AN 08-30APQ5-3

HANDBOOK OF OPERATING INSTRUCTIONS

for

INDICATOR EQUIPMENT AN/APQ-5 AND AN/APQ-5B

RESTRICTED
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LIST OF REVISED PAGES ISSUED

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AAF ACTIVITIES.—In accordance with T. O. No. 00-25-3, base Air Inspectors, Technical, will submit requisitions (AAF Form 104B) to the Commanding General, Fairfield Air Technical Service Command, Patterson Field, Fairfield, Ohio. Attention: Publications Distribution Branch.

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BRITISH ACTIVITIES.—Submit requirements on Form 294A, in duplicate, to the Air Publications and Forms Store, New College, Leadhall Lane, Harrogate, Yorkshire, England.

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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.

1. Rectifier PP-2/APQ-5
2. Compensator CN-1/APQ-5
3. Indicator ID-3/APQ-5
4. Synchronizer SN-8/APQ-5B
5. Control Box C-82/APQ-5B
6. Interconnecting Cable
7. Tracking Unit C-83/APQ-5B
8. Azimuth Potentiometer
9. Junction Box J-10/APQ-5A
10. Capacitor Unit MX-12/APQ-5A
11. Indicator Hood

Figure 1-1. Indicator Equipment AN/APQ-5B—Composite View

SAFETY NOTICE

This equipment employs high voltages which are dangerous and may be fatal if contacted by operating personnel. Observe all safety precautions and exercise extreme care when working with this equipment.

SECTION I
GENERAL DESCRIPTION

1. GENERAL.

a. PURPOSE.—Indicator Equipment AN/APQ-5 and AN/APQ-5B are auxiliary equipment to be used in conjunction with certain airborne radar installations.

b. ASSOCIATED EQUIPMENT.—Indicator Equipment AN/APQ-5 and AN/APQ-5B are designed for use with aircraft radars such as Army type Radio Sets SCR-517-A, SCR-517-B, SCR-517-C, SCR-717-A, and SCR-717-B and Navy type ASC, ASD, ASD-1, ASG, and ASH types with a minimum of electrical changes required in these installations. The attachment of the indicator equipment does not interfere with the normal functioning of the associated equipment when properly installed.

c. POWER REQUIREMENTS. — Maximum power requirements for Indicator Equipment AN/APQ-5 and AN/APQ-5B are 0.75 amperes at 28 volts direct current and 4.04 amperes at 115 volts, 400 cycles (465 watts) alternating current.

Normal a-c power requirement is 410 watts. Power factor is approximately unity. The 400-cycle power is normally supplied by a separate inverter.

d. ADAPTABILITY.

(1) The following table shows the adapter kit required for interconnection of indicator equipment and associated radar equipment.

Radar Equipment	*Adapter Kit Required*
Radio Set SCR-517-A	MC-456
Radio Set SCR-517-B	MC-456
Radio Set SCR-517-C	MC-456
Radio Set SCR-717-A	MX-30/APQ-5*
Radio Set SCR-717-B	MX-30/APQ-5*
Radio Set SCR-667-A	MX-30/APQ-5*
Radar Set AN/APS-2	AN/APA-19*
Radar Set AN/APS-2A	AN/APA-19*
Radar Set AN/APS-2B	AN/APA-19*
Radar Set AN/APS-2C	AN/APA-19*
Radar Set AN/APS-2D	AN/APA-19*
Radar Set AN/APS-2E	AN/APA-19*

* Indicates adapter kit furnished unless otherwise specified.

(2) The following table gives the nomenclature cross reference of the equipments with which the adapter kits are used.

NOMENCLATURE CROSS REFERENCE

Navy Classification	*AN Classification*	*Adapter Kit Required*
ASC	SCR-517-( )	MC-456
ASD	SCR-667-( )	AN/APA-18
ASD-1	AN/APS-3	AN/APA-18
ASG	AN/APS-15	AN/APA-19

2. EQUIPMENT SUPPLIED.

a. Indicator Equipment AN/APQ-5B is composed of the units shown in figure 1-1. Indicator Equipment AN/APQ-5 (Mod.) is composed of the units shown on figure 1-3. Figure 1-3 includes the separate junction box and capacitor units supplied with later equipments.

b. The units supplied with Indicator Equipment AN/APQ-5 (Mod.) are listed in table 1-1. Similar information for Indicator Equipment AN/APQ-5B is given in table 1-2.

