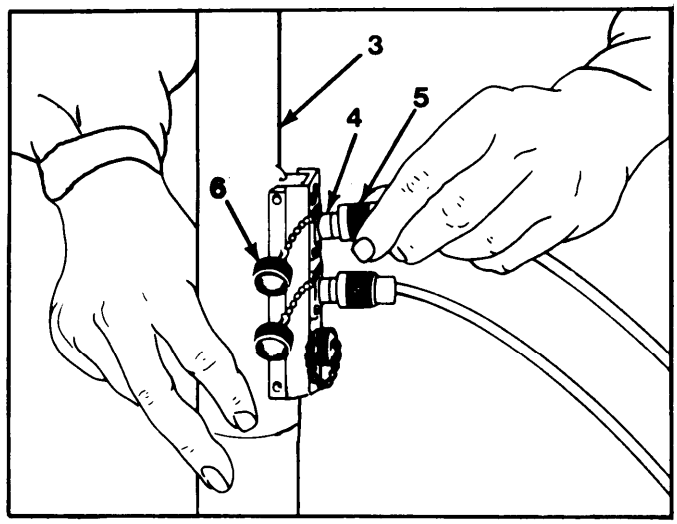


GO ON TO SHEET 2

2-15. PREPARATION FOR MOVEMENT - Continued

DISCONNECTING DF ANTENNA CABLES (SHEET 2 OF 3)

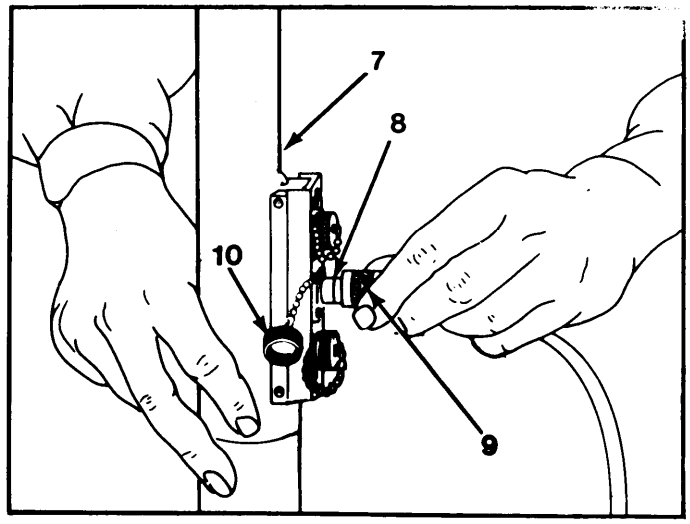
NOTE
Perform 4 through 9 below when using AS-3733/PRD-l1.



4. Loosen rf cable connector at connector J20 (4) on antenna mast column (3) by unscrewing connector collar (5) counterclockwise.

5. Pull rf cable connector off of connector J20 (4) on antenna mast column

6. Replace protective cap (6) at J20 (4) by screwing clockwise.



7. Loosen rf cable connector at connector J19 (8) on antenna mast column (7) by unscrewing connector collar (9) counterclockwise.

8. Pull rf cable connector off of connector J19 (8) on antenna mast column (7).

9. Replace protective cap (10) at connector J19 (8) by screwing clockwise.

GO TO SHEET 3

2-15. PREPARATION FOR MOVEMENT - Continued

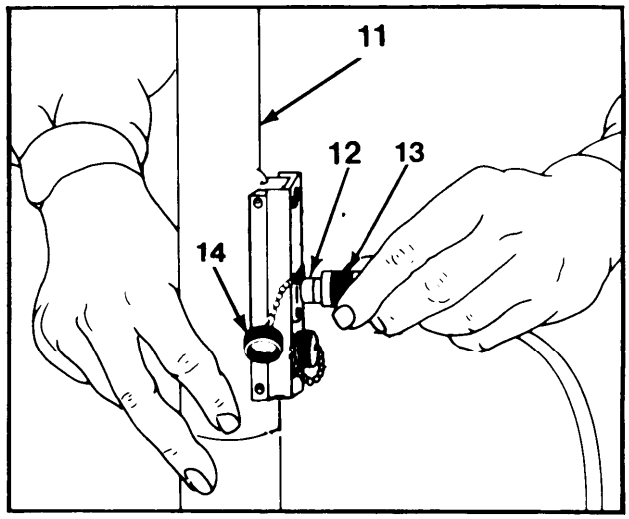
DISCONNECTING DF ANTENNA CABLES (SHEET 3 OF 3)

NOTE
Perform 10, 11 and 12 below when using AS-3732/PRD-11.

10. Loosen rf cable connector J19 at connector J19 (12) on antenna mast column (11) by unscrewing connector collar (13) counterclockwise.

11. Pull rf cable connector J19 off of J19 (12) on antenna mast column (11).

12. Replace protective cap (14) on connector J19 (11) by screwing clockwise.



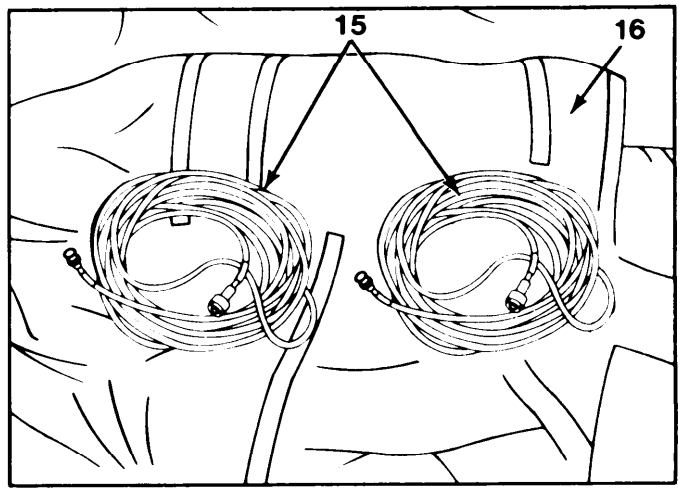
CAUTION
Wrap cables in loose circles sized to fit within the antenna carrying bag. If the cables are too tightly wrapped, they will break.

13. Wrap rf cable(s) and df cable (15) in loose circles.

NOTE
The AS-3733/PRD-11 will have two rf cables.

14. Stow cable(s) (15) in antenna carrying bag (16).

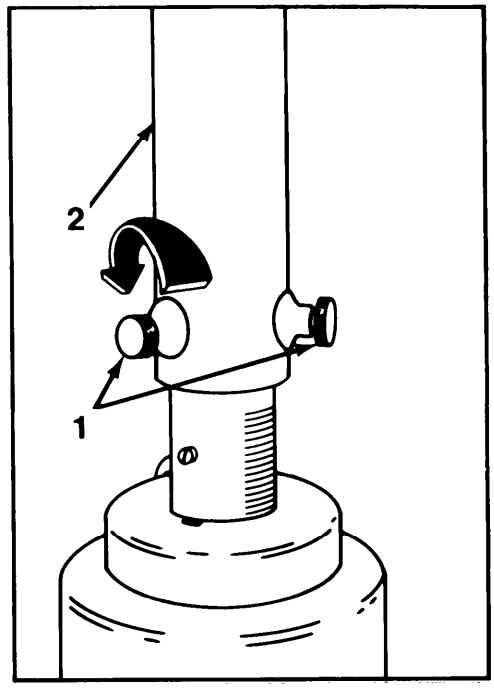
15. Stow bnc patch cables in any convenient location in the antenna bag.



2-15. PREPARATION FOR MOVEMENT - Continued

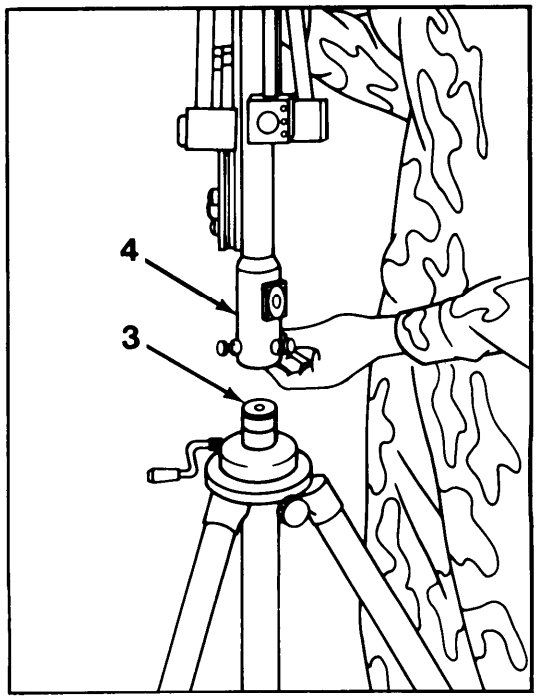
REMOVING DF ANTENNA MAST AND ELEMENTS (SHEET 1 OF 5)

1. Loosen three locking thumb screws (1) at base of antenna mast (2) by turning clockwise.



2. Lift antenna mast and mast extension (4) off tripod mount (3).

NOTE
Second crew member holds antenna at a 45 degree angle while first crew member performs steps 3 through 9.



GO ON TO SHEET 2

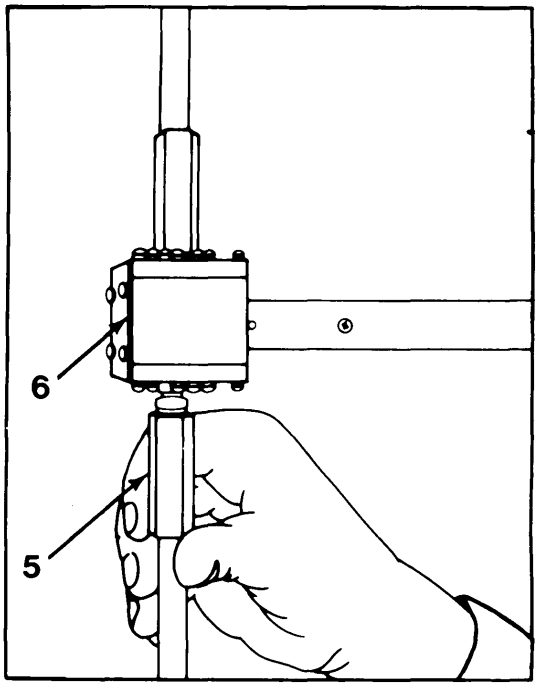
2-15. PREPARATION FOR MOVEMENT - Continued

REMOVING DF ANTENNA MAST AND ELEMENTS (SHEET 2 OF 5)

3. Remove lower antenna element (5) from antenna element box (6) by turning 1/4 turn counterclockwise.

4. Pull off antenna element (5).

5. Repeat 3 and 4 above for remaining three lower antenna elements.

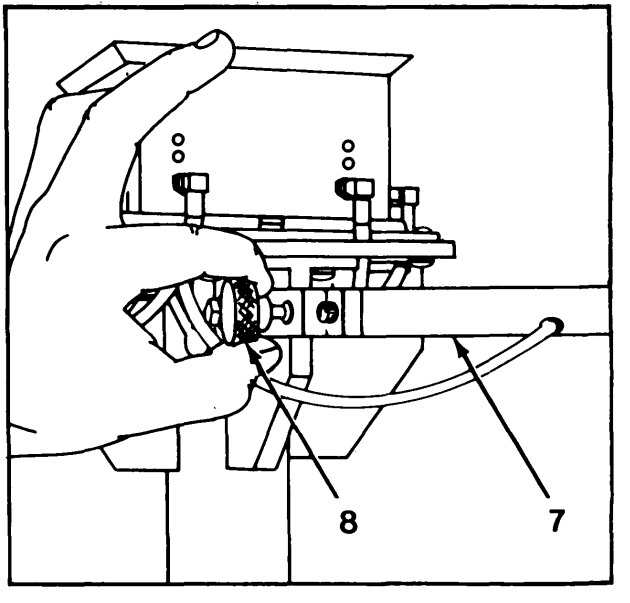


6. Slightly raise antenna arm (7) while simultaneously pulling out on antenna arm locking thumbscrew (8).

CAUTION
Before lowering antenna arm be sure antenna mast cables are free of locking thumbscrews.

7. Lower antenna arm (7) and let go of thumbscrew (8) at same time.

NOTE
A click will be heard when arm is fully lowered and thumbscrew locks into place.



GO ON TO SHEET 3

2-15. PREPARATION FOR MOVEMENT - Continued

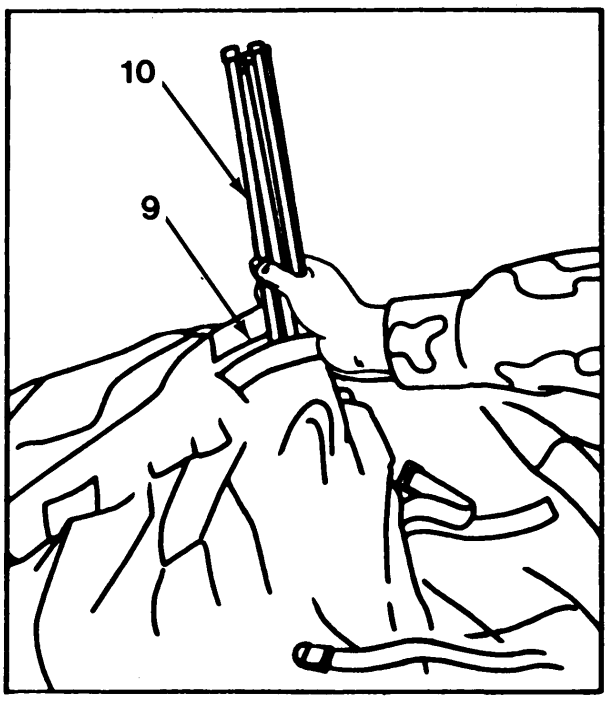
REMOVING DF ANTENNA MAST AND ELEMENTS (SHEET 3 OF 5)

8. Remove upper antenna element by repeating 3 and 4.

9. Repeat steps 6, 7 and 8 above for remaining three arms.

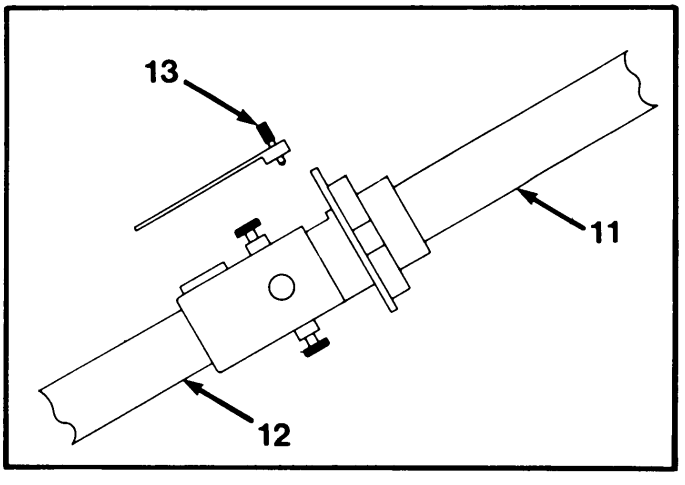
NOTE
If the dual element lower bay antenna elements are used, unscrew the element into two sections prior to placing the elements in the antenna bag in step 8 below.

10. Replace antenna elements (10) in proper compartments of antenna carrying bag (9).



11. Disconnect mast extension (11) from antenna mast (12) by removing the screw (13) and plate.

12. Lay the mast extension (12) aside until later.



GO ON TO SHEET 4

2-15. PREPARATION FOR MOVEMENT - Continued

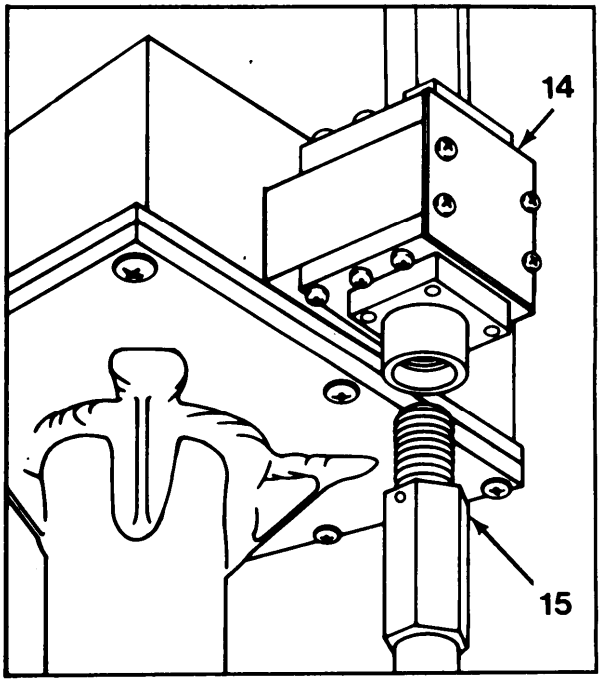
REMOVING DF ANTENNA MAST AND ELEMENTS (SHEET 4 OF 5)

13. Set antenna mast base on edge of antenna carrying bag holding mast upright.

NOTE
- Perform 14, 15 and 16 below if AS-3733/PRD-11 antenna is used.
- Both crew members will perform 14. Second crew member will perform 15.

14. Remove short antenna elements (15) from upper bay element boxes (14) by unscrewing counterclockwise.

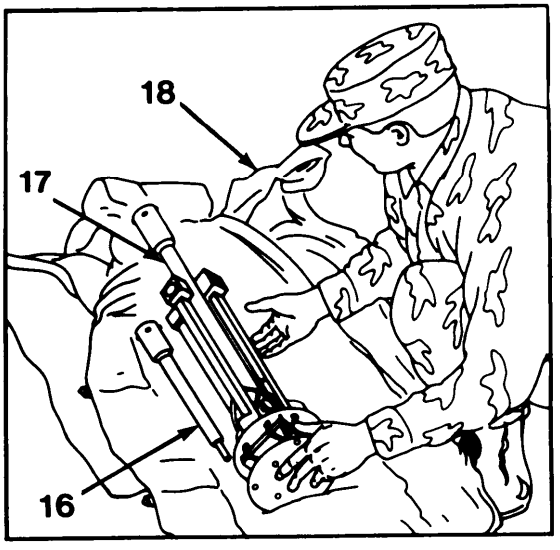
15. Place short antenna elements (15) in proper compartment of antenna carrying bag (18).



16. Place antenna mast (17) and mast extension (16) in proper position in antenna carrying bag (18).

17. Secure with five quick release straps by following steps 18 through 21.

NOTE
The AS-3733/PRD-11 has six quick release straps.



GO ON TO SHEET 5

2-15. PREPARATION FOR MOVEMENT - Continued

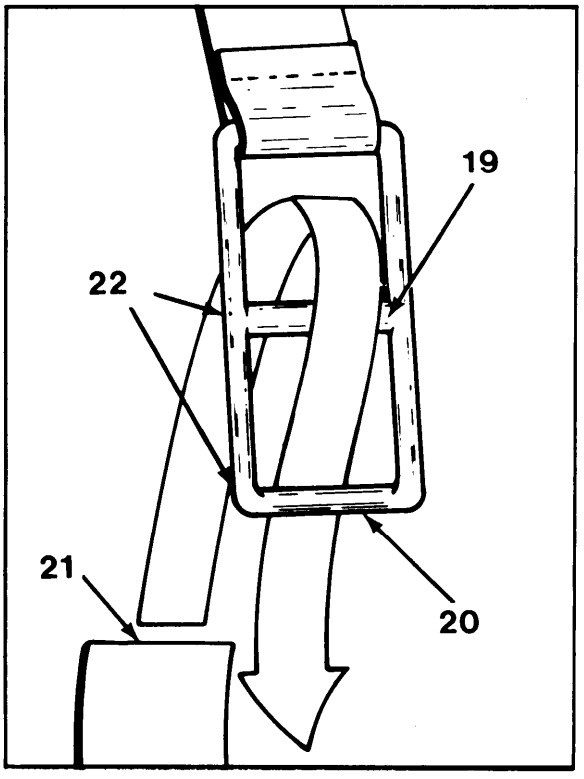
REMOVING DF ANTENNA MAST AND ELEMENTS (SHEET 5 OF 5)

18. Hold buckle (22) of quick release strap with two open bars facing you.

19. Thread end of strap (21) upwards through buckle behind middle bar (19).

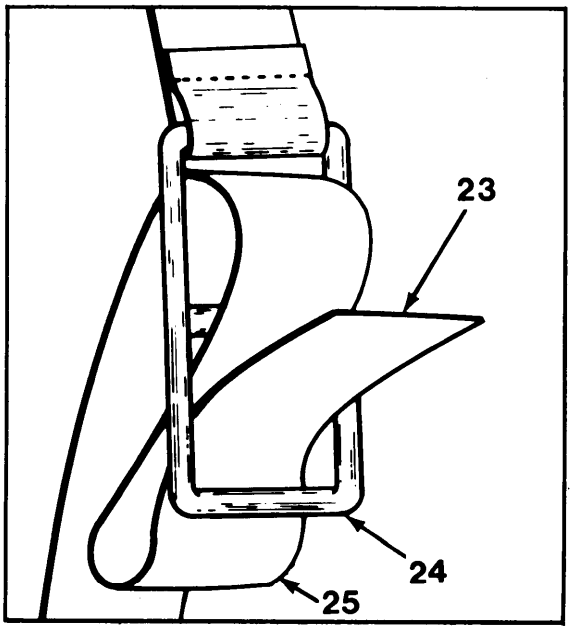
20. Continue threading strap (21) over middle bar (19) and under end bar (20).

21. Pull strap (21) tight.



22. Insert end of strap (23) back under end bar (24) so that strap (23) forms an end loop (25).

23. Grasp loop (25) with one hand and pull toward you while holding loose end of strap (23) with other hand to tighten.

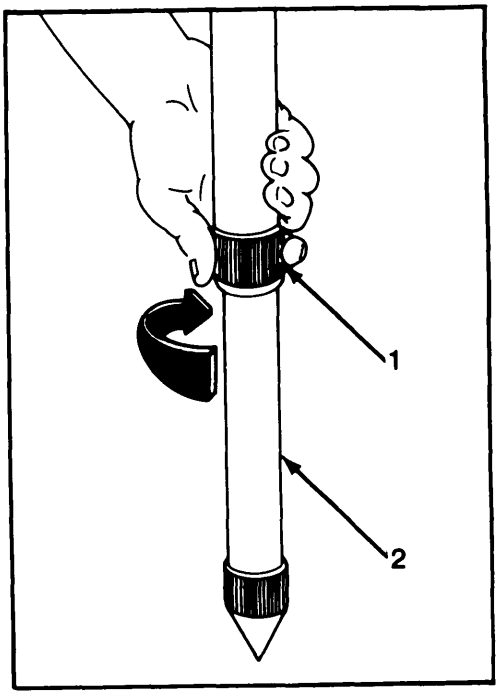


2-15. PREPARATION FOR MOVEMENT - Continued

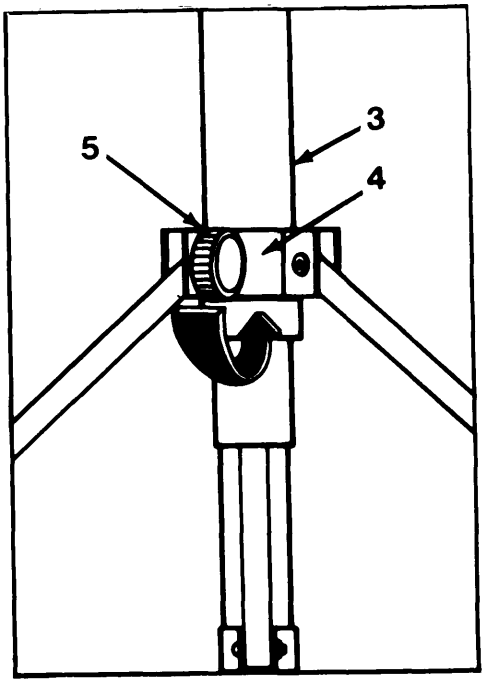
TEARING DOWN TRIPOD (SHEET 1 OF 2)

NOTE
Second crew member will perform 1 below.

1. Lift and hold tripod off ground.
2. Loosen collar (1) on base of tripod leg (2) by turning counterclockwise.
3. Slide tripod leg (2) up all the way.
4. Tighten collar (1) on base of tripod leg (2) by turning clockwise.
5. Repeat 1 through 4 above for remaining tripod legs.



6. Loosen center tension knob (5) on sliding collar (4) of tripod center column (3) by turning counterclockwise.



GO TO SHEET 2

2-15. PREPARATION FOR MOVEMENT - Continued

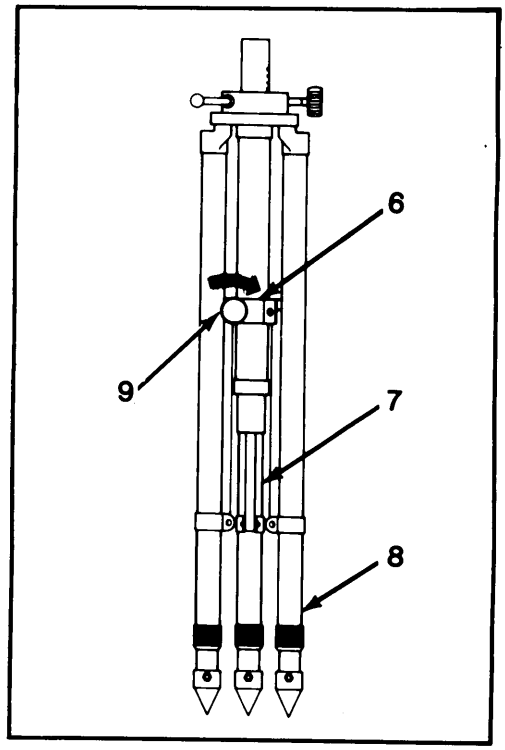
TEARING DOWN TRIPOD (SHEET 2 OF 2)

CAUTION

Be careful that you do not catch your fingers as tripod legs close.

7. Pull up on sliding collar (6) and stabilizing arms (7) to close tripod legs (8).

8. Tighten knurled center tension knob (9) by turning clockwise.



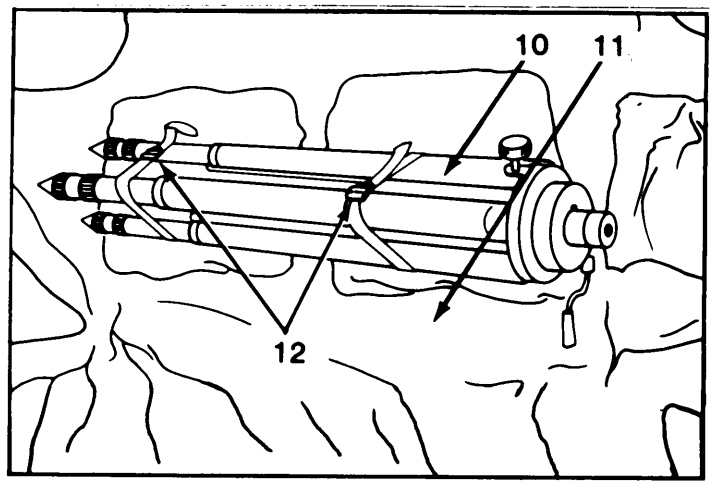
9. Place tripod (10) in proper position in antenna carrying bag (11).

10. Secure tripod (10) with quick release straps (12).

11. Roll up antenna carrying bag and secure with three fastening straps.

NOTE

The AS-3733/PRD-11 has four fastening straps.



2-16. OPERATION OF AUXILIARY EQUIPMENT

The following auxiliary equipment maybe used with the direction finder set:

- Radio Set AN/PRC-77
- Audio Recorder AN/UNH-16A
- Radio Set AN/VRC-12
- Communications Security Equipment TSEC/KY-57
- Headset H-251/U
- External hf antenna (as desired).

Headset H-251/U may be used instead of receiver speaker assembly. See Appendix A of this manual for the listing of technical manuals to be used when operating auxiliary equipment.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

SECTION CONTENTS

2-17. OPERATION UNUSUAL WEATHER

The direction finder set is weatherproof and ruggedized to allow continued operation during unusual weather conditions. However, special operational procedures must be followed during these conditions.

Weather Conditions	Special Operational Procedure	Unit Limitations
Extreme Heat 32 degrees Celsius (90 degrees Fahrenheit or higher)	Install units in a shady area or provide shade with available covering.	Units will not operate efficiently in temperatures higher than 60 degrees Celsius (140 degrees Fahrenheit).
Extreme Cold -5 degrees Celsius (25 degrees Fahrenheit or lower)	• Use magnesium batteries as a power source. • Remove batteries from units if operations expect to be down for more than 15 minutes and keep in warm place. • Check cables regularly for cracks or breaks.	Units will not operate efficiently in temperatures lower than 0 degrees Celsius (32 degrees Fahrenheit).
Ice or Snow	• Wear gloves when installing equipment to avoid ice burns on your hands. • Protect units and cables by building windbreaks and covers.	Antenna elements will not operate efficiently with more than 1/4 inch ice buildup.

2-17. OPERATION IN UNUSUAL WEATHER - Continued

Weather Conditions	Special Operational Procedure	Unit Limitations
Rain or Mist	• Provide water drainage away from units. • Provide cover and keep units dry.	Units are considered waterproof only when front and rear covers are secured.
Mud	• Install units on top of a waterproof cover. • Install df antenna tripod legs in most solid area • Keep units clean.	
Dusty or Sandy	• Provide cover against wind direction. • Keep units clean.	
Windy (10 mph or greater)	• Tie antenna down with guy wires. • Protect units from blowing objects or dirt.	Antenna can withstand gusts up to 100 mph when secured with wires.
Sea Spray	• Provide cover to units to keep dry. • Wipe units with fresh water-darnpened cloth after operation and dry.	

2-18. FORDING

The direction finder set is waterproof when the front and rear covers of each unit are securely fastened. This allows fording the equipment when the procedures below are followed:

BEFORE FORDING:

- Attach front and rear panel covers of the direction finder units.
- Ensure extra batteries are sealed in a plastic or waterproof container.
- Ensure df antenna carrying bag insecurely fastened.

DURING FORDING:

- Submerge equipment only when necessary.

AFTER FORDING:

- Allow excess water to drain out of df antenna carrying bag.
- Dry the direction finder units with a cloth.

2-19. EMERGENCY PROCEDURES

The direction finder set will operate as long as the life of its batteries. In some cases, you will not have the immediate chance to change batteries when they begin losing their maximum charge levels. Normal operation requires you to maintain low intensity levels to conserve battery power. However, the following emergency procedures will help you temporarily adapt the equipment when continued use of the units is required and battery power is rapidly decreasing.

- Turn COUNTER OFF/DISPLAY OFF/DISPLAY INTENSITY switch on the receiver to COUNTER OFF when monitoring only one frequency.
- Turn DISPLAY OFF/DISPLAY INTENSITY switch on df processor to DISPLAY OFF when no lob readings need to rerecorded.
- Turn INTENSITY switch on signal monitor fully counterclockwise when monitoring only one frequency.

2-20. JAMMING AND ECM PROCEDURES

There are no special instructions for operating the direction finder set in areas using signal jamming or electronic countermeasures.

CHAPTER 3

INTRODUCTION

Section I. LUBRICATION INSTRUCTIONS

3.1 LUBRICATION INSTRUCTIONS

No lubrication is performed on the direction finder set by operators.

Section II. OPERATOR TROUBLESHOOTING

SECTION CONTENTS

3-2. INTRODUCTION

When your direction finder set fails, use the symptom index and troubleshooting tables to locate the problem.

a. The symptom index will assist you invocating the correct procedure necessary to troubleshoot. To use the symptom index, match the malfunction description with the page noted. Each troubleshooting table will have a malfunction title heading.

b. Each troubleshooting table addresses a malfunction which you may find during the operation or maintenance of the direction finder set or its components. To use the tables, perform the instructions and corrective actions in the order listed.

c. This manual cannot list all the malfunctions that occur, nor all the tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

3-3. SYMPTOM INDEX

Symptom	Troubleshooting Procedure Page	Contact Organizational Maintenance
RECEIVER		
• POWER lamp that does not light	3-4	
• FREQUENCY MHz display that does not light	3-5	
• No audio and no signal indication on SIGNAL STR meter	3-6	
• FREQUENCY MHz display that has unstable digits	3-8	
• No audio and no signal indication on SIGNAL STR meter:		
When high band is selected		√
When low band is selected		√
In one or two IF BANDWIDTH positions		√
When USB/CW or LSB/CW is selected		√
When AM is selected		√
When FM is selected		√
• No audio when speaker assembly is used		√
• Changes frequency when DAFC LOCK switch is set to LOCK position		√
• FREQUENCY MHz display that locks at a preset frequency		√
DF PROCESSOR		
• POWER lamp that does not light	3-9	
• No line of bearing display	3-11	
• Displays incorrect line of bearing	3-12	
• Displays random lines of bearing	3-13	
• ZERO ADJ control cannot set a 000 or 180 degree bearing		√
• No circular display when set to GATED mode		√
• THRESHOLD lamp that does not light		√
• Random lines of bearing displayed when set to HOLD mode		√
• Random lines of bearing in one or two IF BANDWIDTH (kHz) positions		√
• Circular led that does not turn off when THRESHOLD is adjusted		√
• Angle simulator power lamp does not light	3-22	

3-3. SYMPTOM INDEX

Symptom	Troubleshooting Procedure Page	Contact Organizational Maintenance
SIGNAL MONITOR		
• POWER lamp that does not light	3-16	
• No rf signal on crt	3-17	
• No trace on crt	3-18	
• No marker on crt		√
HF UPCONVERTER/DEMODULATOR		
• Power lamp that does not light	3-19	
• No audio and no signal indication on receiver signal strength meter	3-20	

NOTE
If signals are received but appear to all be weak, call organizational maintenance.

3-4. TROUBLESHOOTING PROCEDURES

Follow these instructions on how to use the troubleshooting tables:

a. Begin with Step 1.

b. Follow the directive listed in the Instruction column.

c. Match your results with the question asked in the Indication column.

d. If the answer to the question in the Indication column is yes, look in the Yes column and proceed to the step listed. If the answer to the question in the Indication column is no, look in the No column and proceed to the step listed.

e Continue through the table until a triangle symbol appears in the Yes or No column. Stop troubleshooting. The malfunction should now be corrected.

f. Read any comments related to troubleshooting procedures in the Remarks column.

NOTE
Unless otherwise noted, direction finder units should be powered up before you begin trouble shooting procedures.

3-4. TROUBLESHOOTING PROCEDURES - Continued

a. POWER LAMP THAT DOES NOT LIGHT

Step	Instruction	Indication	Yes	No	Remarks
1	Check protective capon external POWER connector for looseness.	Cap is loose?	2	3	
2	Tighten protective cap by pushing in on cap and turning clockwise.	POWER lamp lights?	Δ	3	
3	Inspect receiver battery/D-cell insert plug and receiver jack. ● Turn off power to receiver. ● Remove battery/ D-cell insert following paragraph 2-12b. ● Inspect jack/plug for damage.	Jack/plug good?	4	4 or contact organizational maintenance.	If receiver or D-cell insert plug is damaged contact organizational maintenance. If BA-4386/PRC-25 is used go to 4.
4	Remove/replace batteries following paragraph 3-6b. ● Turn on power to receiver.	POWER lamp lights?	Δ	5	
5	Remove/replace F1 fuse in D-cell insert following paragraph 3-6a.	POWER lamp lights?	Δ	Contact organizational maintenance.	

