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Colin Hinson

In the village of Blunham, Bedfordshire.



~~AN 16-40SCR718-2~~  
12P5-3SCR718-1

CLASSIFICATION CANCELLED  
BY AUTHORITY OF CG, AMC  
DATE: 7 Feb 47.....

*Peter K. Plummer*  
Captain

HANDBOOK OF  
OPERATING INSTRUCTIONS

*for*

RADIO SETS

SCR-718-A, SCR-718-AM  
S R-718-B and SCR-718-

NOTE: This handbook replaces AN 08-40SCR718-2, dated  
10 September 1944.

*Published under joint authority of the United States War and  
Navy Departments.*



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### SPECIAL NOTICE

Radio Set SCR-718-AM differs from Radio Set SCR-718-A in that it is slightly more sensitive. The difference is accomplished in Radio Set SCR-718-AM by circuit changes in both Radio Receiver and Transmitter BC-788-A and Indicator I-152-A. The new assemblies are electrically interchangeable with the old.

Radio Set SCR-718-B is a modification of Radio Set SCR-718-A and includes an additional 0- to 50,000-foot scale, obtainable by throwing a scale switch on the indicator from "X1" to "X10" position. The pilot light on the indicator was removed to make room for the scale switch.

Radio Set SCR-718-C is similar in operation and appearance to Radio Set SCR-718-B, the principal differences being it is an engineered equipment, not a modification.

References throughout the handbook to Radio Set SCR-718-( ) or to any of the components, apply equally to all models of the equipment unless otherwise specified.

The components of Radio Sets SCR-718-A and SCR-718-AM are mechanically and electrically interchangeable. The components of Radio Sets SCR-718-B and SCR-718-C are mechanically and electrically interchangeable. The group A parts are identical for all four types. Never mix assemblies of the A and AM series group with the B and C series group, except when the desired equipment is not available, as the dual-scale feature will not then be obtained. If Indicator I-152-B or I-152-C is used with Radio Receiver and Transmitter BC-788-A or VC-788-AM, the scale switch must be safety-wired in the "X1" position for Indicator I-152-B or the "TIMES ONE" position for Indicator I-152-C in order to prevent damage to the transmitter-receiver. Wherever possible, use components of Radio Set SCR-718-C. This is mandatory in combat aircraft.

## **DESTRUCTION OF ABANDONED MATERIEL IN THE COMBAT ZONE**

In case it should become necessary to prevent the capture of this equipment and when ordered to do so, DESTROY IT SO THAT NO PART OF IT CAN BE SALVAGED, RECOGNIZED OR USED BY THE ENEMY. BURN ALL PAPERS AND BOOKS.

*Means:—*

1. Explosives, when provided.
2. Hammers, axes, sledges, machetes, or whatever heavy object is readily available.
3. Burning by means of incendiaries such as gasoline, oil, paper, or wood.
4. Grenades and shots from available arms.
5. Burying all debris or disposing of it in streams or other bodies of water, where possible and when time permits.

*Procedure:—*

1. Obliterate all identifying marks. Destroy nameplates and circuit labels.
2. Demolish all panels, castings, switch- and instrument-boards.
3. Destroy all controls, switches, relays, connections, and meters.
4. Rip out all wiring and cut interconnections of electrical equipment. Smash gas, oil, and water-cooling systems in gas-engine generators, etc.
5. Smash every electrical or mechanical part, whether rotating, moving, or fixed.
6. Break up all operating instruments such as keys, phones, microphones, etc.
7. Destroy all classes of carrying cases, straps, containers, etc.
8. Bury or scatter all debris.

DESTROY EVERYTHING!



## **UNSATISFACTORY REPORT**

*For U. S. Army Air Force Personnel:*

In the event of malfunctioning, unsatisfactory design, or unsatisfactory installation of any of the component units of this equipment, or if the material contained in this book is considered inadequate or erroneous, an Unsatisfactory Report, AAF Form No. 54, or a report in similar form, shall be submitted in accordance with the provisions of Army Air Force Regulation No. 15-54 listing:

1. Station and organization.
2. Nameplate data (type number or complete nomenclature if nameplate is not attached to the equipment).
3. Date and nature of failure.
4. Radio model and serial number.
5. Remedy used or proposed to prevent recurrence.
6. Handbook errors or inadequacies, if applicable.

*For U. S. Navy Personnel:*

Report of failure of any part of this equipment during its guaranteed life shall be made on Form N. Aer. 4112, "Report of Unsatisfactory or Defective Material," or a report in similar form, and forwarded in accordance with the latest instructions of the Bureau of Aeronautics. In addition to other distribution required, one copy shall be furnished to the inspector of Naval Materiel (location to be specified) and the Bureau of Ships. Such reports of failure shall include:

1. Reporting activity.
2. Nameplate data.
3. Date placed in service.
4. Part which failed.
5. Nature and cause of failure.
6. Replacement needed (yes—no).
7. Remedy used or proposed to prevent recurrence.

*For British Personnel:*

Form 1022 procedure shall be used when reporting failure of radio equipment.

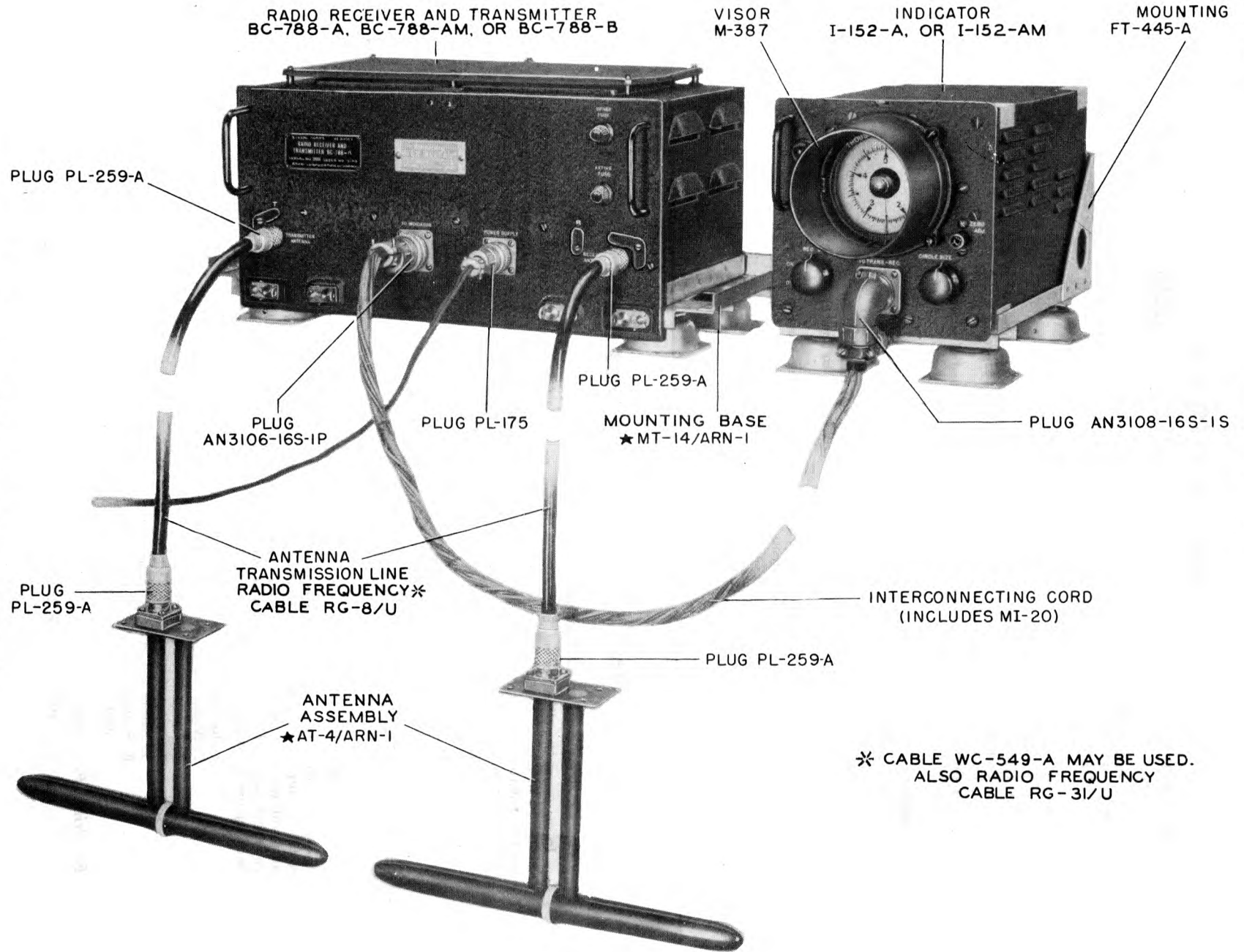


Figure 1-1. Radio Set SCR-718-1—Components

\* CABLE WC-549-A MAY BE USED.  
ALSO RADIO FREQUENCY  
CABLE RG-31/U

**SAFETY NOTICE**

This equipment employs high voltages which are dangerous and may be fatal if contacted by operating personnel. Exercise extreme caution when working with the equipment.

## SECTION I

### GENERAL DESCRIPTION

**1. GENERAL.**

a. Radio Set SCR-718-( )\* (high altitude altimeter), shown in figure 1-1, is a complete equipment for installation in an aircraft for use in determining height above terrain. Nominal range of the equipment is 0 to 40,000 feet. All necessary voltages, other than that of the primary power source, are generated within the radio set. The primary power source should be an aircraft a-c supply of 115 volts  $\pm$  5 percent.† The nominal frequency rating of the supply should be between 400 to 2400 cps, but its actual frequency may vary between 380 and 2600 cps. Power consumption of the radio set is 135 watts.

b. Radio Set SCR-718-B is a modification of Radio Set SCR-718-A. It includes an additional timing circle

on which the altitude is indicated from 0 to 50,000 feet in one encirclement.

c. Radio Set SCR-718-C is an engineered version of Radio Set SCR-718-B. In addition to the 0 to 50,000 foot timing circle, the indicator has a pilot light on the front panel and the scale indicator is labeled "TIMES ONE" and "TIMES TEN."

**2. EQUIPMENT SUPPLIED.**

The radio set includes Indicator I-152-( )\*, Radio Receiver and Transmitter BC-788-( )\*, Antenna ★AT-4/ARN-1, and all associated mountings, fittings, etc., as listed in table 1-1:

\* Applies to any model designation.

† Provision has also been made for operation on a supply voltage of 80 volts, providing the proper connection and fuse changes are made according to directions in the handbook of maintenance instructions for the equipment.

TABLE 1-1. EQUIPMENT SUPPLIED

Quantity per Equipment	Description	Army Type Designation	Navy Type Designation	Over-all Dimensions (inches)	Weight (pounds)
4	ADAPTER, for antenna connectors (to be used only where necessary)	M-359	49192 or 49192-A	1-5/16 x 1-5/16 x 11/16 O.D.	0.31
2	ANTENNA	★AT-4-ARN-1	★AT-4/ARN-1	11-9/16 x 7-9/16 x 1; over all base plate 3 x 1-23/32	1.4
60 feet‡	RADIO FREQUENCY CABLE	RG-8/U**	RG-8/U**	0.415 O.D.	6.4
50 feet‡	CABLE CONDUCTOR (M1-20)	RG-59/U	RG-59/U	0.275 O.D.	2.4
2	FUSE (extra, for use when radio set is operated from 80-volt supply; packed in paper bag attached to transmitter-receiver)	FU-27	—	1-1/4 long x 1/4 O.D.	0.05
1	INDICATOR	I-152-A	<i>10 Q 13/31</i>	6-17/32 x 6-1/2 x 12-5/8 long	9.15
	or				
1	INDICATOR	I-152-AM		6-17/32 x 6-1/2 x 12-5/8 long	9.15
	or				
1	INDICATOR	I-152-B		6-17/32 x 6-1/2 x 12-5/8 long	9.75
	or				
1	INDICATOR	I-152-C		6-17/32 x 6-1/2 x 12-5/8 long	9.7

TABLE 1-1. EQUIPMENT SUPPLIED—(Cont'd)

Quantity per Equipment	Description	Army Type Designation	Navy Type Designation	Over-all Dimensions (inches)	Weight (pounds)
1	MOUNTING	FT-445-A		6-13/16 x 5-7/8 x 12-3/8 long (horizontal mounting)	1.65
				6-13/16 x 5-7/8 x 13-5/8 (vertical mounting)	1.65
1	MOUNTING BASE	★MT-14/ARN-1 or ★MT-14A/ARN-1	★MT-14/ARN-1 or ★MT-14A/ARN-1	7-5/8 x 2-1/4 x 18-1/16	1.3
1	PLUG with CABLE ADAPTER	AN3106-16S-1P AN3057-8	AN3106-16S-1P AN3057-8	2-1/8 x 1-3/16 O.D.	0.1
1	PLUG with CABLE ADAPTER	AN3108-16S-1S AN3057-8	AN3108-16S-1S AN3057-8	2-1/2 x 2 x 1-3/16 O.D.	0.13
1	PLUG with CABLE ADAPTER	AN3106-12S-3S (PL-175) AN3057-4	AN3106-12S-3S AN3057-4	2-1/16 x 15/16 O.D.	0.06
4	PLUG	PL-259-A	49195	1-9/16 x 23/32 O.D.	0.2
1	RADIO RECEIVER and TRANS- MITTER with tubes and CRYSTAL UNIT	BC-788-A DC-22-A	110 D 1912 —	8-11/16 x 7-25/32 x 15-1/2 long	9.9
1	RADIO RECEIVER and TRANS- MITTER with tubes and CRYSTAL UNIT	BC-788-AM DC-22-A	— —	8-11/16 x 7-25/32 x 15-1/2 long	9.9
1	RADIO RECEIVER and TRANS- MITTER with tubes and CRYSTAL UNIT	BC-788-B DC-22-A	— —	8-11/16 x 7-25/32 x 15-1/2 long	12.1
1	RADIO RECEIVER and TRANS- MITTER with tubes and CRYSTAL UNIT	BC-788-C DC-22-A	110 D 139 —	8-11/16 x 7-25/32 x 15-1/2 long	10.2
1	VISOR	M-387		2-3/4 x 3-5/8 O.D.	0.15

‡ Actual cable length will depend on installation requirements. The length stated here is the greatest that should be used in any installation.

†† Estimate weight and size of a suitable type of conductor.

\*\* Radio Frequency Cable RG-31/U (Cable WC-549-A or subsequent production) may be used in place of Radio Frequency Cable RG-8/U.

**3. EQUIPMENT REQUIRED BUT NOT SUPPLIED.**

(Refer to table 1-2.)

TABLE 1-2. EQUIPMENT REQUIRED BUT NOT SUPPLIED.

Quantity	Description	Army Type Designation	Navy Type Designation	Required Characteristics
50 feet*	CABLE, shielded, power and lighting			Size 20, Army Spec. 95-27273
200 feet†	CABLE, electrical, low tension aircraft			Size AN-20, Spec. AN-J-C-48

\* Actual length will depend on installation requirements.

† Actual length will depend on installation requirements; four conductors of 50 feet maximum length.