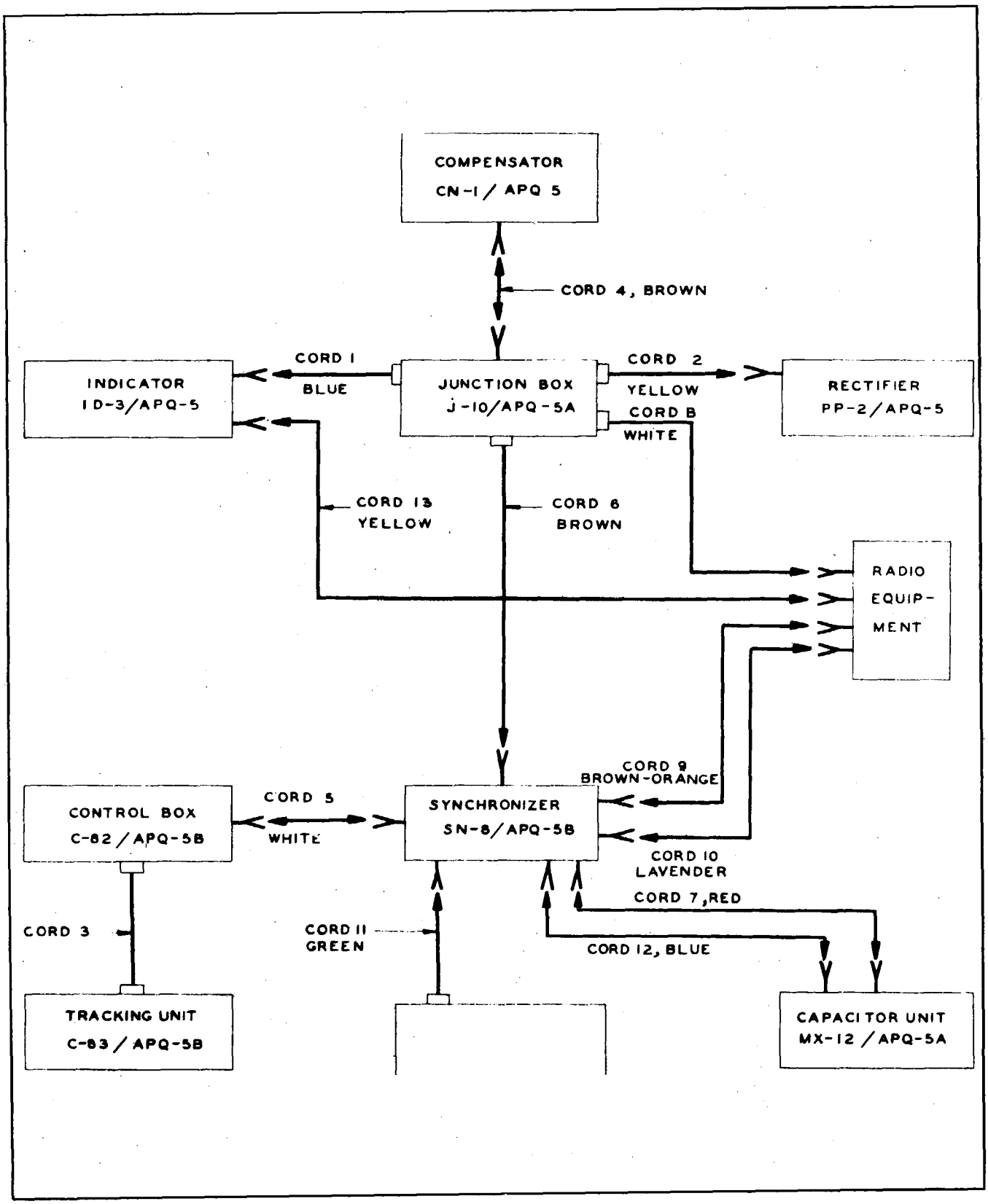


Figure 1-2. Indicator Equipment AN/APQ-5B—Block Diagram

TABLE 1-1. EQUIPMENT SUPPLIED WITH INDICATOR EQUIPMENT AN/APQ-5 (MOD.)

Quantity	*Name of Unit*	*Army-Navy Type Designation*	*Overall Dimensions (Inches)*			*Weight (pounds)*
			L (or D)	*W*	*H*	
1	Synchronizer	SN-1/APQ-5	22-11/16§	11-7/16	9-1/8	28½ (includes mounting)
1	Mounting	MT-43/APQ-5				
1	Control Unit	C-6/APQ-5	6-19/32	11-1/2	8-13/32‡	12 (includes mounting)
1	Mounting	MT-19/APQ-5				
1	Control Box	C-23/APQ-5	3-1/2	7**	2-1/2	2¼
1	Tracking Unit	C-7/APQ-5	4-21/64	13-3/16	6-23/32‡	7¼ (includes mounting)
1	Mounting	MT-17/APQ-5				
1	Indicator	ID-3/APQ-5	22-25/32‖	8-3/4	10	11¾ (includes mounting)
1	Mounting	MT-18/APQ-5				
1	Rectifier	PP-2/APQ-5	22-9/16§	9-1/8	5-7/8	19½ (includes mounting)
1	Mounting	FT-357-B				
1*	(Junction Box)	J-1/APQ-5	11-5/8¶	13-49/64‡	4-1/16	25††
	(Capacitor Unit)	MX-1/APQ-5				
1†	Junction Box	J-10/APQ-5A	2-5/16	9-11/16**	8-1/2	13½††
1†	Capacitor Unit	MX-12/APQ-5A	5-3/4‡	7-15/16	5-7/16	8½
1	Mounting	MT-42/APQ-5A				
1	Compensator	CN-1/APQ-5	5-9/16§	6-1/8	4-13/16	1
1	Adapter Kit and Cables (see figs. 5-2 and 5-3 for information)					Total Installed Weight 125 lbs. (Est.)

* Combined junction box and capacitor unit supplied with early equipments.
† Separate junction box and capacitor unit supplied with later equipments.
‡ Allow 3¼" additional clearance in mounting for removal of cables.
§ Allow 2⅛" additional clearance in mounting for removal of cables.
‖ Allow 1" additional clearance in mounting.
¶ Allow 11¼" additional clearance in mounting for removal of capacitor unit.
** Allow 3¼" additional clearance in mounting at each end for removal of cables.
†† Weight includes attached cables for installation in a B-24 bomber.