3-4. TROUBLESHOOTING PROCEDURES - Continued

b. FREQUENCY MHz DISPLAY THAT DOES NOT LIGHT

Step	Instruction	Indication	Yes	No	Remarks
1	Check setting of COUNTER OFF/ DISPLAY/OFF/ DISPLAY INTEN-SITY switch on receiver.	Switch is set to DISPLAY INTENSITY?	Contact organizational maintenance.	2	
2	Set COUNTER OFF/ DISPLAY OFF/ DISPLAY INTENSITY switch to DISPLAY INTENSITY by turn-ing fully clockwise.	FREQUENCY MHz display lights?	Δ	Contact organizational maintenance.	

3-4. TROUBLESHOOTING PROCEDURES - Continued

c. NO AUDIO AND NO SIGNAL INDICATION ON SIGNAL STR METER (SHEET 1 OF 2)

Step	Instruction	Indication	Yes	No	Remarks
1	Verify that correct cable is connected to RF INPUT on receiver.	Correct cable connected to RF INPUT on receiver?	3	2	
2	Recable receiver: • Turn off power to receiver. • Connect cables to receiver following paragraph 2-12c. • Turn on power to receiver.	Audio and signal indication present ?	Δ		
3	Check antenna rf cable and connectors at RF INPUT on receiver and rf output connector on antenna. • Power down receiver following paragraph 2-15a. • Disconnect rf cable from RF INPUT following paragraph 2-15 a. • Inspect rf cable and connectors for breaks, bent pins, or other damage. • Inspect receiver RF INPUT and df antenna rf output connector for other damage.	Cable connectors or jacks damaged?	Contact organizational maintenance.	4	

GO ON TO SHEET 2

3-4. TROUBLESHOOTING PROCEDURES - Continued

c. NO AUDIO AND NO SIGNAL INDICATION ON SIGNAL STR METER (SHEET 2 OF 2)

Step	Instruction	Indication	Yes	No	Remarks
4	Check speaker assembly cable and connector at PHONES connector for receiver. ● Reconnect antenna rf cable following paragraph 2-12c. ● Disconnect speaker assembly cable. See Index in paragraph 2-15a. ● Inspect speaker cable and connector for breaks, bent pins or other damage. ● Inspect receiver PHONES connector for damage.	Cable, connector or PHONES connector damaged?	Contact organizational maintenance.	5	
5	Reconnect speaker cable to PHONES connector or receiver and turn on power to receiver.	Audio and signal indication present?	Δ	Contact organizational maintenance.	

3-4. TROUBLESHOOTING PROCEDURES - Continued

d. FREQUENCY MHz DISPLAY THAT HAS UNSTABLE DIGITS

Step	Instruction	Indication	Yes	No	Remarks
1	Perform battery test by pressing BAT TEST pushbutton.	POWER lamp stays lit?	Contact organizational maintenance.	2	
2	Remove/replace battery following paragraph 3-6b.	FREQUENCY MHz display stable?	Δ	Contact organizational maintenance.	

3-4. TROUBLESHOOTING PROCEDURES - Continued

e. POWER LAMP THAT DOES NOT LIGHT (SHEET 1 OF 2)

Step	Instruction	Indication	Yes	No	Remarks
1	Check protective cap on external POWER connector for looseness.	Cap is loose?	2	3	
2	Tighten protective cap by pushing in on cap and turning clock-wise.	POWER lamp lights?	Δ	3	
3	Inspect df processor battery/D-cell hsert plug and df processor jack: ● Turnoff power to df processor. ● Remove battery/ D-cell insert follow-ing paragraph 2-12b. ● Impect jack/plug for damage.	Jack/plug good?	4	4 or contact organizational maintenance	If df proces-sor D-cell insert plug is damaged contact organizational maintenance. If BA-4386/ PRC-25 is used go to 4.
4	Remove/replace batteries following paragraph 3-6b. ● Turn on power to df processor.	POWER lamp lights?	Δ	5	

GO ONTO SHEET 2

3-4. TROUBLESHOOTING PROCEDURES - Continued

e. POWER LAMP THAT DOES NOT LIGHT (SHEET 2 OF 2)

Step	Instruction	Indication	Yes	No	Remarks
5	Remove/replace F1 fuse in D-cell insert following paragraph 3-6a.	Power lamp lights?	▲	If D-cell used go to 6.	
6	Remove/replace F1 fuse in D-cell insert following paragraph 3-6a.	Power lamp lights?	▲	Contact organizational maintenance.	

3-4. TROUBLESHOOTING PROCEDURES - Continued

f. NO LINE OF BEARING DISPLAY

Step	Instruction	Indication	Yes	No	Remarks
1	Check setting of DISPLAY OFF/ DISPLAY INTEN switch on df processor.	Switch to DISPLAY/ INTEN?	Contact organizational maintenance.	2	
2	Set DISPLAY OFF/ DISPLAY INTEN switch fully clockwise to DISPLAY INTEN.	Numerical LOB display lit ?	▲	Contact organizational maintenance.	

3-4. TROUBLESHOOTING PROCEDURES - Continued

g. DISPLAYS INCORRECT LINE OF BEARING

Step	Instruction	Indication	Yes	No	Remarks
1	Inspect setting on BAND MHz switch of df processor.	Setting same as receiver BAND MHz?	3	2	
2	Set BAND MHz switch to same setting as BAND MHz switch on receiver.	Displayed bearing is correct ?	▲	3	
3	Orient df antenna following paragraph 2-12.	Displayed bearing is correct ?	▲	4	
4	Inspect antenna arms for damage.	Antenna arms are damaged?	Contact organizational maintenance.	5	
5	Check df site to ensure it meets df requirements of FM 30-476 and paragraph 2-11 of this TM.	DF site is good?	Contact organizational maintenance.	Select new site in accordance with FM 30-476 and paragraph 2-11 of this TM.	

3-4. TROUBLESHOOTING PROCEDURES - Continued

h. DISPLAYS RANDOM LINES OF BEARING (SHEET 1 OF 3)

Step	Instruction	Indication	Yes	No	Remarks
1	Check that IF BAND-WIDTH (khz) setting on df processor matches IF BANDWIDTH (kHz) setting on receiver.	Settings match?	3	2	
2	Set IF BANDWIDTH to the same setting on df processor and on receiver.	Lines of bearing steady?	Δ	3	
3	Check antenna RF cable, connectors at RF INPUT on receiver and RF output connector on antenna mast. • Turn power off to receiver and df processor following paragraph 2-15a. • Disconnect RF cables from receiver RF INPUT and RF output connector on antenna mast following paragraph 2-15 a. and b. • Inspect RF cables and connectors for breaks, bent pins or other damage. • Inspect receiver RF INPUT connector antenna mast or rf output connector for damage.	OK?	Δ	4	

GO ON TO SHEET 2

3-4. TROUBLESHOOTING PROCEDURES - Continued

h. DISPLAYS RANDOM LINES OF BEARING (SHEET 2 OF 3)

Step	Instruction	Indication	Yes	No	Remarks
4	Check antenna df cable and connectors at DF ANT CONTROL and at df cable connector or antenna mast. • Reconnect rf cable to receiver RF INPUT connector and antenna mast connector following paragraph 2-12 a. and 2-12 c. • Disconnect df cable from df processor DF ANT CONTROL connector and antenna mast connector following paragraph 2-15 a. and 2-15 b. • Inspect df cable and connector for breaks, bent pins or other damage. • Inspect DF ANT CONTROL connector df processor and antenna mast connector for damage.	Cable or connector damaged?	Contact organizational maintenance.		
5	check bnc cable connectors and connectors at SM OUTPUT on receiver and DF INPUT on df processor. • Reconnect df cable to DF ANTENNA CONTROL connector on df processor and on antenna mast connector following paragraph 2-12 a. and 2-12 c.				

GO ON TO SHEET 3

3-4. TROUBLESHOOTING PROCEDURES - Continued

h. DISPLAYS RANDOM LINES OF BEARING (SHEET 3 OF 3)

Step	Instruction	Indication	Yes	No	Remarks
5	• Disconnect bnc cable from receiver SM OUTPUT and df processor DF INPUT following paragraph 2-15 a. • Inspect bnc cable connectors for breaks, bent pins or other damage. • Inspect receiver SM OUTPUT jack and df processor DF INPUT jack for damage.	Cable or connector(s). damaged?	Contact organizational maintenance.	6	
6	Reconnect bnc cable to SM OUTPUT on receiver and DF INPUT and df processor and power up units following paragraph 2-13 a.	Lines of bearing steady?	Δ	Contact organizational maintenance.	

3-4. TROUBLESHOOTING PROCEDURES - Continued

i. POWER LAMP THAT DOES NOT LIGHT

Step	Instruction	Indication	Yes	No	Remarks
1	Check protective cap on external POWER connector for looseness	Cap is loose?	2	3	
2	Tighten protective cap by pushing in on cap and turning clockwise.	POWER lamp lights ?	Δ	3	
3	Inspect signal monitor battery/D-cell insert plug and signal monitor jack: • Turn off power to signal monitor. • Remove battery/ D-cell insert following paragraph 2- 12 b. • Inspect connection for damage.	Jack/plug good?	4	4 or contact organizational maintenance.	If signal monitor D-cell insert plug is damaged contact organizational maintenance. If BA-4386/ PRC-25 is used go to 4.
4	Remove/replace batteries following paragraph 3-6 b. • Turn on power to signal monitor.	POWER lamp lights?	Δ	5	
5	Remove/replace F1 use in D-cell insert following paragraph 3-6 a.	POWER lamp lights?	Δ	Contact organizational maintenance.	

3-4. TROUBLESHOOTING PROCEDURES - Continued

i. NO RF SIGNAL ON CRT (SHEET 1 OF 2)

Step	Instruction	Indication	Yes	No	Remarks
1	Turn SM GAIN fully clockwise.	Rf signal spikes appear on crt?	Δ	2	
2	Check bnc cable and connectors at SM INPUT on signal monitor and SM OUTPUT on df processor for damage. ● Turn power off to signal monitor and df processor following paragraph 2-15 a. ● Disconnect cable from SM INPUT on signal monitor and SM OUTPUT on df processor following paragraph 2-15 a. ● Inspect bnc cable and connectors for for breaks, bent pins and other damage. ● Inspect signal monitor SM INPUT connector and df processor SM OUTPUT connector for damage.	Cables damaged?	Δ Contact organizational maintenance.	3	
3	Reconnect bnc cable to SM INPUT on signal monitor and SM OUTPUT on df processor and power up units following paragraph 2-12 c.	Rf signal spikes appear on crt?	Δ	Contact organizational maintenance.	

3-4. TROUBLESHOOTING PROCEDURES - Continued

k. NO TRACE ON CRT

Step	Instruction	Indication	Yes	No	Remarks
1	Turn INTEN knob fully clockwise.	Crt illuminates?	Δ	2	
2	Turn SWEEP WIDTH knob fully clockwise.	Crt illuminates?	Δ	Contact organizational maintenance.	

3-4. TROUBLESHOOTING PROCEDURES - Continued

l. POWER LAMP THAT DOES NOT LIGHT

Step	Instruction	Indication	Yes	No	Remarks
1	Ensure receiver is powered up.	POWER light on?	3	2	
2	Power up receiver.	POWER light on?	3	Δ	
3	Check AUDIO/POWER INPUT connection at receiver PHONES connector for looseness.	Connector is loose?	4	5	
4	Tighten connector by pushing in on connector and turning clockwise.	POWER lamp lights?	Δ	5	
5	Inspect receiver PHONES plug.	Jack/plug good?	6	Contact organizational maintenance.	
6	Check fuse and replace if necessary.	POWER light on?	Δ	Contact organizational maintenance.	

3-4. TROUBLESHOOTING PROCEDURES - Continued

m. NO AUDIO AND NO SIGNAL INDICATION ON RECEIVER SIGNAL STR METER (SHEET 1 OF 3)

Step	Instruction	Indication	Yes	No	Remarks
1	Verify that correct cable is connected to rf input on the hf up-converter/demodulator.	Correct cable connected to rf input connector on the hf upconverter/ demodulator?	3	2	
2	Recable system: • Turn off power to units. • Connect system cables following paragraph 2-12 c. • Turn on power to receiver.	Audio and signal indication present.	Δ	3	
3	Check antenna rf cable, bnc patch cables and connectors at RF INPUT on receiver, rf output connector on antenna and VHF ANTENNA connector on hf upconverter/ demodulator. • Power down units following paragraph 2-15 a. • Disconnect rf cable from RF INPUT on receiver and VHF ANTENNA cable on hf upconverter/ demodulator following paragraph 2-15 a.				

GO ON TO SHEET 2

3-4. TROUBLESHOOTING PROCEDURES - Continued

m. NO AUDIO AND NO SIGNAL INDICATION ON RECEIVER SIGNAL STR METER (SHEET 2 OF 3)

Step	Instruction	Indication	Yes	No	Remarks
3	(Continued) • Inspect rf cable and connectors for breaks, bent pins or other damage. • Inspect hf upconverter/demodulator VHF ANTENNA connector and antenna rf output connector for other damage.	Cable connectors or jacks damage?	Contact organizational maintenance.	4	
4	Check speaker assembly cable and connector at PHONES connector for receiver. • Reconnect antenna rf cable following paragraph 2-12 c. • Disconnect speaker assembly cable. See Index in paragraph 2-13 a. • Inspect speaker cable and connector for breaks, bent pins or other damage. • Inspect hf upconverter/demodulator AUDIO/POWER OUTPUT connector for bent pins or other damage. • Inspect receiver PHONES connector for damage.	Cable, connector or PHONES connector damaged?	Contact organizational maintenance.	5	

GO ON TO SHEET 3

3-4. TROUBLESHOOTING PROCEDURES - Continued

m. NO AUDIO AND NO SIGNAL INDICATION ON RECEIVER SIGNAL STR METER (SHEET 3 OF 3)

Step	Instruction	Indication	Yes	No	Remarks
5	Reconnect speaker cable to AUDIO/ POWER OUTPUT on hf upconverter/ demodulator and hf upconverter/demodulator AUDIO/POWER INPUT connector to the RF INPUT on the receiver.	Audio and signal indication present?	Δ	Contact organizational maintenance.	

o. POWER LAMP THAT DOES NOT LIGHT

Step	Instruction	Indication	Yes	No	Remarks
1	Ensure df processor powered up.	POWER light on?	3	2	
2	Power up receiver.	POWER light on?	3 Δ	Δ	
3	Check DF ANT. CONTROL connection at df processor DF ANT. CONTROL connector for looseness.	Connector is loose?	4	5	
4	Tighten connector by pushing in on connector and turning clockwise.	POWER lamp lights?	Δ	5	
5	Inspect DF ANT. CONTROL jack/plug.	Jack/plug good?	6	Contact organizational maintenance.	
6	Check fuse and replace if necessary.	POWER light on?	Δ	Contact organizational maintenance.	

Section III. OPERATOR MAINTENANCE PROCEDURES

SECTION CONTENTS

3-5. INTRODUCTION

Operator maintenance of the direction finder set consists of:

- Removing and replacing fuses.
- Removing and replacing batteries.

Refer to paragraph 3-6 a., for removing and replacing fuses. Refer to paragraph 3-6 b., for removing and replacing batteries.

3-6. MAINTENANCE PROCEDURES

WARNING

Do not remove the protective covers to any of the units. Voltages within these units can cause electrical shock.

Turn off all power to the units before replacing any of the fuses.

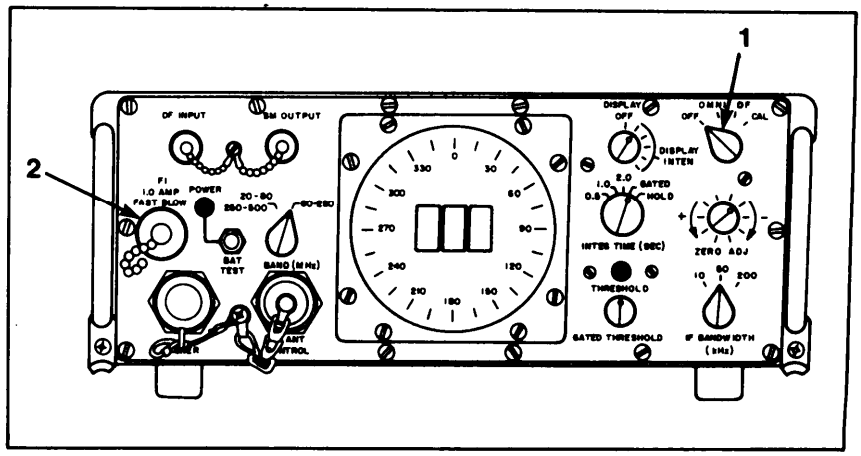
a. Removing and Replacing Fuses. There are four different fuses within the direction finder set that you will have to replace when necessary. One fuse is located on the main chassis of the df processor. The other three fuses are located in the D-cell inserts. Replace these fuses only after instructions listed in the troubleshooting procedures of chapter 3, Section II tell you to replace them.

3-6 a. MAINTENANCE PROCEDURES - Continued

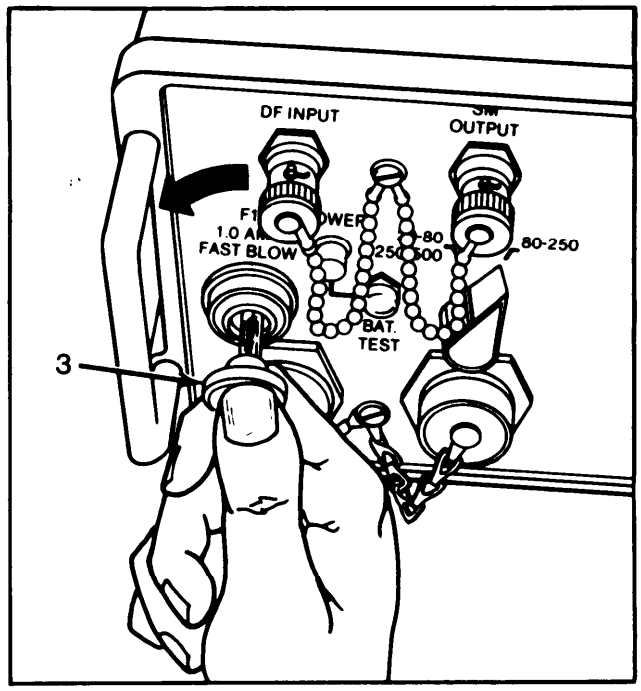
REMOVING AND REPLACING DF PROCESSOR FUSE (SHEET 1 OF 3)

1. Turn OFF/OMNI/DF/CAL switch (1) on df processor to OFF position.

2. Remove protective fuse cap (2) from df processor by turning counter-clockwise.



3. Push in on 1.0 AMP FAST BLOW cap (3) on front panel and turn 1/4 turn counterclockwise.



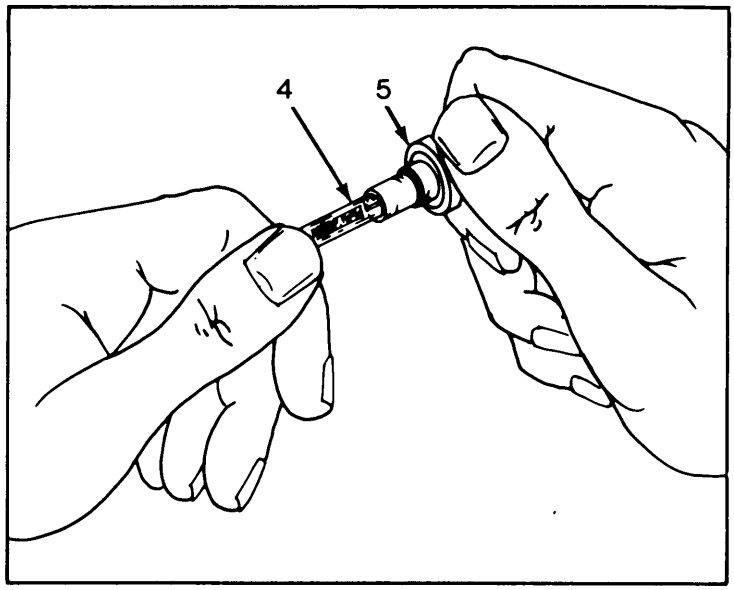
GO ON TO SHEET 2

3-6 a. MAINTENANCE PROCEDURES - Continued

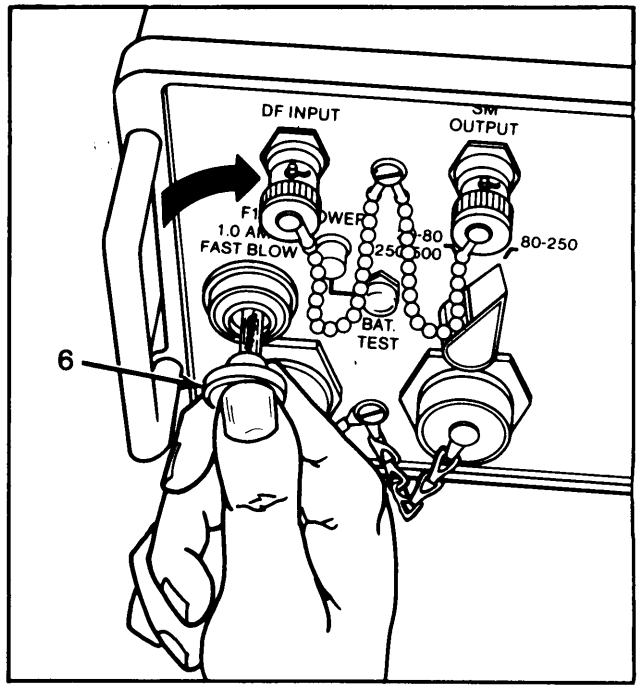
REMOVING AND REPLACING DF PROCESSOR FUSE (SHEET 2 OF 3)

4. Remove fuse (4) from cap (5).

5. Insert a new 1.0 amp fast blow fuse into cap (5).



6. Replace cap (6) in front panel by pushing in and tuning 1/4 turn clockwise.



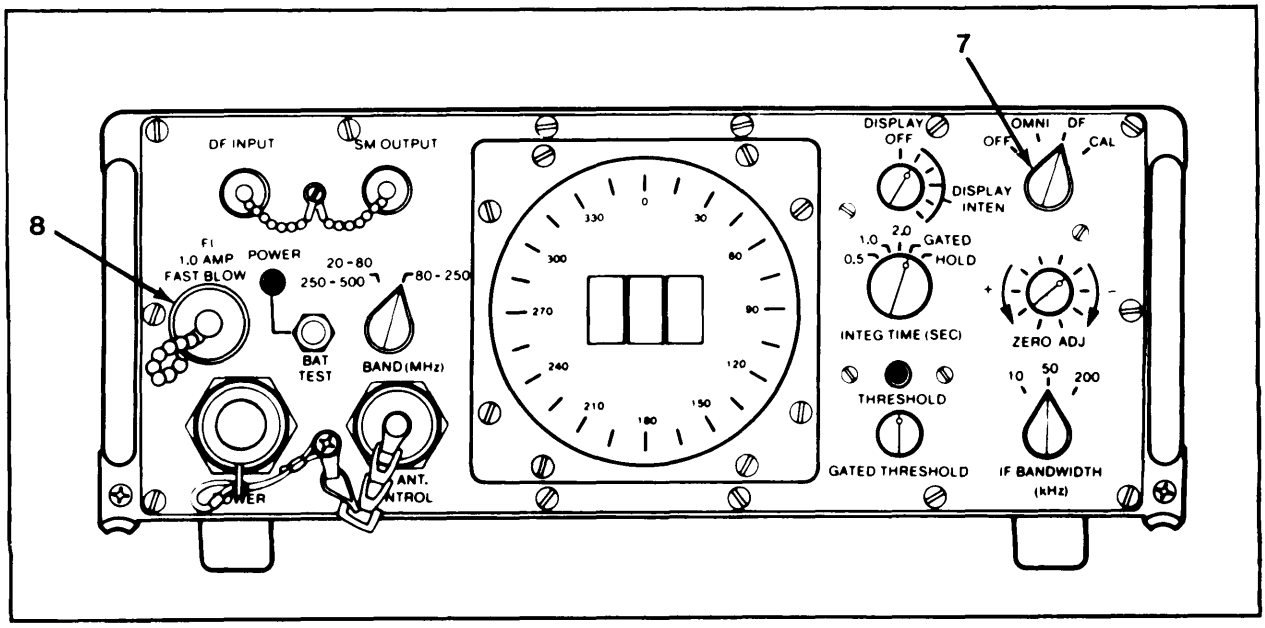
GO ON TO SHEET 3

3-6 a. MAINTENANCE PROCEDURES - Continued

REMOVING AND REPLACING DF PROCESSOR FUSE (SHEET 3 OF 3)

7. Replace protective fuse cap (8) on df processor by turning clockwise.

8. Turn OFF/OMNI/DF/CAL switch (7) on df processor to DF position.



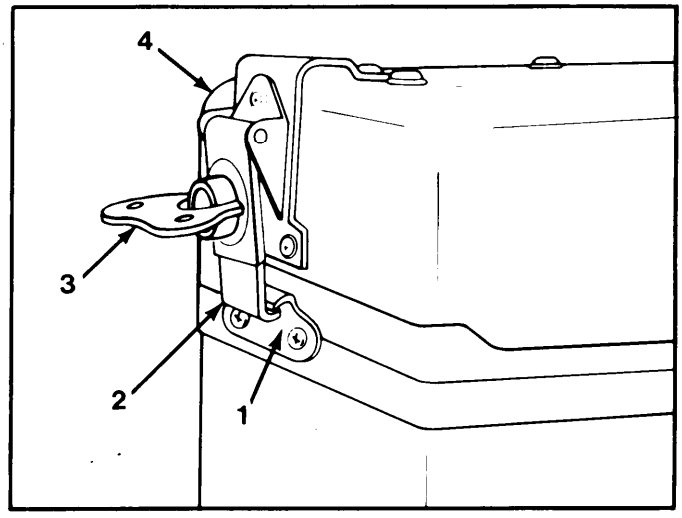
NOTE

Return to the troubleshooting table after removing and replacing the df processor fuse. Troubleshooting procedures must be completed.

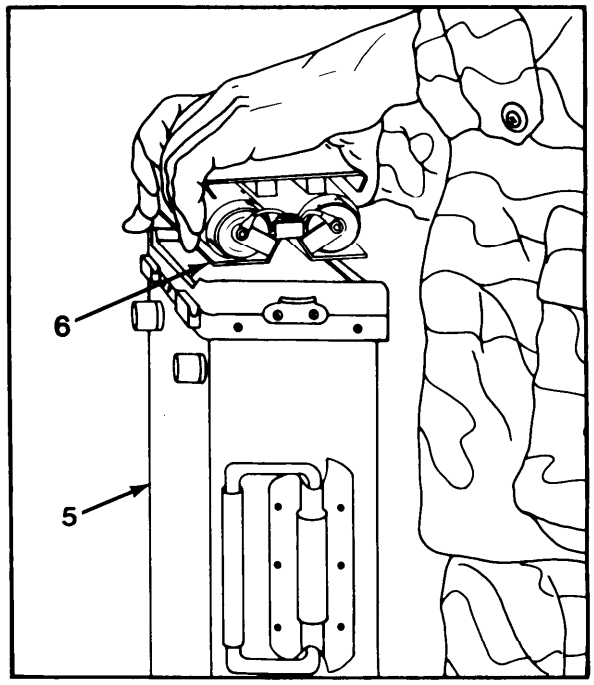
3-6 a. MAINTENANCE PROCEDURES - Continued

REMOVING AND REPLACING D-CELL INSERT FUSE (SHEET 1 OF 3)

1. Turn power off on direction finder unit in accordance with paragraph 2-15 a.
2. Lift up on wing fasteners (3) at each side of battery cover (4).
3. Turn wing fasteners (3) counterclockwise until clamps (2) are free of direction finder unit clips (l).
4. Lift off battery cover (4) and set aside.



5. Remove D-cell insert (6) by lifting it up off direction finder unit (5).



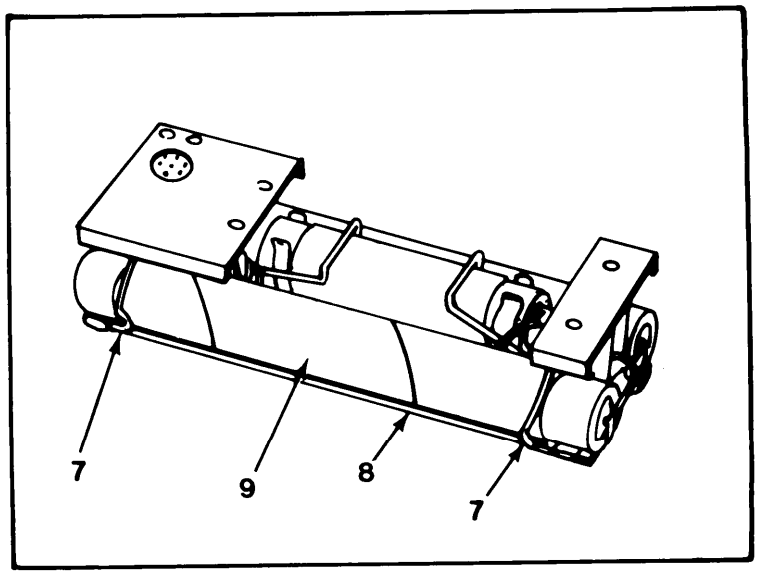
GO ON TO SHEET 2

3-6 a. **MAINTENANCE PROCEDURES - Continued**

REMOVING AND REPLACING D-CELL INSERT FUSE (SHEET 2 OF 3)

6. Remove two retaining clips (7) from cardboard tube (9) at fuse side of D-cell insert (8).

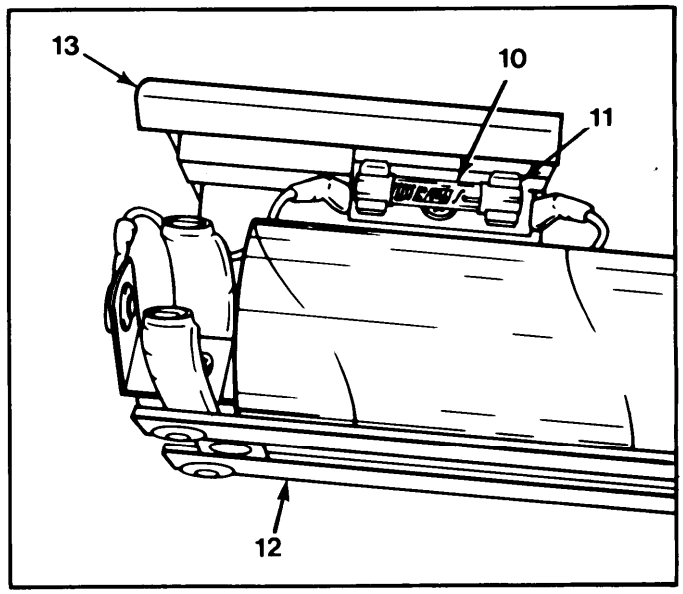
7. Lift cardboard tube (9) at fuse side of D-cell insert from D-cell insert (8) with your hand.



8. Using fingers, reach under inner edge of receptacle plate (13) and pull out fuse (10) from holder (11).

9. Insert new 3/4 amp slow blow fuse into holder (11) under inner edge of receptacle plate (13) in D-cell insert (12).

10. Replace cardboard tube with batteries (9) and two retaining clips (7).



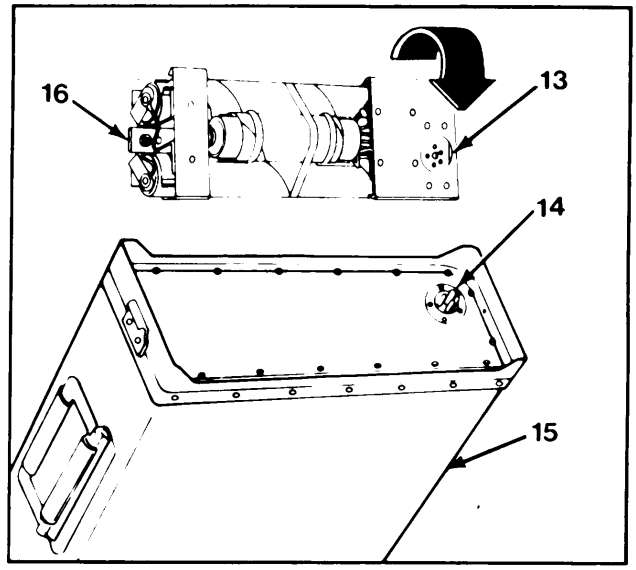
GO ON TO SHEET 3

3-6 a. **MAINTENANCE PROCEDURES - Continued**

REMOVING AND REPLACING D-CELL INSERT FUSE (SHEET 3 0F 3)

11. Replace D-cell insert (16) onto rear of direction finder unit (15) making sure plug slots on D-cell insert (13) align with jack prongs (14) on bottom of direction finder unit.

12. Press D-cell insert (16) into place.



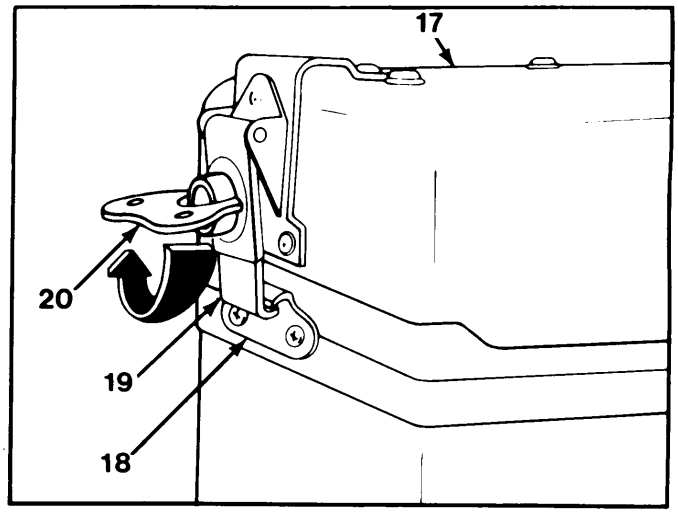
13. Place battery cover (17) on bottom of direction finder unit.