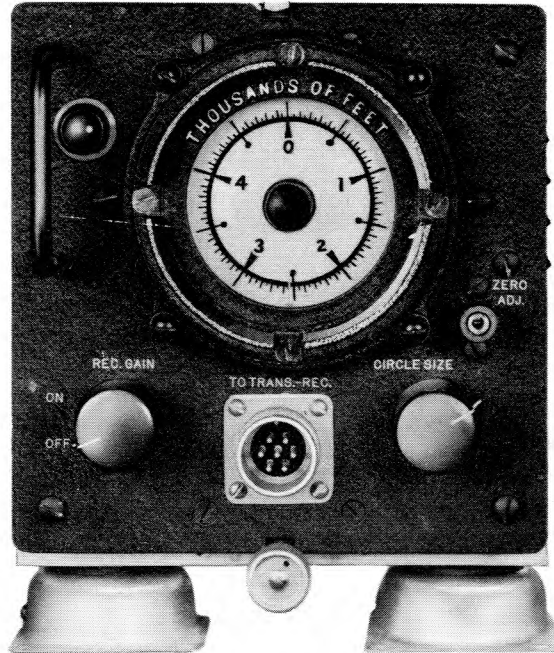


Figure 1-2. Indicator I-152-A or I-152-AM

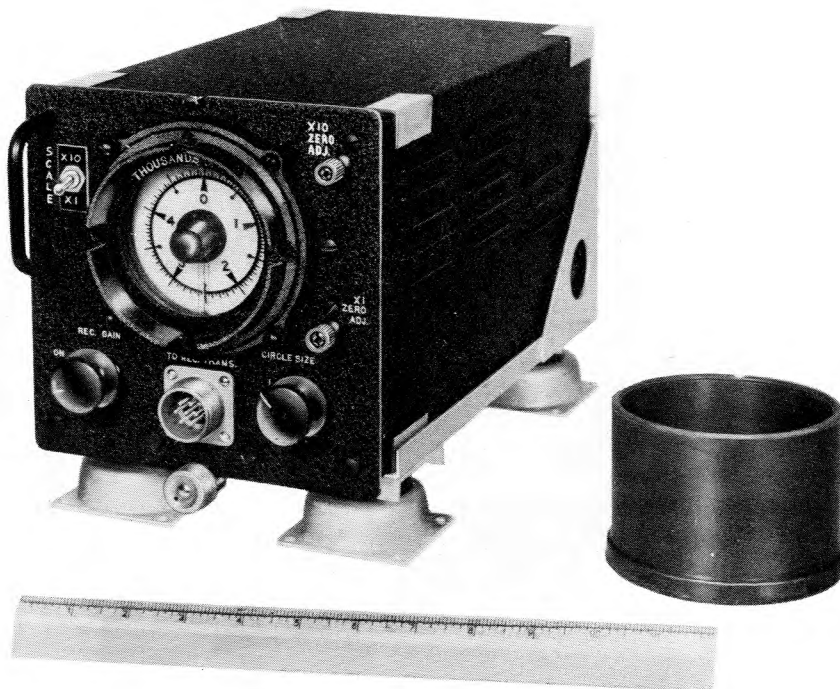


Figure 1-3. Indicator I-152-B



Figure 1-4. Indicator I-152-C

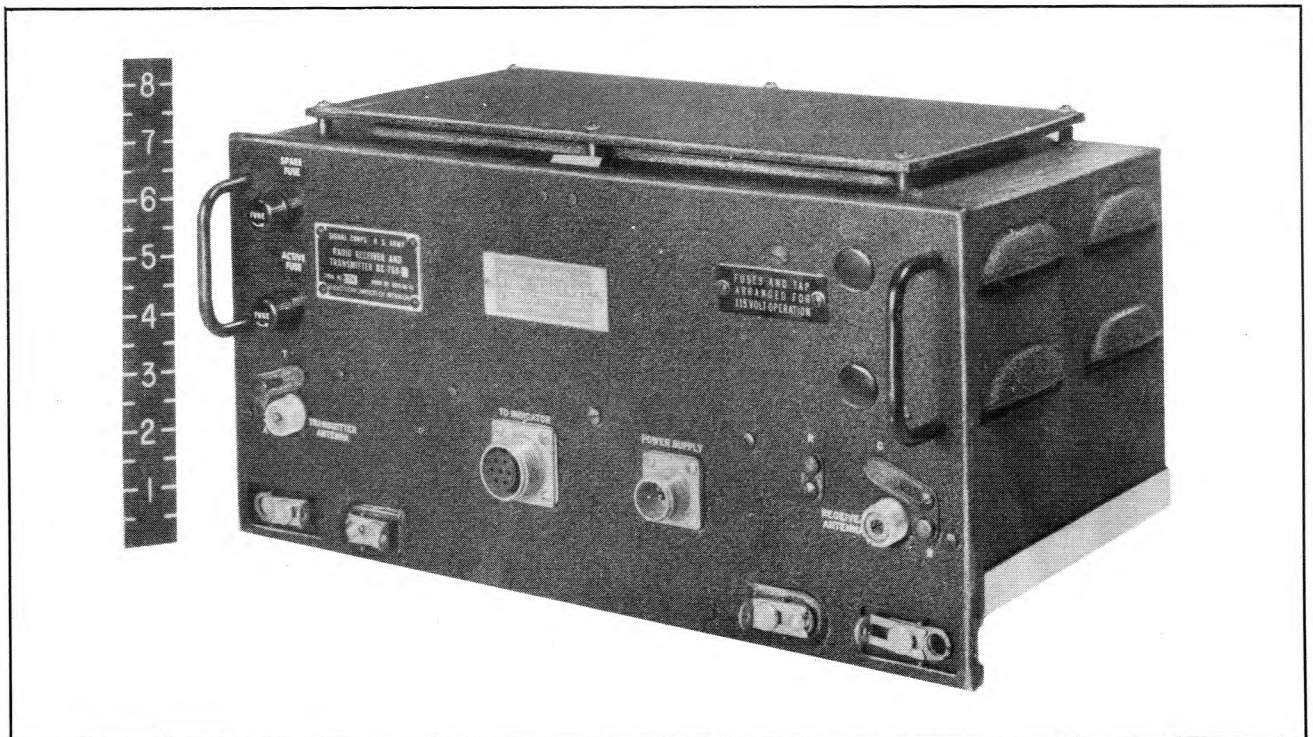


Figure 1-5. Radio Receiver and Transmitter BC-788-B

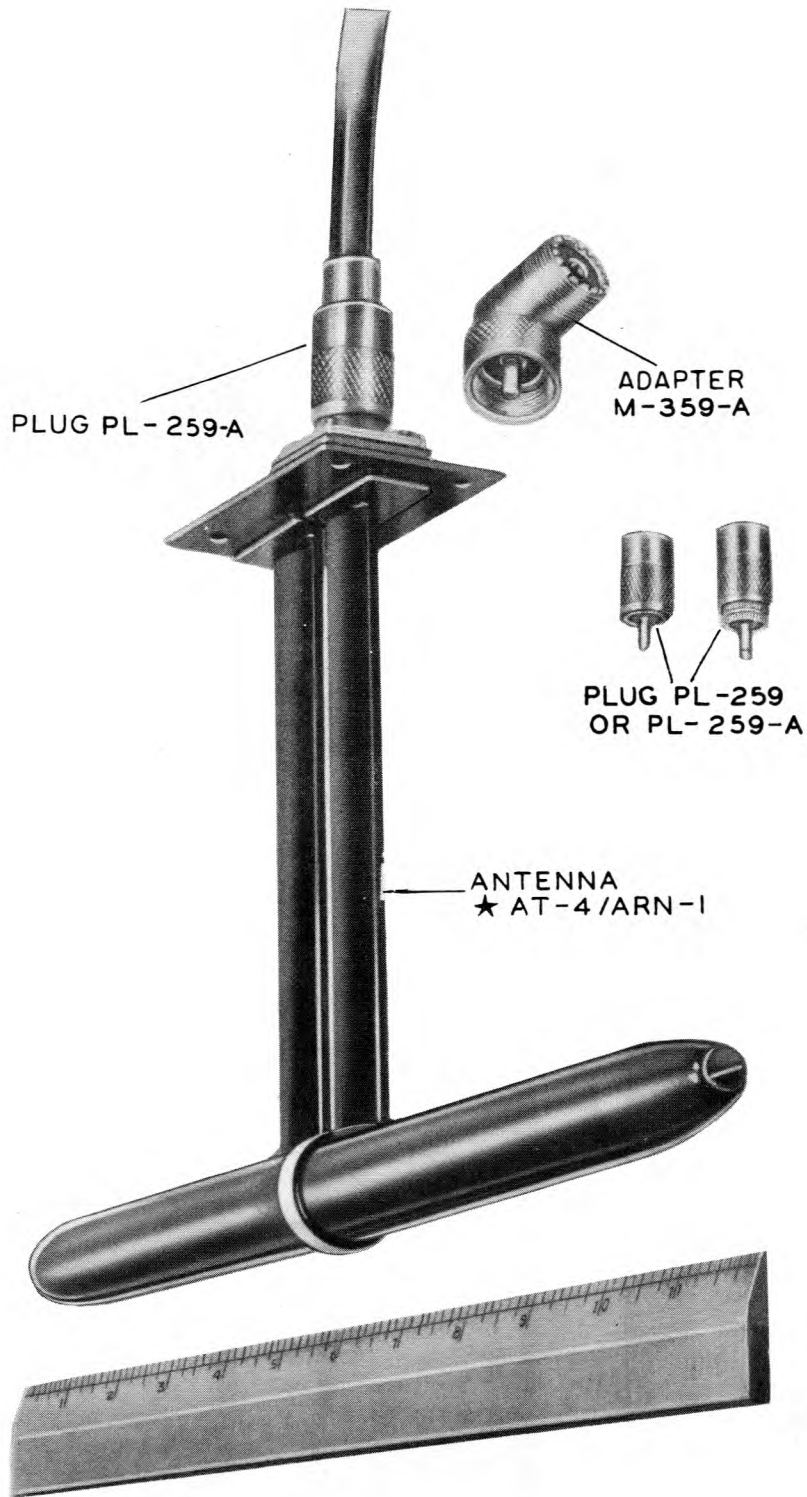


Figure 1-6. Antenna ★AT-4/ARN-1 and Plugs

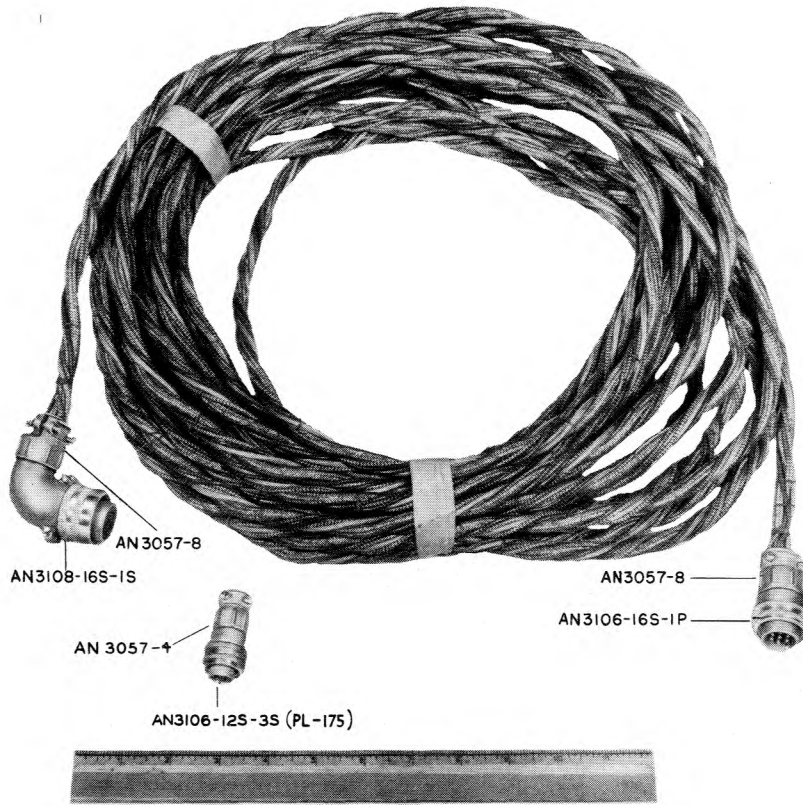


Figure 1-7. Interconnecting Cords and Plugs

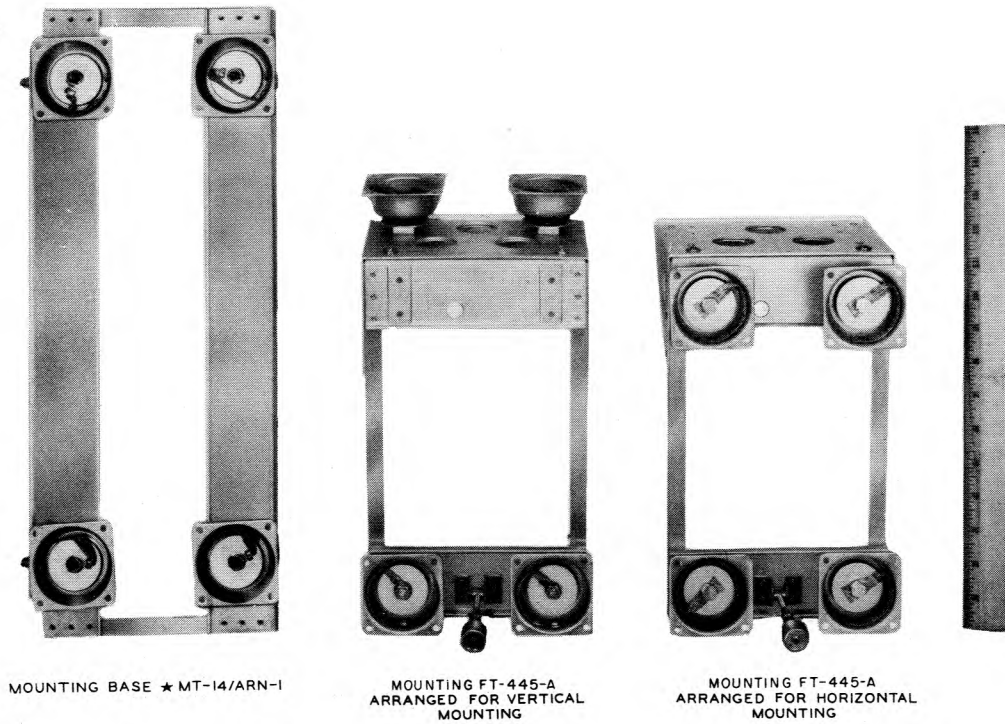


Figure 1-8. Mounting Base \*MT-14/ARN-1 and Mounting FT-445-A

## SECTION II

### INSTALLATION AND ADJUSTMENT

#### 1. INITIAL PROCEDURE.

- a. Carefully remove all components from their packing, and check them against table 1-1.
- b. Examine the components for mechanical damage.
- c. Check that the tubes and Crystal Unit DC-22-A fit their sockets firmly.

#### 2. INSTALLATION OF OPERATING UNITS.

##### CAUTION

If Indicator I-152-B or I-152-C is installed with an unmodified Radio Receiver and Transmitter BC-788-A or BC-788-AM, make sure that the scale switch is in the "X1" position. Wrap a length of safety wire around the screw below and to the right of the switch to prevent accidental throwing of the switch to the "X10" position.

a. RADIO RECEIVER AND TRANSMITTER BC-788-( ).—The radio receiver and transmitter is designed for installation in a horizontal position on mounting base \*MT-14/ARN-1 or \*MT-14A/ARN-1.

(1) Accurately drill 16 holes in the mounting surface according to the plan shown in figure 5-7.

(2) Fasten each of the four shockmounts, on the mounting base, to the aircraft structure by means of four No. 8-32 plated machine screws, flat washers, and elastic stop nuts (not supplied with the radio set). Do not use a plywood base under the mounting, if it can be avoided.

(3) If the radio set is to be operated on 80 volts, make the necessary changes in wiring, fuses and nameplate in accordance with the instructions in the *Handbook of Maintenance Instructions for Radio Set SCR-718-A*.

(4) Slide the radio receiver and transmitter into place on the mounting base so that the centering pins on the back of the base are pushed into the holes in the receiver and transmitter case.

(5) Push the snap slides into position to hold the unit securely.

##### Note

Mounting Base \*MT-14/ARN-1 or \*MT-14A/ARN-1, used with the radio-receiver and transmitter, is the same mounting as that used with Radio Set \*AN/ARN-1. Each shockmount is fastened to the mounting base by a staked screw. Do not loosen or remove the screw.

b. INDICATOR I-152-( ).—Since the controls required for operation of the radio set are on the indicator panel, mount this unit within convenient reach and

view of the operator. If possible, the location should be such that a serviceman, while making adjustments on the receiver and transmitter, can see clearly the face of the indicator, either directly or by means of a mirror. The indicator is designed for installation on Mounting FT-445-A in any position between horizontal and vertical. In order that the indicator may be viewed easily when installed vertically, it is built to fit upon the mounting in either of two positions; in one position, the bottom of the indicator fits against the mounting; in the other, the top fits against the mounting.

(1) Determine whether the indicator is to be installed in an essentially horizontal or essentially vertical position. See figures 1-8 and 5-6 to find the corresponding proper position of the four shockmounts on Mounting FT-445-A.

(2) Remove all shockmounts not in proper positions for the type of installation desired. To remove a mount, unscrew the two flat-head screws holding its top to the mounting frame.

(3) Fasten all removed shockmounts to the mounting frame in the proper positions for the type of installation desired.

(4) Accurately drill 16 holes in the mounting surface according to the plan shown in figure 5-6.

(5) Fasten each of the four shockmounts on the mounting to the aircraft structure by means of four No. 8-32 plated machine screws, flat washers, and elastic stop nuts (not supplied with the radio set). Do not use a plywood base under the indicator mounting, if it can be avoided.

(6) Secure the eight flat-head screws which hold the four shockmounts to the mounting frame. This is performed by peening metal from the frame into the slots in the screw heads.

##### Note

It is undesirable to lock these screws before this time because, in some relatively inaccessible installations, it may be necessary to loosen the screws or even remove the mounts from the frame to permit fastening the mounts to the mounting surface.

(7) Place the indicator upon Mounting FT-445-A so that it is in one of its two positions which will permit the operator to read it most readily. Slide it into place so that the centering pins on the mounting are pushed into the holes in the back of the indicator case.

(8) Pull the knurled head clamping screw up over the clamping bracket on the front panel of the indicator and tighten the screw.

c. INTERCONNECTING CORD.