TABLE 1-2. EQUIPMENT SUPPLIED WITH INDICATOR EQUIPMENT AN/APQ-5B

Quantity	*Name of Unit*	*Army-Navy Type Designation*	*Overall Dimensions (In.)*			*Weight (pounds)*
			L (or D)	*W*	*H*	
1	Synchronizer	SN-8/APQ-5B	22-11/16*	11-7/16	9-1/8	28½ (including mounting)
1	Mounting	MT-43/APQ-5				
1	Control Box	C-82/APQ-5B	5-3/8	11-1/2	8-11/16	7
1	Mounting	MT-19/APQ-5				
1	Tracking Unit	C-83/APQ-5B	5-5/16	16-1/4	8-1/2	10
1	Mounting	MT-206/APQ-5B				
1	Indicator	ID-3/APQ-5	22-25/32§	8-3/4	10	11¾
1	Mounting	MT-18/APQ-5				
1	Rectifier	PP-2/APQ-5	22-9/16*	9-1/8	5-7/8	19½
1	Mounting	FT-357-B				
1	Junction Box	J-10/APQ-5A	2-5/16	9-11/16‖	8-1/2	13½¶
1	Capacitor Unit	MX-12/APQ-5A	5-3/4‡	7-15/16	5-7/16	8½
1	Mounting	MT-42/APQ-5A				
1	Compensator	CN-1/APQ-5	5-9/16*	6-1/8	4-13/16	1
1	Adapter Kit and Cables (See Fig. 5-1 for information)					Total Installed Weight 120 lbs. (Est.)

* Allow 2⅛" additional clearance in mounting for removal of cables.
† Allow 4" additional clearance in mounting for removal of cables.
‡ Allow 3¼" additional clearance in mounting for removal of cables.
§ Allow 1" additional clearance in mounting.
‖ Allow 3¼" additional clearance in mounting at each end for removal of cables.
¶ Weight includes attached cables for installation in B-24 bomber.

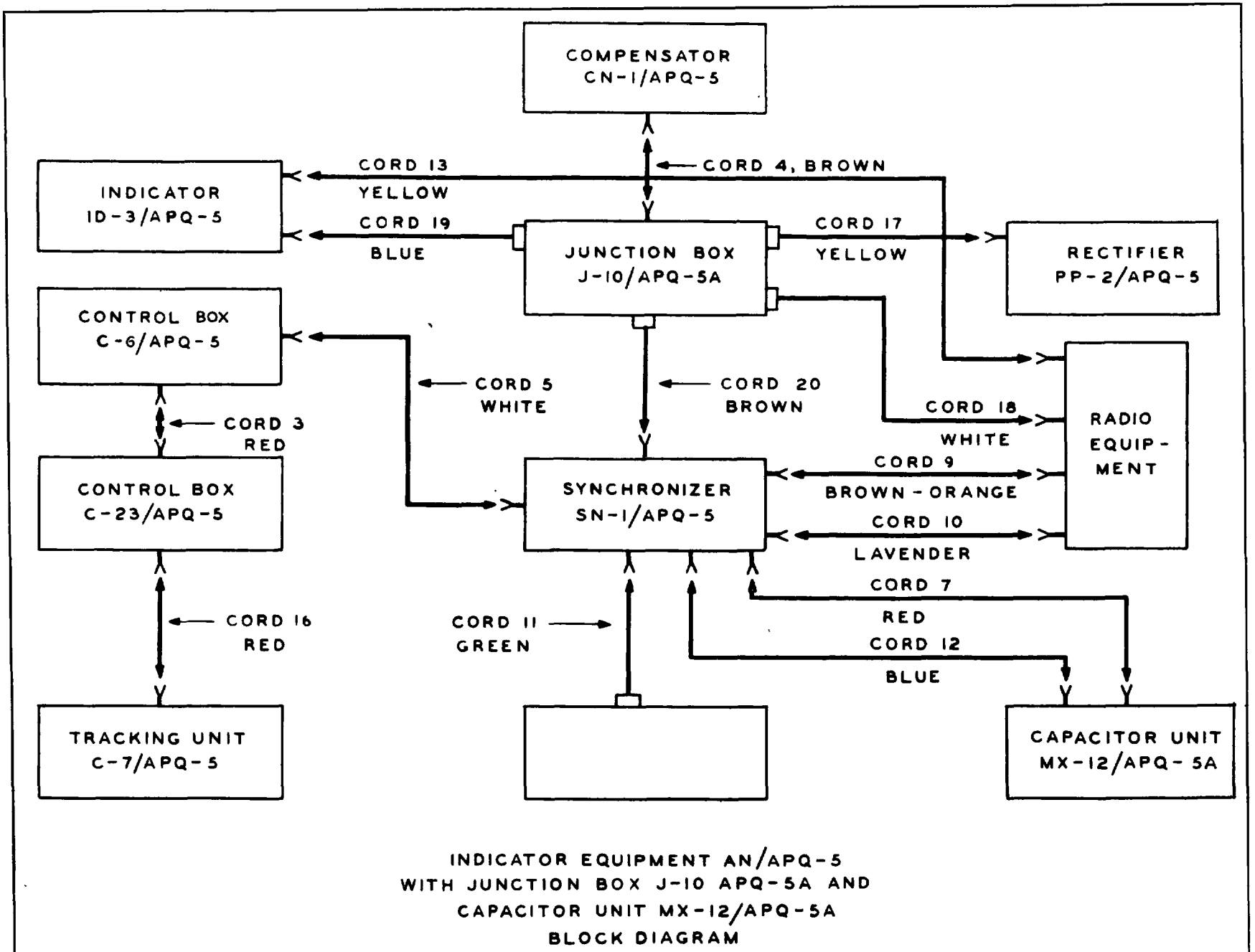


Figure 1-3. Indicator Equipment AN/APQ-5 With Junction Box J-10/APQ-5A and Capacitor Unit MX-12/APQ-5A—Block Diagram