14. Push each clamp (19) against clip (18) and lift up on wing fasteners (20).

15. Turn wing fasteners (20) clockwise until clamps (19) are locked in clips (18).

16. Push wing fasteners (20) flat against sides of direction finder unit.

17. Power on direction finder unit in accordance with paragraph 2-13 a.

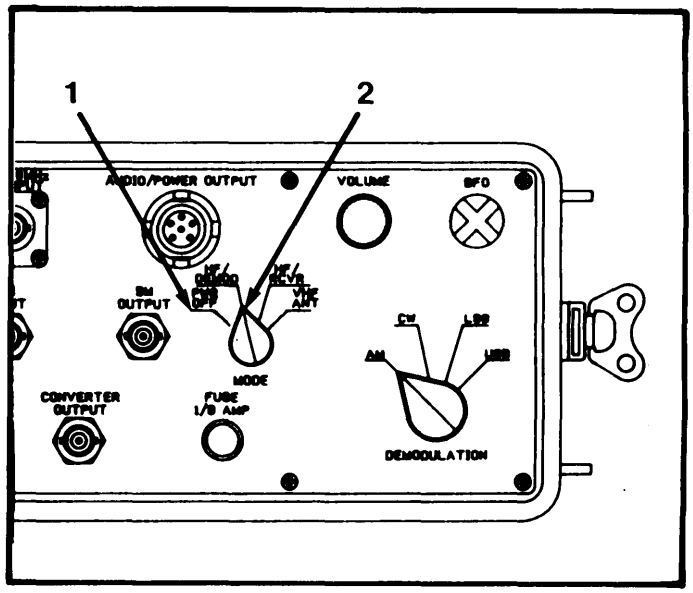


NOTE
Return to the troubleshooting table after removing and replacing the D-cell insert fuse.

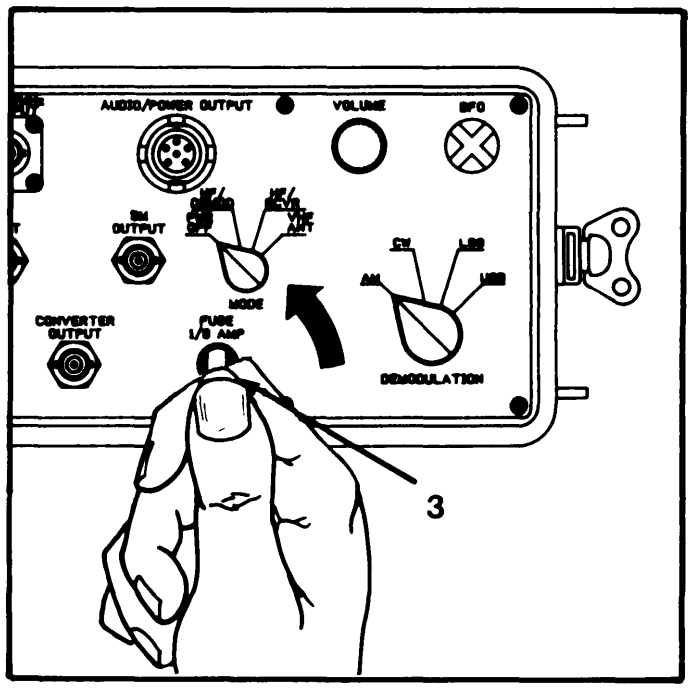
3-6 a. MAINTENANCE PROCEDURES - Continued

REMOVING AND REPLACING HP UPCONVERTER/DEMODULATOR FUSE (SHEET 1 OF 2)

1. Turn MODE switch (2) on hf upconverter/ demodulator to OFF position (l).



2. Push in on 1/8 AMP cap (3) on front panel and turn 1/4 turn counterclockwise.



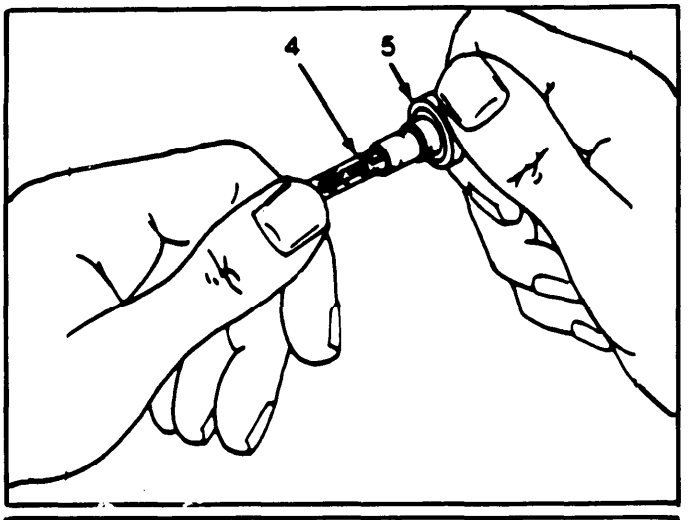
GO ON TO SHEET 2

3-6 a. MAINTENANCE PROCEDURES - Continued

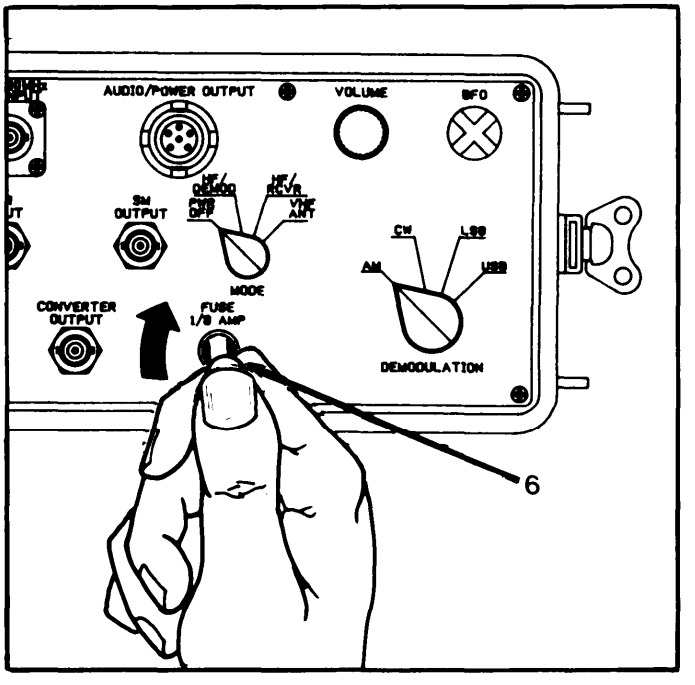
REMOVING AND REPLACING HF UPCONVERTER/DEMODULATOR FUSE (SHEET 2 OF 2)

4. Remove fuse (4) from cap (5).

5. Insert a new 1.0 amp fast blow fuse into cap (5).



6. Replace cap (6) in front panel by pushing in and turning 1/4 turn clockwise.

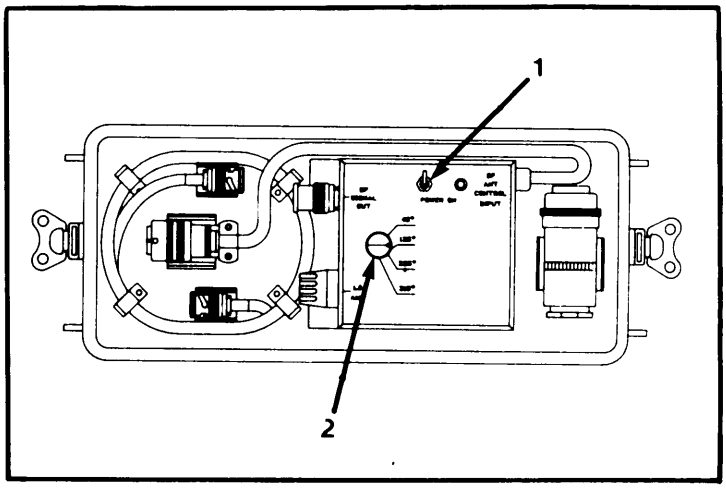


NOTE
Return to the troubleshooting table after removing and replacing the hf upconverter/demodulator fuse.

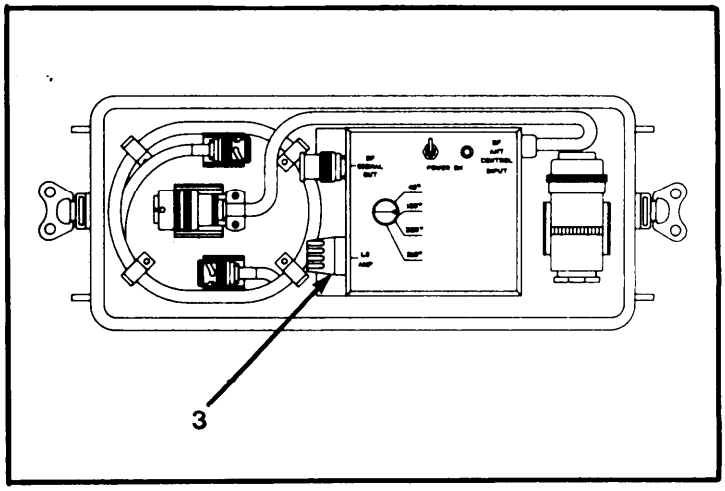
3-6 a. **MAINTENANCE PROCEDURES - Continued**

REMOVING AND REPLACING ANGLE SIMULATOR FUSE (SHEET 1 OF 2)

1. Turn POWER switch (1) on angle simulator (2) to OFF position.



2. Push in on 1.0 AMP cap (3) on front panel and turn 1/4 turn counterclockwise



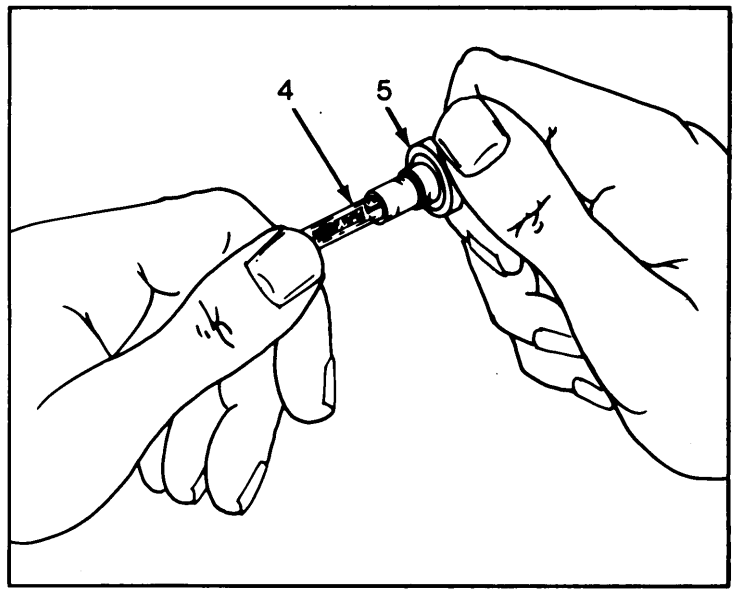
GO ON TO SHEET 2

3-6 a. **MAINTENANCE PROCEDURES - Continued**

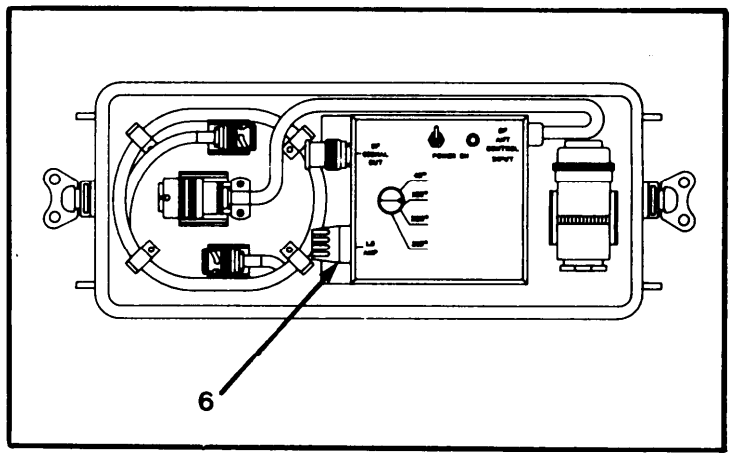
REMOVING AND REPLACING ANGLE SIMULATOR FUSE (SHEET 2 OF 2)

4. Remove fuse (4) from cap (5).

5. Insert a new 1.0 amp fast blow fuse into cap (5).



6. Replace cap (6) in front panel by pushing in and turning 1/4 turn clockwise.



3-6 a. MAINTENANCE PROCEDURES - Continued

b. Removing and Replacing Batteries. When indications on the direction finder set show the batteries have low voltage levels, replace them in all units by following these steps.

1. Power down units in accordance with paragraph 2-15 a.
2. Disconnect cables on units in accordance with paragraph 2-15 a.
3. Remove unit(s) that require batteries by lifting upper unit(s) off and setting aside.
4. Remove discharged battery and install new one in accordance with paragraph 2-12 b.
5. Restack units in accordance with paragraph 2-12 c.
6. Connect cables on units in accordance with paragraph 2-12 c.
7. Power up units in accordance with paragraph 2-13 a.

Section IV. MAINTENANCE OF AUXILIARY EQUIPMENT

3-7. GENERAL

The following auxiliary equipment maybe used with the direction finder set:

- Radio Set AN/PRC-77
- Audio Recorder AN/UNH-16A
- Radio Set AN/VRC-12
- Communications Security Equipment TSEC/KY-57
- Headset H-251/U

These equipment items are not part of the direction finder set and their troubleshooting and maintenance is not covered in this manual. Procedures for troubleshooting and maintenance of this auxiliary equipment can be found in the following manuals and bulletins:

Equipment	Manual or Bulletin
Radio Set AN/PRC-77	TM 11-5820-667-12
Audio Recorder AN/UNH-16A	TM 32-5835-220-10
Radio Set AN/VRC-12	TM 11-5820-401-12
Communications Security Equipment TSEC/KY-57	AR-750-1 (Section IV)
Headset H-251/U	SB 11-628

CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

SECTION CONTENTS Page

Section I. REPAIR PARTS TMDE, AND SUPPORT EQUIPMENT

SECTION CONTENTS Page

4-1. COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

4-2. SPECIAL TOOLS TMDE, AND SUPPORT EQUIPMENT

No special tools, TMDE, or support equipment are needed for organizational maintenance of the direction finder set.

4-3. REPAIR PARTS

There are no repair parts listed for organizational level maintenance of the direction finder set.

Section II. SERVICE UPON RECEIPT

SECTION CONTENTS

4-4. SITE AND SHELTER REQUIREMENTS

The direction finder set has specific siting and antenna orientation requirements. Refer to paragraph 2-11 for siting and orienting requirements. There are no shelter requirements for this equipment.

4-5. SERVICE UPON RECEIPT OF MATERIEL

Upon receiving the direction finder set from the manufacturer, perform the following checks:

a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on the Report of Discrepancy (ROD) (SF 364).

b Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA PAM 738-750.

c. Check DA PAM 25-30 to see if any MWOs need to be applied to the equipment.

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

4-6. GENERAL

a. Preventive maintenance is the systematic care and inspection of equipment necessary to keep it in good operating condition. There are no required PMCS procedures for organizational level maintenance. Keep in mind, however, the routine checks and services listed for operator maintenance in paragraph 2-9.

b. Always keep in mind the warnings and cautions pertaining to the direction finder set.

c. If any portion of the direction finder set fails to operate, refer to paragraphs 3-3 and 3-4.

Section IV. SYSTEM PERFORMANCE TEST

SECTION CONTENTS

4-7. GENERAL

The purpose of this AN/PRD-l1 System Test is to verify that all components of the system are performing to specifications. This system test systematically verifies that both system sensitivity and direction finding calibration are within specifications.

NOTE

If an rf voltmeter is not available, the Oscilloscope may be used in lieu of the rf voltmeter to ensure signals are present and free of distortion during this System Verification Test.

4-8. VERIFY DF PROCESSOR ACCURACY

Perform the angle simulator test as outlined in Chapter 2, Section III, paragraph 2-13. If all readings are not correct, refer to Chapter 4, Section V, paragraph 4-18, df processor section, fault symptom "Displays Incorrect Lines of Bearing."

4-9. VERIFY DF CONTROL CABLE SERVICEABILITY

INITIAL SETUP

Test Equipment	Equipment Condition Description
Oscilloscope	Df processor powered up and connected to df control cable.

Step	Instruction	Indication	Remarks
1	Connect the df antenna control cable to the DF ANT. CONTROL connector on the front panel of the df processor.		
2	Use oscilloscope.	Check for pulses (+15 vdc to -15 vdc ±1 vdc) at pins A, B, C, and D on the connector at the df antenna end of the df control cable.	If the pulses are not present, go to Step 3 below. Verify that the signals are present at the df processor output. If the pulses are present go to paragraph 4-10.
3	Use oscilloscope.	Check for pulses (+15 vdc to -15 vdc ±11 vdc) at pins A, B, C, and D on the DF ANT. CONTROL connector on the df processor.	If the pulses are present at the DF ANT. CONTROL connector, check the df antenna control cable for "opens" and "shorts", and repair or remove and replace the df antenna control cable. If the pulses are not present, refer to Chapter 4, Section V, paragraph 4-18, df processor section, fault symptom "Displays Incorrect Lines of Bearing".

4-10. VERIFY DF ANTENNA ACCURACY AND SENSITIVITY (SHEET 1 OF 14)

INITIAL SETUP

Test Equipment

Oscilloscope or
Rf Voltmeter
Signal Generator
Dc power supply
Digital multimeter

Equipment Condition Description

Df antenna assembled without antenna elements or mast extension installed.

Step	Instruction	Indication	Remarks
1	Set the signal generator to 40 mhz at 0 dB. Set the oscilloscope to the (.2) 200 millivolts position.		
2	Connect the oscilloscope to the df antenna low bay rf output connector J19.		
3	Connect -15 vdc to the df antenna control input connector, J10, on the df antenna. Connect the voltage ground line to pin E and the -15 vdc line to pin A.		
4	Insert the 40 mhz signal from the signal generator at J15 on the low bay antenna arm. This is the connector where the top element on the antenna arm is normally installed. Connect the signal ground to J11 on the antenna arm. This is the connector where the bottom element on the antenna arm is normally installed.		

GO ON TO SHEET 2

4-10. VERIFY DF ANTENNA ACCURACY AND SENSITIVITY - Continued (SHEET 2 OF 14)

Step	Instruction	Indication	Remarks
5	Verify the antenna switching by removing and then reinserting the dc voltage at pin A of the antenna connector.	When the voltage is applied, the signal should be present on the oscilloscope. The signal should be 700 millivolts (±100 millivolts) on the oscilloscope, or -5 dBm (±2 dB) if the rf voltmeter is connected to J19.	
6	With the voltage applied at pin A, remove and reinsert the signal at J15 on the antenna arm.	The signal should be present on the oscilloscope when the signal is applied.	
7	Next insert the 40 mhz signal at J11 and the signal ground to J15.		
8	Verify the antenna switching by removing and then reinserting the dc voltage at pin A of the antenna connector.	When the voltage is applied, the signal should be present on the oscilloscope. The signal level should be 700 millivolts (±100 millivolts) on the oscilloscope, or -5 dBm (±2 dB) if the rf voltmeter is connected to J19.	
9	With the voltage applied at pin A, remove and reinsert the signal at J11 on the antenna arm.	The signal should be present on the oscilloscope when the signal is applied.	
10	Now move the -15 vdc line to pin B on the df antenna control input connector.		

GO ON TO SHEET 3

4-10. VERIFY DF ANTENNA ACCURACY AND SENSITIVITY - Continued (SHEET 3 OF 14)

Step	Instruction	Indication	Remarks
11	Insert the 40 mhz signal from the signal generator at J16 on the low bay antenna arm. This is the connector where the top element on the antenna arm is normally installed. Connect the signal ground to J12 on the antenna arm. This is the connector where the bottom element on the antenna arm is normally installed.		
12	Verify the antenna switching by removing and then reinserting the dc voltage at pin B of the antenna connector.	When the voltage is applied, the signal should be present on the oscilloscope. The signal should be 700 millivolts (±100 millivolts) on the oscilloscope, or -5 dBm (±2 dB) if the rf voltmeter is connected to J19.	
13	With the voltage applied at pin B, remove and reinsert the signal at J16 on the antenna arm.	The signal should be present on the oscilloscope when the signal is applied.	
14	Next insert the 40 mhz signal at J12 and the signal ground to J16.		
15	Verify the antenna switching by removing and then reinserting the dc voltage at pin B of the antenna connector.	When the voltage is applied, the signal should be present on the oscilloscope. The signal level should be 700 millivolts (±100 millivolts) on the oscilloscope, or -5 dBm (±2 dB) if the rf voltmeter is connected to J19.	

GO ON TO SHEET 4

4-10. VERIFY DF ANTENNA ACCURACY AND SENSITIVITY - Continued (SHEET 4 OF 14)

Step	Instruction	Indication	Remarks
16	With the voltage applied at pin B, remove and reinsert the signal at J12 on the antenna arm.	The signal should be present on the oscilloscope when the signal is applied.	
17	Now move the -15 vdc line to pin C on the df antenna control input connector.		
18	Insert the 40 mhz signal from the signal generator at J17 on the low bay antenna arm. This is the connector where the top element on the antenna arm is normally installed. Connect the signal ground to J13 on the antenna arm. This is the connector where the bottom element on the antenna arm is normally installed.		
19	Verify the antenna switching by removing and then reinserting the dc voltage at pin C of the antenna connector.	When the voltage is applied, the signal should be present on the oscilloscope. The signal should be 700 millivolts (±100 millivolts) on the oscilloscope, or -5 dBm (±2 dB) if the rf voltmeter is connected to J19.	
20	With the voltage applied at pin C, remove and reinsert the signal at J17 on the antenna arm.	The signal should be present on the oscilloscope when the signal is applied.	
21	Next insert the 40 mhz signal at J13 and the signal ground to J17.		

GO ON TO SHEET 5

4-10. VERIFY DF ANTENNA ACCURACY AND SENSITIVITY - Continued (SHEET 5 OF 14)

Step	Instruction	Indication	Remarks
22	Verify the antenna switching by removing and then reinserting the dc voltage at pin C of the antenna connector.	When the voltage is applied, the signal should be present on the oscilloscope. The signal level should be 700 millivolts (±100 millivolts) on the oscilloscope, or -5 dBm (±2 dB) if the rf voltmeter is connected to J19.	
23	With the voltage applied at pin C, remove and reinsert the signal at J13 on the antenna arm.	The signal should be present on the oscilloscope when the signal is applied.	
24	Now move the -15 vdc line to pin D on the df antenna control input connector.		
25	Insert the 40 mhz signal from the signal generator at J18 on the low bay antenna arm. This is the connector where the top element on the antenna arm is normally installed. Connect the signal ground to J14 on the antenna arm. This is the connector where the bottom element on the antenna arm is normally installed.		

GO ON TO SHEET 6

4-10. VERIFY DF ANTENNA ACCURACY AND SENSITIVITY - Continued (SHEET 6 OF 14)

Step	Instruction	Indication	Remarks
26	Verify the antenna switching by removing and then reinserting the dc voltage at pin D of the antenna connector.	When the voltage is applied, the signal should be present on the oscilloscope. The signal should be 700 millivolts (±100 millivolts) on the oscilloscope, or -5 dBm (±2 dB) if the rf voltmeter is connected to to J19.	
27	With the voltage applied at pin D, remove and reinsert the signal at J18 on the antenna arm.	The signal should be present on the oscilloscope when the signal is applied.	
28	Next insert the 40 mhz signal at J14 and the signal ground to J18.		
29	Verify the antenna switching by removing and then reinserting the dc voltage at pin D of the antenna connector.	When the voltage is applied, the signal should be present on the oscilloscope. The signal level should be 700 millivolts (±100 millivolts) on the oscilloscope, or -5 dBm (±2 dB) if the rf voltmeter is connected to J19.	
30	With the voltage applied at pin D, remove and reinsert the signal at J14 on the antenna arm.	The signal should be present on the oscilloscope when the signal is applied.	

GO ON TO SHEET 7

4-10. VERIFY DF ANTENNA ACCURACY AND SENSITIVITY - Continued (SHEET 7 OF 14)

NOTE
Perform steps 31 through 60 for the AS-3733/PRD-11 df antenna.

Step	Instruction	Indication	Remarks
31	Set the signal generator to 60 mhz at 0 dB. Set the oscilloscope to the (.2) 200 millivolts position.		
32	Connect the oscilloscope to the df antenna high bay rf output connector J20.		
33	Move the -15 vdc to pin A on the df antenna control input connector, J10, on the df antenna. Ensure the voltage ground line is still connected to pin E.		
34	Insert the 60 mhz signal from the signal generator at J25 on the high bay antenna arm. This is the connector where the top element on the antenna arm is normally installed. Connect the signal ground to J21 on the antenna arm. This is the connector where the bottom element on the antenna arm is normally installed.		

GO ON TO SHEET 8

4-10. VERIFY DF ANTENNA ACCURACY AND SENSITIVITY - Continued (SHEET 8 OF 14)

Step	Instruction	Indication	Remarks
35	Verify the antenna switching by removing and then reinserting the dc voltage at pin A of the antenna connector.	When the voltage is applied, the signal should be present on the oscilloscope. The signal should be 630 millivolts (±100 millivolts) on the oscilloscope, or -9 dBm (±2 dB) if the rf voltmeter is connected to J20.	
36	With the voltage applied at pin A, remove and reinsert the signal at J25 on the antenna arm.	The signal should be present on the oscilloscope when the signal is applied.	
37	Next insert the 60 mhz signal at J21 and the signal ground to J25.		
38	Verify the antenna switching by removing and then reinserting the dc voltage at pin A of the antenna connector.	When the voltage is applied, the signal should be present on the oscilloscope. The signal level should be 630 millivolts (±100 millivolts) on the oscilloscope, or -9 dBm (±2 dB) if the rf voltmeter is connected to J20.	
39	With the voltage applied at pin A, remove and reinsert the signal at J21 on the antenna arm.	The signal should be present on the oscilloscope when the signal is applied.	
40	Now move the -15 vdc line to pin B on the df antenna control input connector.		

GO ON TO SHEET 9

4-10. VERIFY DF ANTENNA ACCURACY AND SENSITIVITY - Continued (SHEET 9 OF 14)

Step	Instruction	Indication	Remarks
41	Insert the 60 mhz signal from the signal generator at J26 on the high bay antenna arm. This is the connector where the top element on the antenna arm is normally installed. Connect the signal ground to J22 on the antenna arm. This is the connector where the bottom element on the antenna arm is normally installed.		
42	Verify the antenna switching by removing and then reinserting the dc voltage at pin B of the antenna connector.	When the voltage is applied, the signal should be present on the oscilloscope. The signal should be 630 millivolts (±100 millivolts) on the oscilloscope, or -9 dBm (±2 dB) if the rf voltmeter is connected to to J20.	
43	With the voltage applied at pin B, remove and reinsert the signal at J26 on the antenna arm.	The signal should be present on the oscilloscope when the signal is applied.	
44	Next insert the 60 mhz signal at J22 and the signal ground to J26.		
45	Verify the antenna switching by removing and then reinserting the dc voltage at pin B of the antenna connector.	When the voltage is applied, the signal should be present on the oscilloscope.	

GO ON TO SHEET 10

4-10. VERIFY DF ANTENNA ACCURACY AND SENSITIVITY - Continued (SHEET 10 OF 14)

Step	Instruction	Indication	Remarks
46	With the voltage applied at pin B, remove and reinsert the signal at J22 on the antenna arm.	The signal should be present on the oscilloscope when the signal is applied.	
47	Now move the -15 vdc line to pin C on the df antenna control input connector.		
48	Insert the 60 mhz signal from the signal generator at J27 on the high bay antenna arm. This is the connector where the top element on the antenna arm is normally installed. Connect the signal ground to J23 on the antenna arm. This is the connector where the bottom element on the antenna arm is normally installed.		
49	Verify the antenna switching by removing and then reinserting the dc voltage at pin C of the antenna connector.	When the voltage is applied, the signal should be present on the oscilloscope. The signal should be 630 millivolts (±100 millivolts) on the oscilloscope, or -9 dBm (±2 dB) if the rf voltmeter is connected to J20.	
50	With the voltage applied at pin C, remove and reinsert the signal at J27 on the antenna arm.	The signal should be present on the oscilloscope when the signal is applied.	
51	Next insert the 60 mhz signal at J23 and the signal ground to J27.		

GO ON TO SHEET 11

4-10. VERIFY DF ANTENNA ACCURACY AND SENSITIVITY - Continued (SHEET 11 OF 14)

Step	Instruction	Indication	Remarks
52	Verify the antenna switching by removing and then reinserting the dc voltage at pin C of the antenna connector.	When the voltage is applied, the signal should be present on the oscilloscope. The signal level should be 630 millivolts (±100 millivolts) on the oscilloscope, or -9 dBm (±2 dB) if the rf voltmeter is connected to J20.	
53	With the voltage applied at pin C, remove and reinsert the signal at J23 on the antenna arm.	The signal should be present on the oscilloscope when the signal is applied.	
54	Now move the -15 vdc line to pin D on the df antenna control input connector.		
55	Insert the 60 mhz signal from the signal generator at J28 on the high bay antenna arm. This is the connector where the top element on the antenna arm is normally installed. Connect the signal ground to J24 on the antenna arm. This is the connector where the bottom element on the antenna arm is normally installed.		
56	Verify the antenna switching by removing and then reinserting the dc voltage at pin D of the antenna connector.	When the voltage is applied, the signal should be present on the oscilloscope. The signal should be 630 millivolts (±100 millivolts) on the oscilloscope, or -9 dBm (±2 dB) if the rf voltmeter is connected to J20.	

GO ON TO SHEET 12

4-10. VERIFY DF ANTENNA ACCURACY AND SENSITIVITY - Continued (SHEET 12 OF 14)

Step	Instruction	Indication	Remarks
57	With the voltage applied at pin D, remove and reinsert the signal at J28 on the antenna arm.	The signal should be present on the oscilloscope when the signal is applied.	
58	Next insert the 60 mhz signal at J24 and the signal ground to J28.		
59	Verify the antenna switching by removing and then reinserting the dc voltage at pin D of the antenna connector.	When the voltage is applied, the signal should be present on the oscilloscope. The signal level should be 630 millivolts (±100 millivolts) on the oscilloscope, or -9 dBm (±2 dB) if the rf voltmeter is connected to J20.	
60	With the voltage applied at pin D, remove and reinsert the signal at J24 on the antenna arm.	The signal should be present on the oscilloscope when the signal is applied.	
61			If all df antenna signals and voltages are not present, contact your next higher level of maintenance for repair or replacement of the df antenna.

GO ON TO SHEET 13

4-10. VERIFY DF ANTENNA ACCURACY AND SENSITIVITY - Continued (SHEET 13 OF 14)

NOTE
Perform Step 62 below for the single (3 ft.) element lower bay antenna elements.

Perform Step 63 below for the dual element (6 ft.) lower bay antenna elements.

Step	Instruction	Indication	Remarks
62	Using the digital multimeter measure 574 ohms resistance (±45 ohms) of each df antenna low bay antenna element. Measure the resistance from the metal stub on the bottom of the element to the metal cap on the top of the element. Note: It may be necessary to scrape a small area of paint off of the metal cap in order to get a proper measurement.	574 ohms (±45 ohms)	
63	Using the digital multimeter to measure 127 ohms resistance (±13 ohms) of each inner element of the df antenna low bay 6 ft. dual element set. Measure 447 ohms resistance (plus or minus 45 ohms) of each outer element of the df antenna low bay 6 ft. dual element set. Measure the resistance from the metal stub on the bottom of the element to the metal cap on the top of the element. Note: It may be necessary to scrape a small area of paint off of the metal cap in order to get a proper measurement.	127 ohms (±13 ohms) 447 ohms (±45 ohms)	

GO ON TO SHEET 14

4-10. VERIFY DF ANTENNA ACCURACY AND SENSITIVITY - Continued (SHEET 14 OF 14)

NOTE

Perform Step 64 below for the AS-3733/PRD-11 df antenna.

Step	Instruction	Indication	Remarks
64	Use the digital multimeter to measure 15K ohms resistance (±1K ohms) of each df antenna high bay antenna element. Measure the resistance from the threaded end of the bottom element to the metal cap on top of the element. Again, it may be necessary to scrape a small area of paint off of the metal cap in order to get a proper measurement.	15K ohms (±1K ohms)?	
65			If any antenna elements show incorrect resistance, replace defective elements in accordance with paragraph 2-12 a.

4-11. VERIFY RF CABLES SERVICEABILITY

INITIAL SETUP

Test Equipment

Rf voltmeter
Signal generator

Equipment Condition Description

Rf cables unpacked from antenna bag.

Step	Instruction	Indication	Remarks
1	Reference the rf voltmeter to a -30 dBm signal at 40 mhz from the signal generator.		
2	Connect one end of the rf cable to the signal generator and the other end of the cable to the rf voltmeter.	Check for less than 2 dB loss in the cable (a -30 to -32 dBm reading on the rf voltmeter).	
	NOTE Perform steps 3, 4, and 5 below for the AS-3733/PRD-11 df antenna.		
3	Repeat steps 1 and 2 above for each rf cable.		
4	Change the signal generator to 250 mhz.		
5	Repeat steps 1 and 2 above. Using the 250 mhz signal, check for less than 4 dB loss in each rf cable.	Check for 4 dB loss in the cables at 250 mhz (a -30 to -34 dBm reading on the rf voltmeter).	If either rf cable does not pass this test, repair or replace the cable.

4-12. VERIFY SYSTEM PATCH CORDS SERVICEABILITY

NOTE

Perform steps 1 and 2 below for each bnc patch cable in the system.

INITIAL SETUP

Test Equipment	Equipment Condition Description
Rf voltmeter Signal generator	Rf cables unpacked from antenna bag.

Step	Instruction	Indication	Remarks
1	Reference the rf voltmeter to a -30 dBm signal at 10 mhz from the signal generator.		
2	Connect one end of the patch cord to the signal generator and the other end of the patch cord to the rf voltmeter.	Check for less than 2 dB loss in the cable (a -30 dBm to -32 dBm reading on the rf voltmeter).	If any patch cord does not pass this test, repair or remove and replace the patch cord and perform this test on the repaired or replaced patch cord.

4-13. VERIFY RECEIVER SENSITIVITY AND SELECTIVITY (SHEET 1 OF 8)

INITIAL SETUP

Test Equipment

Rf voltmeter
Headset or speaker

Equipment Condition Description

Receiver powered up.

Step	Instruction	Indication	Remarks
1	Set the signal generator to 40 mhz at -30 dBm, AM modulation (1 kHz, 50%) and connect the generator output to the RF input on the receiver. Fine tune the receiver for maximum signal strength indication on the signal strength meter and a clear audible signal.		
2	Set the receiver IF BANDWIDTH (kHz) switch to the 10 kHz position.		
3	Set the receiver mode switch to AM and the RF GAIN to AGC.		
4	Monitor the audio output of the receiver as you slowly lower the signal generator output to at least -107 dBm.	If the signal is audible to -107 dB or lower, set the signal generator output level to -30 dBm and go to step 5.	If the signal is not audible with a generator output down to least -107 dBm, repair or remove and replace the receiver and repeat steps 1 through 4 on the repaired or replacement receiver.

GO ON TO SHEET 2

4-13. VERIFY RECEIVER SENSITIVITY AND SELECTIVITY - Continued (SHEET 2 OF 8)

Step	Instruction	Indication	Remarks
5	Set the receiver IF BANDWIDTH (kHz) switch to the 50 kHz position.		
6	Monitor the audio output of the receiver as you slowly lower the signal generator output to at least -100 dBm.	If the signal is audible to -100 dBm or lower. Return the signal generator out-put level to -30 dBm and go to step 7.	If the signal is not audible with a generator output down to least -100 dBm, repair or remove and replace the receiver and repeat steps 1 through 6 on the re-paired or replacement receiver.
7	Set the receiver IF BANDWIDTH (kHz) switch to the 200 kHz position.		
8	Monitor the audio output of the receiver as you slowly lower the signal generator output to at least -94 dBm.	If the signal is audible to -94 dBm or lower, return the signal generator output level to -30 dBm and go to step 9.	If the signal is not audible with a generator output down to least -94 dBm, repair or remove and replace the receiver and repeat steps 1 through 8 on the repaired or replacement receiver.
9	Change the receiver MODE switch to FM.		