(1) The interconnection between the transmitter-receiver and the indicator is shown in figure 5-3. It comprises one plug AN3106-16S-1P with a cable adapter AN3057-8, one plug AN3108-16S-1S with a cable adapter AN3057-8, and six conductors. Four of the conductors are unshielded wire, size AN-20, in accordance with Army-Navy Aeronautical Specification AN-J-C-48a (Cable, Electric, Low Tension, Aircraft). One of the conductors is shielded wire, size AN-20, in accordance with Army Specifications 95-27273-G (Cable, Shielded, Power and Lighting Aircraft). The remaining conductor is Cable Conductor MI-20, (Coaxial cable)\* which is furnished in bulk. The shielded and unshielded wires are not furnished with the radio set. For passing through a pressurized bulkhead use a combination of receptacle AN3100-18-8P, plug AN3106-18-8S, and Cable Adapter AN-3057-10.

(2) Cut the six conductors to the lengths required and assemble the interconnecting cord as shown in figure 5-4. (Note the addition of a ground between the shielded leads and the cable clamps; this is to reduce noise interference by the altimeter to other equipments.) Install the cord allowing sufficient slack at the receiver and transmitter unit and at the indicator unit to permit free movements of units on their mountings, convenient disassembly from mountings, and ease of field testing and servicing. *Cable lengths greater than 50 feet should not be used in the installation because of the signal losses which will result.*

d. POWER CORD.—The cord from the radio receiver and transmitter to the primary power source is shown in figure 5-3. It comprises Plug PL-175 (AN3106-12S-3S) with a cable adapter marked "AN3057-4" and two conductors. Each conductor is unshielded wire, size AN-20, in accordance with Army-Navy Aeronautical Specification AN-J-C-48a (Cable, Electric, Low-Tension, Aircraft). The wire is not furnished with the radio set. Cut, assemble and install the power cord in the same way as the interconnecting cord. Refer to (2) above. Connect it to the a-c power supply through a 3-ampere fuse, Air Corps type No. 94-3227-A. If the a-c power supply is a grounded system, connect ungrounded (hot) lead to pin B of Plug PL-175.

### 3. INSTALLATION OF ANTENNA SYSTEM.

#### Note

Satisfactory performance of the radio set is dependent upon correct arrangement and installation of the antennas. Determination of the best antenna arrangement for a specific application involves technical considerations which are beyond the scope of this operating instruction book. In every application which involves a new aircraft mock-up, the antenna

layout should be approved by a competent technician who is thoroughly familiar with the basic principles explained in the *Handbook of Maintenance Instructions for Radio Sets SCR-718-A, SCR-718-AM, SCR-718-B, and SCR-718-C, and Handbook of Maintenance Instructions for Radio Set ★AN/APN-1 Series.*

#### a. GENERAL.

(1) Main objectives of antenna installations are the following:

- (a) To transmit signals downward to the earth.
- (b) To receive signals reflected upward by the earth.
- (c) To have the antennas as close to each other as possible, but at the same time to prevent, insofar as possible, the transfer of "feed-through" signal directly from the transmitting to the receiving antenna.

(d) To have the receiver signal vary as little as possible with the position or attitude of the aircraft when executing a reasonable dive, bank or climb.

(2) The transmitting and receiving antennas (see fig. 1-6) are identical. Unless there is a possibility of mutual interference with other radio equipment in the aircraft (refer to par. 3d, this sec.), either antenna may be used for transmitting or for receiving without affecting the operation of the altimeter in any way.

(3) Locate the antennas where there are no obstructions such as struts, wires, landing gear, other antennas, etc., within a distance of two feet. In addition no obstruction should exist in the shortest direct reflection path between the transmitting and receiving antennas (refer to par. 3g, this sec.) at any flying position at which altimeter operation is required, as the shielding effect of such obstructions may interrupt the transmitted signal.

(4) Each antenna must be mounted upon a metal reflector at least two feet square. The reflector should be approximately flat, flush with and parallel to the base plate (mounting plate) of the antenna. The outer metal surface of a modern aircraft inherently meets this requirement. If the aircraft surface is not of metal, centrally install a separate, thin, metal plate, with respect to each antenna, as indicated in figure 5-5. Alternatively, if the aircraft surface is of fabric, the fabric may be metalized by a suitable metal spray. To insure good electrical contact between the reflector and each antenna, thoroughly clean the reflector and antenna base where the antenna base plate is fastened upon it, with an approved paint solvent. *If it is necessary to use a wedge under the antenna base plate to level the antenna, this wedge must be of metal.*

#### b. "IN-LINE" ANTENNA ARRANGEMENT.

(1) One satisfactory mounting arrangement is to mount the two antennas on the under surface of the fuselage with the horizontal portions of the antennas aligned on a common axis parallel to the axis of the fuselage, as shown in figure 2-1. Since signal is trans-

\* Cable Conductor MI-20 may be replaced by Radio Frequency Cable RG-59/U.



mitted and received efficiently only from the sides and not the ends of the antennas, this arrangement is effective in preventing transfer of a direct "feed-through" signal between the antennas. Place the antennas at least 7, but not more than 14 feet apart.

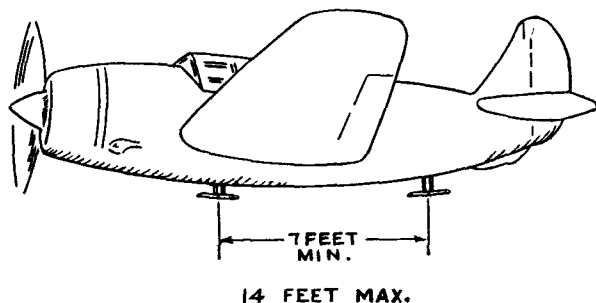


Figure 2-1. "In-Line" Antenna Arrangement

(2) Since signals are transmitted and received efficiently from the sides of the antennas, make sure that there is no nearby object so located that appreciable signal can leave the side of the transmitting antenna and be reflected from the object to the side of the receiving antenna. Such an object might be a torpedo, bomb, or float.

c. "SHIELDED" ANTENNA ARRANGEMENT.—It also is satisfactory to mount the antennas with their sides parallel, provided that some metal part of the aircraft with suitable electrical continuity (such as fuselage or motor mounts, etc.) acts as shielding between the

transmitting and receiving antennas. One installation of this type is shown in figure 2-2. This type of installation is particularly suitable for aircraft having "mid" or high wings.

d. ANTENNA POSITION.—In cases where the radio set must work simultaneously with other radio transmitting equipment which is operating on somewhere near the same frequency, very careful consideration must be given to the antenna positions of both equipments. The main objective, insofar as the radio set is concerned, is to arrange for minimum transfer of signal from the transmitting antenna of the other equipment to the receiving antenna of this equipment. This may be accomplished by suitable consideration of the radiation patterns involved, by utilizing the shielding effect of portions of metal aircraft, etc.

e. ANTENNA MOUNTING.—Details of antenna installations are shown in figure 5-5. In all installations, mount each antenna with its horizontal radiating member parallel to the line of flight and with the thicker edges of the vertical members facing forward so as to obtain minimum slip-stream resistance.

The drilling plan for mounting Antenna \*AT-4/ARN-1 is shown in figure 5-1. Fasten each antenna securely with four No. 8-32 plated machine screws (not furnished with the radio set).

**IMPORTANT**

If at any time it becomes necessary to paint the aircraft or the antennas, do not get any paint on the insulator ring at the mid-section of the horizontal radiating member. Try to mount the antennas where they will not get coated with oil or motor exhaust material.

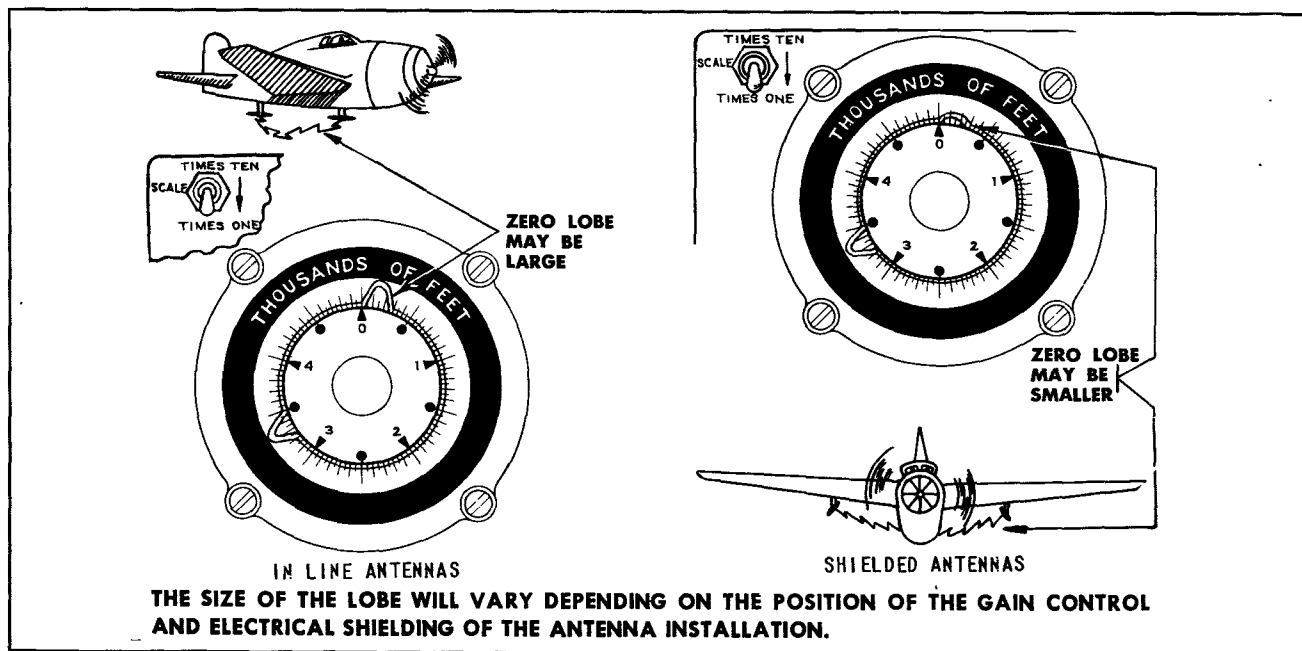


Figure 2-2. "Shielding" Antenna Arrangement

f. ANTENNA CABLES.—The cable connections between Radio Receiver and Transmitter BC-788-( ) and each Antenna ★AT-4/ARN are shown in figure 5-3.

(1) Cut two lengths of Radio Frequency Cable RG-8/U as required for transmitting and receiving antenna cables. The total of these two lengths should not exceed 60 feet, nor should it exceed the maximum length given in figure 2-5 for the particular shortest direct deflection path involved. (Refer to par.3g, this sec.) Make sure that the cable which normally will be used to connect the receiving antenna to the "RECEIVER ANTENNA" socket on the receiver and transmitter unit is long enough so that it can be connected to the "TRANSMITTER ANTENNA" socket for test purposes.

(2) *The receiver and transmitter antenna transmission lines must not be run parallel, taped or laced together; otherwise the coupling effect will cause direct signals to "feed through". Direct "feed through" will cause a large zero pulse. The large zero pulse makes it difficult to read the indicator accurately at low altitudes and at 5000 feet and multiples thereof.*

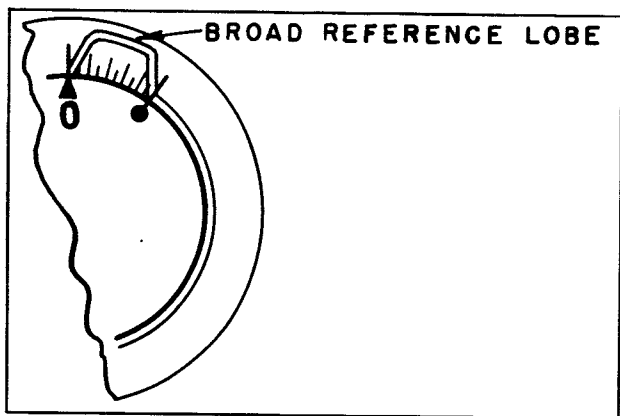


Figure 2-3. Broad Reference Pulse

(3) Attach a receiver cable marker tag (S. C. Stock No. 4ZK7288) to the cable which will be used to connect one Antenna ★AT-4/ARN-1 to the "RECEIVER ANTENNA" socket. Measure the length of Radio Frequency Cable RG-8/U now. Do not wait until after the cable is permanently installed. Following the words "REC. CABLE LENGTH," on the tags, mark the cable footage. Similarly, attach a transmitter cable marker tag to the cable which will be used to connect the other Antenna ★AT-4/ARN-1 to the "TRANSMITTER ANTENNA" socket and mark the corresponding cable footage following the words "TRANS. CABLE LENGTH." Place the tags at the ends of the cables which will be connected to the receiver and transmitter.

(4) Attach Plug PL-259-A to each end of each of the two cables, as shown in figure 5-2. Use a 100-watt soldering iron for all soldering operations. Test cables for continuity and freedom from shorts before installing.

(5) Install the cables as shown in figures 5-2, 5-3, and 5-5. When the use of a right-angle connector is necessary to prevent too sharp bending of the cable, Adapter M-359-A may be inserted between any plug on the cable and the corresponding socket. Allow sufficient slack at the receiver and transmitter to permit free movement of the unit on Mounting Base ★MT-14/ARN-1 and ease of its field testing and servicing. Do not bend Radio Frequency Cable RG-8/U to a radius smaller than 5 inches. Do not use any adapters other than Adapter M-357-A, made by Selectar, Western Electric, Gephart, or Astatic. Do not use Adapter M-359.

**Note**

If this antenna installation should ever be used with Radio Set ★AN/ARN-1 or ★AN/ANP-1, it will then be necessary to install an Adapter M-359-A at the transmitting-antenna-transmission-line socket on the transmitter-receiver unit, and it will be permissible to install an adapter at the receiving-antenna-transmission-line socket on the transmitter-receiver unit whenever desirable. However, while the antenna system is used with Radio Set SCR-718-( ), use the adapters only when necessary to prevent too sharp bending of the cable.

(6) Check that the cable normally connected to the "RECEIVER ANTENNA" socket also can be connected to the "TRANSMITTER ANTENNA" socket

(7) Determine the residual delay of the antenna installation as stated in paragraph 3b, following, and mark it upon each of the two cable marker tags after the words "RESIDUAL DELAY."

**Note**

Other types of radio sets (for example Radio Sets ★AN/ARN-1 and ★AN/APN-1) may be used with the same antenna installation used for Radio Set SCR-718-( ). To permit this, it is necessary that the residual delay of the antenna system be determined, and that marker tags properly labeled as described above be attached to both antenna cables. This will permit proper calibration of the low-altitude altimeter.

(8) The radio-frequency signal travels more slowly through coaxial transmission line than through air. In a given time, the signal will travel about 66.5 percent of the distance in coaxial line that it would have traveled in air. The speed of the propagation or travel is expressed as a decimal called the *propagation constant*. The propagation constant is marked on the reels of coaxial cable and averages about 0.665. Different antenna installations will require adjustment of the altimeter zero, because of varying lengths of coaxial cable, propagation constant, and air reflection path distances on the ground.





Figure 2-4. Shortest Direct Reflection Paths

(9) If it is *necessary* (not merely convenient) to break the antenna transmission lines in order to run them through a bulkhead or the like, use one of the following combinations of "N-type" connectors for each line.

(a) For non-pressurized connections: Radio Frequency Plug UG-21/U and Radio Frequency Jack UG-22/U.

(b) For pressurized bulkhead connections: Two Radio Frequency Plugs UG-21/U and one Radio Frequency Jack UG-30/U. For a right-angle approach, add Radio Frequency Adapter UG-27/U.

**g. SHORTEST DIRECT REFLECTION PATH.**—The shortest direct reflection path between transmitting and receiving antennas is that path formed by the signal which leaves the transmitting antenna, travels to the earth, and is reflected back to the receiving antenna in such a manner that the angle made by the signal when it hits the earth is the same as the angle made when it leaves the earth. This path depends on the relative positions of the antennas and the earth and is different for different aircraft heights above terrain and different aircraft positions. Examples of shortest direct reflection paths are shown in figure 2-4. *It is important that no obstruction exist in the shortest direct reflection path at any flying position at which operation of the radio set is required, for the shielding effect of such obstruction may interrupt the transmitted signal.*

**b. RESIDUAL DELAY.**—The residual delay of the antenna installation is found as follows:

(1) Determine the shortest direct reflection path between transmitting and receiving antennas when the aircraft is resting on the ground. This is done most conveniently by visualizing a line from each antenna to a spot on the ground, and then moving the spot until both lines make the same angle with the ground.

(2) Measure the total length in feet of the path determined in step (1), above. Multiply the path length by  $\frac{1}{2}$ .

(3) Add together the lengths in feet of the receiving antenna cable and the transmitting antenna cable. Multiply the total cable length by  $\frac{3}{4}$ .