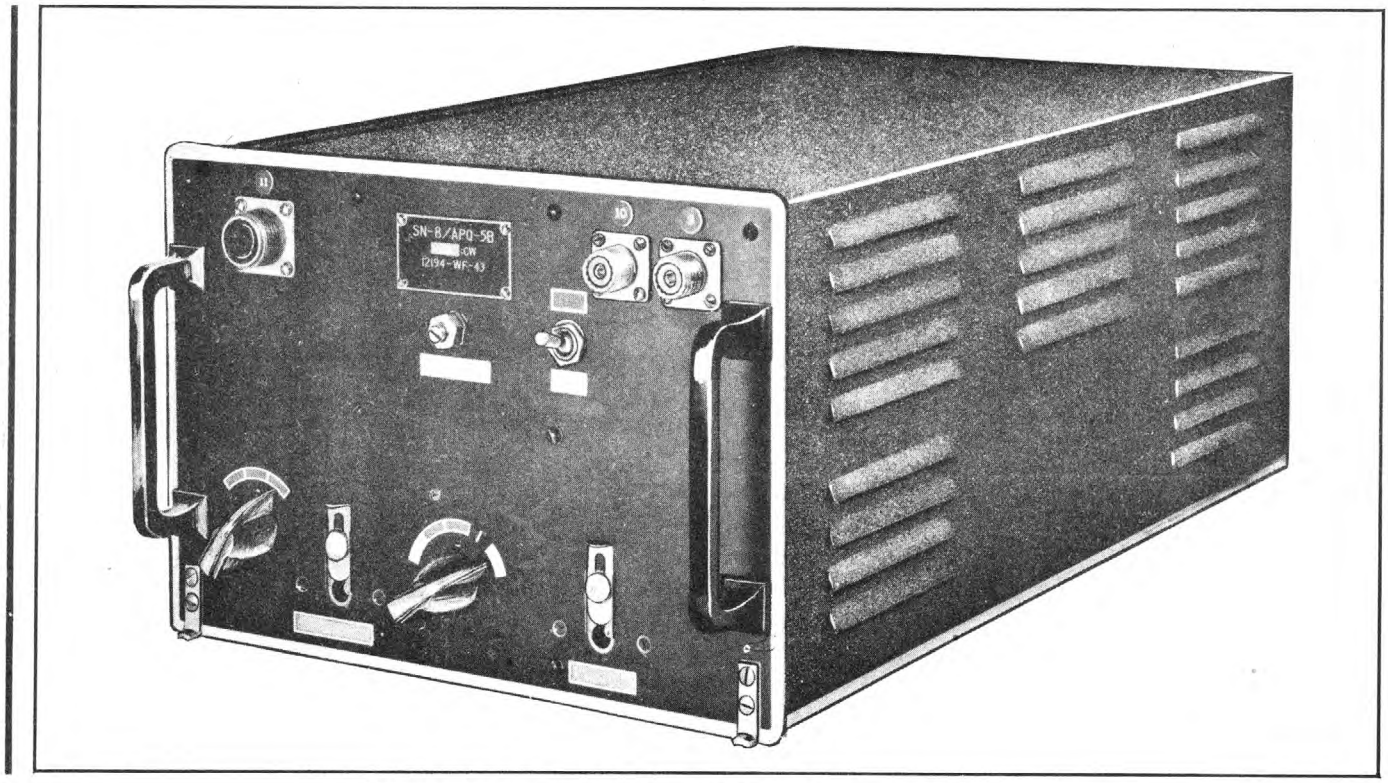


Figure 1-4. Synchronizer SN-8/APQ-5B—Front View

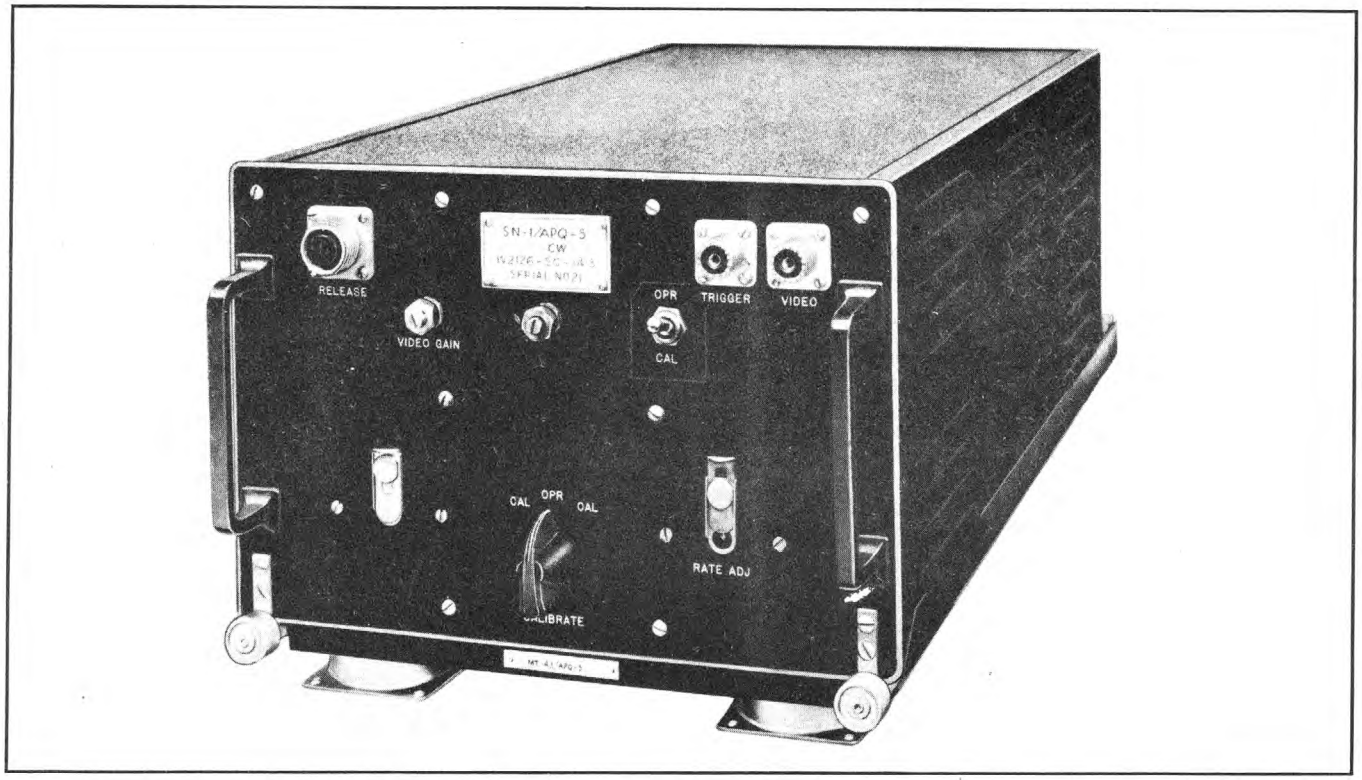


Figure 1-5. Synchronizer SN-1/APQ-5—Front View

3. EQUIPMENT REQUIRED BUT NOT SUPPLIED.

The following table lists the equipment required but not supplied with Indicator Equipment AN/APQ-5 or AN/APQ-5B.

TABLE 1-3. EQUIPMENT REQUIRED BUT NOT SUPPLIED

Quantity	*Name of Unit*	*Army Type Designation*	*Required Characteristics*
1	Test Equipment	TS-102/AP or TS-19/APQ-5	Supply trigger pulse and video markers.
1	Power Unit	PE-143-( )	28 volts, 150 amperes d-c. (3H-4600-143B)
1	Cord (required if not supplied with power unit)	CD-723	200-ampere capacity (3E-1723C)
1	Voltmeter	IS-189	20,000 ohms per volt
1	Wheatstone Bridge	I-49	Standard commercial type
1	Voltmeter, Weston, Simpson or similar	IS-185	20,000 ohms or more per volt
1	Radar Equipment		See table, section 1, paragraph 1*d*.
1	Optical Sight		Normally installed in bombing plane.
1	Pilot Direction Indicator		Normally installed in bombing planes.
1	Inverter	PE-218-( )	Must furnish 500 volt-amperes, 115 volts a-c usually a duplicate of inverter supplying associated radar.