GO ON TO SHEET 3

4-13. VERIFY RECEIVER SENSITIVITY AND SELECTIVITY - Continued (SHEET 3 OF 8)

Step	Instruction	indication	Remarks
10	Set the signal generator to FM modulation (Mod Freq = 400 Hz, PD = 3 kHz) and fine tune the receiver for maximum signal strength indication on the signal strength meter.		
11	Set the receiver IF BAND-WIDTH (kHz) switch to the 10 kHz position.		
12	Monitor the audio output of the receiver as you slowly lower the signal generator output to at least -107 dBm.	lf the signal is audible to -107 dBm or lower, return the signal generator out-put level to -30 dBm and go to step 13.	If the signal is not audible with a generator output down to least -107 dBm, repair or remove and replace the receiver and repeat steps 1 through 12 on the re-paired or replacement receiver.
13	Set the receiver IF BANDWIDTH (kHz) switch to the 50 kHz position.		
14	Change the generator FM modulation (Mod Freq = 1000 hz, PD = 15 kHz)		

GO ON TO SHEET 4

4-13. VERIFY RECEIVER SENSITIVITY AND SELECTIVITY - Continued
(SHEET 4 OF 8)

Step	Instruction	Indication	Remarks
15	Monitor the audio output of the receiver as you slowly lower the signal generator output to at least -100 dBm.	If the signal is audible to -100 dBm or lower, return the signal generator output level to -30 dBm and go to step 16.	If the signal is not audible with a generator output down to least -100 dBm, repair or remove and replace the receiver and repeat steps 1 through 15 on the repaired or replacement receiver.
16	Set the receiver IF BANDWIDTH (kHz) switch to the 200 kHz position.		
17	Change the generator FM modulation (Mod Freq = 1 kHz, PD = 60 hz).		
18	Monitor the audio output of the receiver as you slowly lower the signal generator output to at least -94 dBm.	If the signal is audible to -94 dBm or lower, go to step 19.	If the signal is not audible with a generator output down to least -94 dBm repair or remove and replace the receiver and repeat steps 1 through 18 on the repaired or replacement receiver.
19	Remove the modulation from the signal generator and set the output level to -70 dBm.		

GO ON TO SHEET 5

4-13. VERIFY RECEIVER SENSITIVITY AND SELECTIVITY - Continued (SHEET 5 OF 8)

Step	Instruction	Indication	Remarks
20	Set the receiver IF BANDWIDTH (kHz) to the 10 kHz position, set the mode switch to the USB/CW position, set the receiver RF GAIN to maximum manual gain, and fine tune the receiver so you can hear the audio signal at a medium pitch (about 1 kHz).		
21	Monitor the audio output of the receiver as you slowly lower the signal generator output to at least -107 dBm.	If the signal is audible to -107 dB or lower, return the signal generator output level to -70 dBm and go to step 22.	If the signal is not audible with a generator output down to least -107 dBm, repair or remove and replace the receiver and repeat steps 1 through 21 on the repaired or replacement receiver.
22	Set receiver MODE switch to the LSB/CW position and fine tune the receiver so you can hear the audio signal.		
23	Monitor the audio output of the receiver as you slowly lower the signal generator output to at least -107 dBm.	If the signal is audible to -107 dBm or lower, go to step 24.	If the signal is not audible with a generator output down to least -107 dBm, repair or remove and replace the receiver and repeat steps 1 through 23 on the repaired or replacement receiver.

GO ON TO SHEET 6

4-13. VERIFY RECEIVER SENSITIVITY AND SELECTIVITY - Continued (SHEET 6 OF 8)

Step	Instruction	Indication	Remarks
24	Set the signal generator to 25 mhz, AM modulation at 50%, and -30 dBm signal level.		
25	Change the receiver MODE to AM and fine tune the receiver to the 25 mhz signal for maximum signal strength reading on the signal strength meter and a clear audible tone.		
26	Monitor the audio output of the receiver as you slowly lower the signal generator output to at least -107 dBm.	If the signal is audible to -107 dBm or lower, go to step 27.	If the signal is not audible with a generator output down to least -107 dBm, repair or remove and replace the receiver and repeat steps 1 through 26 on the repaired or replacement receiver.
27	Set the signal generator to 75 mhz at -30 dBm signal level.		
28	Fine tune the receiver to the 75 mhz signal for maximum signal strength reading on the signal strength meter and a clear audible tone.		

GO ON TO SHEET 7

4-13. VERIFY RECEIVER SENSITIVITY AND SELECTIVITY - Continued (SHEET 7 OF 8)

Step	Instruction	Indication	Remarks
29	Monitor the audio output of the receiver as you slowly lower the signal generator output to at least -107 dBm.	If the signal is audible to -107 dBm or lower, go to step 30.	If the signal is not audible with a generator output down to least -107 dBm, repair or remove and replace the receiver and repeat steps 1 through 29 on the repaired or replacement receiver.
30	Set the signal generator to 85 mhz at -30 dBm signal level.		
31	Fine tune the receiver to the 85 mhz signal for maximum signal strength reading on the signal strength meter and a clear audible tone.		
32	Monitor the audio output of the receiver as you slowly lower the signal generator output to at least -107 dBm.	If the signal is audible to -107 dBm or lower, go to step 33.	If the signal is not audible with a generator output down to least -107 dBm repair or remove and replace the receiver and repeat steps 1 through 32 on the repaired or replacement receiver.
33	Set the signal generator to 245 mhz at -30 dBm signal level.		

GO ON TO SHEET 8

4-13. VERIFY RECEIVER SENSITIVITY AND SELECTIVITY - Continued (SHEET 8 OF 8)

Step	Instruction	Indication	Remarks
34	Fine tune the receiver to the 245 mhz signal for maximum signal strength reading on the signal strength meter and a clear audible tone.		
35	Monitor the audio output of the receiver as you slowly lower the signal generator output to at least -107 dBm.	If the signal is audible to -107 dBm or lower, go to paragraph 4-14.	If the signal is not audible with a generator output down to least -107 dBm, repair or remove and replace the receiver and repeat steps 1 through 35 on the repaired or replacement receiver.

4-14. VERIFY SIGNAL MONITOR SENSITIVITY (SHEET 1 OF 4)

INITIAL SETUP

Test Equipment	Equipment Condition Description
Signal Generator	Signal monitor powered up.

Step	Instruction	Indication	Remarks
1	Set the SWEEP RATE control to maximum clockwise, then 1/4 turn counter clockwise.		
2	Set the SWEEP WIDTH control to mid-range.		
3	Place the MARKER switch in the ON position.	If the MARKER signal displayed covers at least a 1/2 screen vertical deflection, go to step 4.	If the MARKER signal displayed does not cover at least 1/2 screen vertical deflection repair or remove and replace the signal monitor and perform steps 1 through 3 on the repaired or replacement signal monitor.
4	Set the SWEEP WIDTH control to maximum counter clockwise.		
5	Adjust the CENTER FREQ control for a maximum deflection of the trace toward the top of the display.		
6	Set the SWEEP WIDTH control to maximum clockwise.		
7	Turn the MARKER Switch to the OFF position.		
8	Set the signal generator to 10 mhz at -90 dBm signal level.		

GO ON TO SHEET 2

4-14. VERIFY SIGNAL MONITOR SENSITIVITY - Continued (SHEET 2 OF 4)

Step	Instruction	Indication	Remarks
9	Connect the signal generator to the SM INPUT on the signal monitor.		
10	Adjust the SM GAIN control for a full-scale vertical deflection on the display.		
11	Set the SWEEP REVERSE control to the UP position.		
12	Lower the frequency of the signal generator to 9.5 mhz (±100 kHz).	The signal displayed on the signal monitor should be displayed at the left edge of the signal monitor display.	
13	Raise the frequency of the signal generator to 10.5 mhz (±100 kHz).	The signal displayed on the signal monitor should be displayed at the right edge of the signal monitor display.	
14	Set the SWEEP REVERSE control to the DOWN position.		
15	Lower the frequency of the signal generator to 9.5 mhz (±100 kHz).	The signal displayed on the signal monitor should be displayed at the right edge of the signal monitor display.	
16	Raise the frequency of the signal generator to 10.5 mhz (±100 kHz).	The signal displayed on the signal monitor should be displayed at the left edge of the signal monitor display.	

GO ON TO SHEET 3

4-14. VERIFY SIGNAL MONITOR SENSITIVITY - Continued (SHEET 3 OF 4)

Step	Instruction	Indication	Remarks
17	Set the SWEEP REVERSE to the UP position.	If all signals were displayed properly in steps 11 through 16, go to step 18.	If all signals were not displayed properly, repair or remove and replace the signal monitor and perform steps 1 through 17 on the repaired or replacement signal monitor.
18	Set the signal generator to 10 mhz and check to ensure the output level is -90 dBm.		
19	Set the SM GAIN control for a 3/4-scale vertical display on the signal monitor display.		
20	Vary the signal generator frequency from 9.5 mhz to 10.5 mhz and set the signal generator frequency to the highest vertical deflection point observed from left to right on the signal monitor display.		
21	Adjust the signal generator output for a full-scale vertical deflection on the display.		
22	Record the signal generator output level.		

GO ON TO SHEET 4

4-14. VERIFY SIGNAL MONITOR SENSITIVITY - Continued (SHEET 4 OF 4)

Step	Instruction	Indication	Remarks
23	Vary the signal generator frequency from 9.5 mhz to 10.5 mhz and set the signal generator frequency to the lowest vertical deflection point observed from left to right on the signal monitor display.		
24	Increase the signal generator output until a full-scale vertical deflection is obtained on the signal monitor display.		
25	Record the generator output level.	If the difference in the two generator output levels recorded in step 22 and in this step is 3 dB or less, this completes the signal monitor performance test.	If the difference in signal generator output levels recorded in step 22 and in this step is greater than 3 dB, repair or remove and replace the signal monitor and perform steps through 25 on the repaired or replacement signal monitor.

4-15. VERIFY DF PROCESSOR SM OUTPUT SENSITIVITY (SHEET 1 OF 2)

INITIAL SETUP

Test Equipment	Equipment Condition Description
Signal generator Signal monitor	Signal monitor and df processor powered up.

Step	Instruct ion	Indication	Remarks
1	Set the signal generator to 10 mhz, -90 dBm.		
2	Connect the signal generator to the SM Input on the signal monitor.		
3	Adjust the SWEEP WIDTH so that a -90 dBm signal generator input produces a signal at least 2 graticules wide on the signal monitor display.		
4	Readjust the SM GAIN so that a -90 dBm signal generator input produces a full-scale vertical deflection on the signal monitor display.		
5	Remove the signal generator from the SM INPUT on the signal monitor and connect it to the DF INPUT on the df processor.		

GO ON TO SHEET 2

4-15. VERIFY DF PROCESSOR SM OUTPUT SENSITIVITY (SHEET 2 OF 2)

Step	Instruction	Indication	Remarks
6	Connect a patch cable between the SM OUTPUT on the df processor and the SM INPUT on the signal monitor.	If the vertical deflection on the signal monitor display is exactly full-scale, you have completed the df processor SM OUTPUT performance test.	
7	If the vertical deflection on the signal monitor display is more than full-scale, adjust the output level of the signal generator until the vertical deflection of the signal is exactly full-scale.	You have completed the df processor SM OUTPUT performance test.	
8	If the vertical deflection on the signal monitor display is less than full scale, adjust the SM GAIN on the signal until the vertical deflection of the signal is exactly full-scale.	If the increase in the signal generator output to achieve a full-scale deflection on the signal monitor display is less than 3 dB, you have completed the df processor SM OUTPUT per formance test.	If the increase in signal generator output required to achieve a full-scale deflection on the signal monitor display is more than 3 dB repair or remove and replace the df processor and perform steps 1 through 8 on the repaired or replacement df processor.

4-16. VERIFY RECEIVER SM OUTPUT AND HF UPCONVERTER/DEMODULATOR SENSITIVITY (SHEET 1 OF 2)

INITIAL SETUP

Test Equipment	Equipment Condition Description
Signal Generator Signal Monitor	Direction finder set assembled and prepared for use. Units powered up.

Step	Instruction	Indication	Remarks
1	Set the receiver to maximum MANUAL gain.		
2	Set the signal generator to 40 mhz at a -90 dBm output level.		
3	Tune the receiver to 40 mhz and fine tune the receiver for a maximum signal strength indication on the SIGNAL STR meter.		
4	Connect the SM OUTPUT of the receiver to the SM INPUT of the signal monitor.	If the signal displayed on the signal monitor is more than a full-scale vertical deflection on the signal monitor display, go to step 5.	If the signal displayed on the signal monitor is less than a full-scale vertical deflection on the signal monitor display, repair or remove and replace the receiver and steps 1 through 4 on the repaired or replacement receiver.
5	Reduce the output level of the signal generator to -100 dBm.	If the signal displayed on the signal monitor display is equal to more than a full-scale vertical deflection on the signal monitor display, you have completed the receiver SM OUTPUT sensitivity performance test.	If the signal displayed on the signal monitor display is less a full-scale vertical deflection on the signal monitor display, repair or remove and replace the receiver and perform steps 1 through 5 on the repaired or replacement receiver.
6	Connect the signal generator to the 0.5 to 30 MHz RF INPUT on the hf upconverter/demodulator.		
7	Set the ANTENNA SELECT switch to the right hand position, and set the signal generator to 10 MHz at a level of -30 dBm, 50% AM modulation.		

GO ON TO SHEET 2

4-16. VERIFY RECEIVER SM OUTPUTAND HF UPCONVERTER/DEMODULATOR SENSITIVITY - Continued (SHEET 2 OF 2)

Step	Instruction	Indication	Remarks
8	Tune the receiver to 10 mhz, fine tune the signal for maximum signal strength indication on the SIGNAL STR meter, and set the receiver BANDWIDTH (kHz) switch to 10 KHz and the MODE switch to AM.		
9	Set the hf upconverter/ demodulator MODE switch to HF/RCVR POSITION.		
10	Monitor the audio output as you slowly lower the signal generator output to at least -100 dBm.	If the signal is audible to -100 dBm or lower, return the signal generator input to -30 dBm and go to step 11.	If the signal is not audible to at least -100 dBm, replace the hf upconverter/demodulator and repeat steps 6 through 10.
11	Set the hf upconverter/ mode switch to the HF/ DEMOD position and the DEMODULATION switch to the AM position.		
12	Repeat Step 10 above.		
13	Reset the signal generator modulation to CW and set the hf upconverter/demodulator DEMODULATION switch to CW.		
14	Repeat Step 10 above.		
15	Set the hf upconverter/ demodulator DEMODULATION switch to LSB and fine tine the receiver for a clear, audible tone on the headset or speaker.		
16	Repeat Step 10 above.		
17	Set the hf upconverter/ demodulator DEMODULATION switch to USB and fine tune the receiver for a clear, audible tone on the headset or speaker.		
18	Repeat Step 10 above.		

Section V. ORGANIZATIONAL TROUBLESHOOTING

SECTION CONTENTS

4-17. INTRODUCTION

When an operator identifies a malfunction and the operator corrective actions have failed, use the organizational maintenance symptom index and-troubleshooting procedures to locate the cause of the problem.

a. The symptom index will assist you in locating the correct troubleshooting procedure. To use the index, match the malfunction description with the troubleshooting procedure page noted. Each troubleshooting table has a heading which matches the malfunction description in the symptom index.

b. Each troubleshooting table addresses a malfunction which you may find during the operation or maintenance of the direction finder set or its components. To use the tables, perform the instructions and corrective actions in the order listed.

c. This manual cannot list all the malfunctions that occur, all the tests, or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

4-18. SYMPTOM INDEX

4-18. SYMPTOM INDEX - Continued

Symptom	Troubleshooting Procedure Page
HF UPCONVERTER/DEMODULATOR	
• POWER lamp that does not light	4-87
• No audio and no signal strength indication on receiver signal strength meter in the hf intercept mode only.	4-88

4-19. TROUBLESHOOTING PROCEDURES

Organizational troubleshooting of the direction finder set is authorized for an EW/Intercept Systems Repairer only. The test equipment and materials that may be required for fault location and their nomenclature are provided in the following table.

Maintenance Supplies	Identification
Test Equipment	
Multimeter	AN/PSM-45
RF Voltmeter	Boonton 92C
Angle Simulator	WJ-8975/AS
High Frequency Probe	Boonton 91-12F
Test Lead Set	Simpson No. 00577
Oscilloscope	AN/USM-488
Signal Generator	SG-1112(V) I/U w/options 001, 002, 003
Materials/Parts	
Battery, Dry	BA-4386/PRC-25
Battery, Storage	BB-586/U
Battery, D-Cell	BA-30
Fuse, lamp, 3AG (71400) AGC1	5920-00-280-8342
Fuse/Cartridge, 3/4 amp, 3AG SLOW (71400) MDL 3/4	5920-00-230-9128
Receiver	AN/GRR-8(V)
Indicator, Panoramic	IP-1355/GRR-8(V)
Antenna, Direction Finder	AS-3732/PRD-11
Antenna, Direction Finder	AS-3733/PRD-11
Control, Processor Display (df processor)	C-11495/PRD-11
Converter, Frequency Electronic	CV-4090/PRD-11

4-19. TROUBLESHOOTING PROCEDURE - Continued

Follow these instructions when using the troubleshooting tables:

- Check initial setup for the exact equipment and materials required to perform the procedure.
- Begin troubleshooting with Step 1.
- Follow the directive listed in the Instruction column.
- Match your results with the question asked in the Indication column.
- If the answer to the question in the Indication column is Yes, look in the Yes column and proceed to the step listed. If the answer to the question in the Indication column is No, look in the No column and proceed to the step listed.
- Continue through the table until ▲ or □ appears in the Yes column or No column. A triangle means to stop troubleshooting because the malfunction shouldn't be corrected. A box means to refer back to the symptom index.
- Read any comments related to troubleshooting procedures in the Remarks column.

4-19. TROUBLESHOOTING PROCEDURES - Continued

a. RECIEVER POWER LAMP THAT DOES NOT LIGHT

INITIAL SETUP

Test Equipment
Multimeter
Test lead set

Materials/Parts
Batteries
3/4 amp slow blow fuse
Receiver

Equipment Condition
Paragraph
2-12.

Condition Description
Direction finder set assembled and prepared for use.

Step	Instruction	Indication	Yes	No	Remarks
1	Turn receiver power on by turning volume switch clockwise.	POWER lamp lights?	Δ	2	
2	Check for 11.5 to 15 v dc at battery with multi meter in accordance with paragraph 4-21 e.	Voltage reading correct ?	5	3	
3	Replace battery in accordance with paragraph 2-12 b., and repeat 1 above.	POWER lamp lights?	Δ	Repeat 3 and go to 4 or 5.	
4	Replace D-Cell insert fuse in accordance with paragraph 3-6 a., and repeat 1 above.	POWER lamp lights?	Δ	5	Perform only if D-Cell insert is used.
5	Replace receiver in accordance with paragraph 4-2l a., and repeat 1 above.	POWER lamp lights?	Δ	4	

4-19. TROUBLESHOOTING PROCEDURES - Continued

b. FREQUENCY MHz DISPLAY THAT DOES NOT LIGHT

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
None	2-12.	Direction finder set assembled and prepared for use. Units powered up.
Materials/Parts: Receiver	2-13 a.	

Step	Instruction	Indication	Yes	No	Remarks
1	Rotate DISPLAY INTENSITY knob fully clockwise.	Display lights?	Δ	2	
2	Replace receiver in accordance with paragraph 4-2l b., and repeat 1 above.	Display lights?	Δ	Repeat 2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

c. NO AUDIO AND NO SIGNAL INDICATION ON SIGNAL STR METER (SHEET 1 OF 5)

INTIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
Rf voltmeter Angle simulator Multimeter High frequency probe Test lead set	2-12.	Direction finder set assembled and prepared for use.
Oscilloscope	2-13 a.	Units powered up.

Materials/Parts
- Rf cable
- Receiver
- Df cable
- Df processor
- Df antenna

Step	Instruction	Indication	Yes	No	Remarks
1	Tune receiver to known signal.	Audio and signal indication on SIGNAL STRENGTH meter?	Δ	2	
2	Check for signal at AUDIO jacks: ● Check for audio signals at RECORD jack pin B and pin A with oscilloscope.	Both voltages present?	Go to table 4-19 j.	3	
3	Check receiver under stand alone condition: ● Disconnect rf cable at RF INPUT jack. ● Connect whip antenna to ANTENNA socket on receiver front panel.				

GO ON TO SHEET 2

4-19. TROUBLESHOOTING PROCEDURES - Continued

c. NO AUDIO AND NO SIGNAL INDICATION ON SIGNAL STR METER (SHEET 2 OF 5)

Step	Instruction	Indication	Yes	No	Remarks
3 cont.	• Connect bnc of antenna socket to RF input jack. • Tune to known frequency. • Check for audio signal at RECORD jack pin B and pin A with oscilloscope.	Both voltages present?	4	8	
4	Disconnect rf cable from rf connector on df antenna and from VHF INPUT on hf upconverter/demodulator and check for continuity with a multimeter. Also check continuity of bnc patch cable between CONVERTER OUTPUT on hf upconverter/demodulator and RF INPUT on receiver.	Continuity?	11	5	J19 on AS-3732/PRD-11. J19 or J20 on AS-3733/PRD-11.
5	Reconnect antenna rf cable and bnc patch cable and check for signal at AUDIO connectors. • Check for audio signal at RECORD jack pin B and pin A with oscilloscope.	Both voltages present?	Δ	9	
6	Connect rf cable to RF Input on receiver and check for audio signal at RECORD jack pin B and A with oscilloscope.	Both voltages present?	7	8	
7	Replace hf upconverter/demodulator in accordance with paragraph 4-21 a.	Both voltages present?	Δ	2	

GO ON TO SHEET 3

4-19. TROUBLESHOOTING PROCEDURES - Continued

c. NO AUDIO AND NO SIGNAL INDICATION ON SIGNAL STR METER (SHEET 3 OF 5)

Step	Instruction	Indication	Yes	No	Remarks
8	Replace receiver in accordance with paragraph 4-21 a., and tune frequency.	Audio present?	Δ	2	
9	Test df processor with angle simulator in accordance with paragraph 4-21 d.	Df processor readings match angle simulator settings?	10	12	
10	Disconnect df cable from DF ANT. CONTROL jack on df processor and J10 on df antenna and check for continuity with a multimeter.	Continuity?	13	11	
11	Replace df cable and check for signal at AUDIO jacks. ● Check for audio signal at RECORD jack pin B and pin A with oscilloscope.	Both voltages present?	Δ	13	

GO ON TO SHEET 4

4-19. TROUBLESHOOTING PROCEDURES - Continued

c. NO AUDIO AND NO SIGNAL INDICATION ON SIGNAL STR METER (SHEET 4 OF 5)

Step	Instruction	Indication	Yes	No	Remarks
12	Replace df processor in accordance with paragraph 4-21 a., and check for signal at AUDIO jacks. • Tune receiver to a known signal. • Check for audio signal at RECORD jack pin B and pin A with oscilloscope.	Both voltages present?	Δ	2	
13	Check antenna elements (low bay). • Remove elements from antenna in accordance with paragraph 2-15 b. • Measure resistance of each element from metal stub on bottom of element to metal cap on top of element with multi meter.	574 ohms ±57 ohms present? (3 ft. lower bay elements) 447 ohms ±45 ohms present? (6 ft. lower bay outer elements) 127 ohms ±13 ohms present? (6 ft. lower bay inner elements)	See Remarks.	14	If troubleshooting AS-3732/PRD-11, go to 15. If troubleshooting AS-3733/PRD-11, go to 13.
14	Replace defective element(s) and repeat 1 above.	Audio and signal indication on SIGNAL STR meter?	Δ	2	

GO ON TO SHEET 5

4-19. TROUBLESHOOTING PROCEDURES - Continued

c. NO AUDIO AND NO SIGNAL INDICATION ON SIGNAL STR METER (SHEET 5 OF 5)

Step	Instruction	Indication	Yes	No	Remarks
15	Check antenna elements (high bay). • Remove elements from antenna in accordance with paragraph 2-15 b. • Measure resistance of each element from threaded end on bottom of element to metal cap on top of element.	15 K ohms ±1K ohm present?	17	16	
16	Replace defective element(s) and repeat 1 above.	Audio and signal indication on SIGNAL STR meter?	Δ	2	
17	Replace df antenna and check for signal at AUDIO jacks. • Tear down antenna in accordance with paragraph 2-15 b. • Emplace new df antenna in accordance with paragraph 2-12 a. • Tune receiver to known signal. • Check for audio signal at RECORD jack pin B and pin A with oscilloscope.	Both voltages present?	Δ	2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

d. NO AUDIO AND NO SIGNAL INDICATION ON SIGNAL STR METER WHEN HIGH BAND IS SELECTED

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
Multimeter Test lead set Oscilloscope	2-12.	Direction finder set assembled and prepared for use.
Materials/Parts Receiver	2-13 a.	Units powered up.

Step	Instruction	Indication	Yes	No	Remarks
1	Set receiver BAND MHz switch to higher band and tune receiver to a known signal.	Audio present?	Δ	2	
2	Check for signal at AUDIO jacks. • Check for audio signal at RECORD jack pin B and pin A with oscilloscope.	Both voltages present?	□	2	
3	Replace receiver in accordance with paragraph 4-21 a., and repeat 1 above.	Audio present?	Δ	2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

e. NO AUDIO AND NO SIGNAL INDICATION ON SIGNAL STR

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
Multimeter Test lead set Oscilloscope	2-12.	Direction finder set assembled and prepared for use.
Materials/Parts Receiver	2-13 a.	Units powered up.

Step	Instruction	Indication	Yes	No	Remarks
1	Set receiver BAND MHz switch to lower band and tune receiver to a known signal.	Audio present?	Δ	2	
2	Check for signal at AUDIO jacks. • Check for audio signal at RECORD jack pin B and pin A with oscilloscope.	Both voltages present?	Δ	3	
3	Replace receiver in accordance with paragraph 4-2 a., and repeat 1 above.	Audio present ?	Δ	2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

f. NO AUDIO AND NO SIGNAL INDICATION ON SIGNAL STR METER IN ONE OR TWO IF BANDWIDTH kHz POSITIONS

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
Multimeter Test lead set Oscilloscope	2-12.	Direction finder set assembled and prepared for use.
Materials/Parts Receiver	2-13 a.	Units powered up.

Step	Instruction	Indication	Yes	No	Remarks
1	Set receiver IF BANDWIDTH (kHz) switch to 10 kHz and tune receiver to a known signal.	Audio present?	2	4	
2	Set receiver IF BANDWIDTH (kHz) switch to 50 kHz and tune to known signal.	Audio present?	3	4	
3	Set receiver IF BANDWIDTH (kHz) switch to 200 kHz and tune to known signal.	Audio present?	□	4	
4	Check for signal at AUDIO jacks. • Check for audio signal at RECORD jack pin B and pin A with oscilloscope.	Both voltages present ?	□	5	
5	Replace receiver in accordance with paragraph 4-2l a., and repeat 1, 2 and 3 above.	Audio present?	Δ	4	

4-19. TROUBLESHOOTING PROCEDURES - Continued

g. NO AUDIO AND NO SIGNAL INDICATION ON SIGNAL STR

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
Multimeter	2-12.	Direction finder set assembled and prepared for use. Units powered up.
Test lead set		
Oscilloscope		
Materials/Parts		
Receiver	2-13 a.	

Step	Instruction	Indication	Yes	No	Remarks
1	Set receiver MODE switch to USB/CW and tune receiver to known signal.	Audio present?	2	3	
2	Set receiver MODE switch to LSB/CW.	Audio present?	☐	3	
3	Check for signal at AUDIO jacks. • Check for audio signal at RECORD jack pin B and pin A with oscilloscope.	Both voltages present?	☐	4	
4	Replace receiver in accordance with paragraph 4-21 a., and repeat 1 and 2 above.	Audio present?	Δ	3	

4-19. TROUBLESHOOTING PROCEDURES - Continued

h. NO AUDIO AND NO SIGNAL INDICATION ON SIGNAL STR METER WHEN AM IS SELECTED

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
Multimeter Test lead set Oscilloscope	2-12.	Direction finder set assembled and prepared for use.
Materials/Parts Receiver	2-13 a.	Units powered up.

Step	Instruction	Indication	Yes	No	Remarks
1	Set receiver MODE switch to AM and tune receiver to known signal.	Audio present?	□	2	
2	Check for signal at AUDIO jacks. • Check for audio signal at RECORD jack pin B and pin A with oscilloscope.	Both voltages present?	□	3	
3	Replace receiver in accordance with paragraph 4-21 a., and repeat 1 above.	Audio present?	Δ	2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

i. NO AUDIO AND NO SIGNAL INDICATION ON SIGNAL STR METER WHEN FM IS SELECTED

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
Multimeter	2-12.	Direction finder set assembled and prepared for use.
Test lead set		
Oscilloscope		
Materials/Parts		
Receiver	2-13 a.	Units powered up.

Step	Instruction	Indication	Yes	No	Remarks
1	Set receiver MODE switch to FM and tune receiver to known signal.	Audio present?	☐	2	
2	Check for signal at AUDIO jacks. ● Check for audio signal at RECORD jack pin B and pin A with oscilloscope.	Both voltages present ?	☐	3	
3	Replace receiver in accordance with paragraph 4-2l a., and repeat 1 above.	Audio present?	Δ	2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

j. NO AUDIO WHEN SPEAKER ASSEMBLY IS USED

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
Multimeter Test lead set Oscilloscope	2-12.	Direction finder set assembled and prepared for use.
Materials/Parts Speaker assembly	2-13 a.	Units powered up.

Step	Instruction	Indication	Yes	No	Remarks
1	Tune receiver to known signal and listen for audio at speaker.	Audio present?	□	2	
2	Check signal at AUDIO jacks. ● Check for audio signal at RECORD jack pin B and pin A with oscilloscope.	Both voltages present?	3	Go to table 4-19 c., step 3.	
3	Replace speaker assembly in accordance with paragraph 4-21 a., and repeat 1 above.	Audio present?	Δ	2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

k. CHANGES FREQUENCY WHEN DAFC LOCK SWITCH IS SET TO LOCK POSITION

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
None	2-12.	Direction finder set assembled and prepared for use.
Materials/Parts: Receiver	2-13 a.	Units powered up.

Step	Instruction	Indication	Yes	No	Remarks
1	Tune to known signal, set DAFC LOCK switch to LOCK and observe FREQUENCY MHz display.	Display locked on frequency?	□	2	
2	Replace receiver in accordance with paragraph 4-21 a., and repeat 1 above.	Display locked on frequency?	Δ	Repeat 2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

l. FREQUENCY MHz DISPLAY THAT LOCKS AT A PRESET FREQUENCY

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
None	2-12.	Direction finder set assembled and prepared for use. Units powered up.
Materials/Parts: Receiver	2-13 a.	

Step	Instruction	Indication	Yes	No	Remarks
1	Rotate TUNE knob clockwise and then counterclockwise while observing FREQUENCY MHz display.	Display remaining at preset frequency?	2	☐	
2	Replace receiver in accordance with paragraph 4-21 a., and repeat 1 above.	Display remaining at preset frequency?	Repeat 2	Δ	

4-19. TROUBLESHOOTING PROCEDURES - Continued

m. FREQUENCY MHz DISPLAY THAT HAS UNSTABLE DIGITS

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
None	2-12.	Direction finder set assembled and prepared for use.
Materials/Parts: Receiver	2-13 a.	Units powered up.

Step	Instruction	Indication	Yes	No	Remarks
1	Tune receiver to known signal observe FREQUENCY MHz display.	Digits unstable?	2	☐	
2	Replace receiver in accordance with paragraph 4-21 a., and repeat 1 above.	Digits unstable?	Repeat 2	▲	

4-19. TROUBLESHOOTING PROCEDURES - Continued

n. WEAK AUDIO AND/OR LOW SIGNAL INDICATION ON SIGNAL STR METER WHEN HIGH BAND IS SELECTED (SHEET 1 OF 2)

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
None		
Materials/Parts	2-12.	Receiver powered up.
Receiver		Signal generator output connected to receiver RF INPUT.
Signal generator		
Headset or speaker	2-13 a.	

Step	Instruction	Indication	Yes	No	Remarks
1	Set the signal generator to 85 mhz at -30 dB signal level and set the receiver IF BANDWIDTH kHz control to 10 kHz.				
2	Fine tune the receiver to the 85 mhz signal for maximum signal strength reading on the signal strength meter and a clear audible tone.				
3	Monitor the audio output of the receiver as you slowly lower the signal generator output to at least -107 dBm.	Signal audible to -107 dBm or lower?	5	4	
4	Replace receiver in accordance with paragraph 4-21 b., and repeat 1 through 3 above.	Signal audible to -107 dB or lower?	▲	Repeat 2	
5	Set the signal generator to 245 mhz at -30 dBm signal level.				

GO ON TO SHEET 2

4-19. TROUBLESHOOTING PROCEDURES - Continued

n. WEAK AUDIO AND/OR LOW SIGNAL INDICATION ON SIGNAL STR METER WHEN HIGH BAND IS SELECTED (SHEET 2 OF 2)

Step	Instruction	Indication	Yes	No	Remarks
6	Fine tune the receiver to the 245 mhz signal for maximum signal strength reading on the signal strength meter and a clear audible tone.				
7	Monitor the audio output of the receiver as you slowly lower the signal generator output level to at least -107 dB.	Signal audible to -107 dB or lower?	Δ	8	
8	Replace receiver in accordance with paragraph 4-21 b., and repeat 1 through 7 above.	Signal audible to -107 dB or lower?	Δ	Repeat 2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

o. WEAK AUDIO AND/OR LOW SIGNAL INDICATION ON SIGNAL STR METER WHEN LOW BAND IS SELECTED (SHEET 1 OF 2)

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
None	2-12.	Receiver powered up.
Materials/Parts		Signal generator
Receiver		output connected to
Signal generator		receiver RF INPUT.
Headset or speaker	2-13 a.	

Step	Instruction	Indication	Yes	No	Remarks
1	Set the signal generator to 25 mhz at -30 dB signal level and set the receiver IF BANDWIDTH (kHz) control to 10 khz.				
2	Fine tune the receiver to the 25 mhz signal for maximum signal strength reading on the signal strength meter and a clear audible tone.				
3	Monitor the audio output of the receiver as you slowly lower the signal generator output to at least -107 dBm.	Signal audible to -107 dBm or lower?	5	4	
4	Replace receiver in accordance with paragraph 4-21 b., and repeat 1 through 3 above.	Signal audible to -107 dB or lower?	Δ	Repeat 2	
5	Set the signal generator to 75 mhz at -30 dBm signal level.				