(4) Add together  $\frac{1}{2}$  of the total reflection-path length as computed in step (2) and  $\frac{3}{4}$  of the total cable length as computed in step (3). The sum is the residual delay of the antenna installation.

#### Note

The computation of residual delay may be made clearer by use of the formula: Residual Delay =  $\frac{1}{2}$  Shortest Direct Reflection Path with Aircraft on Ground +  $\frac{3}{4}$  Total Antenna Cable Length.

#### 4. AFTER-INSTALLATION CHECK

a. Check all cables. They must be clear of sharp edges and other interference, of ample length to facilitate servicing of Radio Receiver and Transmitter BC-788-( ) and Indicator I-152-( ), and so positioned as not to restrain the motion of the units on their shockmounts.

b. Check that all connectors are properly placed and tight and that the collar holding each plug in position is tight.

c. Check that both shockmountings, Mounting FT-445-A and Mounting Base \*MT-14/ARN-1 are firmly fastened and grounded to the aircraft structure, that the radio receiver and transmitter and the indicator are properly secured to the mountings, and that the units have sufficient clearance in which to move on their shockmounts.

d. Check that both Antenna \*TA-4/ARN-1 are properly fastened to the aircraft structure.

#### 5. ADJUSTMENT OF RADIO SETS SCR-718-A AND SCR-718-AM.

(See figure 3-1 for location of controls.)

a. Check the plate on the front panel of the receiver and transmitter to make certain that the equipment is adjusted for the voltage source available on the aircraft.

b. Turn the radio set on; the pilot light should light.

c. Allow the radio set to warm up for 5 minutes. Measure the voltage of the primary-power source at a point as near as possible to the "POWER INPUT" socket on the receiver and transmitter. Unless the voltage for 115-volt supply is between 109 and 121 volts, adjust the primary power source so that it is 115 volts.\*

#### WARNING

Higher voltages will cause damage to the altimeter.

d. Turn the "REC. GAIN" control to its extreme counterclockwise position.

\*If the equipment is arranged for 80-volt operation, adjust the power supply to that value. The supply must not vary beyond the limits of 76-84 volts.

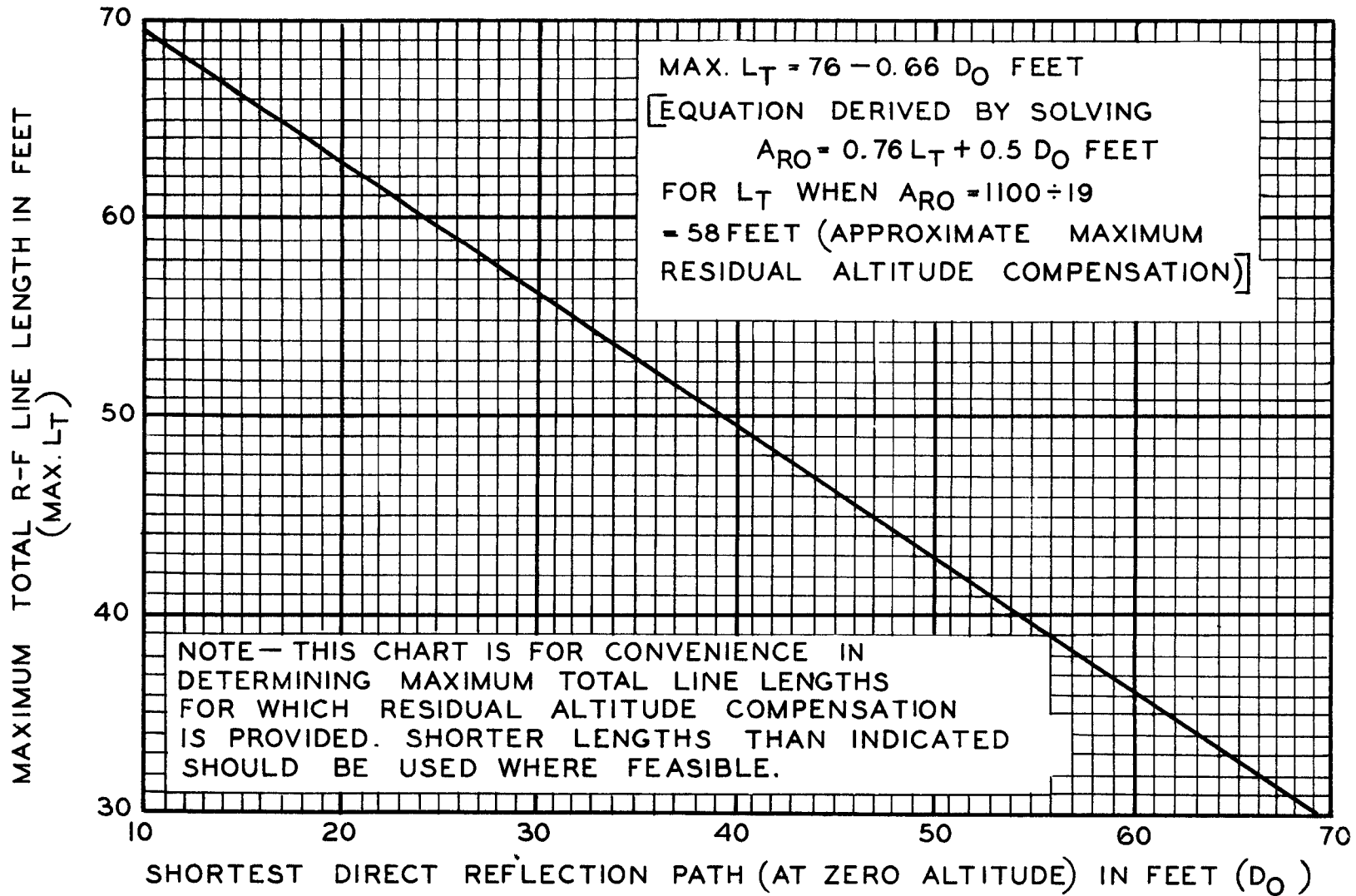


Figure 2-5. Maximum R-F Line Length for Various Reflection Paths

e. Set the "CIRCLE SIZE" control so that the circle on the indicator is entirely visible.

f. The circle should appear bright against a background free from faint green lines. If it does not, remove the indicator from Mounting FT-445-A, turn it upside down, and adjust the "BRIL." screwdriver adjustment on its bottom so that the circle and background brilliance is as desired. (See fig. 3-4.) Visor M-387 should be in place during this adjustment. Do not set the brilliance any higher than necessary for good readability, or the life of the cathode-ray tube fluorescent material will be shortened.

g. The circle should be sharply defined without fuzz or blur. If it is not, remove the indicator from its mounting, turn it upside down, and adjust the "FOCUS" screwdriver adjustment on its bottom so that the circle sharpness is a maximum. It may be necessary to readjust brilliance control.

h. Set the "CIRCLE SIZE" and, if necessary, remove the indicator from its mounting, turn it upside down, and adjust the "VERT. CENTERING" and "HORIZ. CENTERING" screwdriver adjustments so that the outer edge of the luminous circle is just barely visible at the outer edge of the black calibrated scale and the circle is centered with the scale.

i. If the indicator has been removed from its mounting, replace it.

j. Turn the "REC. GAIN" control clockwise until a pulse appears near "O" on the circle and so that the pulse is approximately 1/4-inch high.

k. Turn the "ZERO ADJ." knob to check that the pulse can be moved to any point on the circle between the 150-foot indication to the left of "O" and the 150-foot indication to the right of "O." Then set the reference pulse to the left of zero by the amount of the residual delay of the installation, if known. (Refer to par. 3b, this sec.)

l. Check over-all sensitivity and the condition of the antenna system by using Test Set TS-10B/APN or TS-10C/APN as outlined in the *Handbook of Maintenance Instructions for Radio Sets SCR-718-A, SCR-718-AM, SCR-718-B, and SCR-718-C.*

## 6. ADJUSTMENT OF RADIO SET SCR-718-B.

(See figure 3-2 for location of controls.)

a. With the scale switch set in the "X1" position, check visual performance, following the steps outlined in preceding paragraph 5. (Note that Indicator I-152-B has no pilot light.)

b. Set the scale switch in the "X10" position and observe the circle, which should be well-shaped and approximately 1-1/2 inches in diameter.

c. Turn the "X10 ZERO ADJ." knob to check that the initial pulse can be moved to any point on the scale between 1/4 inch to the left of "O" to 1/4-inch to the right of "O." Then set the reference pulse at zero.

## 7. ADJUSTMENT OF RADIO SET SCR-718-C.

(See figure 3-3 for location of controls.)

a. With the scale switch set in the "TIMES ONE" position, check visual performance, following the steps outlined in the preceding paragraph 5. (Note that Indicator I-152-B has no pilot light.)

b. With the scale switch in the "TIMES TEN" position, adjust "REC. GAIN" until a pulse 1/4 inches high is obtained. The circle should be well shaped and approximately 1-1/2 inches in diameter. If the diameter is appreciably different, make proper adjustment with "CIRCLE SIZE" control; then switch to "TIMES ONE" scale and adjust resistor R-240 for proper size. Resistor R-240 is located near front of indicator, on left side near top, and is accessible through a movable cover on late models of Indicator I-152-C, some of which are marked "CIRCLE SIZE RATIO" near this cover.

c. Turn the "TIMES TEN ZERO ADJ." knob to check that the initial pulse can be moved to any point on the scale between 1/4 inch to the left of "O" to 1/4 inch to the right of "O." Then set the reference pulse at zero.

## 8. TRANSMITTER AND RECEIVER ADJUSTMENT.

### Note

This adjustment is to be made only if over-all sensitivity is low.

### a. TRANSMITTER ADJUSTMENTS.

(1) Adjust transmitter tuning control "T" by means of Test Set TS-23/APN. (See fig. 3-6.)

(2) Adjust transmitter antenna coupling capacitor "A" for maximum output as indicated on a sensitive ultra-high-frequency wavemeter, field strength indicator, or for maximum output as indicated by Test Set TS-23/APN.

(3) The transmitter output coupling loop is pre-set.

### Note

Do not attempt to adjust the transmitter output coupling loop without Test Set TS-23/APN. Refer to the *Handbook of Maintenance Instructions for Radio Sets SCR-718-A, SCR-718-AM, SCR-718-B, and SCR-718-C.* Overcoupling will produce two or more peaks on the pulse, while undercoupling may give a delayed second pulse or no output.

### b. RECEIVER ADJUSTMENTS.

### Note

For Radio Set SCR-718-B or SCR-718-C, set scale switch in "X1" or "TIMES ONE" position.

(1) Set "REC. GAIN" control to one-half maximum. Connect Test Set TS-10B/APN or TS-10C/APN between the "TRANSMITTER ANTENNA" re-

ceptacle and "RECEIVER ANTENNA" receptacle. Adjust the attenuator for 1/4-inch delayed pulse height (which appears at about 350 feet).

(2) Adjust receiver oscillator adjustment "R" for maximum pulse height, consistent with the narrowest and sharpest pulse possible. Maintain a 1-1/4-inch delayed pulse height by readjusting the attenuator as required. (See fig. 3-6.)

(3) Adjust converter fine tuning control "C" to maximum output and narrowest delayed pulse on indicator.

(4) Adjust converter coarse tuning control only if "C" will not peak.

(5) Adjust antenna coupling control "B" for maximum amplitude and narrowest delayed pulse.

(6) Coupling loop position is not critical and re-adjustment should not be required; it has been adjusted for maximum amplitude and narrowest altitude pulse.

(7) Intermediate-frequency transformer adjustments are sealed at the factory.

**Note**

For adjustments to circle forming transformers, timing circuits, driver circuits, and shape controls, refer to the *Handbook of Maintenance Instructions for Radio Sets SCR-718-A, SCR-718-AM, SCR-718-B, and SCR-718-C.*

**9. PREFLIGHT CHECK.**

a. Check the transmitting antenna for radiation after the altimeter has been turned on. The radiation check can be made with a sensitive wavemeter, a field strength meter, or with Indicator ID-98/APN or ID-98A/APN (used with Test Set TS-10B/APN or TS-10C/APN). Perform the check under the following different conditions:

(1) With the transmitting antenna connected to the transmitter output socket.

(2) With the receiving antenna connected to the transmitter output socket.

b. After radiation checks have been completed, return the antenna connections to their proper sockets.

**SECTION III  
OPERATION**

**1. STARTING AND STOPPING THE EQUIPMENT.**

**CAUTION**

If indicator I-152-B or I-152-C is used with an unmodified Radio Receiver and Transmitter BC-788-A or BC-788-AM, the scale switch must be wired in the "X1" or the "TIMES ONE" position. This is to prevent the throwing of the scale switch to the "X10" or the "TIMES TEN" position and to prevent consequent damage to the detector tube in the radio receiver and transmitter.

a. To turn the equipment on, turn the "REC. GAIN" knob clockwise about one-half turn. Since this energizes all components of the radio set, the pilot light should light. (There is no pilot light on Radio Set SCR-718-B.)

b. To stop the equipment, turn "REC. GAIN" fully counterclockwise until the switch is opened.

**2. OPERATION.**

(See figures 3-1, 3-2, and 3-3.)

a. After turning the equipment on, allow about 3 minutes or more, if possible, for the tubes to reach their

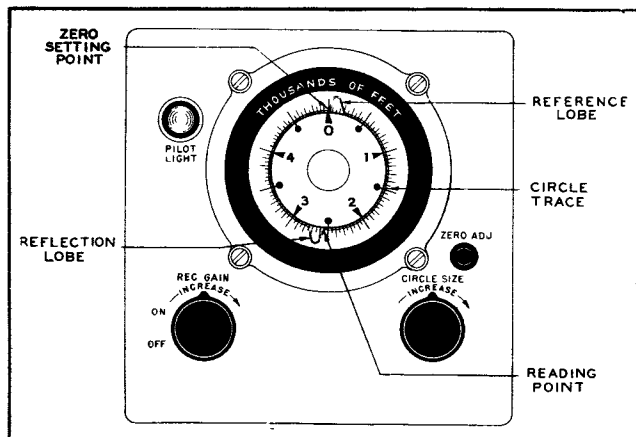


Figure 3-1. Dial and Controls for Indicators I-152-A and I-152-AM

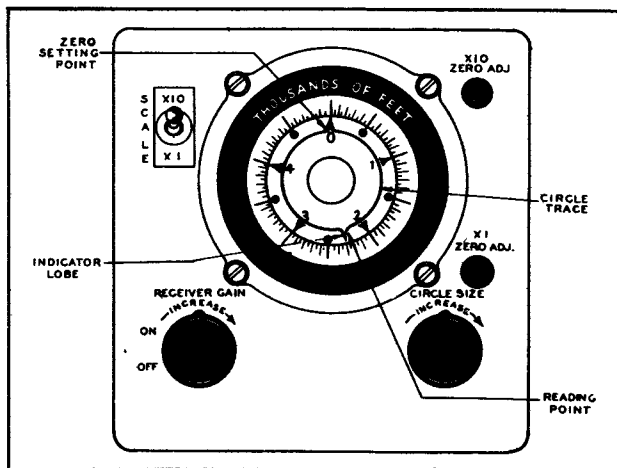


Figure 3-2. Dial and Controls for Indicator I-152-B

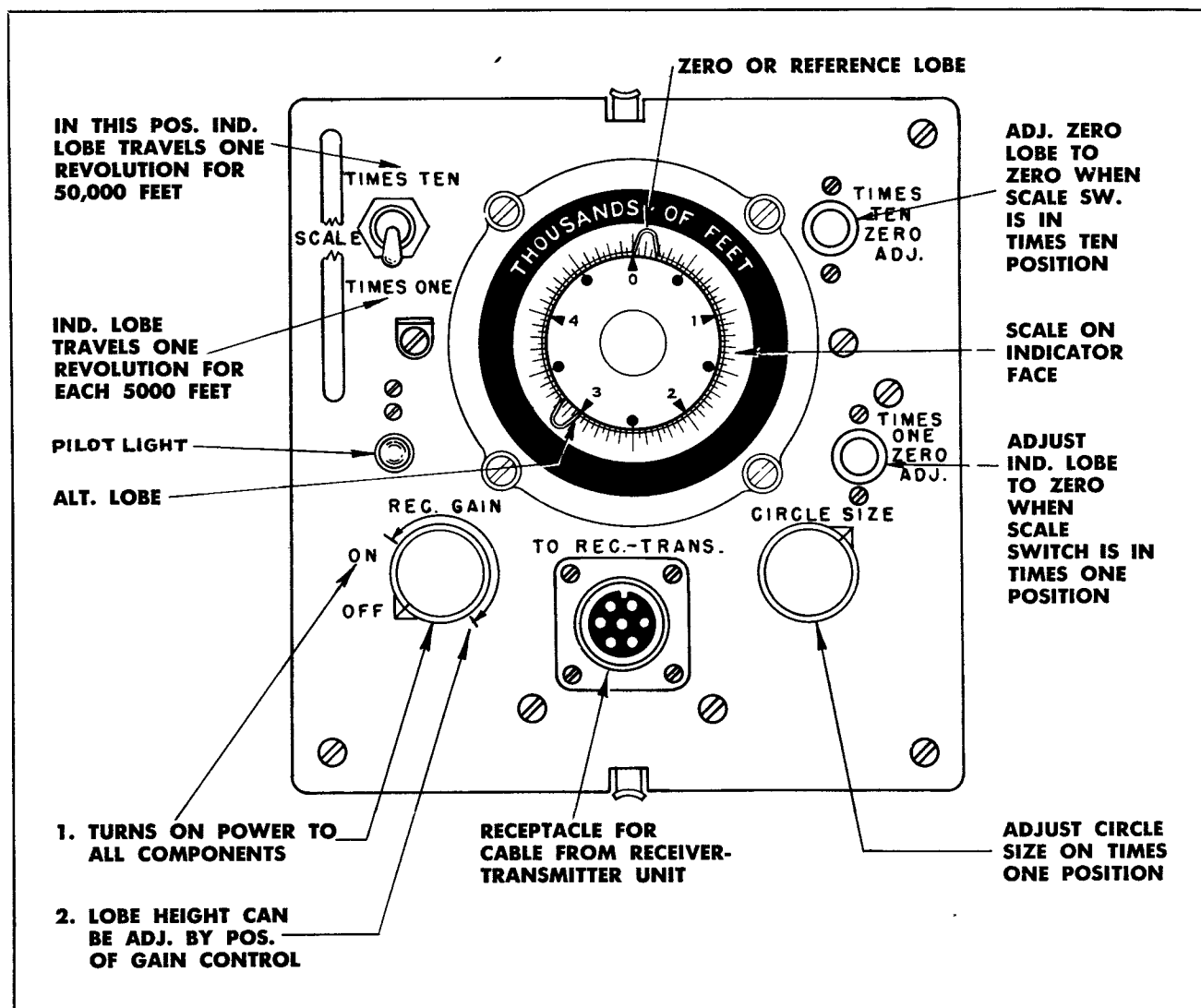


Figure 3-3. Dial and Controls for Indicator I-152-C

operating conditions; then turn "REC. GAIN" until a trace in the form of a green circle with one or more pulses on it appears on the face of the indicator tube. Set scale switch in "TIMES ONE" position.