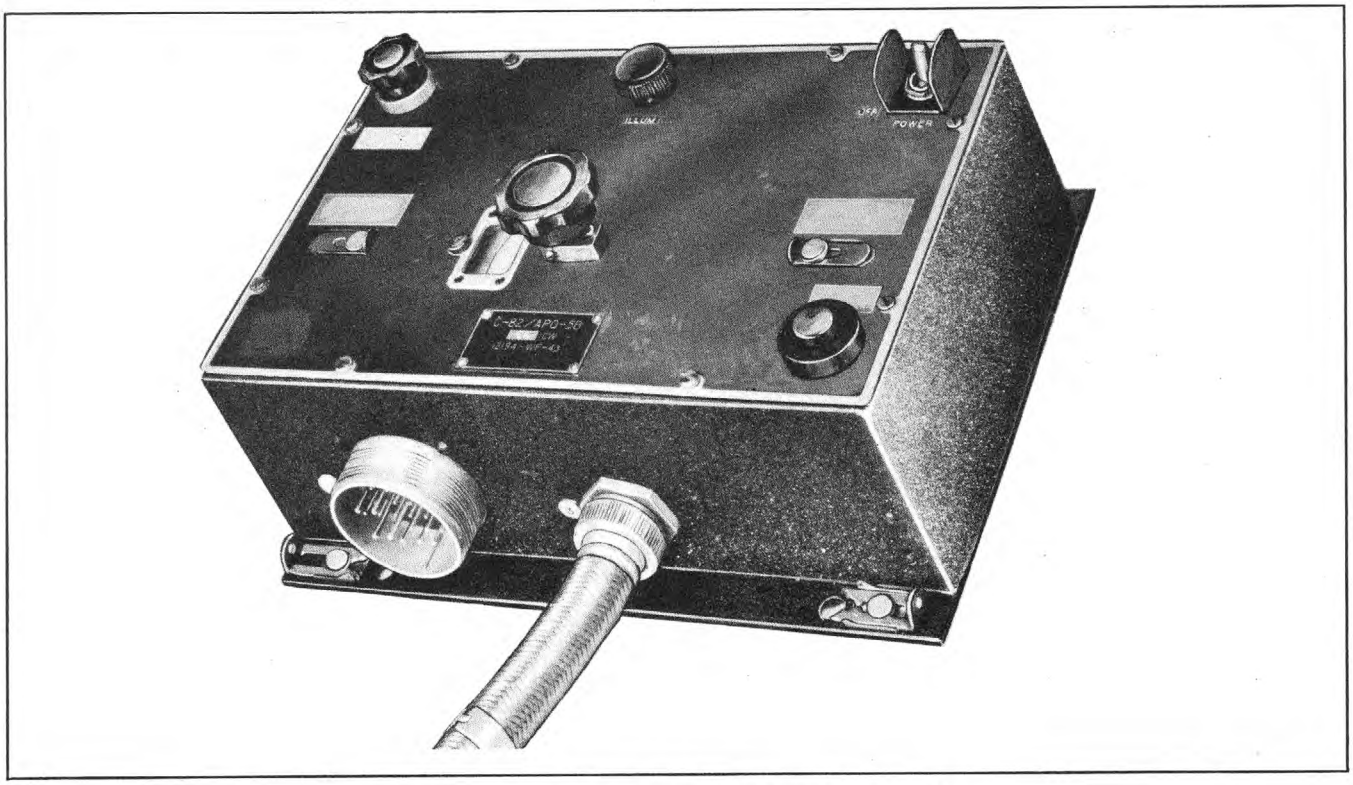


Figure 1-6. Control Box C-82/APQ-5B—Front View

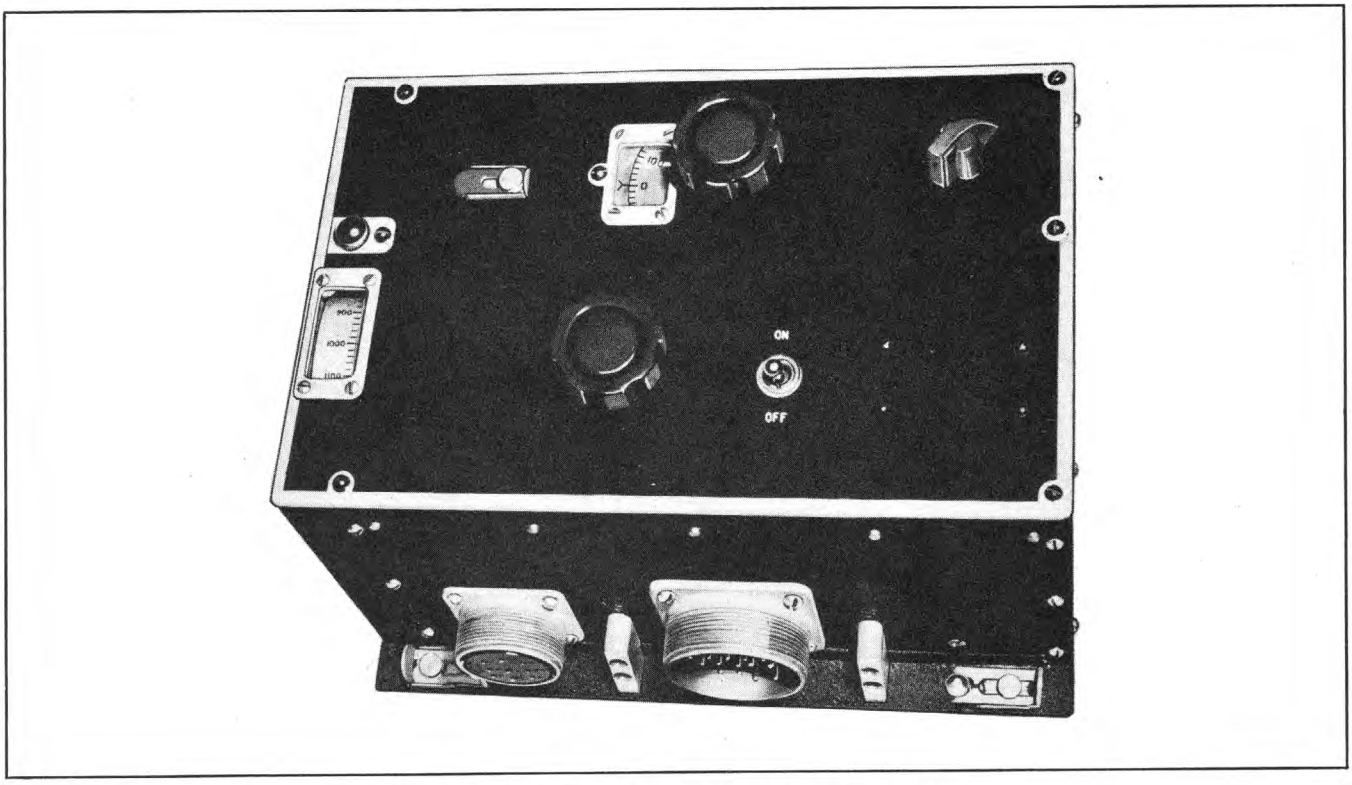