GO ON TO SHEET 2

4-19. TROUBLESHOOTING PROCEDURES - Continued

g. WEAK AUDIO AND/OR LOW SIGNAL INDICATION ON SIGNAL STR METER WHEN LOW BAND IS SELECTED (SHEET 2 OF 2)

Step	Instruction	Indication	Yes	No	Remarks
6	Fine tune the receiver to the 75 mhz signal for maximum signal strength reading on the signal strength meter and a clear audible tone.				
7	Monitor the audio output of the receiver as you slowly lower the signal generator output level to at least -107 dBm.	Signal audible to -107 dBm or lower?	**Δ**	**8**	
8	Replace receiver in accordance with paragraph 4-21 b., and repeat 1 through 7 above.	Signal audible to -107 dBm or lower?	**Δ**	Repeat 2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

p. WEAK AUDIO AND/OR LOW SIGNAL INDICATION ON SIGNAL STR IN ONE OR MORE IF BANDWIDTHS (SHEET 1 OF 2)

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
None	2-12.	Receiver powered up.
Materials/Parts		Signal generator
Receiver		output connected to
Signal generator		receiver RF INPUT.
Headset or speaker	2-13 a.	

Step	Instruction	Indication	Yes	No	Remarks
1	Set the signal generator to 40 mhz at -30 dBm, AM modulation (1 kHz, 50%). Fine tune the receiver for maximum signal strength indication on the signal strength meter and a clear audible signal.				
2	Set the receiver IF BANDWIDTH (kHz) switch to the 10 kHz position.				
3	Set the receiver mode switch to AM and the RF GAIN to AGC.				
4	Monitor the audio output of the receiver as you slowly lower the signal generator output to at least -107 dBm.	Signal audible to -107 dBm or lower?	6	5	
5	Replace receiver in accordance with paragraph 4-21 b., and repeat 1 through 4 above.	Signal audible to -107 dBm or lower?	Δ	Repeat 2	

GO ON TO SHEET 2

4-19. TROUBLESHOOTING PROCEDURES - Continued

p. WEAK AUDIO AND/OR LOW SIGNAL INDICATION ON SIGNAL STR IN ONE OR MORE IF BANDWIDTHS (SHEET 2 OF 2)

Step	Instruction	Indication	Yes	No	Remarks
6	Set the receiver IF BANDWIDTH (kHz) switch to the 50 kHz position and reset the signal generator output level to -30 dBm.				
7	Monitor the audio output of the receiver as you slowly lower the signal generator output level to at least -100 dBm.	Signal audible to -100 dBm or lower?	9	8	
8	Replace receiver in accordance with paragraph 4-21 a., and repeat 1 through? above.	Signal audible to -100 dBm or lower?	Δ	Repeat 2	
9	Set the receiver IF BANDWIDTH (kHz) switch to the 200 kHz position and reset the signal generator output level to -30 dBm.				
10	Monitor the audio output of the receiver as you slowly lower the signal generator output level to at least -94 dBm.	Signal audible to -94 dBm or lower?	Δ	11	
11	Replace receiver in accordance with paragraph 4-21 a., and repeat 1 through 10 above.	Signal audible in all bandwidths?	Δ	Repeat 2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

g. WEAK AUDIO AND/OR LOW SIGNAL INDICATION ON SIGNAL STR WHEN USB/CW OR LSB/CW IS SELECTED (SHEET 1 OF 2)

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
None		
Materials/Parts	2-12.	Receiver powered up.
Receiver		Signal generator
Signal Generator		output connected to
Headset or speaker	2-13 a.	receiver RF INPUT.

Step	Instruction	Indication	Yes	No	Remarks
1	Set the signal generator to 25 mhz at -70 dBm signal level, no modulation. Set the MODE switch to the USB/CW position, and set the receiver IF BAND-WIDTH (kHz) control to 10 kHz.				
2	Fine tune the receiver to the 25 mhz signal for maximum signal strength reading and so you can hear the audio signal at a medium pitch (about 1 kHz).				
3	Monitor the audio output of the receiver as you slowly lower the signal generator output to at least -107 dB.	Signal audible to -107 dBm or lower.	5	4	
4	Replace receiver in accordance with paragraph 4-21 b., and repeat 1 through 3 above.	Signal audible to -107 dBm or lower.	5	Repeat 2	

GO ON TO SHEET 2

4-19. TROUBLESHOOTING PROCEDURES - Continued

g. WEAK AUDIO AND/OR LOW SIGNAL INDICATION ON SIGNAL STR METER WHEN USB/CW OR LSB/CW IS SELECTED (SHEET 2 OF 2)

Step	Instruction	Indication	Yes	No	Remarks
5	Reset the signal generator output level to -30 dBm.				
6	Set the MODE switch to the LSB/CW position and fine tune the receiver so you can hear the audio signal (about 1 khz).				
7	Monitor the audio output of the receiver as you slowly lower the signal generator output level to at least -107 dBm.	Signal audible to -107 dBm or lower?	▲	7	
8	Replace receiver in accordance with paragraph 4-21 b., and repeat 1 through 7 above.	Signal audible to -107 dBm or lower?	▲	Repeat 2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

r. WEAK AUDIO AND/OR LOW SIGNAL INDICATION ON SIGNAL STR METER WHEN AM IS SELECTED (ALL BANDWIDTHS)

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
None		
Materials/Parts	2-12.	Receiver powered up.
Receiver		Signal generator
Signal generator		output connected to
Headset or speaker	2-13 a.	receiver RF INPUT.

Step	Instruction	Indication	Yes	No	Remarks
1	Set the signal generator to 40 MHz at -30 dBm, AM modulation (1 kHz, 50%) and connect the generator output to the RF input on the receiver. Fine tune the receiver for maximum signal strength indication on the signal strength meter and a clear audible signal.				
2	Set the receiver IF BANDWIDTH (kHz) switch to the 10 kHz position.				
3	Set the receiver mode switch to AM and the RF GAIN to AGC.				
4	Monitor the audio output of the receiver as you slowly lower the signal generator output level to at least -107 dBm.	Signal audible to -107 dBm or lower?	Δ	5	
5	Replace receiver in accordance with paragraph 4-2l b., and repeat 1 through 4 above.	Signal audible to -107 dBm or lower?	Δ	Repeat 2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

s. WEAK AUDIO AND/OR LOW SIGNAL INDICATION ON SIGNAL STR METER WHEN FM IS SELECTED (ALL BANDWIDTHS)

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
None	2-12.	Receiver powered up.
Materials/Parts		Signal generator output connected to receiver RF INPUT.
Receiver		
Signal generator		
Headset or speaker	2-13 a.	

Step	Instruction	Indication	Yes	No	Remarks
1	Set the signal generator to 40 MHz at -30 dBm, FM Modulation (MOD Freq = 1000 hz, PD = 15 khz).				
2	Set the receiver IF BANDWIDTH (kHz) switch to the 50 kHz position.				
3	Set the receiver mode switch to FM and the RF GAIN to AGC.				
4	Fine tune the receiver for maximum signal strength indication on the signal strength meter and a clear audible signal.				
5	Monitor the audio output of the receiver as you slowly lower the signal generator output level to at least -107 dBm.	Signal audible to -107 dBm or lower?	Δ	6	
6	Replace receiver in accordance with paragraph 4-21 b., and repeat 1 through 5 above.	Signal audible to -107 dBm or lower?	Δ	Repeat 2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

t. DF PROCESSOR POWER LAMP DOES NOT LIGHT

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
Multimeter Test lead set	2-12.	Description finder set assembled and prepared for use.
Materials/Parts Batteries 3/4 amp slow blow fuse Df processor	2-13 a.	Units powered up.

Step	Instruction	Indication	Yes	No	Remarks
1	Turn df processor power on by turning DISPLAY OFF/DISPLAY INTENSITY switch clockwise.	Power lamp lights?	☐	2	
2	Check front panel fuse.	Fuse blown?	3	4	
3	Replace fuse in accordance with paragraph 3-6 a., and repeat 1 above.	Power lamp lights?	Δ	4	
4	Check for 11.5 to 15 v dc at battery with multimeter in accordance with paragraph 4-21 e.	Voltage reading correct?	7	5	
5	Replace battery in accordance with paragraph 3-6 b., and repeat 1 above.	Power lamp lights?	Δ	Repeat 5 and go to 6 or 7	Go to 6 if D-Cell insert used.
6	Replace D-Cell insert fuse in accordance with paragraph 3-6 a., and repeat 1 above.	Power lamp lights?	Δ	7	Perform only if D-Cell insert is used.
7	Replace df processor in accordance with paragraph 4-21 a., and repeat 1 above.	Power lamp lights?	Δ	2	

GO ON TO SHEET 2

4-19. TROUBLESHOOTING PROCEDURES - Continued

u. NO LINE OF BEARING DISPLAY

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
None	2-12.	Description finder set assembled and prepared for use.
Materials/Parts Df processor Df processor bnc cable	2-13 a.	Units powered up.

Step	Instruction	Indication	Yes	No	Remarks
1	Tune receiver to known frequency and observe df processor display for indication of lob.	Lob displayed?	□	2	
2	Replace df processor in accordance with paragraph 4-21 a., and repeat 1 above.	Lob displayed?	Δ	2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

v. DISPLAYS INCORRECT LINE OF BEARING

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
Angle Simulator	2-12.	Direction finder set assembled and prepared for use.
Materials/Parts: Df processor	2-13 a.	Units powered up.

Step	Instruction	Indication	Yes	No	Remarks
1	Tune receiver to signal of known 10b and observe df processor display for indication of correct lob.	Lob correct?	□	2	
2	Test df processor with angle simulator in accordance with paragraph 2-13 b.	Df processor readings match angle simulator settings?	□	3	
3	Replace df processor in accordance with paragraph 4-21 a., and repeat 1 above.	Lob correct?	Δ	2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

w. DISPLAY RANDOM LINES OF BEARING (SHEET 1 OF 2)

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
Rf voltmeter Multi meter Angle simulator High frequency probe Test lead set	2-12. 2-13 a.	Direction finder set assembled and prepared for use. Units powered up.

Materials/Parts
Df processor
Df processor bnc cable

Step	Instruction	Indication	Yes	No	Remarks
1	Tune receiver to signal of known lob and observe df processor display for indication of correct lob.	Lob stable?			
2	Perform the VERIFY RECEIVER SM OUTPUT SENSITIVITY performance check in accordance with paragraph 4-16.	Receiver passed test ?	4	3	
3	Replace receiver in accordance with paragraph 4-21 a., and repeat 1 above.	Lob stable?	Δ	4	
4	Check for continuity of df processor bnc cable with a multimeter.	Continuity?	6	5	

GO ON TO SHEET 2

4-19. TROUBLESHOOTING PROCEDURES - Continued

v. DISPLAYS RANDOM LINES OF BEARING (SHEET 2 OF 2)

Step	Instruction	Indication	Yes	No	Remarks
5	Replace df processor bnc cable, connect it into SM OUTPUT jack on hf upconverter/ demodulator and SM INPUT on df processor and repeat 1 above.	Lob displayed?	Δ	6	
6	Test df processor with angle simulator in accordance with paragraph 2-13 b., repeat 1 above.	Df processor OK?	□	7	
7	Replace df processor in accordance with paragraph 4-21 a., and repeat 1 above.	Lob displayed?	Δ	2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

x. ZERO ADJ CONTROL CANNOT SET A 000 OR 180 DEGREE BEARING

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
None	2-12.	Direction finder set assembled and prepared for use.
Materials/Parts: Df processor	2-13 a.	Units powered up.

Step	Instruction	Indication	Yes	No	Remarks
1	Calibrate df processor: • Set OFF/OMNI/DF/CAL switch to CAL. • Rotate ZERO ADJ knob until lob display reads 000 or 180.	Display adjusts to 100 or 180?	Δ	2	Display adjusts to 000 when BAND (WIDTH) switch is set to 80-250.
2	Replace df processor and repeat 1 above.	Display adjusts to 000 or 180?	Δ	Repeat 2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

y. NO CIRCULAR DISPLAY WHEN SET TO GATED MODE

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
None	2-12.	Direction finder set assembled and prepared for use.
Materials/Parts Df processor	2-13 a.	Units powered up.

Step	Instruction	Indication	Yes	No	Remarks
1	Observe circular LED on df processor lob display. • Set INTEG TIME (SEC) switch to GATED. • Rotate GATED THRESHOLD control fully clockwise.	Circular LED lit?		2	
2	Replace df processor in accordance with paragraph 4-21 a., and repeat 1 above.	Circular LED lit?		Repeat 2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

z. RANDOM LINES OF BEARING WHEN SET TO HOLD MODE.

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
None	2-12.	Direction finder set assembled and prepared for use. Units powered up.
Materials/Parts: Df processor	2-13 a.	

Step	Instruction	Indication	Yes	No	Remarks
1	Observe lob display for stable lob. • Set INTEG TIME (SEC) switch to HOLD.	Lob stable?	Δ	2	
2	Replace df processor in accordance with paragraph 4-21 a., and repeat 1 above.	Lob stable?	Δ	Repeat 2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

aa. RANDOM LINES OF BEARING IN ONE OR TWO IF BANDWIDTHS (kHz) POSITIONS

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
Angle Simulator	2-12.	Direction finder set assembled and prepared for use.
Materials/Parts: Df processor	2-13 a.	Units powered up.

Step	Instruction	Indication	Yes	No	Remarks
1	Test df processor with angle simulator in accordance with paragraph 2-13 b.	Lob stable in all bandwidths?	□	2	
2	Replace df processor in accordance with paragraph 4-21 a.	Lob stable in all bandwidths?	Δ	Repeat 2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

ab. CIRCULAR LED THAT DOES NOT TURN OFF WHEN THRESHOLD IS ADJUSTED

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
None	2-12.	Direction finder set assembled and prepared for use.
Materials/Parts Df processor	2-13 a.	Units powered up.

Step	Instruction	Indication	Yes	No	Remarks
1	Observe circular LED display. • Set INTEG TIME (SEC) switch to GATED. • Turn GATED THRESHOLD knob fully counter-clockwise.	Circular LED turned off?	Δ	2	
2	Replace df processor in accordance with paragraph 4-21 a., and repeat 1 above.	Circular LED turned off?	Δ	Repeat 2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

ac. ANGLE SIMULATOR POWER LAMP DOES NOT LIGHT

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
Multimeter Test lead set	2-12.	Direction finder set assembled and prepared for use.
Materials/Parts Angle Simulator 1 Amp Fuse	2-13 a.	Units powered up. Angle simulator connected for angle simulator test.

Step	Instruction	Indication	Yes	No	Remarks
1	Set POWER switch to OFF.				
2	Check 1 amp fuse on front panel of angle simulator.	Fuse good?	4	3	
3	Replace fuse and set POWER switch to ON.	Power lamp lights?	Δ	4	
4	Remove DF ANT CONTROL INPUT cable connector from DF ANT. CONTROL connector on df processor.				
5	Using the digital multimeter check for -5 vdc at pin F of DF ANT. CONTROL connector on df processor.	Voltage present ?	6	7	
6	Replace df processor in accordance with paragraph 4-21 a., and repeat steps 1 and 2 above.	Volt age present?	Δ	Repeat 6	
7	Replace angle simulator in accordance with paragraph 4.21 a.	Power lamp lights?	Δ	Repeat 1	

4-19. TROUBLESHOOTING PROCEDURES - Continued

ad. SIGNAL MONITOR POWER LAMP THAT DOES NOT LIGHT

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
Multimeter Test lead set	2-12.	Direction finder set assembled and prepared for use.
Materials/Parts Batteries 3/4 amp slow blow fuse Signal monitor	2-13 a.	Units powered up.

Step	Instruct ion	Indication	Yes	No	Remarks
1	Turn signal monitor power on by setting POWER/on switch to ON.	POWER lamp lights?	Δ	2	
2	Check for 11.5 to 15 v dc at battery with multimeter in accordance with paragraph 4-21 e.	Voltage reading correct?	5	3	
3	Replace battery in accordance with paragraph 3-6 b., and repeat 1 above.	POWER lamp lights?	Δ	Repeat 3 and go to 4 or 5.	Go to 5 if D-Cell insert used.
4	Replace D-Cell insert fuse in accordance with paragraph 3-6 a., and repeat 1 above.	POWER lamp lights?	Δ	5	Perform only if D-Cell insert is used.
5	Replace signal monitor in accordance with paragraph 4-21 a.	POWER lamp lights?	Δ	4	

4-19. TROUBLESHOOTING PROCEDURES - Continued

ae. NO RF SIGNAL ON CRT (SHEET 1 OF 2)

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
Multimeter		
Angle Simulator		
Test lead set	2-12.	Direction finder set assembled and prepared for use.
Materials/Parts		
Signal monitor	2-13 a.	Units powered up.
Signal monitor bnc cable		Initial adjustments made.

Step	Instruction	Indication	Yes	No	Remarks
1	Tune receiver to known signal and observe signal monitor crt.	Rf signal displayed?	☐	2	
2	Check signal monitor: • Connect cable from DF ANT CONTROL INPUT on angle simulator to DF INPUT connector on df processor. • Disconnect signal monitor bnc cable from SM INPUT on signal monitor. • Connect cable from DF SIGNAL OUTPUT on angle simulator to SM INPUT on signal monitor. • Set MARKER switch on signal monitor to off. Observe signal monitor crt for signal spike.	Signal spike displayed?	5	3	

GO ON TO SHEET 2

4-19. TROUBLESHOOTING PROCEDURES - Continued

ae. NO RF SIGNAL ON CRT (SHEET 2 OF 2)

Step	Instruction	Indication	Yes	No	Remarks
3	Perform VERIFY DF PROCESSOR SM OUTPUT SENSITIVITY test in accordance with paragraph 4-15.	Df processor passed test?	5	4	
4	Replace df processor in accordance with paragraph 4-12 a., and repeat 1 above.	Rf signal displayed?	Δ	2	
5	Check for continuity of signal monitor bnc cable using a multimeter.	Continuity?	7	6	
6	Replace signal monitor bnc cable and observe signal monitor crt.	Rf signal displayed?	Δ	7	
7	Replace signal monitor in accordance with paragraph 4-21 a., and repeat 1 above.	Rf signal displayed?	Δ	2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

af. NO TRACE OF CRT

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
None	2-12.	Direction finder set assembled and prepared for use.
Materials/Parts Signal monitor	2-13 a.	Units powered up. Initial adjustments made.

Step	Instruction	Indication	Yes	No	Remarks
1	Observe signal monitor crt for marker display when MARKER switch is set to ON.	Marker present?	☐	2	
2	Replace signal monitor in accordance with paragraph 4-21 a., and repeat 1 above.	Marker present?	Δ	Repeat 2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

ag. NO MARKER ON CRT

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
None	2-12.	Direction finder set assembled and prepared for use.
Materials/Parts Signal monitor	2-13 a.	Units powered up. Initial adjustments made.

Step	Instruction	Indication	Yes	No .	Remarks
1	Place MARKER switch to ON position.				
2	Observe signal monitor crt for marker.	Marker present?	□	3	
3	Replace signal monitor in accordance with paragraph 4-21 a., and repeat 1 above.	Marker present ?	Δ	Repeat 2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

ah. CRT DISPLAYS WEAK VERTICAL DEFLECTION OF STRONG RF SIGNALS (SHEET 1 OF 2)

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
None	2-12.	Direction finder set assembled and prepared for use.
Materials/Parts Signal monitor Receiver Df processor Patch cords	2-13 a.	Units powered up. Initial adjustments made.

Step	Instruction	Indication	Yes	No	Remarks
1	Tune receiver to known strong signal and observe crt.	Strong signal displayed on crt?	□	2	
2	Perform VERIFY DF PROCESSOR SM OUTPUT SENSITIVITY test in accordance with paragraph 4-15.	Df processor passed test?	4	3	
3	Replace df processor in accordance with paragraph 4-21 a., and repeat 1 above.	Rf signal displayed?	Δ	2	
4	Perform VERIFY RECEIVER SM OUTPUT SENSITIVITY test in accordance with paragraph 4-16.	Receiver passed test?	5	4	
5	Replace receiver in accordance with paragraph 4-21 a., and repeat 1 above.	Strong rf signal displayed?	Δ	6	

GO ON TO SHEET 2

4-19. TROUBLESHOOTING PROCEDURES - Continued

ah. CRT DISPLAYS WEAK VERTICAL DEFLECTION OF STRONG RF SIGNALS (SHEET 2 OF 2)

Step	Instruction	Indication	Yes	No	Remarks
6	Perform VERIFY SYSTEM PATCH CORDS SERVICEABILITY TEST in accordance with paragraph 4-12.	Cords passed test ?	8	7	
7	Replace defective patch cords?	Strong rf signal?	Δ	8	
8	Replace signal monitor in accordance with paragraph 4-21 a., and repeat 1 above.	Marker present ?	Δ	Repeat 2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

ai. CRT DISPLAY DOES NOT DISPLAY EQUAL PORTIONS OF FREQUENCY SPECTRUM TO THE LEFT AND RIGHT OF THE MARKER

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
None	2-12.	Direction finder set assembled and prepared for use.
Materials/Parts: Signal monitor	2-13 a.	Units powered up. Initial adjustments made.

Step	Instruction	Indication	Yes	No	Remarks
1	Perform VERIFY SIGNAL MONITOR SENSITIVITY performance test in accordance with paragraph 4-14.	Equal display?	Δ	2	
2	Replace signal monitor in accordance with paragraph 4-21 a, and repeat 1 above.	Marker present?	Δ	Repeat 2	

4-19. TROUBLESHOOTING PROCEDURES - Continued

aj. HP UPCONVERTER WITH A POWER LAMP THAT DOES NOT LIGHT

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
Multimeter Test lead set	2-12.	Direction finder set assembled and prepared for use. Units powered up. Initial adjustments made.
Materials/Parts HF upconverter/ demodulator Receiver 1/8 amp fuse	2-13 a.	

Step	Instruction	Indication	Yes	No	Remarks
1	Set MODE switch to PWR OFF.				
2	Check 1/8 amp fuse on front panel of hf up-converter/demodulator.	Fuse good?	4	3	
3	Replace fuse and set MODE switch to HF/ DEMOD.	Power lamp lights?	Δ	4	
4	Remove AUDIO/POWER INPUT connector from PHONES connector on receiver.				
5	Using the digital multi-meter check for +12 to +15 vdc at pin F of the receiver PHONES con-nector.	Voltage present ?	6	7	
6	Replace receiver in accordance with para-graph 4-21 a., and repeat steps 1 and 2 above.	Voltage present ?	Δ	Repeat 6	
7	Replace hf upconverter/ demodulator in accord-ance with paragraph 4-21 a.	Power lamp lights?	Δ	Repeat 1	

4-19. TROUBLESHOOTING PROCEDURES - Continued

ak. NO AUDIO AND NO SIGNAL STRENGTH INDICATION ON RECEIVER SIGNAL STRENGTH METER IN THE HF INTERCEPT MODE ONLY

INITIAL SETUP

Test Equipment	Equipment Condition Paragraph	Condition Description
None	2-12.	Direction finder set assembled and prepared for use.
Materials/Parts HF upconverter/ demodulator	2-13 a.	Units powered up. Initial adjustments made.

Step	Instruction	Indication	Yes	No	Remarks
1	Remove the bnc patch cord between the CONVERTER OUTPUT on hf upconverter/demodulator and RF INPUT on receiver.				
2	Perform VERIFY SYSTEM PATCH CORDS SERVICEABILITY TEST in accordance with paragraph 4-12.	Cord passed test?	4	3	
3	Replace bnc patch cord.	Signal strength indication and audio signal present?	Δ	4	
4	Replace the hf upconverter/demodulator in accordance with paragraph 4-21 a.	Signal strength indication and audio signal present?	Δ	Repeat 1	

Section VI. ORGANIZATIONAL MAINTENANCE PROCEDURES

SECTION CONTENTS

4-20. INTRODUCTION

Organizational maintenance of the direction finder set consists of:

4-21. MAINTENANCE PROCEDURES

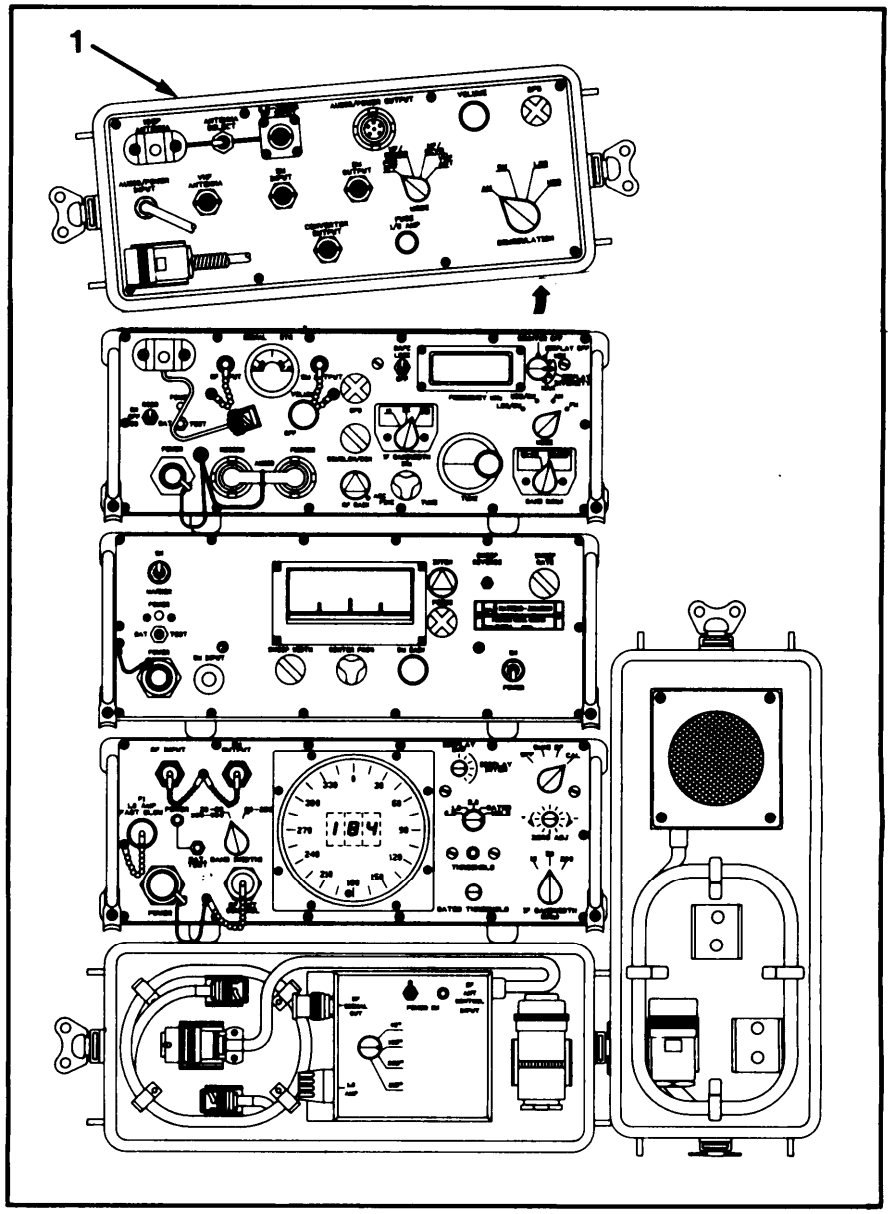
When a unit of the direction finder set needs to be replaced for servicing follow the remove and replace procedures listed below:

> CAUTION
> Due to the complexity of the system cables, always uncable units in accordance with paragraph 2-15 a. prior to removing and replacing unit.

MAINTENANCE PROCEDURES - Continued

REMOVING AND REPLACING HP UPCONVERTER/DEMODULATOR

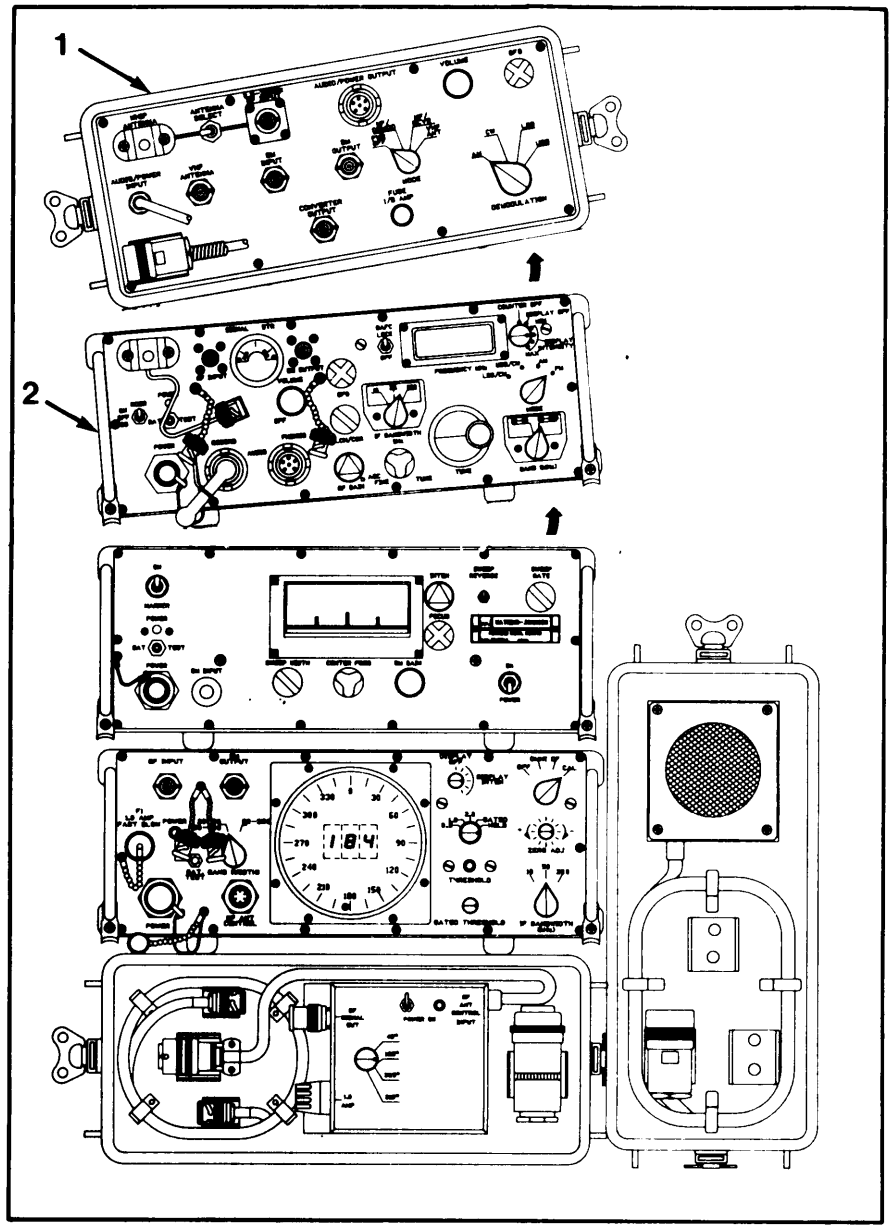
1. Power down units in accordance with paragraph 2-15 a.
2. Uncable units in accordance with paragraph 2-15 a.
3. Remove faulty hf upconverter/demodulator (l) and replace with an operational unit.
4. Cable units in accordance with paragraph 2-12 c.
5. Power up units in accordance with paragraph 2-13 a.