b. Adjust the "CIRCLE SIZE" control so that the circle trace is barely visible as a luminous ring at the outer edge of the black calibrated scale.

c. Adjust the "REC. GAIN" control so that a pulse approximately 1/4-inch high appears on the circle trace near "0" on the calibrated scale.

d. With the scale switch in the "X10" or the "TIMES TEN" position, check that the circle trace is about 1/4-inch inside the black calibrated scale.

e. Adjust the "TIMES TEN ZERO ADJ." until the reference pulse is at zero.

(1) After warm-up, wait until the voltage to the equipment is normal (between 110 and 120 volts). If

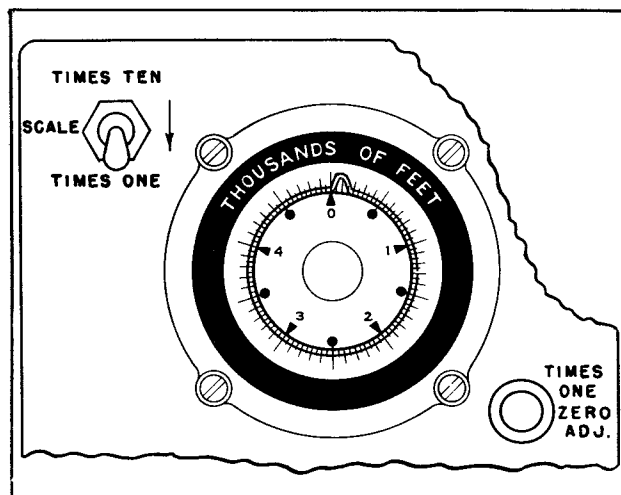


Figure 3-4. Times One Zero Adjustment

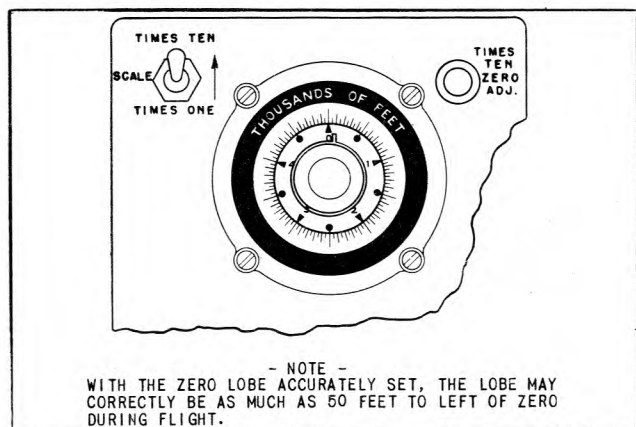


Figure 3-5. Times Ten Zero Adjustment

this cannot be read on a voltmeter, it may be estimated by judging the speed of the aircraft engines, which should be greater than idling but less than takeoff speed.

(2) Set the scale switch to the "TIMES ONE" position.

(3) Adjust the "TIMES ONE ZERO ADJ." so that the reading point of the reference pulse is set to zero on the indicator scale (see fig 3-3). This should be done just as the wheels of the aircraft are about to leave the ground.

(4) As the aircraft climbs, the reflected pulse will move away from zero and decrease in amplitude.

(5) At an altitude of several hundred feet turn up the gain control so that the reflected pulse (a new pulse appearing near zero) is 1/4-inch high.

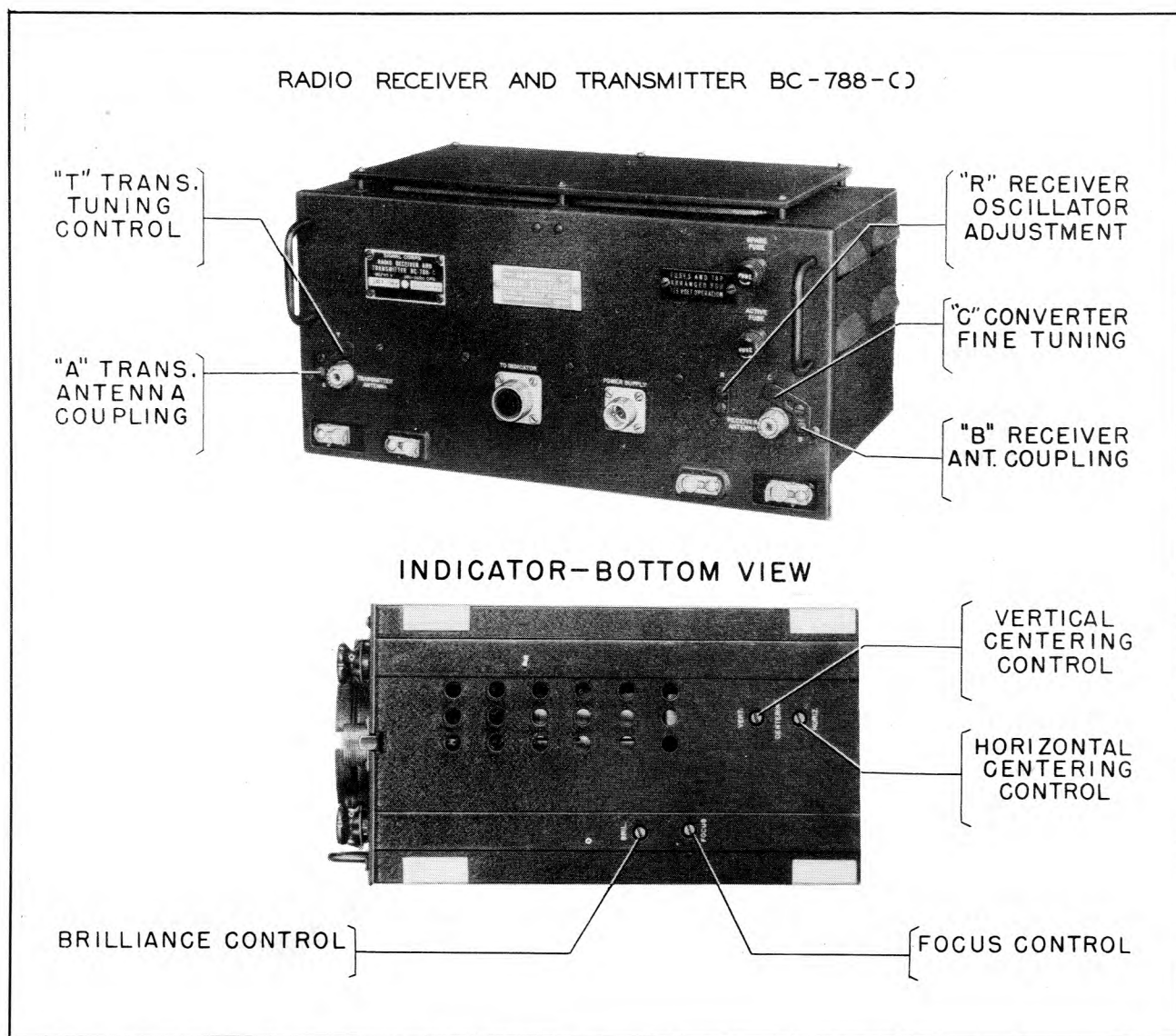


Figure 3-6. Radio Set SCR-718-( )—Adjustment Locations

(6) The reference pulse is due to leakage in the transmitter-receiver unit and between the transmitter and receiver antenna systems (cables and antennas); it may not be exactly at zero on the indicator scale. Record its exact position for later use. When reading altitude, adjust the gain control so that the reflected pulse is 1/4-inch high, disregarding any slight shift of the reference pulse to the left.

(7) For zero adjustment during flight, adjust the gain control so that the reference pulse is 1/4-inch high. Then use the "TIMES ONE ZERO ADJ." if necessary to set the pulse to the reading recorded in (6) above. This may be necessary to compensate for the effects of temperature and humidity changes; changes in barometric pressure have negligible effect on the zero setting. After making this adjustment set the gain control so that the reflected pulse is 1/4-inch high before reading altitude. Do not add or subtract the reading of the reference pulse.

### 3. READING ALTITUDE.

a. The black circular scale on the indicator is provided with a 0-to-5,000-foot altitude calibration. Calibration marks are provided for every 50 feet of altitude and are sufficiently widely spaced so that readings can be estimated to the nearest 25 feet. To read the position of any pulse, determine the point along the scale where the counterclockwise edge of the pulse intersects the luminous green circle, making sure that the gain control is set so that the pulse to be read is 1/4-inch high. For instance, on the indicator shown in figure 3-1, the reference pulse is at "0" and the reflected pulse at "2,550." Following take-off the reflection pulse travels clockwise around the scale as aircraft height above terrain increases. Until the aircraft reaches 5,000 feet, read height merely by noting the positions of the pulse. For instance, pulse positions such as those in figure 3-1 would indicate 2,550 feet.

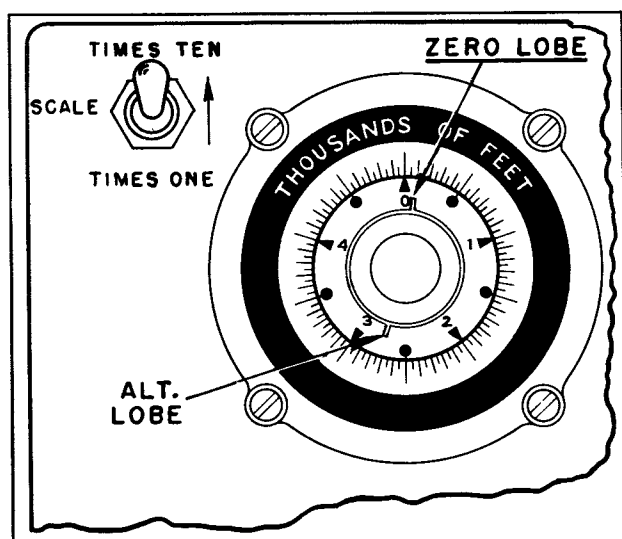


Figure 3-7. Reading Indicator Times Ten Scale

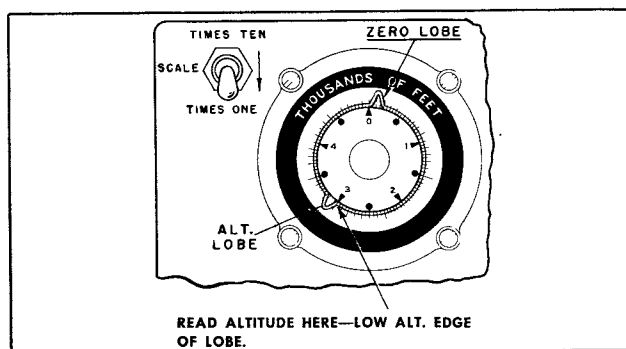


Figure 3-8. Reading Indicator Times One Scale

b. When the aircraft reaches 5,000 feet, the reflected pulse will have progressed completely around the scale and returned to "0". As height above terrain increases further, up to 10,000 feet, the reflected pulse will travel clockwise on a second encirclement of the scale and 5,000 feet must be added to the indication of the pulses. For instance, pulse positions such as those in figure 3-1 would then indicate a height of 7,550 feet.

c. When the aircraft reaches 10,000 feet, the reflected pulse will have completed a second encirclement of the scale, and one further clockwise encirclement will take place for each additional 5,000 feet of altitude attained. Similarly, a *counterclockwise* encirclement will take place for each *drop* of 5,000 feet sustained. To obtain actual height above terrain at any time, add 5,000 feet to the indication of the pulses for every previous clockwise encirclement and subtract 5,000 feet from the indication of the pulses for every previous counterclockwise encirclement of the scale by the reflected pulse. However, it generally is more practicable to estimate the approximate height above terrain (by use of an aneroid altimeter such as a Kollsman and knowledge of approximate terrain height above sea level) and then to determine the exact height above terrain by adding to the reading of the indicator pulses an appropriate multiple of 5,000 feet, such that the total closely checks the estimated height. For instance, if the estimated height above terrain is 26,000 feet and the indication of the pulses is 1,275 feet, then the exact height is 25,000 plus 1,275 feet, that is 26,275 feet.

d. When using radio Set SCR-718-B or SCR-718-C, remember that the large times one circle (5,000 foot scale) is merely an expanded vernier on the small times ten circle (50,000 foot scale). On the small circle it is possible to read to within approximately 500 feet and the scale switch should generally be left in the "TIMES TEN" position, especially at high altitudes. When greater accuracy is required, the large circle reading must be taken into consideration as follows: With the scale switch in the "X10" or "TIMES TEN" position, read the reflected pulse position on the small circle to the next lower 5,000 foot mark (indicated by dots and arrow-heads on the indicator scale). Note this