Figure 1-7. Control Box C-6/APQ-5—Front View

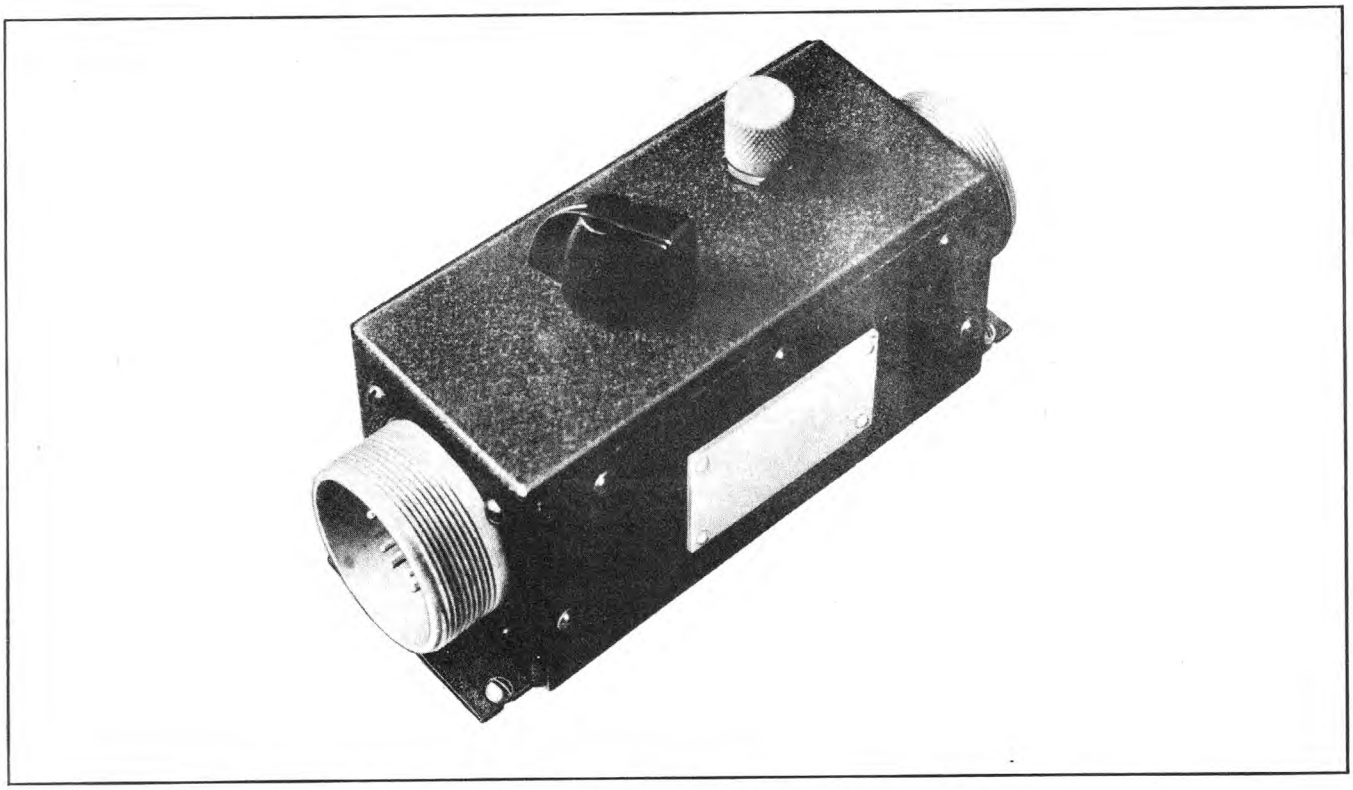


Figure 1-8. Control Box C-23/APQ-5—Front View

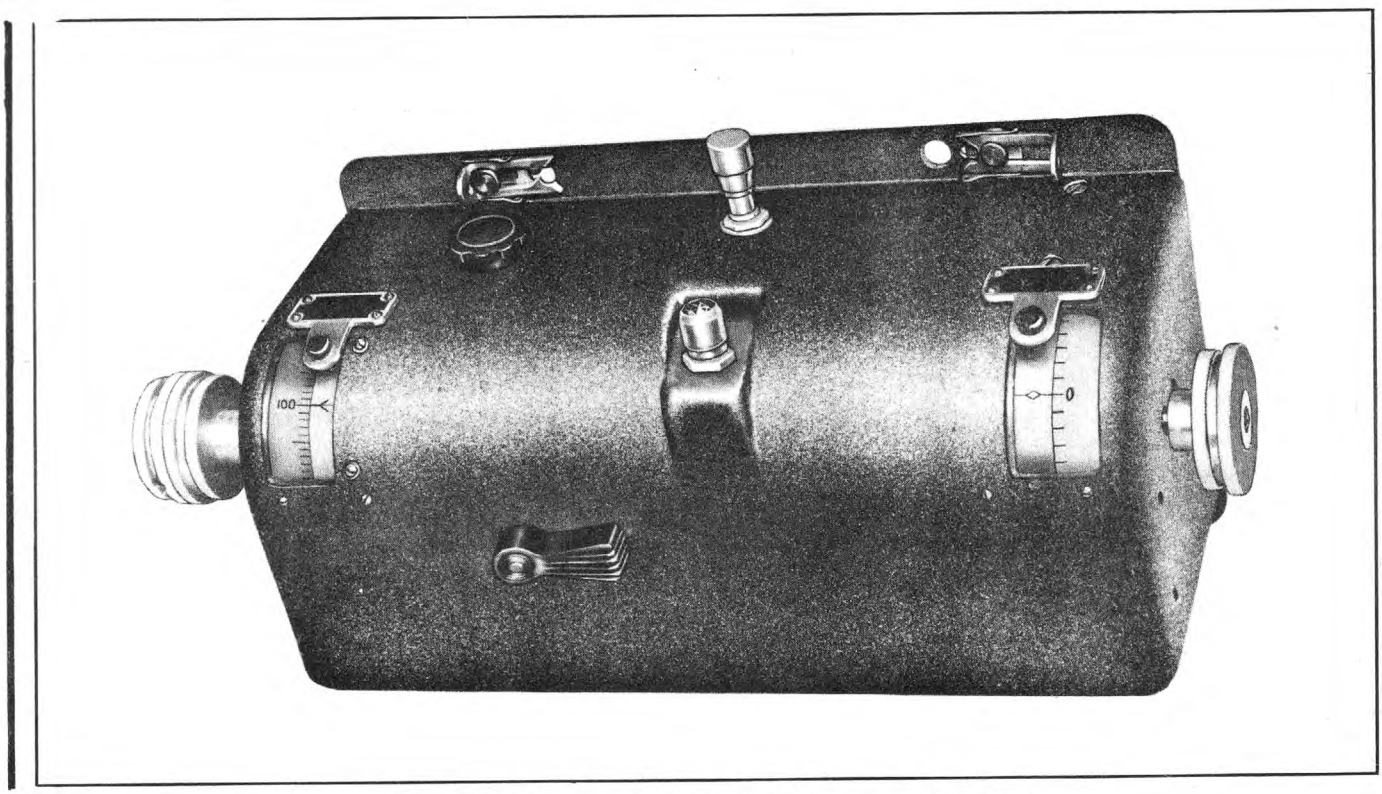