4-21 a. **MAINTENANCE PROCEDURES - Continued**

REMOVING AND REPLACING RECEIVER

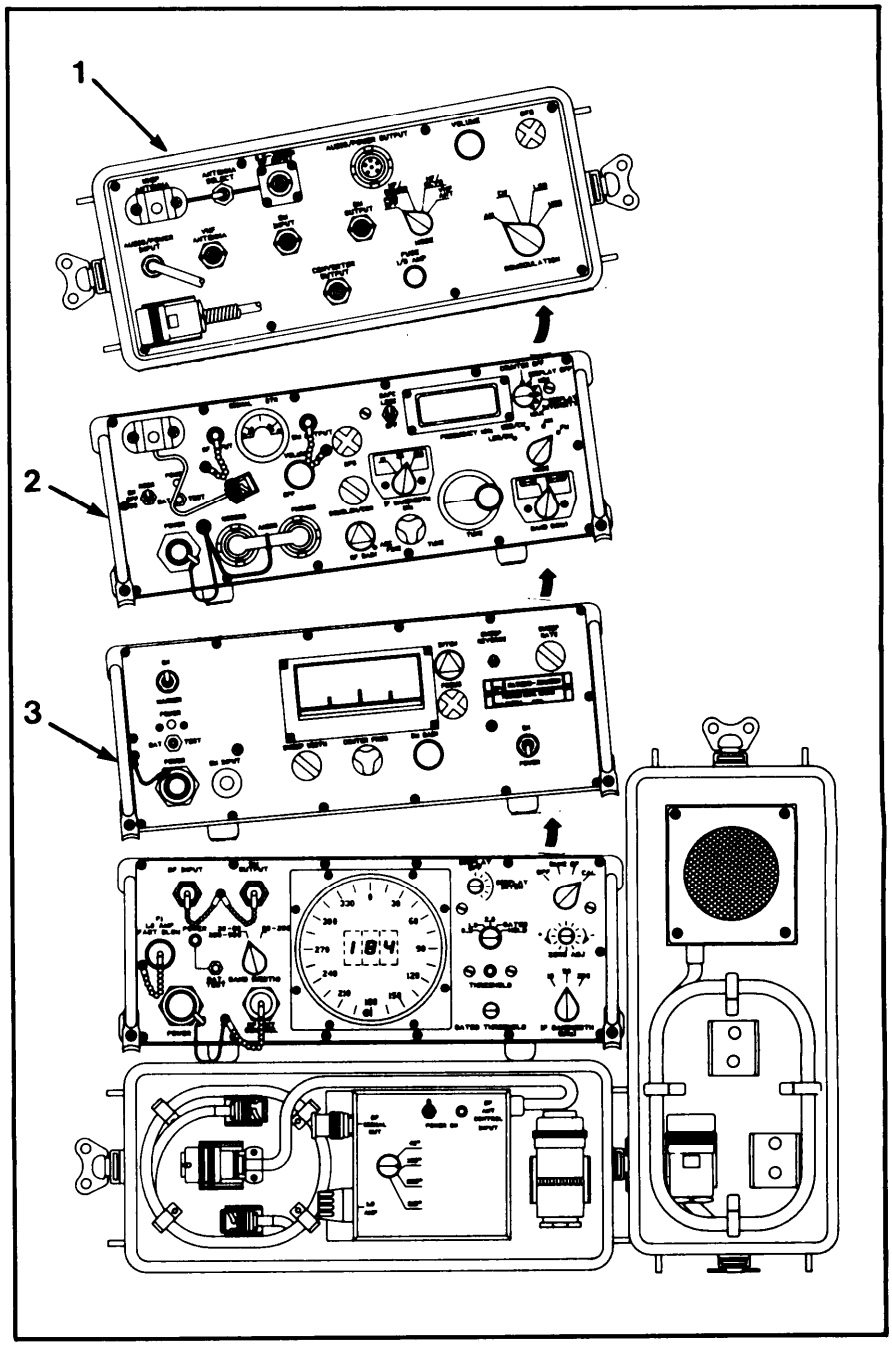
1. Power down units in accordance with paragraph 2-15 a.
2. Uncable units in accordance with paragraph 2-15 a.
3. Lift off the hf upconverter/demodulator (1) and set it aside.
4. Lift off the receiver (2) and replace with an operational unit.
5. Restack and cable units in accordance with paragraph 2-12 c.
6. Power up units in accordance with paragraph 2-13 a.,



4-21 a. **MAINTENANCE PROCEDURES - Continued**

REMOVING AND REPLACING SIGNAL MONITOR

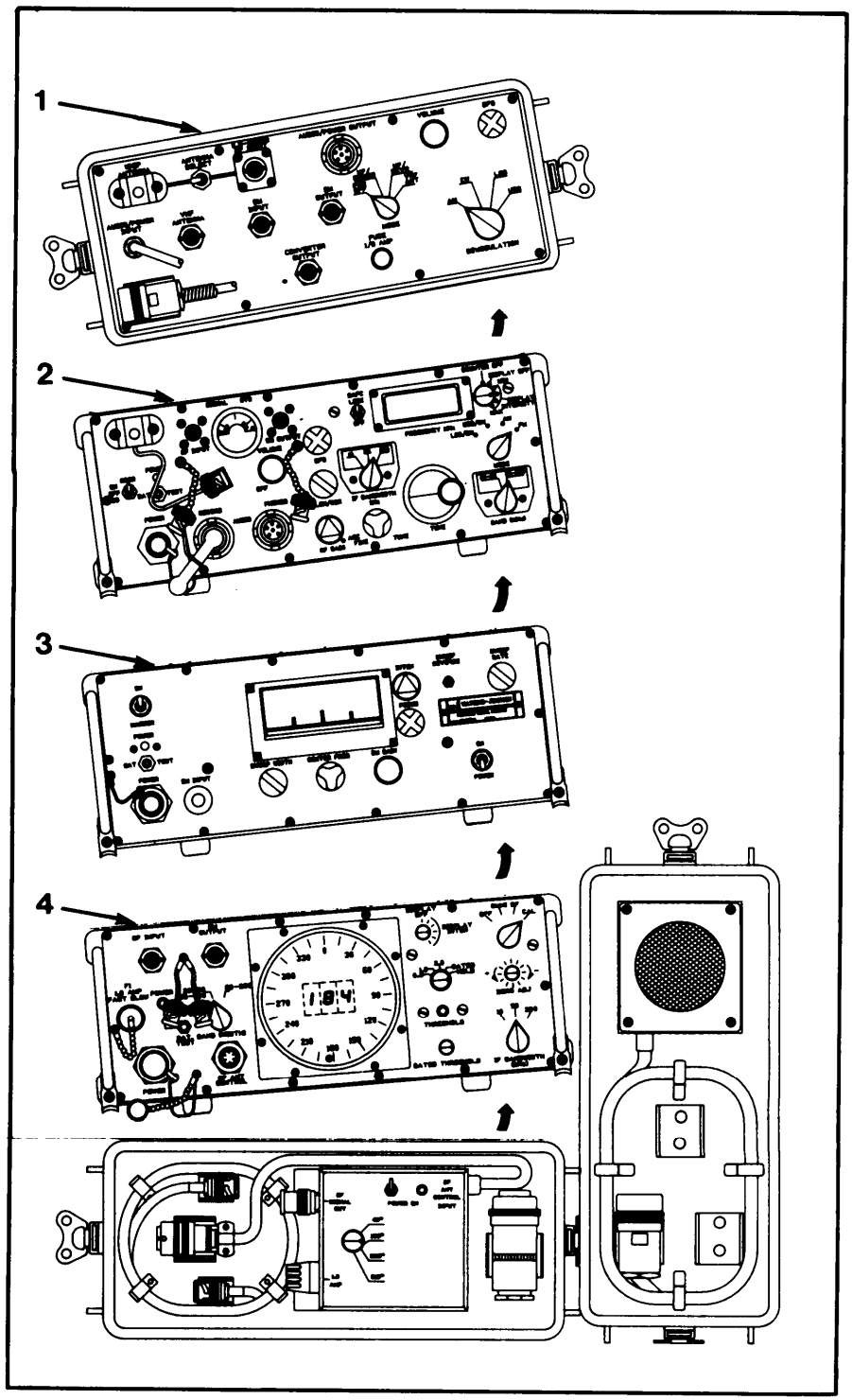
1. Power down units in accordance with paragraph 2-15 a.
2. Uncable units in accordance with paragraph 2-15 a.
3. Lift off the hf upconverter/demodulator (1) and the receiver (2) set them aside.
4. Lift off the signal monitor (3) and replace with an operational unit.
5. Restack and cable units in accordance with paragraph 2-12 c.
6. Power up units in accordance with paragraph 2-13 a.



4-21 a. MAINTENANCE PROCEDURES - Continued

REMOVING AND REPLACING DF PROCESSOR

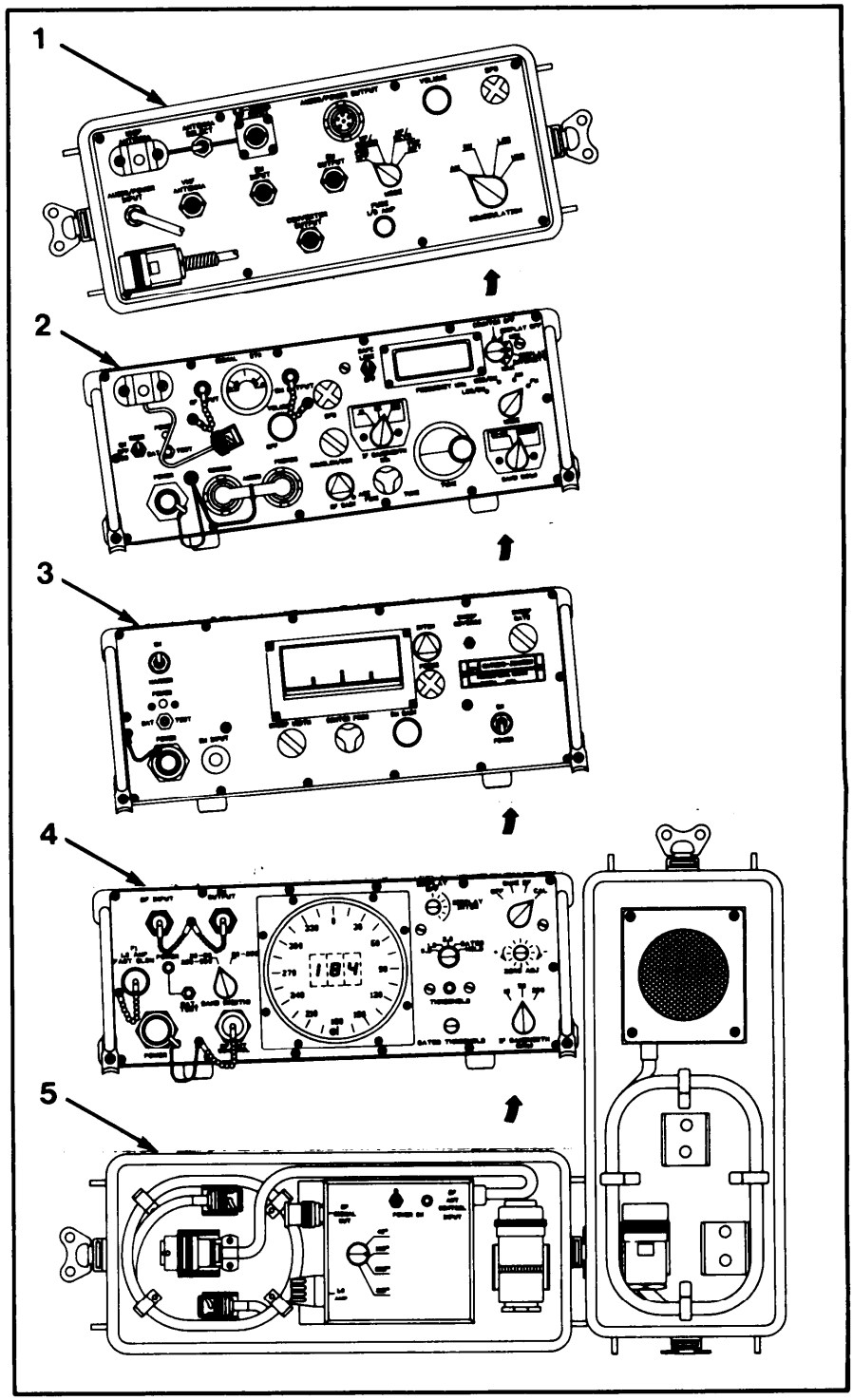
1. Power down units in accordance with paragraph 2-15 a.
2. Uncable units in accordance with paragraph 2-15 a.
3. Lift off the hf upconverter/demodulator (l), the receiver (2), and the signal monitor (3) and set them aside.
4. Lift off the df processor (4) and replace with an operational unit.
5. Restack and cable units in accordance with paragraph 2-12 c.
6. Power up units in accordance with paragraph 2-13 a.



4-21 a. MAINTENANCE PROCEDURES - Continued

REMOVING AND REPLACING ANGLE SIMULATOR

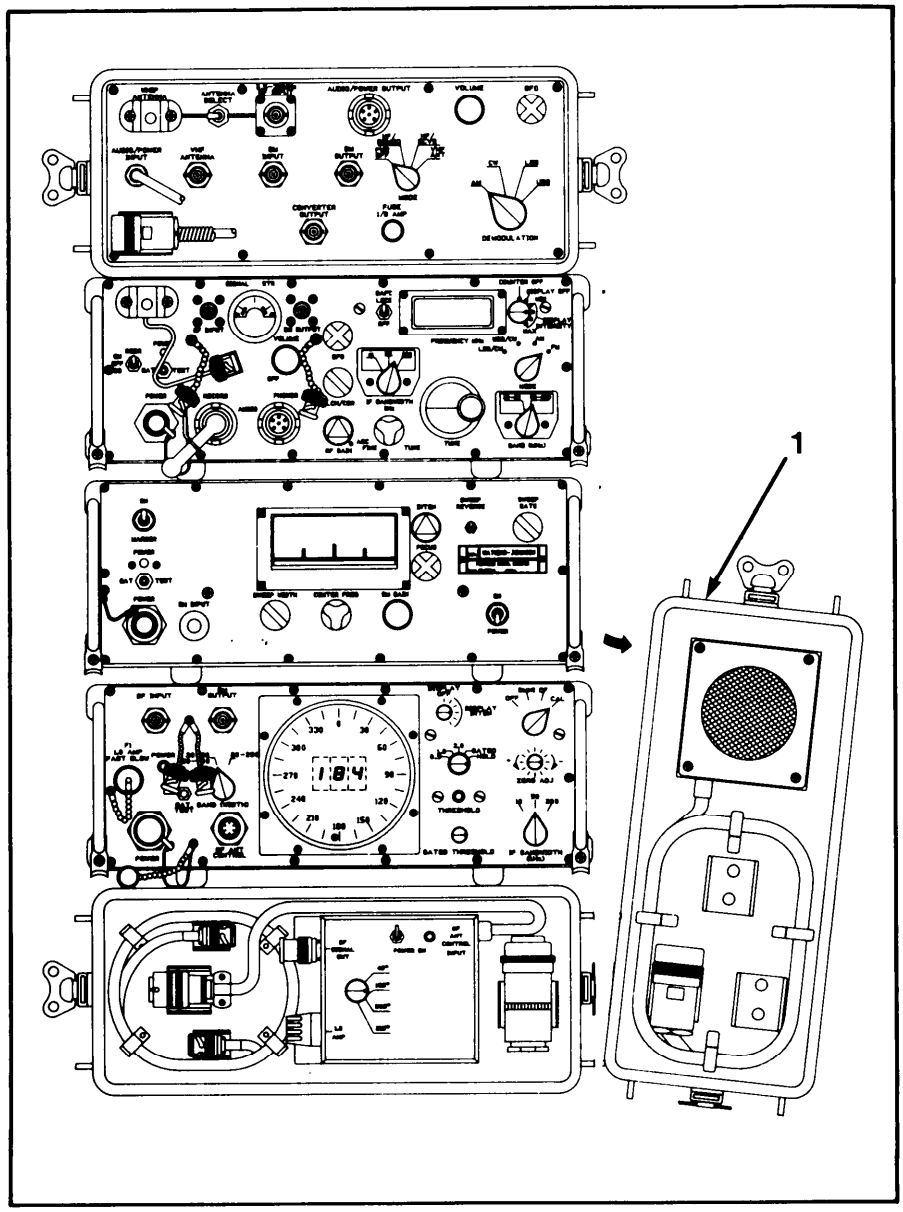
1. Power down units in accordance with paragraph 2-15 a.
2. Uncable units in accordance with paragraph 2-15 a.
3. Lift off the hf upconverter/demodulator (l), the receiver (2), and the signal monitor (3), and the df processor (4) and set them aside.
4. Replace the angle simulator (5) with an operational unit.
5. Restack and cable units in accordance with paragraph 2-12 c.
6. Power up units in accordance with paragraph 2-13 a.



4-21 a. MAINTENANCE PROCEDURES - Continued

REMOVING AND REPLACING SPEAKER

1. Power down units in accordance with paragraph 2-15 a.
2. Replace the speaker assembly (1) with an operational unit.
3. Cable units in accordance with paragraph 2-12 c.
4. Power up units in accordance with paragraph 2-13 a.



4-21. MAINTENANCE PROCEDURES - Continued

b. When indications on the direction finder set show D-Cell batteries have low voltage levels, replace the D-Cell insert in all units by following these steps.

1. Remove defective units in accordance with paragraph 4-21 a.
2. Remove defective D-Cell insert from unit following steps in paragraph 2-12 b.
3. Remove batteries from defective D-Cell insert following steps in paragraph 2-12 b.
4. Place D-Cell batteries in D-Cell insert following steps in paragraph 2-12 b.
5. place D-Cell insert into unit following steps in paragraph 2-12 b.
6. Replace units in stack in accordance with paragraph 4- a.

4-21. MAINTENANCE PROCEDURES - Continued

c. According to mission requirements, you will be removing and installing tuner assemblies within the receiver of the direction finder set. Follow the remove and install procedures in this paragraph.

WARNING
Voltages within the direction finder units can cause electrical shock. Do not work on equipment when power is applied.

INITIAL SETUP

Test Equipment
None

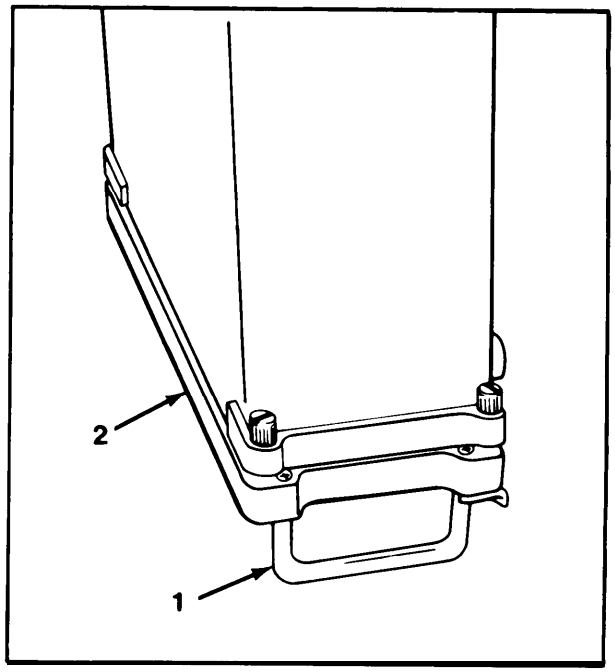
Personnel Required
EW Intercept Systems Repairer, MOS 33510

Tools
Tool Kit, Electronic Equipment TK-105/G
No. 1 Phillips screwdriver
4 in. flat-tip screwdriver
7/32 in. box end wrench
.05 in. hex head screw key
Needlenose pliers

4-21 c. MAINTENANCE PROCEDURES - Continued

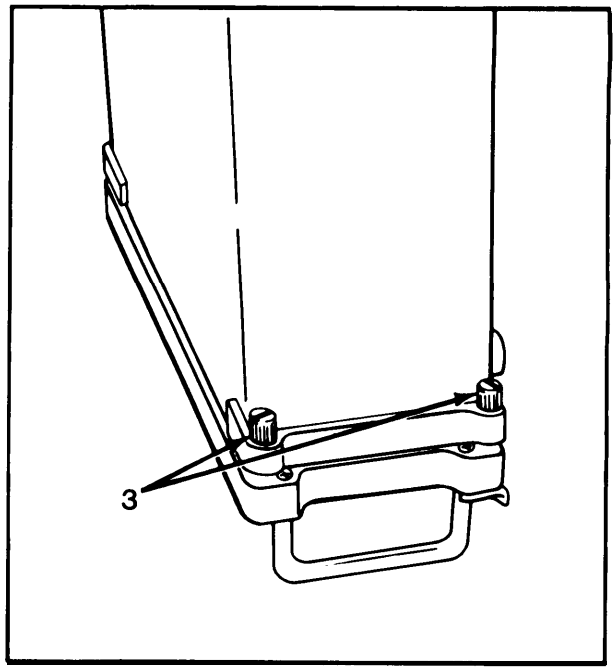
REMOVING RECEIVER COVER (SHEET 1 OF 2)

1. Remove front cover and stand receiver (2) up on a flat surface so it rests on its front panel handles (l).



NOTE
- Bottom of receiver (battery cover) will be in up position.
- Ensure battery has been removed.

2. Loosen two slotted screws (3) from each side of front panel with a 4 in. flat-tip screwdriver.

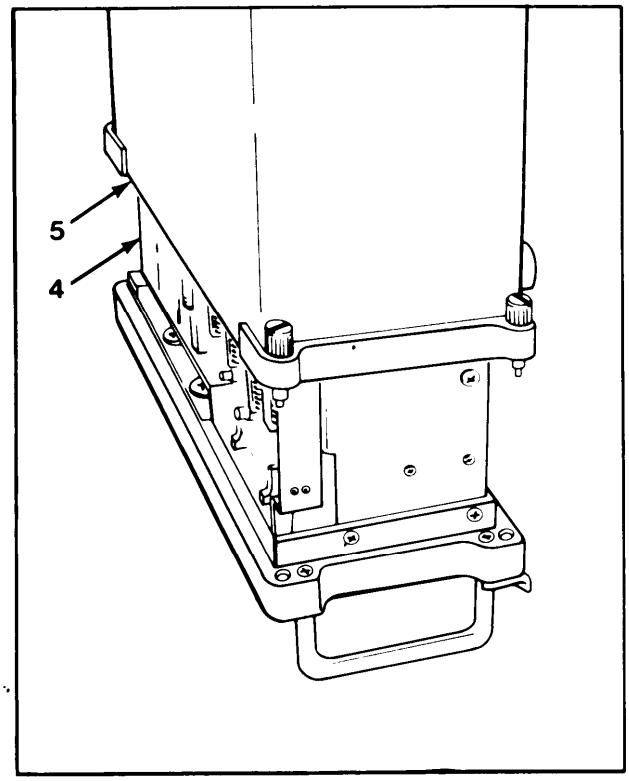


GO ON TO SHEET 2

4-21 c. **MAINTENANCE PROCEDURES - Continued**

REMOVING RECEIVER COVER (SHEET 2 OF 2)

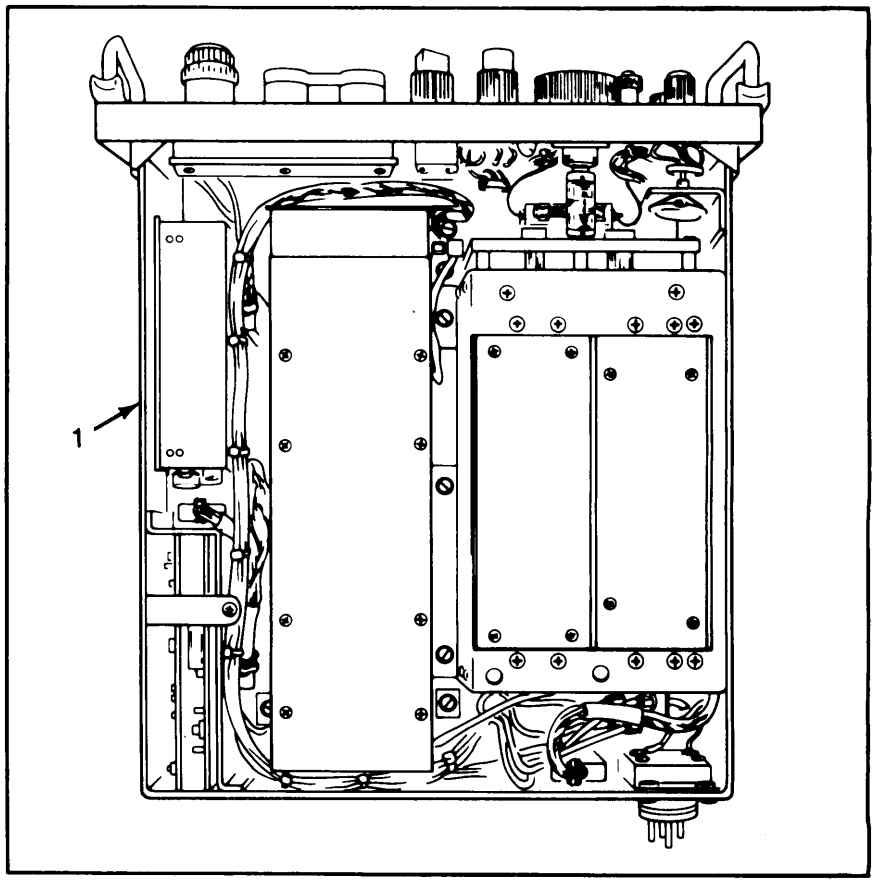
3. Pull receiver cover (5) up and off of receiver chassis (4).



4-21 c. MAINTENANCE PROCEDURES - Continued

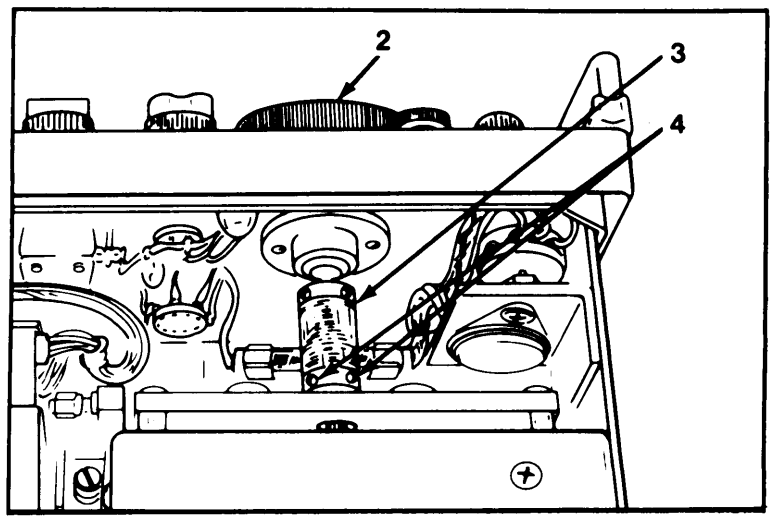
REMOVING TUNER ASSEMBLY (SHEET 1 OF 5)

1. Place receiver (1) top side down.



2. Rotate black TUNE knob (2) on front panel of receiver (1) until two setscrews (4) on tuner shaft spring (3) are accessible.

3. Loosen 2 setscrews (4) using .05 in. hex head screw key.



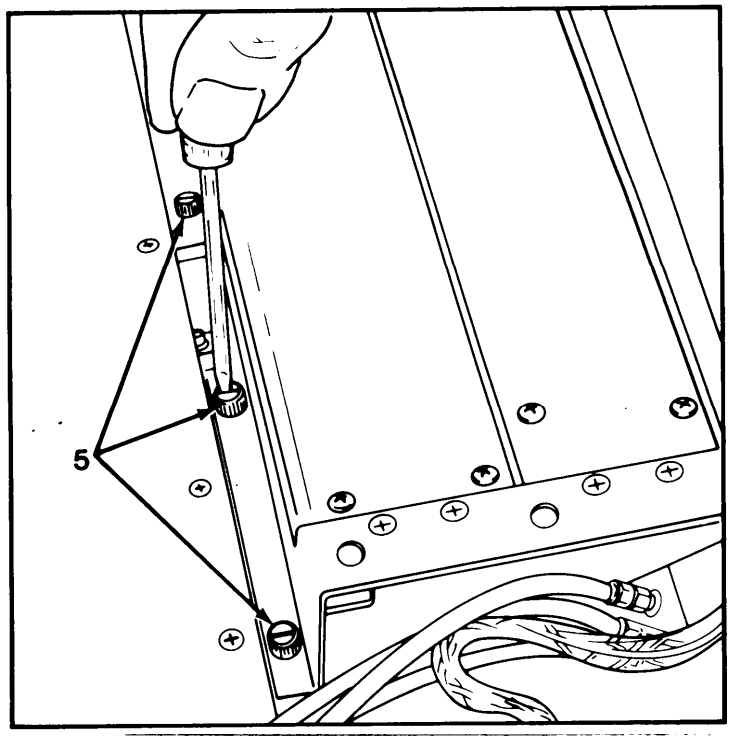
GO ON TO SHEET 2

4-21 c. **MAINTENANCE PROCEDURES - Continued**

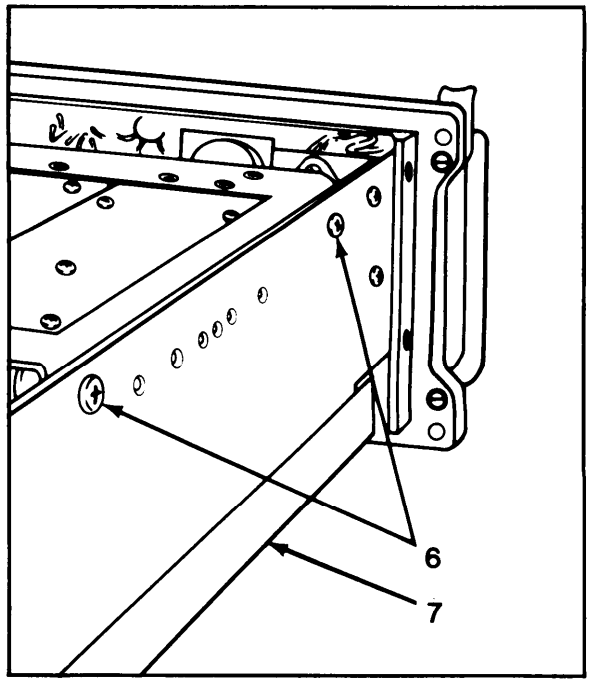
REMOVING TUNER ASSEMBLY (SHEET 2 OF 5)

4. Loosen 3 slotted acres (5) that hold tuner assembly to receiver using 4 in. flat tip screwdriver.

NOTE
Slotted screws are located between tuner assembly and IF demodulator assembly.



5. Remove 2 Phillips screws (6) from right side of receiver chassis (7) using No. 1 Phillips screwdriver.

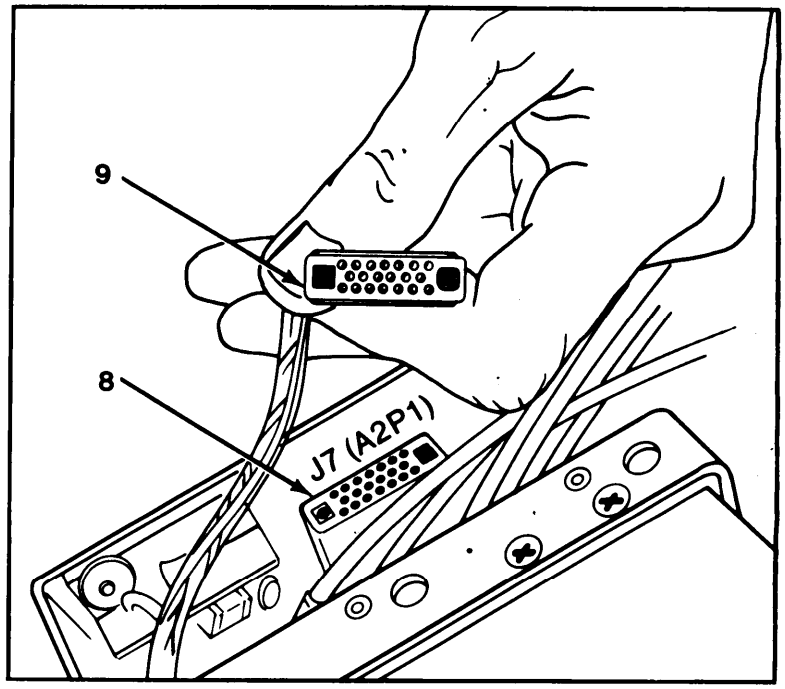


GO ON TO SHEET 3

4-21 c. MAINTENANCE PROCEDURE - Continued

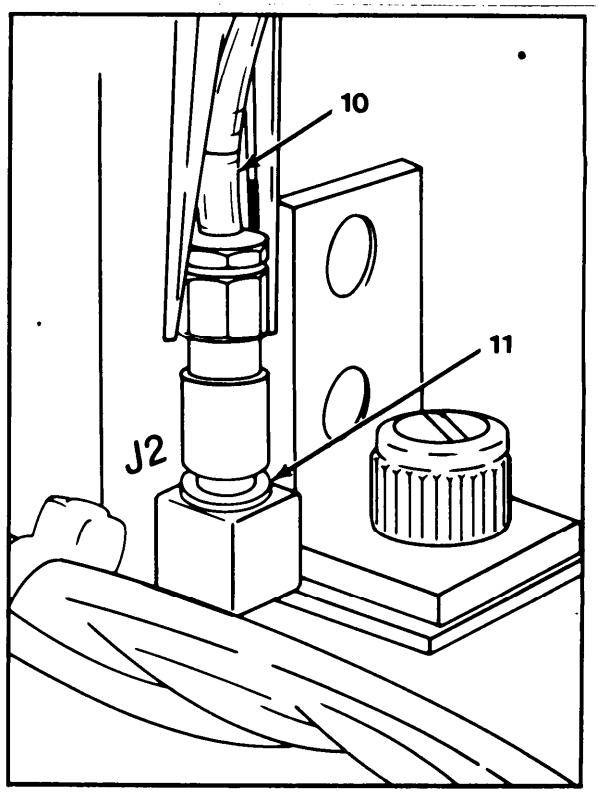
REMOVING TUNER ASSEMBLY (SHEET 3 OF 5)

6. Disconnect multipin SRE plug (9) marked J7 A2P1 from jack J7 at rear of tuner assembly (8).



7. Disconnect cable (10) marked P9 A4J2 from jack J2 (11) at rear of IF demodulator assembly using needlenose pliers.

NOTE
Jack J2 is an SMB pull off-push on type connector.

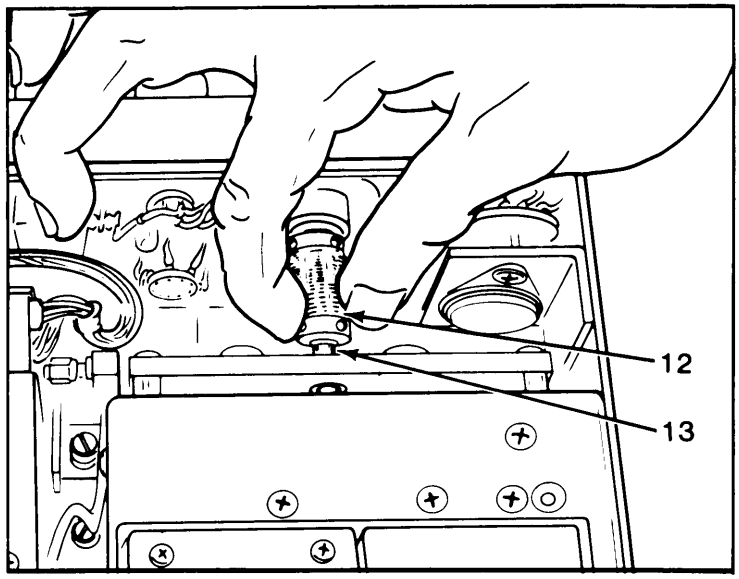


GO ON TO SHEET 4

4-21 c. **MAINTENANCE PROCEDURES - Continued**

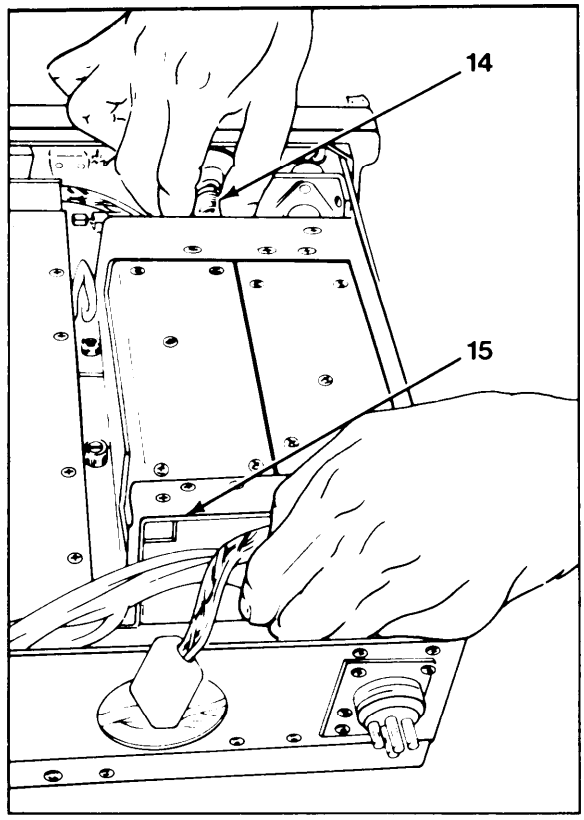
REMOVING TUNER ASSEMBLY (SHEET 4 OF 5)

8. Pull tuner shaft spring (12) backward off of tuner shaft (13).



CAUTION
Do not lift tuner assembly by its cable.