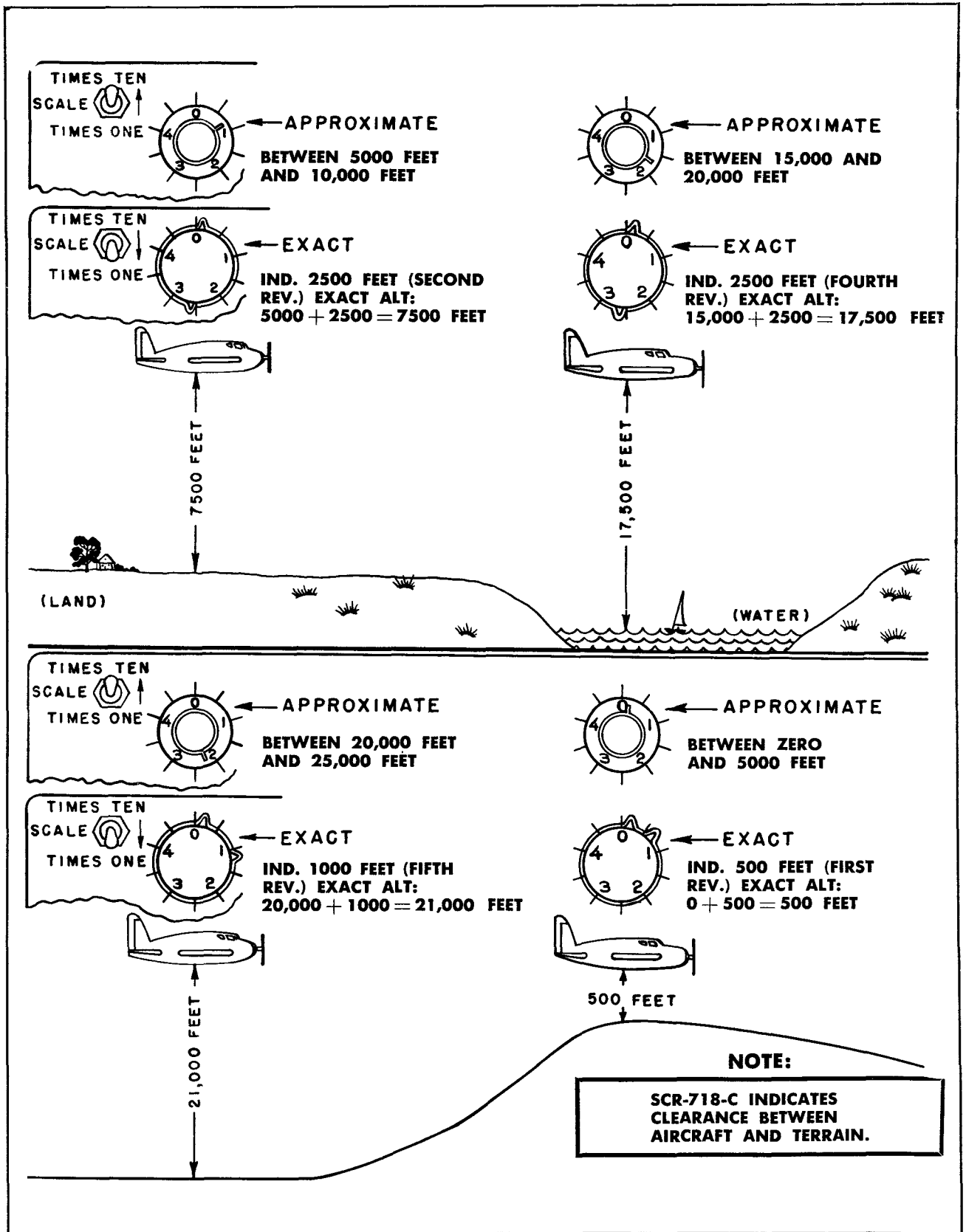


Figure 3-9. Altitude Indications in Flight



reading and switch to the "X1" or "TIMES ONE" position; add the new reading to the one obtained previously. The large circle can, with practice, be read to within 25 feet. (For example, in figure 3-2 the reading is a little over 23,000 feet.)

e. Radio Set SCR-718-( ) is not designed for use as an extremely low-altitude altimeter. As the height of the aircraft above ground decreases to less than 1000 feet, reduce the gain as required to prevent the reflected pulse from becoming too broad and more than 1/4-inch high. While doing this, at about 500 feet

the reference pulse will begin to be affected by the reduced gain and will begin to decrease in amplitude. By careful adjustment of the gain control it will be possible to see the reflected pulse move in to zero, the reference or zero pulse having completely disappeared by the time the aircraft lands.

**4. NOTES AND PRECAUTIONS.**

a. EFFECT OF TERRAIN.—Flying over rough terrain will produce fluctuating indications, and flying over water will produce relatively steady indications.

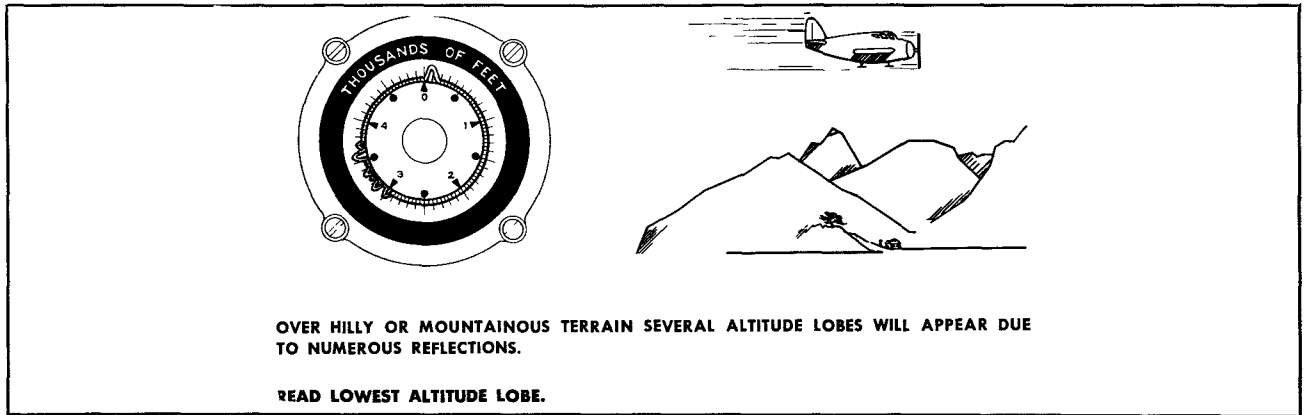


Figure 3-10. Indications over Rough Terrain

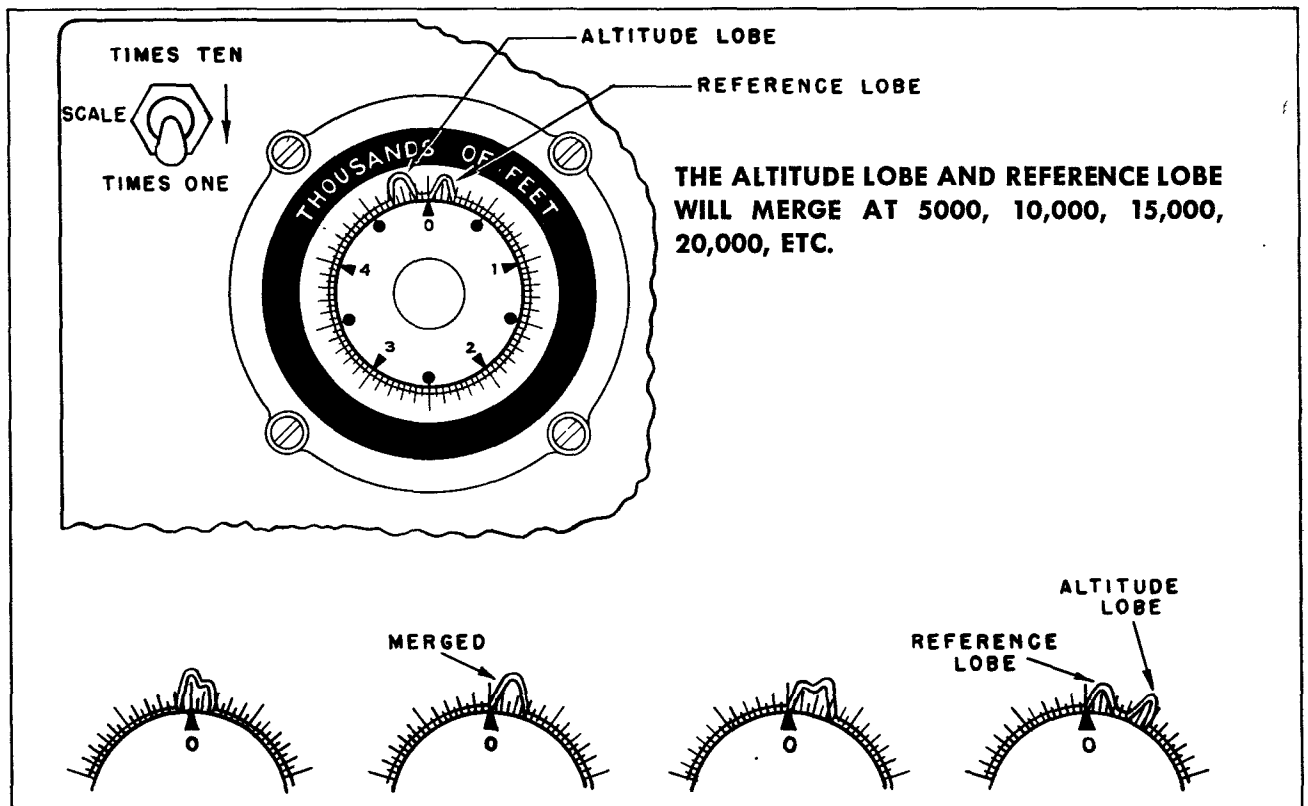


Figure 3-11. Merging of Lobes

*b. BLIND SPOTS.*—At altitudes of 5,000 feet and all multiples thereof, the reflected pulse will occupy the same position as the reference pulse. The pulses will appear to merge and cause a “blind spot” that is, a region about 250 feet wide in which the position of the reflected pulse cannot be determined accurately.

*c. ACCURACY.*—When the radio set is operating properly, the deviation of its indication from exact height above terrain is less than 50 feet. When improper operation causes the error to become greater than stated

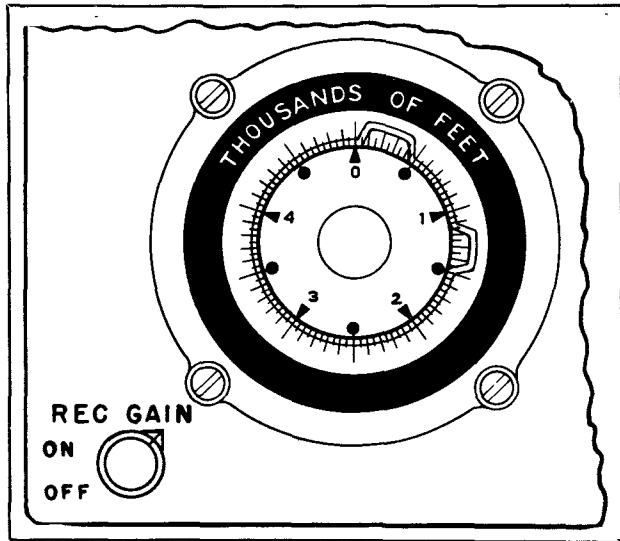


Figure 3-12. Indications with High Receiver Gain

above, such improper operation is almost always shown by the indicator circle becoming oval in shape.

*d. RECEIVER GAIN.*—Turning the “REC. GAIN” up higher than is necessary for a satisfactory image will result in a blurred or fuzzy trace.

*e. DIVES, CLIMBS, AND BANKS.*—Sharp banks, dives, and turns may flatten out the reflected pulse, or the pulse may disappear completely during the bank or dive.

*f. OBSERVABLE DEFECTS.*

(1) A circle trace which is not truly circular will cause inaccurate readings.

(2) A circle trace that is off center will cause inaccurate readings.

(3) Shifting of the reference pulse will cause inaccurate readings unless compensated for as stated in paragraph 2*d*, this section.

*g. EXCESSIVE ALTITUDE.*—Use of the radio set at heights above sea level greater than 40,000 feet may result in impaired operation, although the accuracy of its indication will not be diminished. Use at heights above sea level greater than 45,000 feet may result in permanent damage. This damage would be caused if the reduction in air pressure were sufficient to allow voltage breakdown between closely-spaced circuits carrying high potential difference.

**CAUTION**

Before disconnecting any unit or cable of the equipment, and before removing the fuse, be sure the altimeter is turned off.

## SECTION IV EMERGENCY REPAIR

### 1. REPLACEMENT OF FUSE.

*a.* If the pilot light does not light, check the active fuse.

*b.* If the active fuse is not blown, check the pilot bulb.

*c.* If the pilot light still does not light, check the primary source voltage to be sure it is supplied to radio set by the power input cable. There is no pilot light on Radio Set SCR-718-C.

*d.* If spare fuse blows when inserted in active fuse holder, equipment or wiring probably requires servicing.

### 2. REPLACEMENT OF MAJOR UNITS.

If one of the major units should fail to operate, as stated in section III, it should be replaced by another

unit which has been checked for normal operation.

*a.* Replace the indicator first and check for normal operation.

*b.* If operation is not corrected by replacing the indicator, replace the transmitter-receiver unit.

*c.* If operation is not corrected by either of the above replacements, there is some defect in the cables or the connections.

### 3. INDICATIONS OF MALFUNCTION.

*a.* When scale switch is in “TIMES ONE” position and “REC. GAIN” is turned fully clockwise, the circle trace should be a minimum of 1/8-inch wide. If not, the sensitivity may be low.

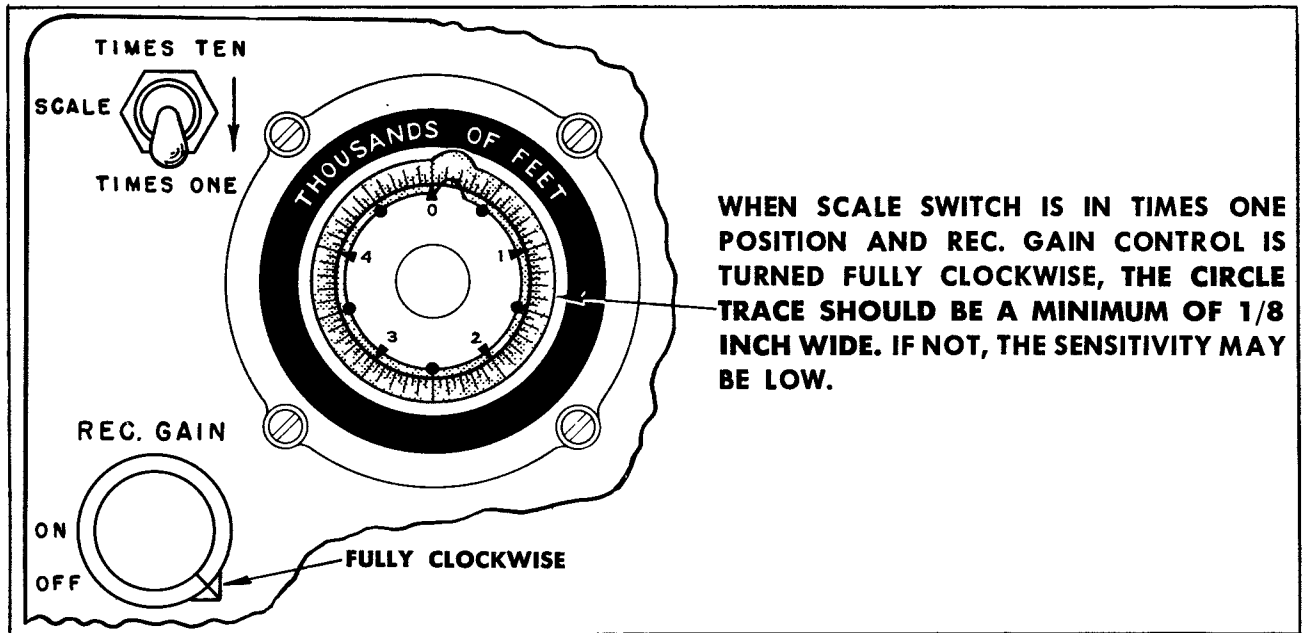


Figure 4-1. Sensitivity Check

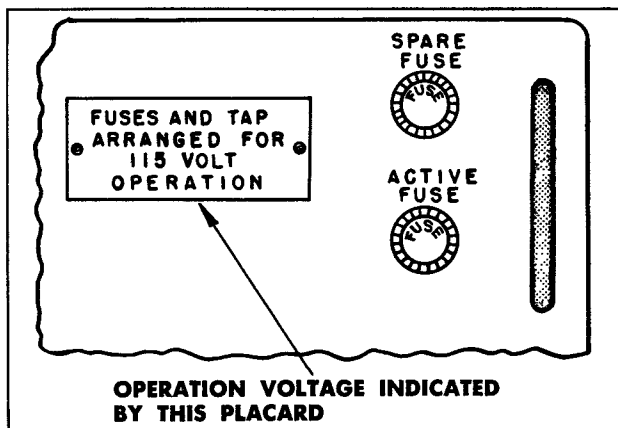


Figure 4-2. Location of Fuses

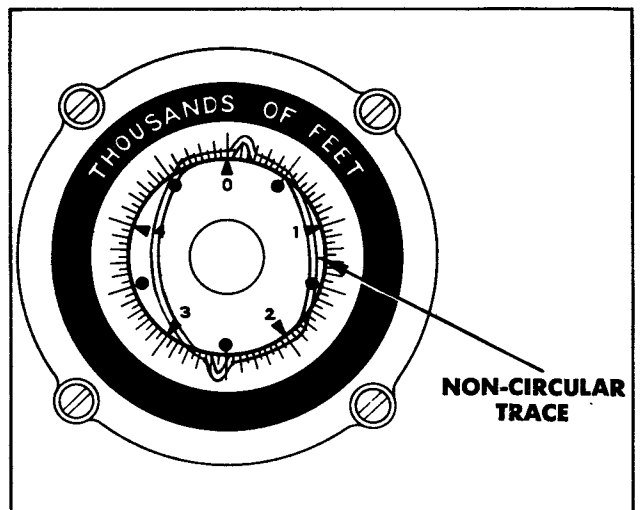


Figure 4-4. Trace Not Circular

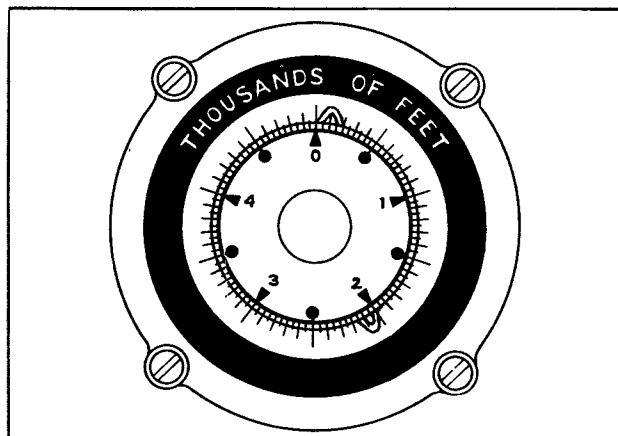


Figure 4-3. Pulse Appears Filled-In

b. If no circle trace appears, check fuses, check position of controls, and check plugs for proper insertion.

c. If pulse is absent or appears filled in by trace, check transmitter tubes.

d. If trace is not circular, equipment requires servicing.

e. If trace or pulse is dim or fuzzy and cannot be corrected by focus and brilliance adjustments, equipment requires servicing. Note, however, that at high altitudes the gain control must be advanced for proper pulse height; this increased receiver gain increases the noise level and the trace may become wide and fuzzy.

**SECTION V**  
**DRAWINGS**

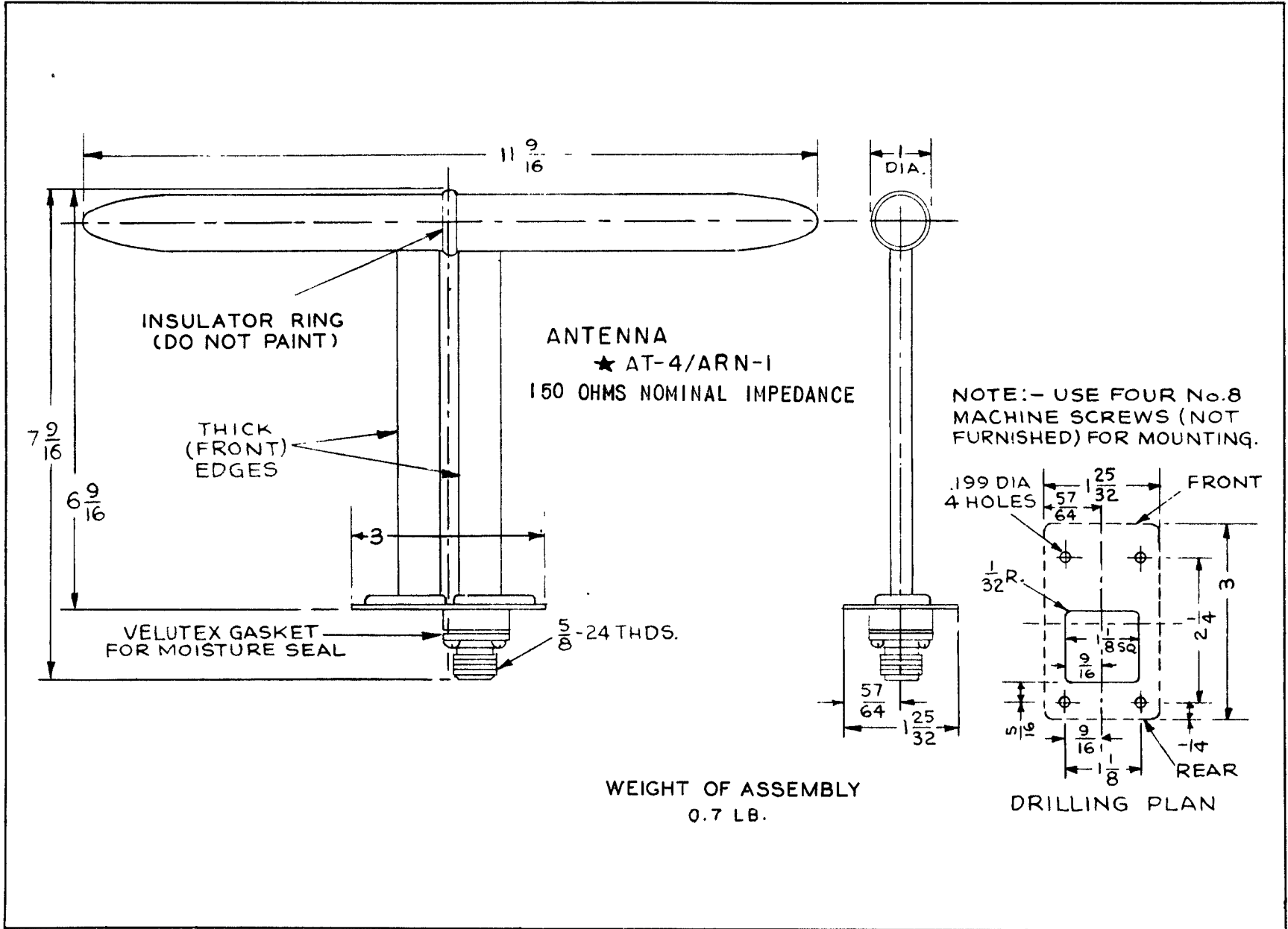
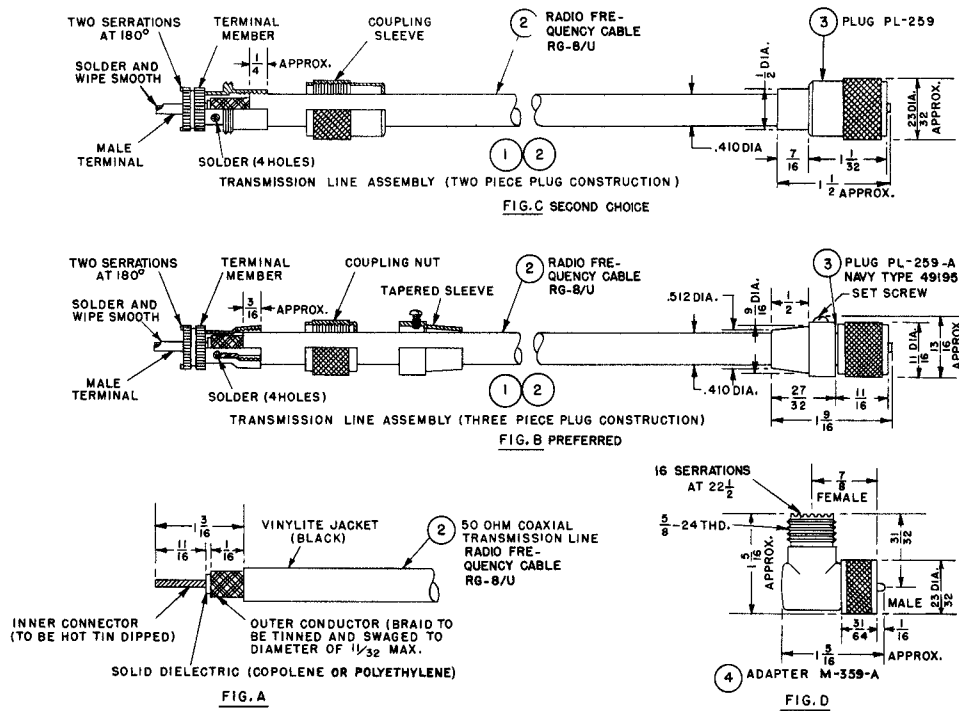


Figure 5-1. Antenna ★AT-4/ARN-1—Outline Drawing

### WIRING AND ASSEMBLY INSTRUCTIONS

1. Cut bulk Radio Frequency Cable RG-8/U (item 2) to lengths required for the particular installation (see equipment diagram, figure 5-3). Trim both ends of each cable as shown in figure A. Be careful not to cut copper braid or to nick strands of center conductor. Hot tin dip inner conductor extensions and tin outer conductor braid to within 1/8-inch from vinylite jacket. Avoid surplus solder and excessive heating of copolene dielectric and vinylite jacket. Quench with damp cloth immediately after soldering. Swage tinned braid, if necessary, to 11/32 diameter maximum.
2. Disassemble plugs (item 3). If plugs are of three-piece construction, PL-259-A, slip tapered sleeve and coupling nut over each end of cables in the relation shown at left in figure B. If plugs are of two-piece construction slip coupling sleeve over cable with knurled portion toward slip end of cable, as shown at left in figure C.
3. Feed ends of cable into plug terminal members so that end of inner conductor is approximately flush with tip of hollow terminal and tinned braid extends slightly beyond the four soldering holes in the neck, as shown in figures B and C. Both types of plugs have internal threads which engage the vinylite outer jacket of the cable. The type shown in figure B is slotted to permit expansion for insertion of cable. The type shown in figure C is not slotted and must be turned so as to thread onto vinylite jacket. At least 1/4-inch of jacket should enter threaded portion of terminal member.
4. Using non-corrosive flux or rosin core solder, carefully solder end of inner conductor to terminal tip and solder braid to neck of terminal member at four holes. Quench with damp cloth immediately after soldering. Avoid excess solder and remove all solder on outer periphery of hollow pin terminal to prevent mating interference. Snip off conductor extensions (if any) flush with tip of terminal.
5. Reassemble plugs as shown at right of figures B and C. If plug is of three-piece construction (figure B), draw tapered sleeve over slotted member and tighten setscrew firmly against solid metal portion of neck, after adjusting for minimum clearance which will allow coupling nut to turn freely; if plug is of two-piece construction (figure C), thread knurled coupling sleeve onto terminal member until threads disengage.
6. Adapters M-359-A (item 4) may, if absolutely necessary, be interposed between transmission lines and receptacles J103 and J104 of receiver and transmitter and J301 and J302 of antennas, as indicated on figure 5-3, or transmission lines may be connected to receptacles directly. If adapters are to be used, couple female end of adapter to male plug at each end of transmission lines. Make sure that serrations at front rim of plugs are engaged with serrations at rim of adapter before coupling nuts are firmly tightened.



### TRANSMISSION LINE MATERIALS AND FITTINGS—FURNISHED IN BULK

Item No.	All Symbol Designations	Description	Signal Corps Nomenclature	Unit Weight (Pounds)	Quan.
1	CA401, 402	Antenna Transmission Line Assembly			2
2	W401, 402	50 Ohm Coaxial Transmission Line	RF Cable RG-8/U	0.10/Ft.	as reg.*
3	P404, 406, 408, 410	Plug	Plug PL-259 or Plug PL-259-A	0.06	4
4	P405, 407, 409, 411	Adapter	M-359-A	0.08	0 to 4

\*Furnished in continuous lengths (not less than 60 feet +2-0 or multiples thereof).

Figure 5-2. Radio Set SCR-718-( )—Antenna Transmission Lines Assembly Drawing

AN 16-40SCR718-2

Section V  
Figure 5-2

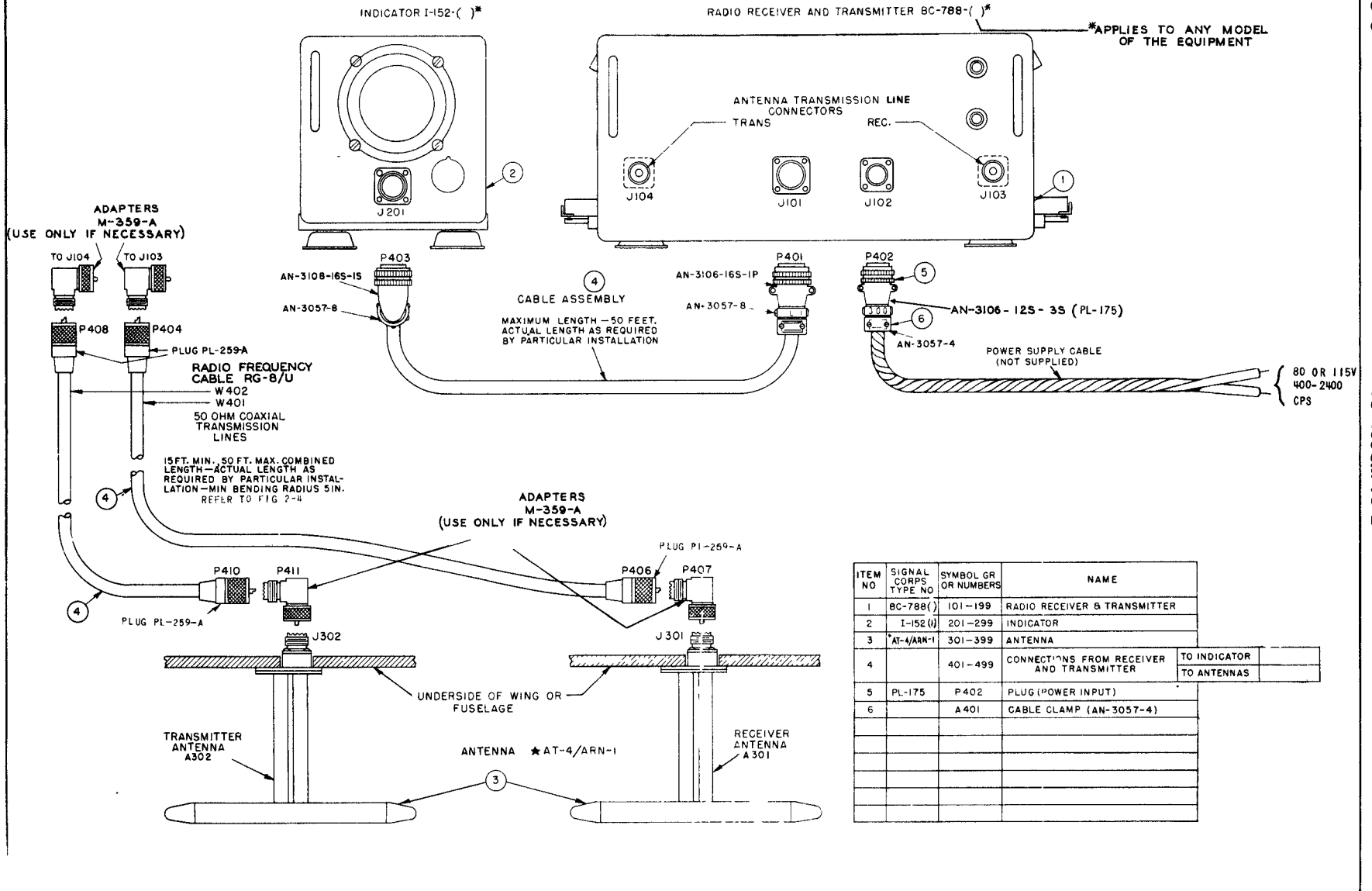
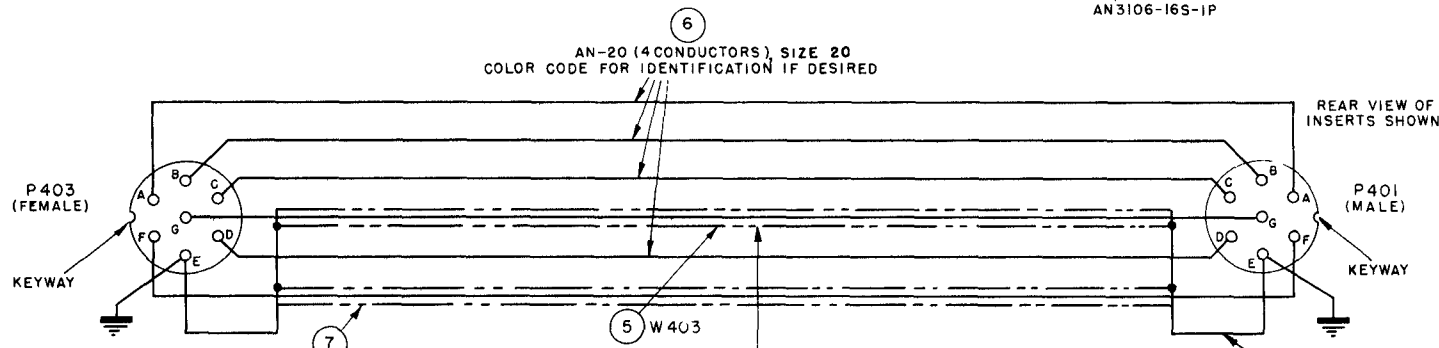
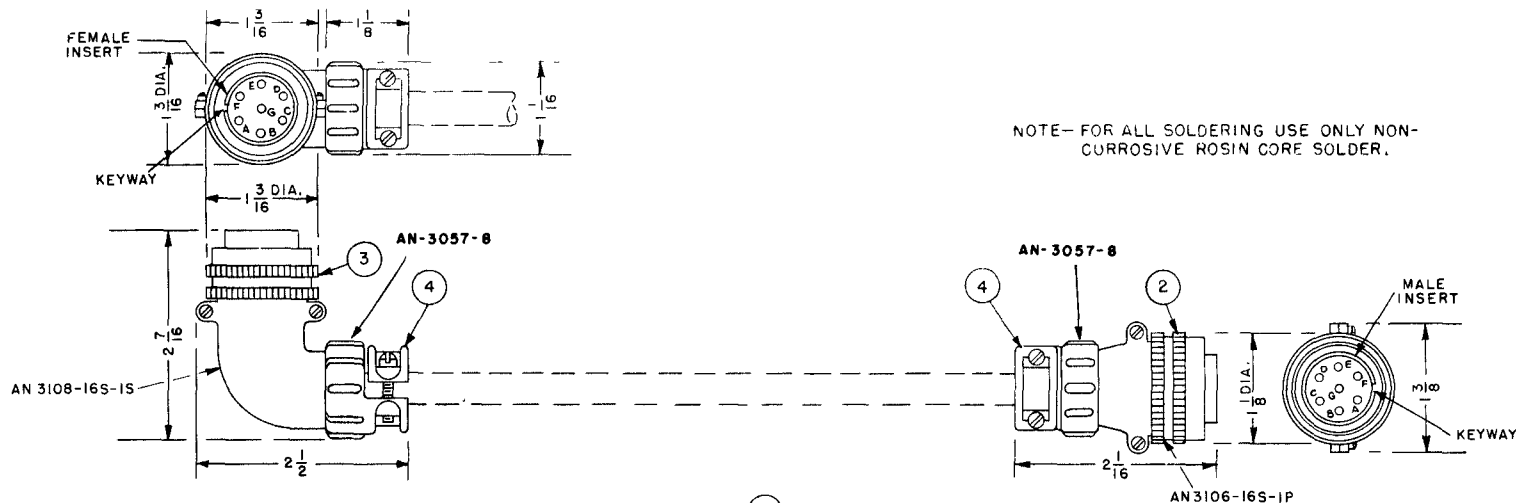


Figure 5-3. Radio Set SCR-718-(-) — Interconnection Diagram



NOTE 1: SHIELDED LEAD SIZE 20, IN ACCORDANCE WITH ARMY SPECIFICATION 95-27273-G

ASSEMBLED CABLE MAY BE LENGTH AS REQUIRED BY INSTALLATION UP TO 50 FT.