9. Lift rear of tuner assembly (15) up and out of chassis while still holding tuner shaft spring (14) back.



GO ON TO SHEET 5

4-2l c. MAINTENANCE PROCEDURES - Continued

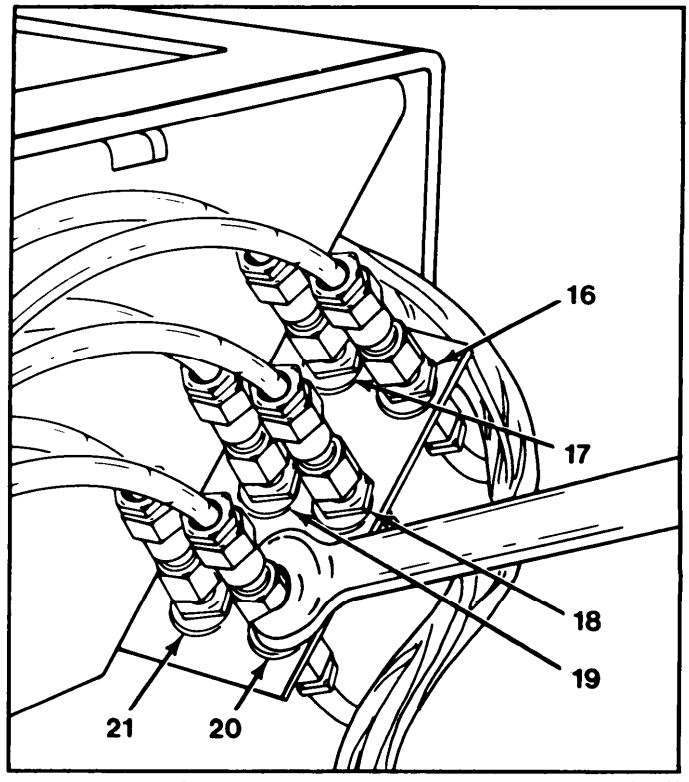
REMOVING TUNER ASSEMBLY (SHEET 5 OF 5)

10. Disconnect the following cables from SMC jacks at rear of tuner assembly using a 7/32 box end wrench:

Cable A3P2 A2J6 from plug J6 (20)
Cable A3P1 A2J4 from plug J4 (18)
Cable P5 A2J2 from plug J2 (16)
Cable P8 A2J5 from plug J5 (21)
Cable P6 A2J3 from plug J3 (19)
Cable P3 A2J1 from plug J1 (17)

11. Lift tuner assembly out of receiver and set aside.

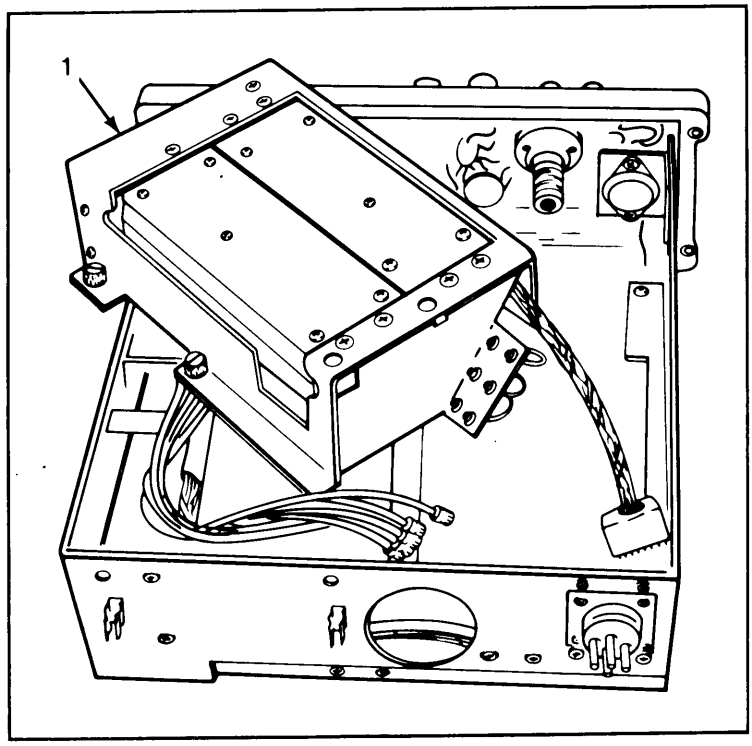
12. Prepare removed tuner assembly for storage by following procedures in paragraph 4-23 b.



4-21 c. MAINTENANCE PROCEDURES - Continued

INSTALLING TUNER ASSEMBLY (SHEET 1 OF 4)

1. Place tuner assembly to be installed (1) on top of receiver.

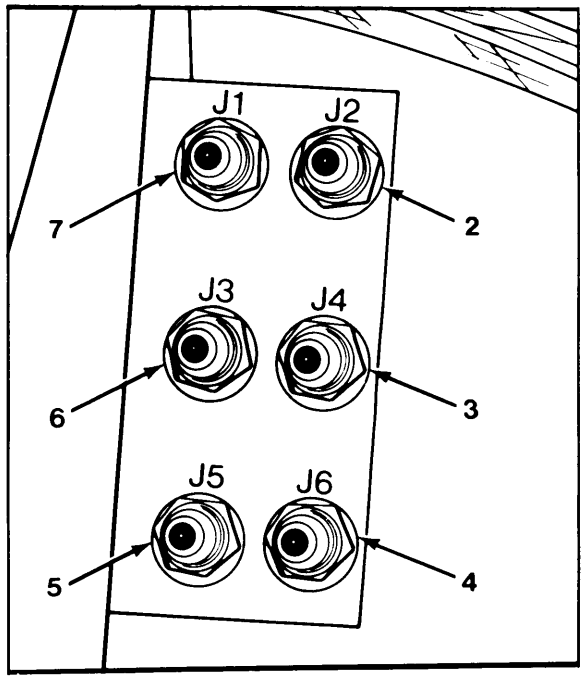


CAUTION
- Ensure the correct cable is connected to correct jack.
- Do not overtighten any of the six cables onto their jacks.

2. Connect and tighten each cable l/4 turn clockwise with a 7/32 in. box end wrench into the following jacks:

Cable P8 A2J5 to jack J5 (5)
Cable P6 A2J3 to jack J3 (6)
Cable P3 A2J1 to jack J1 (7)
Cable A3P2 A2J6 to jack J6 (4)
Cable A3P1 A2J4 to jack J4 (3)
Cable P5 A2J2 to jack J2 (2)

CAUTION
Cables are identified by their number marked sleeves. Jacks are identified by numbers on connector plate.

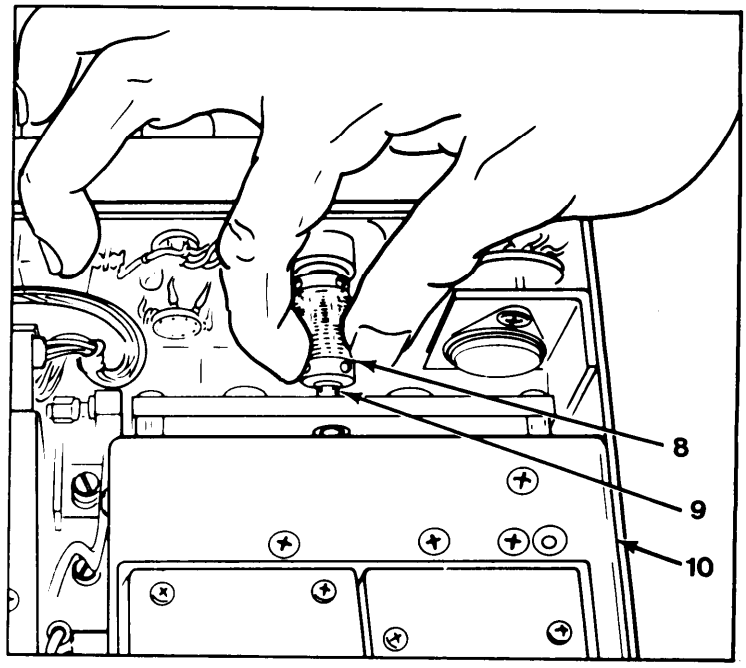


GO ON TO SHEET 2

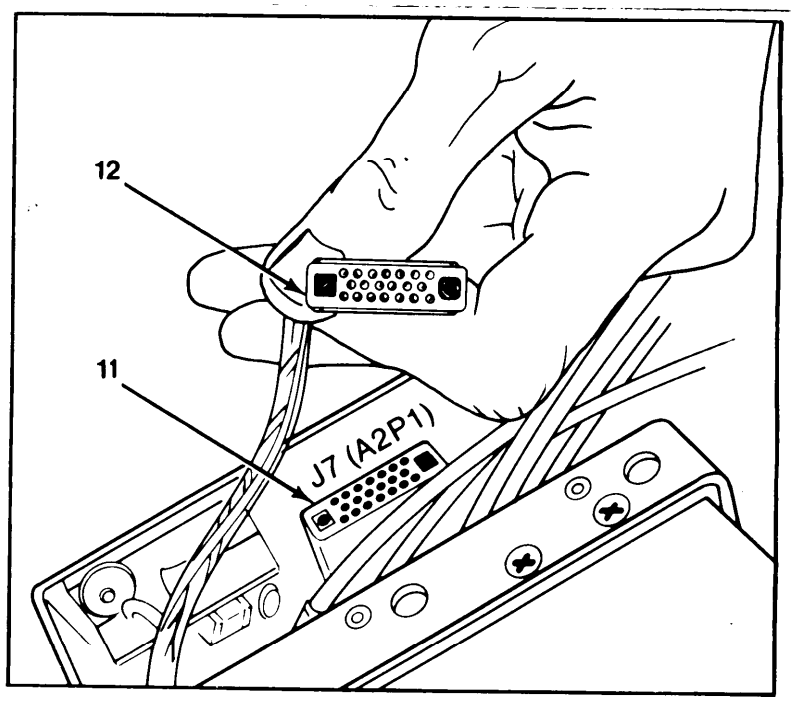
4-2l c. MAINTENANCE PROCEDURES - Continued

INSTALLING TUNER ASSEMBLY (SHEET 2 OF 4)

3. Replace tuner assembly (10) into receiver at 45 degrees angle by placing tuner shaft (9) into tuner shaft spring (8) and then setting tuner assembly in place.



4. Connect multipin SRE plug marked J7 A2P1 (12) onto jack J7 (11) at rear of tuner assembly.

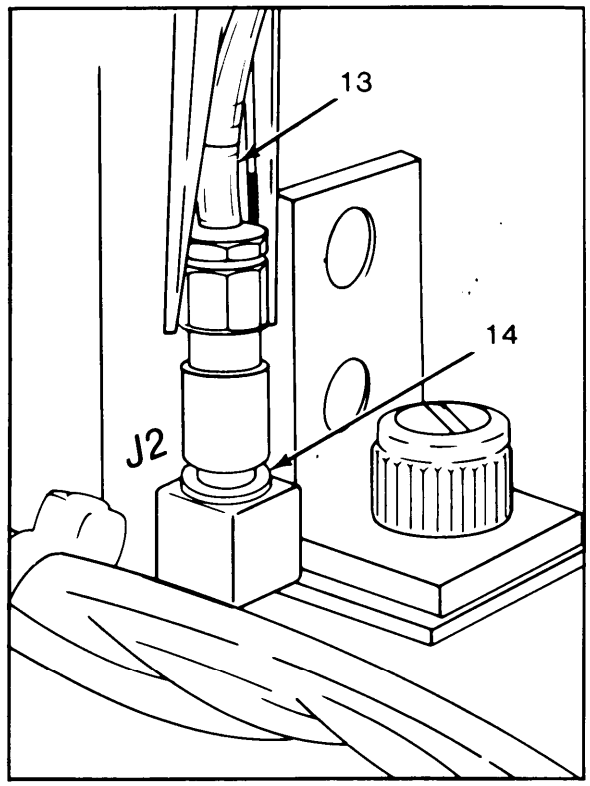


GO ON TO SHEET 3

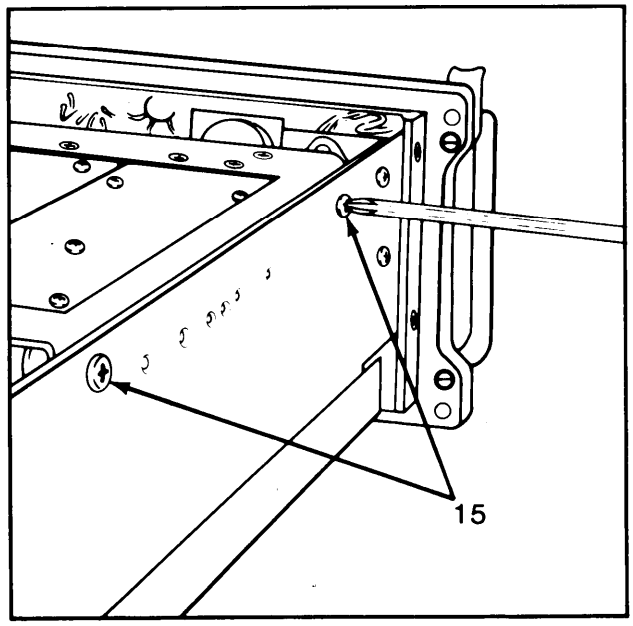
4-21 c. **MAINTENANCE PROCEDURES - Continued**

INSTALLING TUNER ASSEMBLY (SHEET 3 OF 4)

5. Connect cable marked P9 A4J2 (13) into jack J2 (14) at rear of IF demodulator assembly by using needlenose pliers.



6. Replace 2 Phillips screws on right side of receiver (15) and tighten with a No. 1 Phillips screwdriver.

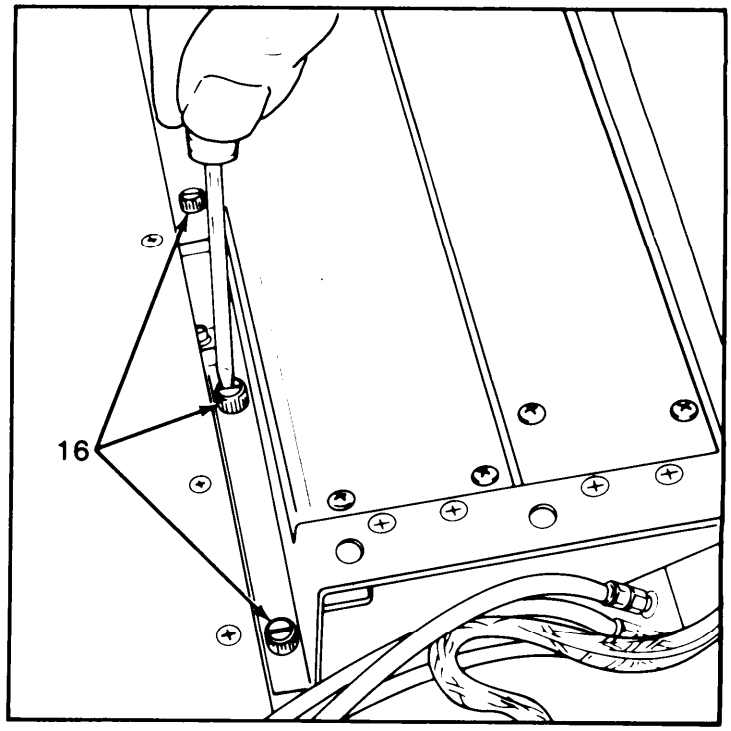


GO ON TO SHEET 4

4-21 c. **MAINTENANCE PROCEDURES - Continued**

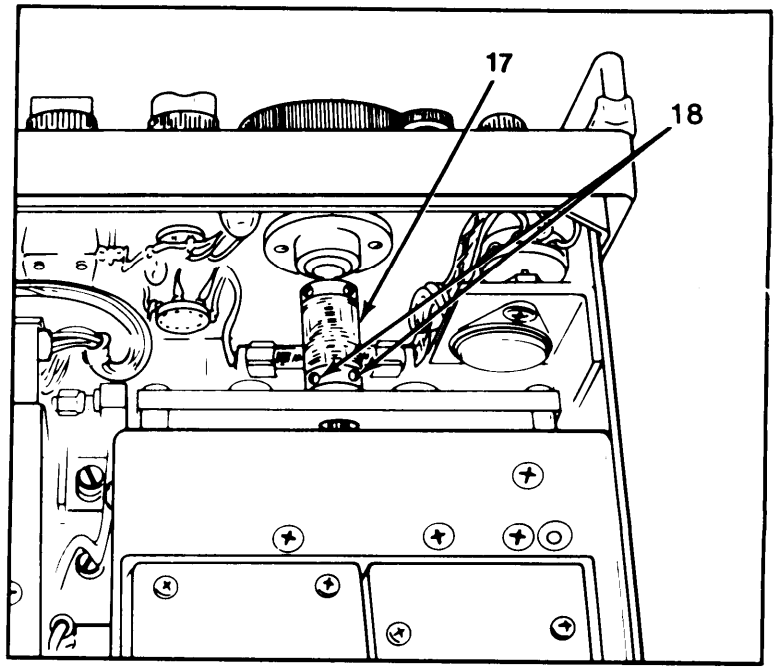
INSTALLING TUNER ASSEMBLY (SHEET 4 OF 4)

7. Tighten three slotted screws (16) next to tuner assembly and tighten with a 4 inch flat-tip screwdriver.



8. Tighten two set-screws (18) on tuner shaft spring (17) with a .05 in. hex head screw key.

9. Rotate TUNE knob on front of receiver to assure tuner rotates freely.

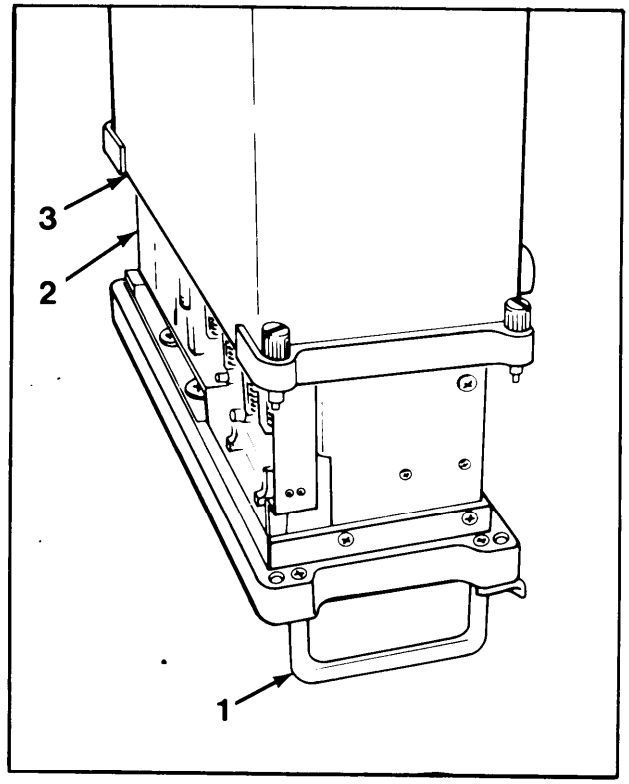


4-2l c. MAINTENANCE PROCEDURES - Continued

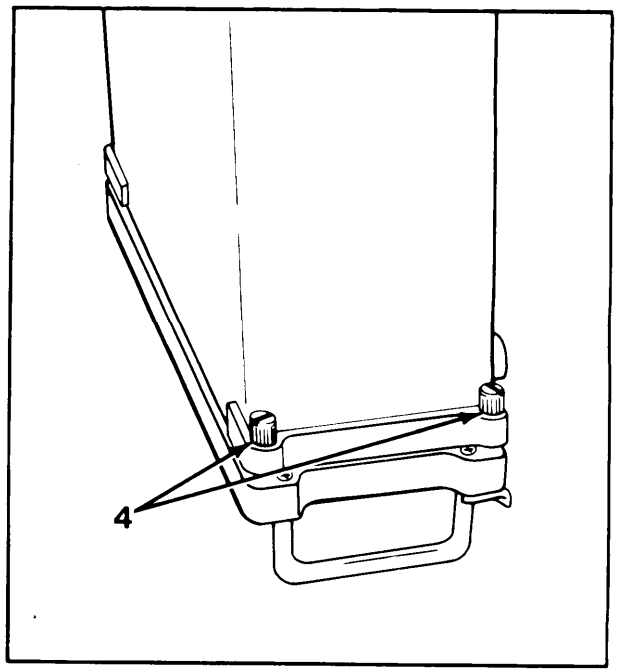
REPLACING RECEIVER COVER

1. Place receiver face down on front panel handles (l).

2. Place receiver cover (3) over chassis (2).



3. Tighten two slotted screws (4) on each side of front panel with a 4 in. flat tip screwdriver.



4-21 c. MAINTENANCE PROCEDURES - Continued

REMOVING AND REPLACING BAND MHz PLATE (SHEET 1 OF 2)

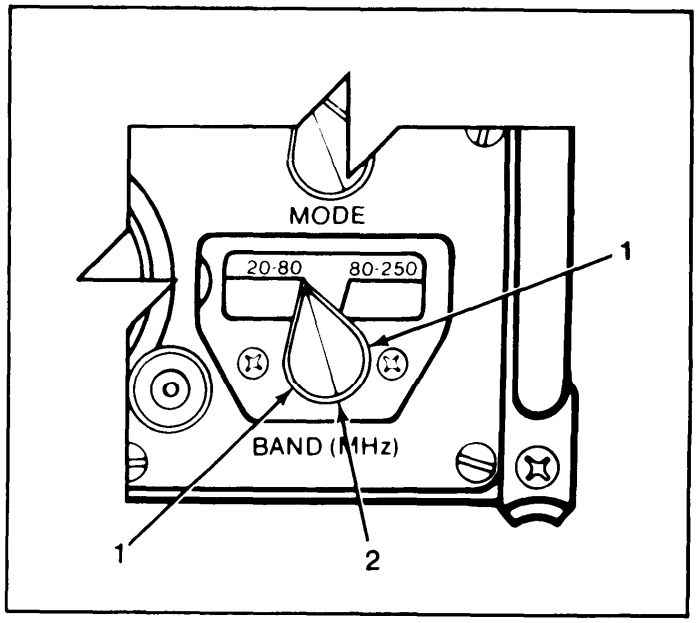
NOTE
Following steps are to be performed after the new tuner assembly is installed in receiver.

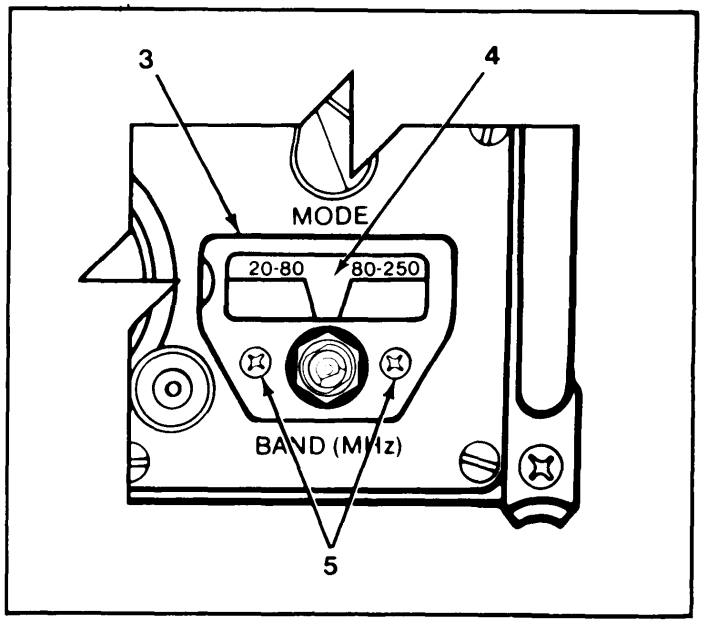
1. Set BAND (MHz) knob (2) to lower band setting on left.
2. Loosen two setscrews (1) on BAND (MHz) knob (2) using a .05 in. hex head screw key and remove BAND (MHz) switch from its shaft.
3. Remove two Phillips screws (5) on BAND (MHz) window plate (3) using a No. 1 Phillips screwdriver.
4. Remove BAND (MHz) plate (3) along with placard (4) behind plate.

NOTE
There should also be a plastic protective cover inside plate. It is not necessary to remove it when changing placards.

5. Insert new placard packaged with new tuner assembly into rear of BAND MHz window plate (3).

NOTE
Placards for associated tuner assembly are stored in plastic bag attached to side of tuner assembly.



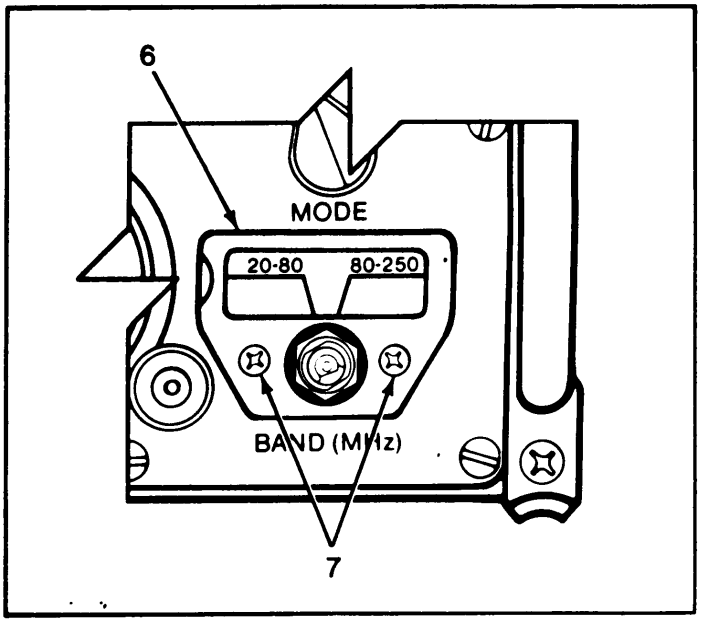


GO ON TO SHEET 2

4-21 c. MAINTENANCE PROCEDURES - Continued

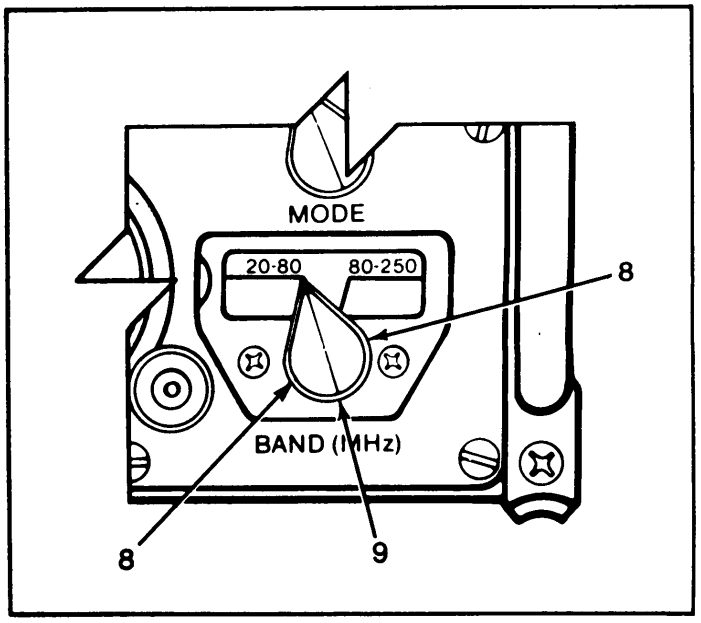
REMOVING AND REPLACING BAND MHZ PLATE (SHEET 2 OF 2)

6. Replace BAND (MHz) window plate (6) onto receiver and replace and tighten two Phillips screws (7) using a No. 1 Phillips screwdriver.



7. Replace BAND (MHz) knob (9) onto its shaft with knob pointing to lower band on left.

8. Tighten two setscrews (8) on BAND (MHz) switch using a .05 in. hex head screw key.

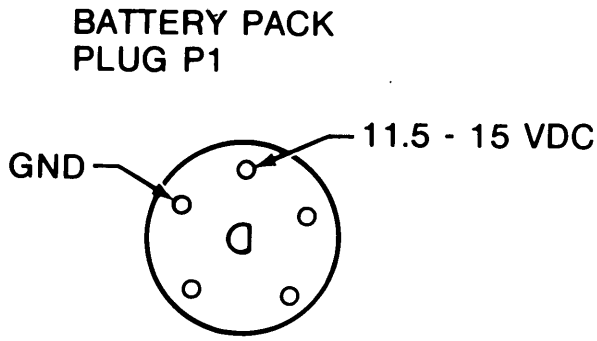


4-21 d. MAINTENANCE PROCEDURES - Continued

d. Verify Df Processor Alignment Using Angle Simulator. An angle simulator is used during troubleshooting procedures on the direction finder set. The simulator verifies that the df processor is calibrated for accurate line of bearing readings. It acts as a df antenna that is receiving a transmission at 45, 135, 225, or 315 degrees. Procedures for using the simulator include preparing the df processor for testing and testing the df processor with the simulator. Follow the illustration and steps contained in paragraph 2-13 b. (Angle Simulator Test) when using the simulator.

4-2l e. TESTING BATTERY PACK PLUG

Use the illustration below to identify test points on the battery pack plug.



Section VII. PREPARING EQUIPMENT FOR STORAGE OR SHIPMENT

SECTION CONTENTS

4-22. SECURITY PROCEDURES

Refer to AR 190-11 and AR 190-13 for security procedures when preparing the direction finder set for storage or shipment.

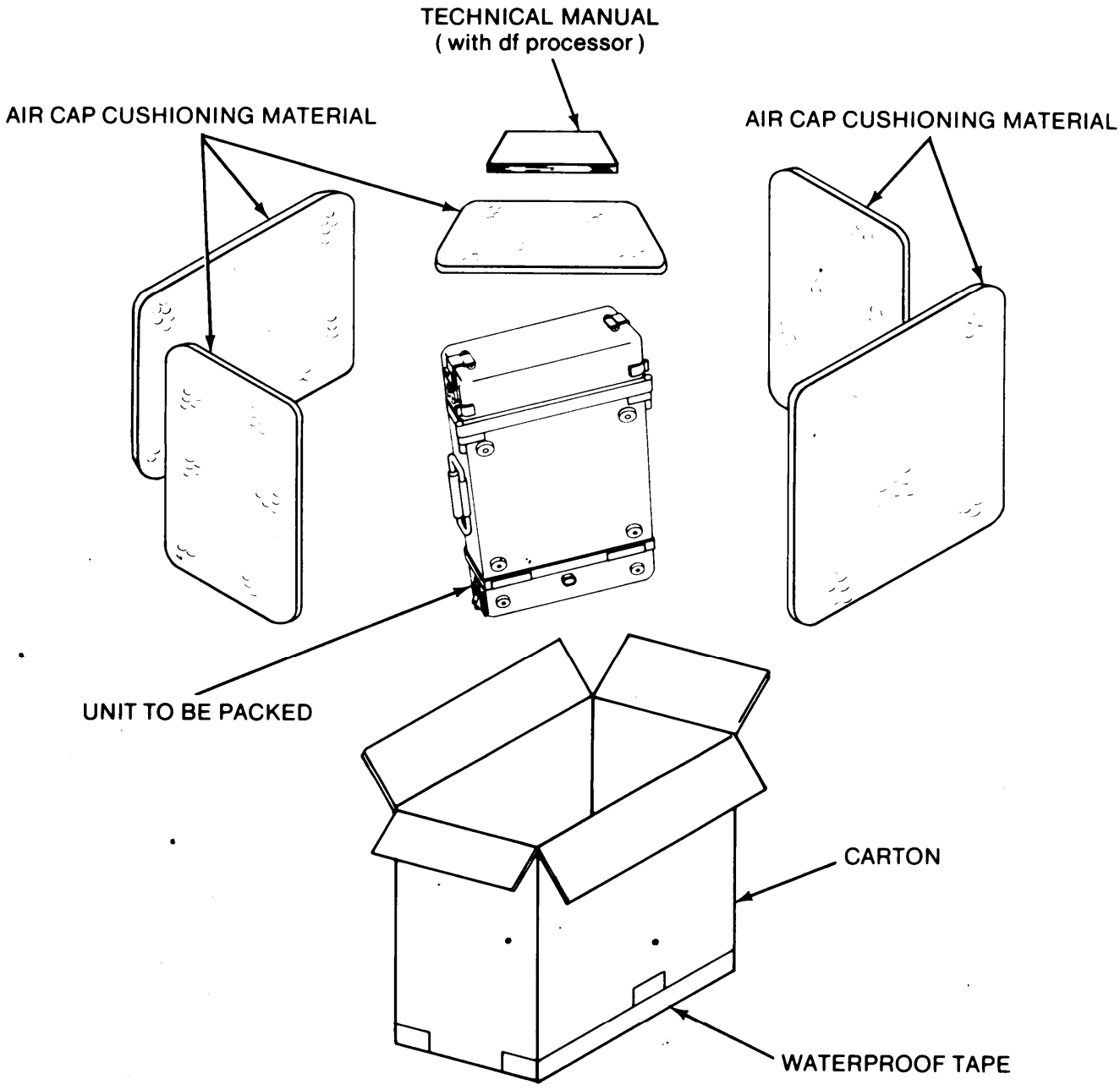
4-23. PACKING INSTRUCTIONS

The exact procedures for packaging the direction finder set depends on the materials available and the conditions under which the equipment is to be shipped or stored. Follow the procedures outlined below whenever circumstances permit.

The following materials are required for packaging components of the direction finder set:

- Waterproof tape
- Air cap cushing material
- Fiberboard
- Moistureproof-vaporproof barrier

4-23. PACKING INSTRUCTIONS - Continued



4-23. PACKING INSTRUCTIONS - Continued

b. Packing the Tuner Assembly. The following procedures are to be followed when packing any of the tuner assemblies:

(1) Secure the multipin cable to the tuner assembly case with tape.

(2) Cushion the tuner assembly with air cap cushing material on all sides.

(3) Form a carton large enough to hold the tuner assembly with fiberboard and waterproof tape.

(4) Place the tuner assembly in the carton.

(5) Fill all voids in the carton with air cap cushing material.

(6) Seal the carton with waterproof tape.

(7) Cover the carton with moistureproof and vaporproof foil.

(8) Identify the contents of the carton with exterior markings.

c. Packing the Direction Finer Units. The following procedures are to be used when packing the units of the direction finder set:

Do not pack any unit without first ensuring that the batteries have been removed from the rear covers.

(1) Cushion the unit to be packed with air cap cushing material on all sides.

(2) Package each technical manual within a close fitting waterproof bag and seal the bags with waterproof tape.

(3) Form a carton large enough to hold the unit with fiberboard and waterproof tape.

(4) Place the unit in the carton.

(5) Fill all voids in the carton with air cap cushing material.

(6) Seal the carton with waterproof tape.

(7) Cover the carton with moistureproof and vaporproof foil.

(8) Identify the contents of the carton with exterior markings.

4-24. ADMINISTRATIVE STORAGE OF EQUIPMENT

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 paragraph 4-23.

APPENDIX A
REFERENCES

A-1. SCOPE

This appendix lists all the forms, field manuals, technical manuals and miscellaneous publications that apply to the df set. Only those publications available to, and required by operators and organizational maintenance personnel are listed.