BRAIDED SHIELD OF MI-20 AND SHIELDED LEAD, WIRED AND SOLDERED TOGETHER THEN CONNECTED TO PIN "E". ALSO CONNECT TO SCREWS OF CABLE ADAPTER WITH SHORT, HEAVY WIRE OR STRAP

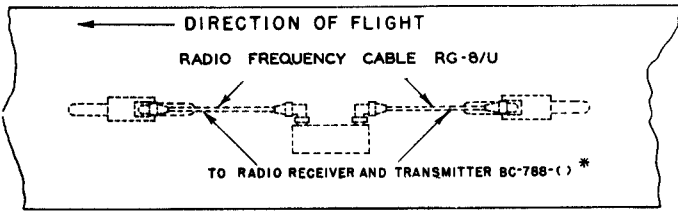
APPLIES TO ANY MODEL OF EQUIPMENT

ITEM	SYMBOL	DESCRIPTION	QUANTITY
1		RECEIVER & TRANS. TO INDICATOR	X
2	P401	CONNECTOR	1
3	P403	CONNECTOR	1
4	A402,403	CABLE CLAMP	2
5	W403	CABLE MI-20 OR RG-59/U	1
6	*	LCW TENSION AIRCRAFT CABLE AN-20	4
7	*	SHIELDED LEAD (SEE NOTE 1)	1

\* NOT SUPPLIED

Figure 5-4. Radio Set SCR-718-( )—Cable Assembly Diagram



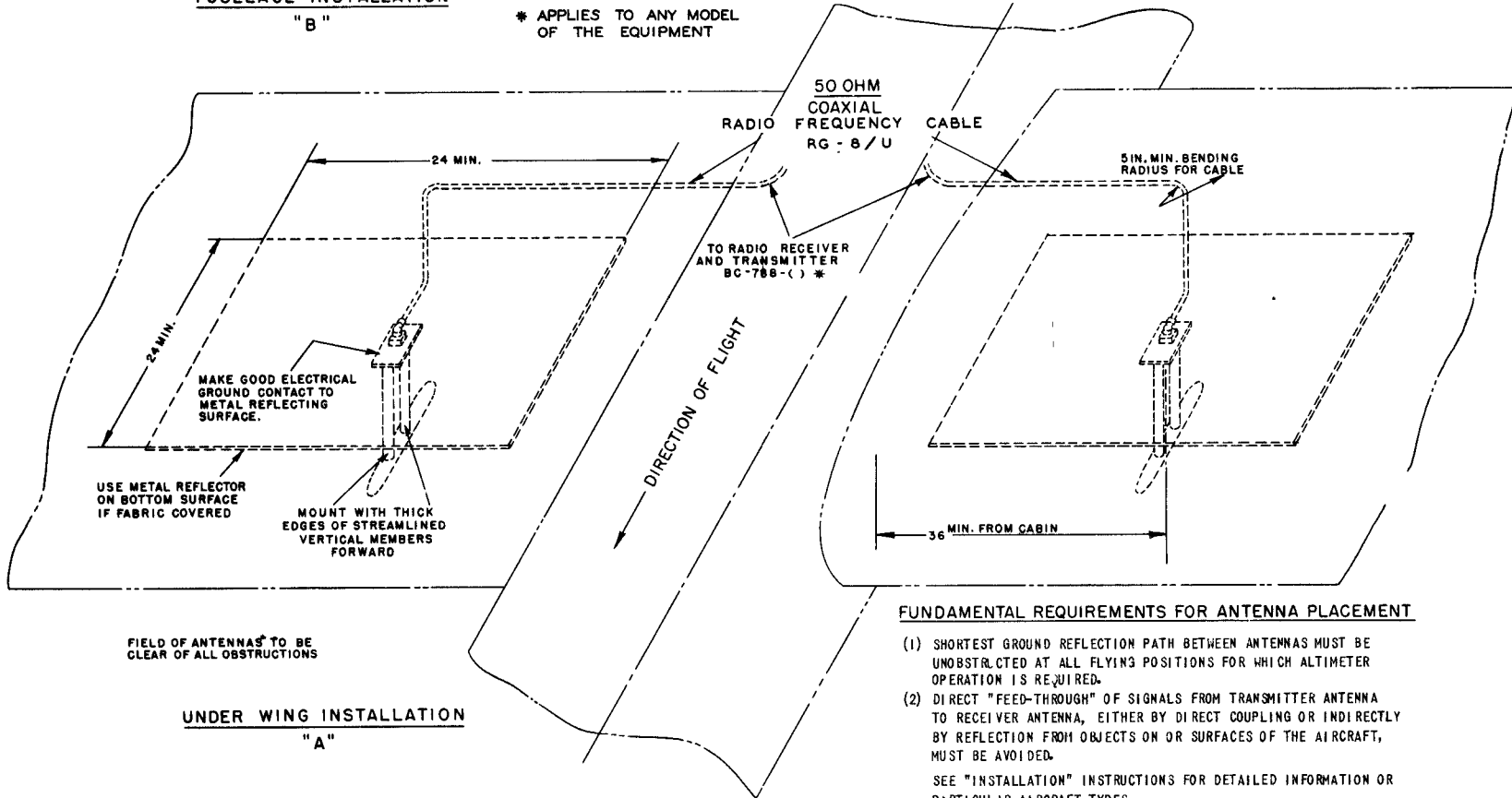


**FUSELAGE INSTALLATION**  
"B"

\* APPLIES TO ANY MODEL OF THE EQUIPMENT

NOTE:  
FOR UNDER WING MOUNTING—WITH AXES OF TRANSMITTER AND RECEIVER ANTENNAS PARALLEL AS SHOWN IN FIGURE "A" INTERMEDIATE SHIELDING IS REQUIRED AND IS NORMALLY PROVIDED BY METAL FUSELAGE.  
THE TWO ANTENNAS WITH AXES IN LINE CAN ALSO BE INSTALLED AS IN FIGURE "B" UNDERNEATH FUSELAGE APPROX 7 TO 14 FT APART, APPROX PARALLEL TO AXIS OF FUSELAGE THIS METHOD DOES NOT REQUIRE SHIELDING AND IS RECOMMENDED IN ALL CASES WHEN FUSELAGE IS FABRIC COVERED.

SEE ANTENNA INSTALLATION INSTRUCTIONS



**UNDER WING INSTALLATION**  
"A"

**FUNDAMENTAL REQUIREMENTS FOR ANTENNA PLACEMENT**

- (1) SHORTEST GROUND REFLECTION PATH BETWEEN ANTENNAS MUST BE UNOBSTRUCTED AT ALL FLYING POSITIONS FOR WHICH ALTIMETER OPERATION IS REQUIRED.
- (2) DIRECT "FEED-THROUGH" OF SIGNALS FROM TRANSMITTER ANTENNA TO RECEIVER ANTENNA, EITHER BY DIRECT COUPLING OR INDIRECTLY BY REFLECTION FROM OBJECTS ON OR SURFACES OF THE AIRCRAFT, MUST BE AVOIDED.

SEE "INSTALLATION" INSTRUCTIONS FOR DETAILED INFORMATION OR PARTICULAR AIRCRAFT TYPES.

Figure 5-5. Antenna Installation Diagram

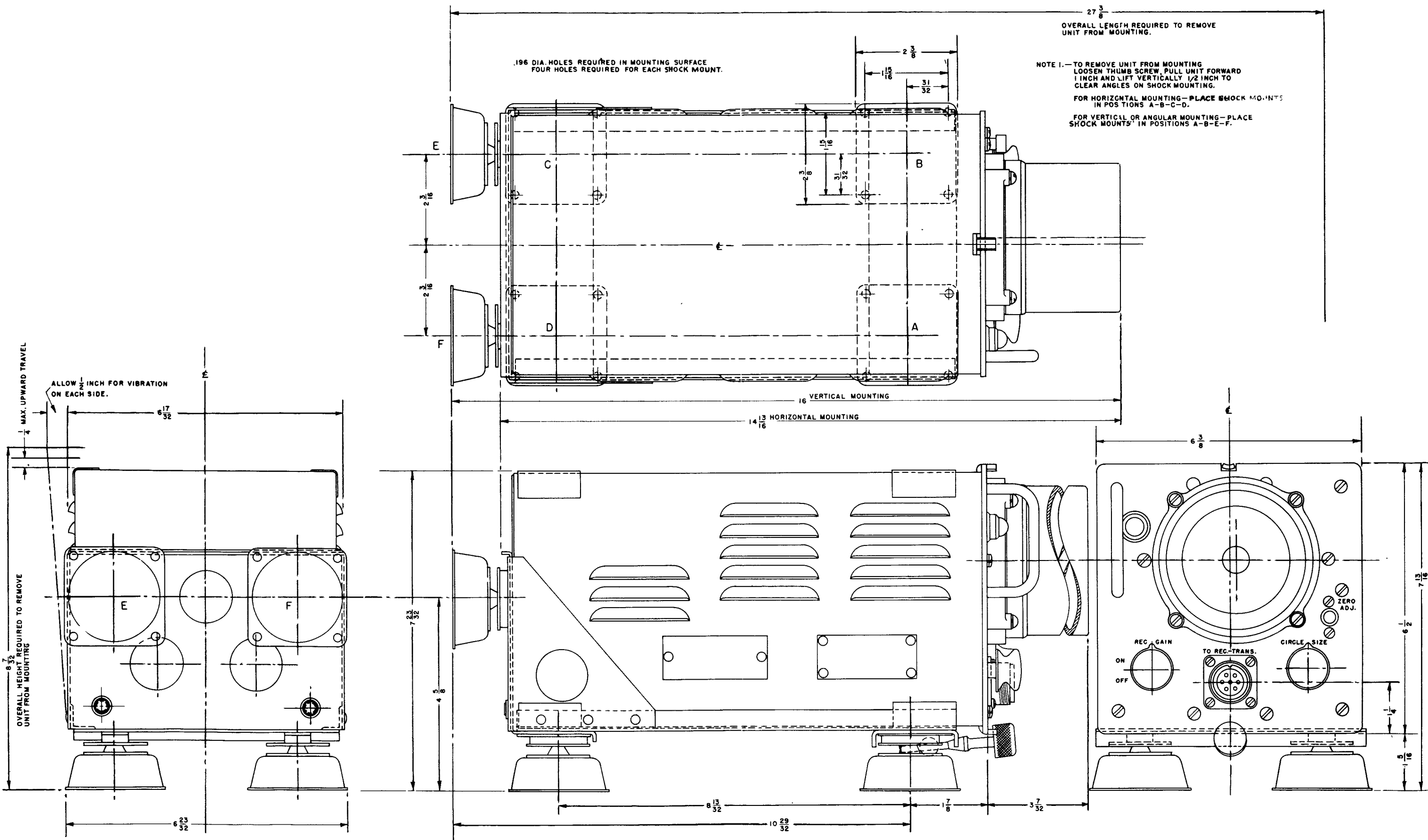


Figure 5-6. Indicator I-152-(-) —Outline Drawing

Section V  
Figure 5-7

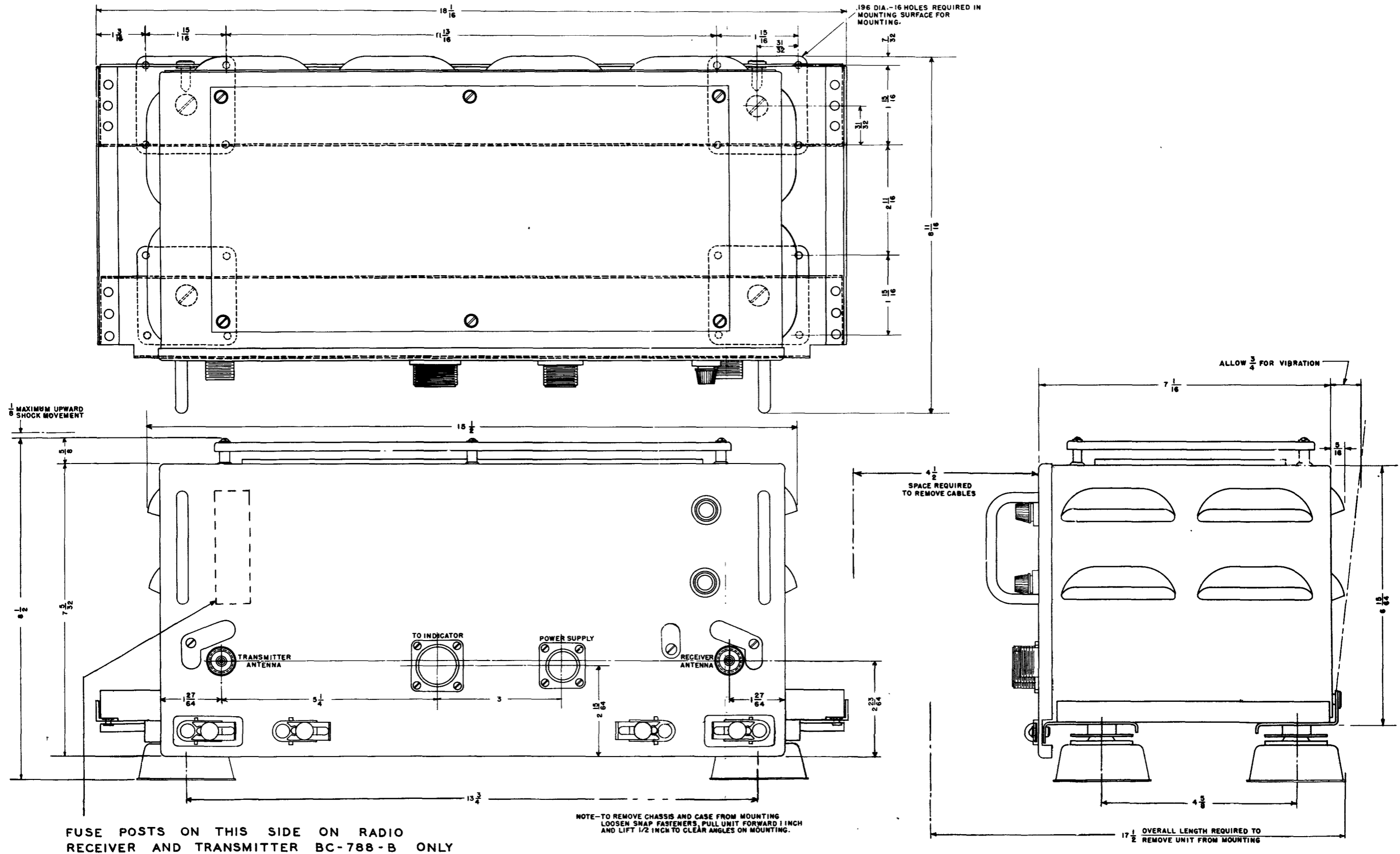


Figure 5-7. Radio Receiver and Transmitter BC-788-I Outline Drawing