A-2. FORMS

Transportation Discrepancy Report (TDR)	SF 361
Equipment Control Record	DA Form 2408-9
Equipment Inspection and Maintenance Work Sheet	DA Form 2404
Hand Receipts	DA Form 2062
Maintenance Request	DA Form 2407
Product Quality Deficiency Report	SF 368
Recommended Changes to Equipment Technical Manuals	DA Form 2028-2
Recommended Changes to Publications and Blank Forms	DA Form 2028
Reporting of Item and Packaging Discrepancies	SF 364

A-3. FIELD MANUALS

Basic Cold Weather Manual	FM 31-70
Care and Use of Individual Clothing and Equipment	FM 21-15
First Aid for Soldiers	FM 21-11
Radio Direction Finding	FM 30-476

A-4. TECHNICAL MANUALS

Audio Recorder AN/UNH-16	TM 32-5835-220-10
Hand Receipt Technical Manual Covering End Item/Components of End Item (COEI). Basic Issue Items (BIT) and Additional Authorization List (AAL) for Radio Sets, AN/VRC-12 (5820-00-223-7412)	TM 11-5820-401-10-2-HR
Operators Manual: AN/VRC-12 Radio Sets (Used Without An Intercom System.) (5820-00-223-7412)	TM 11-5820-401-10-1
Operator and Organizational Maintenance Manual Including Repair Parts and Special Tools List for Intercommunications Set AN/VIC-l(V) (5830-00-856-3273)	TM 11-5830-340-12&P

A-4. TECHNICAL MANUALS - Continued

Operator and Organizational Maintenance Manual Including Repair Parts and Special Tools List for Radio Set AN/PRC-77 (5820-00-930-3724) . . . . . TM 11-5820-667-12&P

Operator, Organizational, Direct Support and General Support Maintenance Receiver, R-2200/GRR-8(V) (5895-01-060-6492) . . . . . TM 11-5895-1227-14-1

Operator, Organizational, Direct Support and General Support Maintenance Tuner TN-586/GRR-8(V) (5895-01-075-3694) . . . . . TM 11-5895-1227-14-1-1

Operator, Organizational, Direct Support and General Support Maintenance Tuner TN-584/GRR-8(V) (5895-01-075-6391) TM11-5895-1227-14-1-2

Operator, Organizational, Direct Support and General Support Maintenance Tuner TN-585/GRR-8(V) (5895-01-073-1582) . . . . . TM 11-5895-1227-14-1-3

Operator, Organizational, Direct Support and General Support Maintenance Frequency Converter CV-4090/PRD-11 . . . TM 11-5895-1227-14-1-4

Operator, Organizational, Direct Support and General Support Maintenance Processor Display Control C-11496/PRD-11 (5820-01-160-4411) . . . . . TM 11-5895-1227-14-2

Operator, Organizational, Direct Support and General Support Maintenance Panoramic Indicator IP-1355/GRR-8(V) (5895-01-073-1604) .. . . . . TM 11-5895-1227-14-3

Operator, Organizational, Direct Support and General Support Maintenance Direction Finder Antenna AS-3732/ PRD-11 (5865-01-165-4578) and Direction Finder Antenna AS-3733/PRD-11 (5820-01-200-0177) ..... TM 11-5895-1227-14-4

A-5. MISCELLANEOUS PUBLICATIONS

Communications Security Equipment TSEC/KY-57	AR 750-1 (Section IV)
Consolidated Index of Army Publications and Blank Forms	DA Pam 25-30
Dictionary of United States Army Terms	AR 310-25
Field Instructions for Painting and Preserving Communications-Electronics Equipment	TB 43-0118
FSC Class 6135; Primary Battery Supply Data	SB 11-6
Headset H-251/U	SB 11-628
Painting and Preservation Supplies for Field Use for Electronics Command Equipment	SB 11-573
Procedures for Destruction of Electronic Materiel to Prevent Enemy Use	TM 750-244-2
Reporting of Item and Packaging Discrepancies	AR 735-11-2
Reporting of Transportation Discrepancies	AR 55-38
Safety Measures to Be Observed When Installing and Using Whip Antennas Field-Type Masts, Towers and Antennas and Metal Poles That Are Used With Communications, Radar and Direction Finder Equipment	TB SIG 291
Safety Precautions for Maintenance of Electrical/Electronic Equipment	TB 385-4
The Army Maintenance Management System (TAMMS)	DA Pam 738-750
Vehicular Radio Sets and Authorized Installations	SB 11-131
Warning Notice for Vehicles in Which Radios Are Mounted	SB 11-624

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. GENERAL

This appendix provides a summary of the maintenance operations for the direction finder set. 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.

B-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, Le., 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.

B-2. MAINTENANCE FUNCTIONS - Continued

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.

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) in 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.

B-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 members in the MAC and RPSTL coincide.

d. Column 4, Maintenance Categorv. 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 work time 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 - Intermediate Direct Support
H - Intermediate General Support
L - Special Repair Activity (SRA)
D - Depot

B-3. COLUMN ENTRIES - Continued

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

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

B-4. TOOL AND TEST EQUIPMENT REQUIREMENTS (Section 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 Categorv. 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.

NOTE
The National Stock Numbers that are missing from this list have been requested and will be added by a change to the list upon receipt.

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.

B-5. REMARKS (Section 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.

Section II. MAINTENANCE ALLOCATION CHART

(1) Group Number	(2) Component Assembly	(3) Maintenance Function	(4) Maintenance Level					(s) Tools and Equipment	(6) Remarks
			Unit		Intermediate		Depot		
			C	O	F	H	D		
00	Radio Receiver Direction Finder Set, AN/PRD-11	Inspect	0.2						
		Inspect			0.2				
		Inspect					0.8		
		Test		0.5				2-5	
		Test			0.3			2-5,7-14	
		Test					2.0	2-5,7-18	
		Replace		0.2				1	
		Repair		0.2				1	A
		Repair			0.5			6	B
		Repair					1.0	6	
		Alignment					1.1	2-5,8,10-18	

Section II. MAINTENANCE ALLOCATION CHART - Continued

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Unit		Intermediate		Depot		
			C	O	F	H	D		
01	R-2200 Receiver	Inspect			0.2				
		Inspect					0.6		
		Test		0.3				2-5	
		Test			3.0			2-5,8-14	
		Test					3.0	2-5,8,10-17	
		Replace		0.2				1	
		Repair		0.4				1	C, D
		Repair			0.4			6	B
		Repair					1.0	6	
		Alignment					2.1	2-5,8,10-18	
0101	Antenna Switch Assembly (A1)	Test					1.0	2-5,8,10-11,15	
		Replace			0.7			6	
		Repair			0.7			6	E
		Repair					0.5	6	
010101	Antenna Switch P.C. Assembly (A1A1)	Test					1.0	2-5	
		Repair			0.5			6	F
		Repair					1.0	6	
0102	TN-586/GRR-8(V) (.5 -30 MHz) (A2)	Test					2.0	8,10-15,17	
		Replace			0.5			6	
		Repair					1.0	6	
010201	Auto Band Select and Tuning Voltage Shapers (A2A1)	Test					2.0	8,10-15	
		Replace					0.2	6	
		Repair					1.0	6	
010202	RF Preselector .5-1.5 MHz (A2A2)	Test					2.0	8,10-15	
		Replace					0.2	6	
		Repair					1.0	6	
010203	RF Preselector 1.5- 4.5 MHz (A2A3)	Test					2.0	8,10-15	
		Replace					0.2	6	
		Repair					1.0	6	
010204	RF Preselect 4.5-12 MHz (A2A4)	Test					2.0	8,10-15	
		Replace					0.2	6	
		Repair					1.0	6	

Section II. MAINTENANCE ALLOCATION CHART - Continued

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Unit		Intermediate		Depot		
			C	O	F	H	D		
010205	RF Preselector 12-30 MHz (A2A5)	Test Replace Repair					2.0 0.2 1.0	8,10-15 6 6	
010206	If Amplifiers (A2A6)	Test Replace Repair					2.0 0.2 1.0	8,10-15 6 6	
010207	Local Oscillators (A2A7)	Test Replace Repair					2.0 0.2 1.0	8,10-15 6 6	
010208	10.5 Voltage Reference Assembly (A2A8)	Test Replace Repair					2.0 0.2 1.0	8, 10-15 6 6	
010209	Tuning Drive Assembly (A2A9)	Test Replace Repair					2.0 0.2 1.0	8,10-15 6 6	
0103	TN-584/GRR-8(V) (20 -250 MHz) (AZ)	Test Replace Repair			0.5		2.0 1.0	8,10-15,17 6 6	
010301	RF Tuner 80-250 MHz (A2A1)	Test Replace Repair					2.0 0.2 1.0	8,10-15 6 6	
01030101	RF Amplifier (A2A1A1)	Test Replace Repair					2.0 0.2 1.0	8,10-15 6 6	
01030102	Buffer, Mixer (A2A1A2)	Test Replace Repair					2.0 0.2 1.0	8,10-15 6 6	
01030103	Oscillator, Buffer (A2A1A3)	Test Replace Repair					2.0 0.2 1.0	8,10-15 6 6	

Section II. MAINTENANCE ALLOCATION CHART - Continued

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Unit		Intermediate		Depot		
			C	O	F	H	D		
010302	RF Tuner 20-80 MHz (A2A2)	Test Replace Repair					2.0 0.2 1.0	8,10-15 6 6	
01030201	Input Network (A2A2A1)	Test Replace Repair					2.0 0.2 1.0	8,10-15 6 , 6	
01030202	Interstate Mixer (A2A2A2)	Test Replace Repair					2.0 0.2 1.0	8,10-15 6 6	
01030203	Local oscillator (A2A2A3)	Test Replace Repair					2.0 0.2 1.0	8,10-15 6	
010303	Tuning Drive Assembly (A2A3)	Test Replace Repair					2.0 0.2 1.0	8,10-15 6 6	
0104	TN-585/GRR-8(V) (250-500 MHz) (A2)	Test Replace Repair			0.5		2.0 1.0	8,10-15,17 6 6	
010401	250-500 MHz Tuner (A2A1)	Test Replace Repair					2.0 0.2 1.0	8,10-15 6 6	
01040101	PIN Diode Attenuator (A2A1A1)	Test Replace Repair					2.0 0.2 1.0	8,10-15 6 6	
01040102	Attenuator Shaper (A2A1A2)	Test Replace Repair					2.0 0.2 1.0	8,10-15 6 6	
01040103	Balanced Mixer (A2A1A3)	Test Replace Repair					2.0 0.2 1.0	8,10-15 6 6	

Section II. MAINTENANCE ALLOCATION CHART - Continued

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Unit		Intermediate		Depot		
			C	O	F	H	D		
010402	560 MHz Binary Divider Assembly (A2A2)	Test					2.0	8,10-15	
		Replace					0.2	6	
		Repair					1.0	6	
01040201	560 MHz Binary Divider (A2A2A1)	Test					2.0	8,10-15	
		Replace					0.2	6	
		Repair					1.0	6	
010403	60/21.4 MHz Converter Assembly (A2A3)	Test					2.0	8,10-15	
		Replace					0.2	6	
		Repair					1.0	6	
01040301	60/21.4 MHz Converter (A2A3A1)	Test					2.0	8,10-15	
		Replace					0.2	6	
		Repair					1.0	6	
010404	Tuning Drive Assembly (A2A4)	Test					2.0	8,10-15	
		Replace					0.2	6	
		Repair					1.0	6	
0105	Counter Assembly (A3)	Test			0.3			2-5,8-13	
		Test					1.1	2-3,8,10-13,15	
		Replace					0.8	6	
		Repair			0.5			6	G
		Repair					1.5	6	
010501	Counter Board (A3A1)	Test			0.3			2-5,8-13	
		Test					1.0	2-5,8,10-13,15	
		Replace			0.3			6	
		Repair			0.5			6	H
		Repair					1.0	6	
01050101	Display Board (A3A1A1)	Test					1.0	2-3,8,10-13,15	
		Replace			0.5			6	
		Repair					1.0	6	
010502	Wide Band Amplifier (A3A2)	Test					1.0	2-3,8,10-13,15	
		Replace			0.3			6	
		Repair					1.0	6	

Section II. MAINTENANCE ALLOCATION CHART - Continued

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Unit		Intermediate		Depot		
			C	O	F	H	D		
0106	IF Demodulator	Test			0.3			2-5,8-11	
	(A4)	Test					3.0	2-5,8,10-16	
		Replace					0.8	6	
		Repair			0.5			6	I
		Repair					2.0	6	
010601	BW Control	Test					0.8	2-5,8,10-11,15	
	(A4A2)	Replace			0.3			6	
		Repair					1.0	6	
010602	IF Filters&	Test					0.8	2-5,8,10-11,15	
	Diode Switches	Replace			0.3			6	
	(A4A4)	Repair					1.0	6	
010603	AM Detector	Test					1.5	2-5,8,10-11,15	
	Buffer	Replace			0.3			6	
	(A4A6)	Repair					1.0	6	
010604	Product Detector	Test					0.8	2-5,8,10-13,15	
	(A4A7)	Replace			0.3			6	
		Repair					1.0	6	
010605	LSB/USB Filters	Test					1.5	2-5,8,10-11,15	
	(A4A9)	Replace			0.3			6	
		Repair					1.0	6	
0107	AGC Squelch	Test					1.5	2-5,8,10-11,15	
	(A5)	Replace			0.3			6	
		Repair					1.0	6	
0108	DC/DX Converter	Test			0.3			2-3,8-9	
	(A6)	Test					1.5	2-3,8,12-13,15	
		Replace			0.4			6	
		Repair			0.4			6	J
		Repair					1.0	6	
010801	DC/DC Converter	Test					2.0	8,10-15	
	Board	Replace					0.2	6	
	(A6A1)	Repair					1.0	6	

Section II. MAINTENANCE ALLOCATION CHART - Continued

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Unit		Intermediate		Depot		
			C	O	F	H	D		
0109	FM Discriminator Assembly (A7)	Test					1.5	8,10-13,15	
		Replace			0.3			6	
		Repair					1.0	6	
010901	FM Discriminator (A7A1)	Test					1.5	8,10,13,15	
		Replace					0.3	6	
		Repair					1.0	6	
0110	Audio/Record Amplifier (A8)	Test					0.8	8,10-13,15	
		Replace			0.3			6	
		Repair					1.0	6	
0111	Battery Pack (A9)	Test		0.8				2-3	
		Replace		0.1				1	
		Repair		0.1				1	K
011101	D Cell Insert (A9A1)	Test		0.3				2-3	
		Test			0.3			2-3	
		Replace		0.2				1	
		Repair		0.2				1	L, M
0112	Front Panel Protective Covers with Speaker (A10)	Test			0.3			8-13	
		Test					0.7	8,10-13,15	
		Replace		0.2				1	
		Repair			0.3			6	N
		Repair					1.0	6	
0113	Converter Frequency Electronic CV-4090/PRD-11	Test					2.0	8,10-15,17	
		Replace		0.2				6	
		Repair			0.2			6	0
		Repair					1.5	6	
011301	Upconverter/ Demodulator (Al)	Test					1.0	2-5,8,10-15	
		Replace					0.8	6	
		Repair					1.0	6	
01130101	Active Antenna Amplifier Assembly (A1A1)	Test					1.0	2-5,8,10-15	
		Replace					0.8	6	
		Repair					1.0	6	

Section II. MAINTENANCE ALLOCATION CHART - Continued

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Unit		Intermediate		Depot		
			C	O	F	H	D		
0113010101	Active Antenna Amplifier (A1A1A1)	Test					1.0	2-5,8,10-15	
		Replace					0.8	6	
		Repair					1.0	6	
01130201	20 MHz Low Pass Filter (A1A2)	Test					1.0	2-5,8,10-15	
		Replace					0.8	6 “	
		Repair					1.0	6	
01130301	100 MHz TCXO Converter (A1A3)	Test					1.0	2-5,8,10-15	
		Replace					0.8	6	
		Repair					1.0	6	
01130401	Amplifier/Filter (A1A4)	Test					1.0	2-5,8,10-15	
		Replace					0.8	6	
		Repair					1.0	6	
01130501	Demodulator/ Regulator (A1A5)	Test					1.0	2-5,8,10-15	
		Replace					0.8	6	
		Repair					1.0	6	
0114	8640/BC	Test					1.0	2-5,8,10-15	
		Replace		0.2				6	
		Repair					1.0	6	
02	Indicator, Panoramic IP-1355/GRR-8(V)	Inspect		0.1					
		Inspect			0.1				
		Inspect					0.8		
		Test		0.3				2-3	
		Test			2.5			2-5,7-11	
		Test					1.5	8,10-15,17	
		Replace		0.2				1	
		Repair		0.3				1	B
		Repair			0.3			6	P
		Repair					1.0		
		Alignment					2.1	8,10-15	
0201	DC/DC Converter (Al)	Test			0.3			2-3,8-9	
		Test					1.5	2-3,8,12-13,15	
		Replace			0.4			6	
		Repair			0.4			6	J
		Repair					1.0	6	

Section II. MAINTENANCE ALLOCATION CHART - Continued

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Unit		Intermediate		Depot		
			C	O	F	H	D		
020101	DC/DC Converter Board (A1A1)	Test					2.0	8,10-15	
		Replace					0.2	6	
		Repair					1.0	6	
0202	DC/AC Converter (A2)	Test					0.5	2-3	
		Replace			0.3			6	
		Repair					0.5	6	
0203	Signal Monitor (A3)	Test		0.3				2-5,7-11	
		Test					1.0	2-5,8,10-15	
		Replace					0.3	6	
		Repair			0.4			6	Q
		Repair					1.0	6	
020301	IF Amplifier (A3A1)	Test			0.5			4-5,8-11	
		Test					0.5	8,10-11,15	
		Replace					0.4	6	
		Repair			0.3			6	R
		Repair					0.5	6	
02030101	Crystal Marker Module (A3A1A3)	Test					2.0	8,10-15	
		Replace					0.2	6	
		Repair					1.0	6	
020302	Sweep Generator and Horizontal Amplifier (A3A2)	Test					2.0	8,10-15	
		Replace					0.2	6	
		Repair					1.0	6	
0204	Battery Pack (A4)	Test		0.8				2-3	
		Replace		0.1				1	
		Repair		0.1				1	K
020401	D Cell Insert (A4A1)	Test		0.3				2-3	
		Test			0.3			2-3	
		Replace		0.2				1	
		Repair		0.2				1	L, M
0205	BNC Patch Cables	Inspect		0.2					
		Test		0.2				2-3	
		Replace		0.1					
		Repair		0.5				1	S

Section II. MAINTENANCE ALLOCATION CHART - Continued

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Unit		Intermediate		Depot		
			C	O	F	H	D		
03	Antenna	Inspect		0.2					T
	AS-3732/PRD-11	Inspect			0.2				
	and	Inspect					0.4		
	AS-3733/PRD-11	Test		0.2				2-3	
		Test			0.5			2-6,8-13,15	
		Test					2.0	2-6,8-13,15	
		Replace		0.2				1	
		Repair		0.2				1	U
		Repair			2.0			6	V
		Repair					2.0	6	
0301	RF Switch	Test					1.0	2-6,8-13,15	
	(Al)	Replace					1.0	6	
		Repair					2.0	2-6,8-13,15	
030101	Antenna Switch	Test					1.0	2-6,8-13,15	
	(A1A1)	Replace					1.0	6	
		Repair					2.0	2-6,8-13,15	
0302	RF Switch	Test					1.0	2-6,8-13,15	
	(A10)	Replace					1.0	6	
		Repair					2.0	2-6,8-13,15	
030201	Antenna Switch	Test					1.0	2-6,8-13,15	
	(A10A1)	Replace					1.0	6	
		Repair					2.0	2-6,8-13,15	
0303	Antenna Arm	Inspect		0.2					
	Assembly	Test			0.2			1-3	
		Replace			0.7			1	
		Repair			1.0			1	V
		Repair					1.0	2-6,8-13,15	
0304	Antenna Tripod	Inspect		0.2					
		Replace		0.2					
		Repair			1.0			1	V
0305	RF Cable	Inspect		0.2					
		Test		0.2				2-3	
		Replace		0.1					
		Repair		0.5				1	S

Section II. MAINTENANCE ALLOCATION CHART - Continued

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Unit		Intermediate		Depot		
			C	O	F	H	D		
306	DF Control Cable	Inspect		0.2					
		Test		0.2				2-3	
		Replace		0.1					
		Repair		0.5				1	S
04	Control,	Inspect		0.2					
	Processor	Inspect			0.2				
	Display	Inspect					0.6		
	C-11495/PRD-11	Test		0.3				2-5	
		Test			3.0			2-5,8-14	
		Test					3.0	2-5,8,10-17	
		Replace		0.2				1	
		Repair		0.4				1	B
		Repair			0.4			6	W
		Repair					1.0	6	
		Alignment					2.1	2-5,8,10-18	
0401	IF Demodulator	Test		0.3				2-5,8-13	
	(Al)	Test					1.2	8,10-13,15-16	
		Replace		0.5				6	
		Repair			0.5			6	X
		Repair					1.5	6	
040101	Bandwidth Control	Test					2.0	8,10-15	
	(A1A2)	Replace			0.2			6	
		Repair					1.0	6	
040102	IF Filters&	Test					0.8	2-5,8,10-11,15	
	Diode Switches	Replace			0.3			6	
	(A1A4)	Repair					1.0	6	
040103	AM Detector	Test					1.5	2-5,8,10-11,15	
	Buffer	Replace			0.3			6	
	(A1A6)	Repair					1.0	6	
0402	AGC Squelch	Test					0.4	2-3,8,10-11,15	
	(A2)	Replace			0.3			6	
		Repair					1.0	6	
0403	FM Discriminator	Test					1.5	8,10-13,15	
	Assembly (A3)	Replace			0.3			6	
		Repair					1.0	6	

Section II. MAINTENANCE ALLOCATION CHART - Continued

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Unit		Intermediate		Depot		
			C	O	F	H	D		
040301	FM Discriminator (A3A1)	Test					2.0	8,10-15	
		Replace					0.2	6	
		Repair					1.0	6	
0404	Motherboard (A4)	Test			0.5			2-5,8-13	
		Test					3.0	2-3,8,10-15,15-16	
		Replace					0.6	6	
		Repair			0.3			6	Y
		Repair					2.0	6	
040401	Commutative Filter (A4A1)	Test					0.7	8,10,13-15	
		Replace			0.3			6	
		Repair					1.0	6	
040402	Calibrate & Antenna Switch Driver (A4A2)	Test					1.0	2-3,8,10-13,15	
		Replace			0.3			6	
		Repair					1.0	6	
040403	Antenna & Sine Wave Logic (A4A3)	Test					0.7	4-5,8,10-13,15	
		Replace			0.3			6	
		Repair					1.0	6	
040404	Angle Count Generator (A4A5)	Test					0.7	8,10-13,15	
		Replace			0.3			6	
		Repair					1.0	6	
040405	Master Time Controller and Display Logic (A4A6)	Test					0.7	2-3,8,10-13,15	
		Replace			0.3			6	
		Repair					1.0	6	
0405	DF Display Assembly (A5)	Test					0.7	2-3	
		Replace			0.5			6	
		Repair					1.0	6	
040501	Display Driver Assembly (A5A1)	Test					1.0	2-5,8,10-13,15	
		Replace					0.5	6	
		Repair					1.5	6	
0406	Battery Pack (A6)	Test		0.8				2-3	
		Replace		0.1				1	
		Repair		0.1				1	K

Section II. MAINTENANCE ALLOCATION CHART - Continued

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Unit		Intermediate		Depot		
			C	O	F	H	D		
040601	D Cell Insert	Test		0.3				2-3	
	(A6A1)	Test			0.3			2-3	
		Replace		0.2				1	
		Repair		0.2				1	L, M
0407	DC Converter	Test			0.3			2-3,8-9	
	(A7)	Test					1.5	2-3,8,12-13,15	
		Replace			0.4			6	
		Repair			0.4			6	J
		Repair					1.0	6	
040701	DC/DC Converter	Test					2.0	8,10-15	
	Board	Replace					0.2	6	
	(A7A1)	Repair					1.0	6	
0408	BNC Patch Cables	Inspect		0.2					
		Test		0.2				2-3	
		Replace		0.1					
		Repair		0.5				1	S
0409	Angle Simulator	Test			0.5			2-3	
	(W-8975/AS)	Test					0.5	2-3	
		Replace		0.3				1	
		Repair			0.5			6	Z
		Repair					1.0	6	
040901	Angle Simulator	Test					0.5	2-3,8,10-13,15	
	Module	Replace					0.5	6	
	(Al)	Repair					1.0	6	
04090101	Angle Simulator	Test					1.5	2-3,8,10-13,15	
	PWA	Replace					1.0	6	
	(A1A1)	Repair					2.0	6	
040902	BNC Patch Cables	Inspect		0.2					
		Test		0.2				2-3	
		Replace		0.1					
		Repair		0.5				1	S

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

(1) Tool or Test Equipment Reference Code	(2) Maintenance Category	(3) Nomenclature	(4) National/NATO Stock Number	(5) Tool Number
1	O	Tool Kit, Electronic Equipment TK-100/G	5180-00-605-0079	
2	O, F, D	Multimeter, Digital AN/PSM-45	6625-01-134-2512	
3	O, F, D	Test Lead Set, Simpson Catalog No. 00577	6625-00-435-2499	
4	O, F, D	Voltmeter, RF, Boonton 95C	6625-01-116-9500	
5	O, F, D	High Frequency Probe, Boonton 91-21F	6625-00-137-6871	
6	F, D	Tool Kit, Electronic Equipment, TK-105/G	5180-00-510-8177	
7	F, D	High Voltage Probe, 5 KV, Simpson Cat. No. 00053	6625-01-177-1180	
8	O, F, D	Power Supply, PP-6547/U	6625-01-823-5359	
9	O, F	Power Supply Leads *Local Manufacturer	N/A	
10	O, F, D	Generator, Signal SG-1112(V)I/U, w/options 00l, 002, 003 (2 required)	6625-00-500-6525	
11	O, F, D	Cable, RF, 50 ohms, 4ft., BNC-BNC, HP-1053A (9 required)	5995-00-070-8747	
12	O, F, D	Oscilloscope AN/USM-488	6625-01-187-7847	

* Power Supply Leads, (+24 VDC at less than 1 amp) Banana Plugs-to a U-316/U, 14 pin plug with power (Red) Lead to pin H, black Lead to pin A (Ground).

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS - Continued

(1) Tool or Test Equipment Reference Code	(2) Maintenance Category	(3) Nomenclature	(4) National/NATO Stock Number	(5) Tool Number
13	F, D	Voltage Probe, 10X, TEX P6006	6625-00-524-0572	
14	F, D	Counter, Frequency TD-1225A(V)l/U	6625-00-498-8946	
15	D	Power Supply Test Leads, HP-l1002A	6625-00-079-1426	
16	D	Analyzer, Spectrum AN/USM-489	6625-01-079-9495	
17	D	Generator Sweep SG-1206	6625-01-204-0032	
18	D	Step Attenuator HP-3550	N/A	

Section IV. REMARKS

Reference Code	Remarks
A	AN/PRD-11 Repair is accomplished by removal and replacement of LRUs and throwaway coaxial cables, antenna control cable, and expendable fuses and batteries.
B	Repair is accomplished by removal and replacement of selected modules and circuit cards, intraconnecting cables, and chassis mounted piece parts.
C	Repair is accomplished by removal and replacement of the Front Panel Cover with Speaker and throwaway batteries and fuses.
D	Tuner and Receiver are removed as a unit.
E	Repair is accomplished by removal and replacement of the Antenna Switch PC Assembly (A1A1).
F	Repair is accomplished by removal and replacement of Relay (K1).
G	Repair is accomplished by removal and replacement of Counter Board (A3A1) and the Display Board (A3A1A1).
H	Repair is accomplished by removal and replacement of the Display Board (A3A1A1).
I	Repair is accomplished by removal and replacement of throwaway, 21.4 to 10 MHz Converter (A4A1), Gain BW Comp. Amp. (A4A3), 10 MHz Amp. (A4A5) and 10 MHz Amp. (A4A8).
J	Repair consists of equipment adjustments.
K	Repair is accomplished by removal and replacement of the D-Cell assembly.
L	Repair is accomplished by removal and replacement of throwaway batteries and fuses.
M	Repair is accomplished by removal and replacement of throwaway batteries and fuses, the Battery Pack Power Plug (A9A1 P1-RCVR, A6P1-DF, or A4P1-Signal Monitor).
N	Repair is accomplished by removal and replacement of the throwaway Audio Power Amplifier Assembly (A10A1), LSI component (speaker), and Multipin Plug (A10P1).
O	Repair is accomplished by removal and replacement of the CV-4090/PRD-11 Converter, Frequency Electronic.

Section IV. REMARKS - Continued

Reference Code	Remarks
P	Repair is accomplished by removal and replacement of selected throwaway modules and circuit cards, intraconnecting cables, and chassis mounted piece parts.
Q	Repair is accomplished by removal and replacement of throwaway, Focus and Intensity Control (A3A3), and selected piece parts.
R	Repair is accomplished by removal and replacement of throwaway, IF Amplifier Board (A3A1A1), and IF Amplifier (A3A1A2).
S	Repair is accomplished by removal and replacement of throwaway piece parts.
T	AS-3732/PRD-l1 has one RF Switch and the AS-3733/PRD-11 has two RF Switches.
U	Repair is accomplished by removal and replacement of the antenna tripod and throwaway antenna elements.
V	Repair is accomplished by removal and replacement of throwaway piece parts, antenna arm assemblies, RF Connectors, DF Control Connectors, and Tripod piece parts.
W	Repair is accomplished by removal and replacement of the throwaway BW Comp. Amp. (A8) plus other selected modules and circuit cards, intra-connecting cables, and chassis mounted piece parts.
X	Repair is accomplished by removal and replacement of throwaway 10 MHz Amp. (A1A1), 10 MHz Amp Amp. (A1A5), 10 MHz Amp (A1A8), Gain BW Comp. Amp. (A1A3), and Low Pass Filter (A1A7).
Y	Repair is accomplished by removal and replacement of throwaway IF Delay Generator (A4A4).
Z	Repair is accomplished by removal and replacement of the fuse, fuse holder, power switch (PS1), LEDs, and angle select switch.

APPENDIX C
COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

C-1. SCOPE

This appendix lists the components of end item and basic issue items for the direction finder set to help you inventory items required for safe and efficient operation.

C-2. GENERAL

The Components of End Item and Basic Issue Items Lists are divided into the following sections:

a. Section II - Components of End Item. This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts.

b. Section III - Basic Issue Items. These are the minimum essential items required to place the direction finder set in operation, to operate it and to perform emergency repairs. Although shipped separately packaged, basic issue items must be with the direction finder set during operation and whenever it is transferred between property accounts. This manual is your authority to request/requisition replacement basic issue items, based on TOE/MTOE authorization of the end item.

C-3. EXPLANATION OF COLUMNS

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

a. Column 1- National Stock Number. This column indicates the national stock number assigned to the item and will be used for requisitioning purposes.

b. Column 2- Description, FSCM and Part Number. This column indicates the federal item name and, when applicable, a brief description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number.

c. Columns 3- Unit of Measure (O/M). This column indicates the measure used in performing the actual operation/maintenance function. This measurement is expressed by a two-character alphabetical abbreviation.

d. Column 4- Quantity Required (Qty Rqd). This column indicates the quantity of the item authorized to be used with/on the equipment.

Section II. COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LIST

(1) National Stock Number	(2) Description FSCM and Part Number	(3) Unit of Measure	(4) Quantity Required
5865-01-165-4578	Antenna A AS-3732/PRD-11 (14632) WJ-9880A	Ea.	1
5820-01-200-0177	Antenna A-l AS-3733/PRD-11 (14632) WJ-9880A-1	Ea.	1
5820-01-160-4411	Control, Processor Display, C-11495/PRD-11 (14632) WJ-8975A	Ea.	1
5895-01-060-6492	Receiver AN/GRR-8(V) (14632) WJ-8640-1	Ea.	1
5895-01-073-1604	Indicator, Panoramic IP-1355/GRR-8(V) (14632) WJ-9180-1	Ea.	1
5895-01-075-3694	Tuner, RF, TN-586/GRR-8(V) (14632) WJ-9120	Ea.	1
5895-01-075-6391	Tuner, RF, TN-584/GRR-8(V) (14632) WJ-9121	Ea.	1
5895-01-073-1582	Tuner, RF, TN-585/GRR-8(V) (14632) WJ-9124	Ea.	1
	Converter, Frequency CV-4090-PRD-11 (14632) WJ-9230	Ea.	1

Section III. BASIC ISSUE ITEMS LIST

(1) National Stock Number	(2) Description FSCM and Part Number	(3) Unit of Measure	(4) Quantity Required
	TM-12-3 (80058) N/A	Ea.	1
5820-00-889-3803	Antenna, Whip (26419) AT 892/PRC-25	Ea.	1
5820-01-207-9965	Angle Simulator (14632) WJ-8975/AS	Ea.	1
*5895-01-073-6839	Power Supply/BA PP-7566/GRR-8(V) (14632) WJ-8640-1/BC	Ea.	1
	Battery, Nickel Cadmium (09823) BB-5866	Ea.	10

*Optional item, used with, but not part of the AN/PRD-l1.

APPENDIX D
ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

D-1. SCOPE

This appendix lists additional items you are authorized for the support of the direction finder set.

D-2. GENERAL

This list identifies items that do not have to accompany the direction finder set during operations and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

D-3. EXPLANATION OF LISTING

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type document (i.e., CTA, MTOE, TDA or JTA) which authorizes the item to you.

Section II. ADDITIONAL AUTHORIZATION LIST

(1) National Stock Number	(2) Description FSCM and Part Number	(3) Unit of Measure	(4) Quantity Required
5965-010-170-549	Headset, Electrical H-251/U (81134)	Ea.	1

APPENDIX E
EXPENDABLE SUPPLIES AND MATERIAL LIST

Section I. INTRODUCTION

E-1. SCOPE

This appendix lists expendable supplies and materials you will need to operate and maintain the direction finder set. These items are authorized to you by CTA 50-970, Expendable 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.

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

C - Operator/Crew
O - Organizational Maintenance
F - Intermediate Direct Support Maintenance
H - Intermediate General Support Maintenance
D - Depot Maintenance

c. Column 3 - National Stock Number. This is the National stock number assigned to the item; use it to requisition the item.

d. Column 4- Description, FSCM and Part Number. Indicates the federal item name and, when applicable, a brief description of the item. The last line for each item indicates the Federal Supply Code for Manufacturers (FSCM) in parentheses followed by the part number.

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 (eg., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) Item No.	(2) Level	(3) National Stock Number	(4) Description FSCM and Part Number	(5) Unit of Measure
1	C	6135-00-926-8322	Battery, Dry (80058) BA-4386/PRC-25	Ea.
2	C	6135-00-835-7210	Battery (83740) BA-30	Ea.
3	C	5920-00-280-8342	Fuse, lamp, Cartridge 3 AG (71400) AGC 1	Ea.
4	C	5920-00-230-9128	Fuse, Cartridge 3/4 amp, 3 AG Slow blow (71400) MDL 3/4 ‘	Ea.

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INDEX - Continued

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

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

DATE SENT: 10 July 1975

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

BE EXACT. . PIN-POINT WHERE IT IS

PAGE NO	PARAGRAPH	FIGURE NO	TABLE NO
2-25	2-28		
3-10	3-3		3-1
5-6	5-8		
		F03	

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

Recommend that the installation antenna alignment procedure be changed throughout to specify a 2^{o} IFF antenna lag rather than 1^{o}.

REASON: Experience has shown that with only a 1^{o} 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^{o} without degradation of operation.

Item 5, Function column. Change "2 db" to "3db."

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.

Add new step f.1 to read, "Replace cover plate removed in step e.1, above."

REASON: To replace the cover plate.

Zone C 3. On J1-2, change "+24 VDC to "+5 VDC."

REASON: This is the output line of the 5 VDC power supply. +24 VDC is the input voltage.

SAMPLE

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

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PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 11-5825-278-12-3	1 Nov 1988	Radio Receiver Direction Finder Set AN/PRC-11

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PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.

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PAGE NO.	PARA-GRAPH	FIGURE NO	TABLE NO.

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