Figure 1-9. Tracking Unit C-83/APQ-5B—Front View

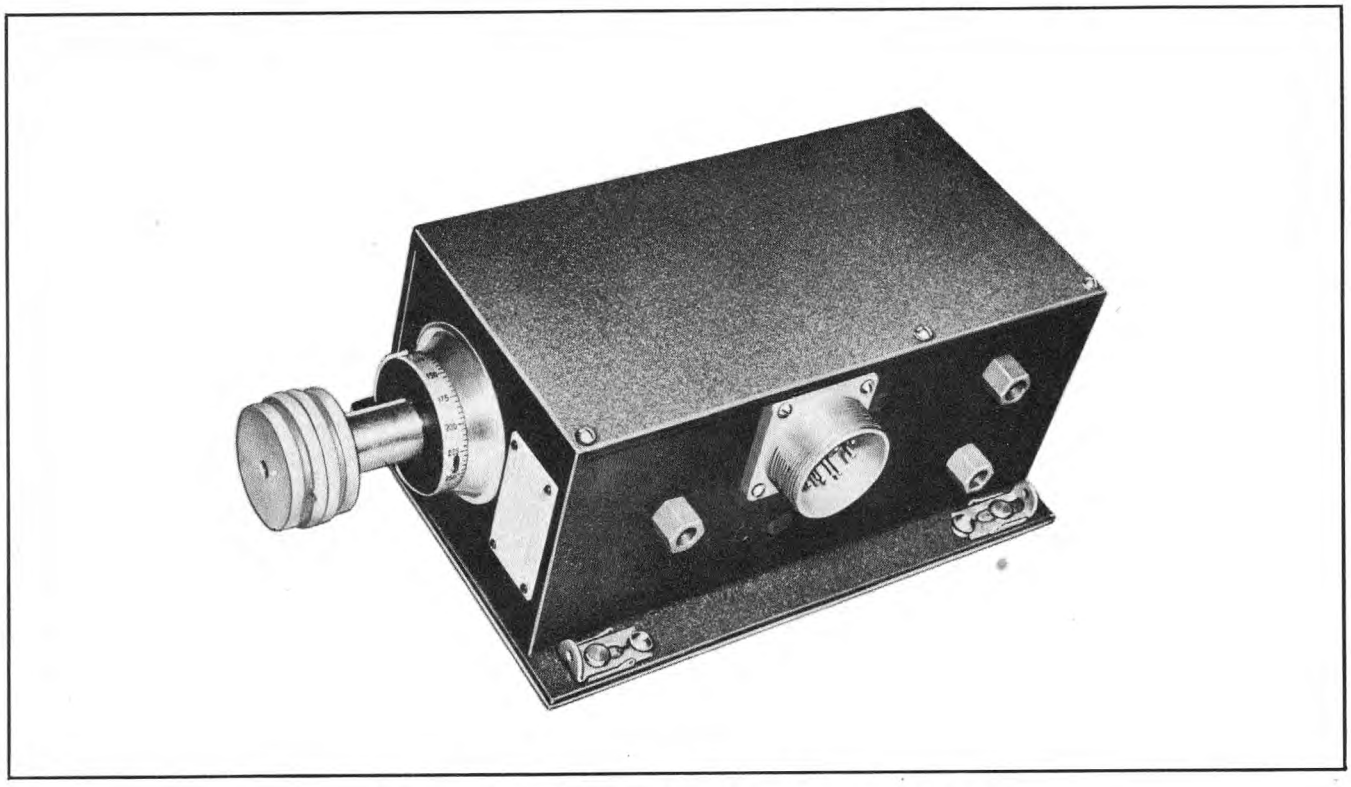


Figure 1-10. Tracking Unit C-7/APQ-5—Front View

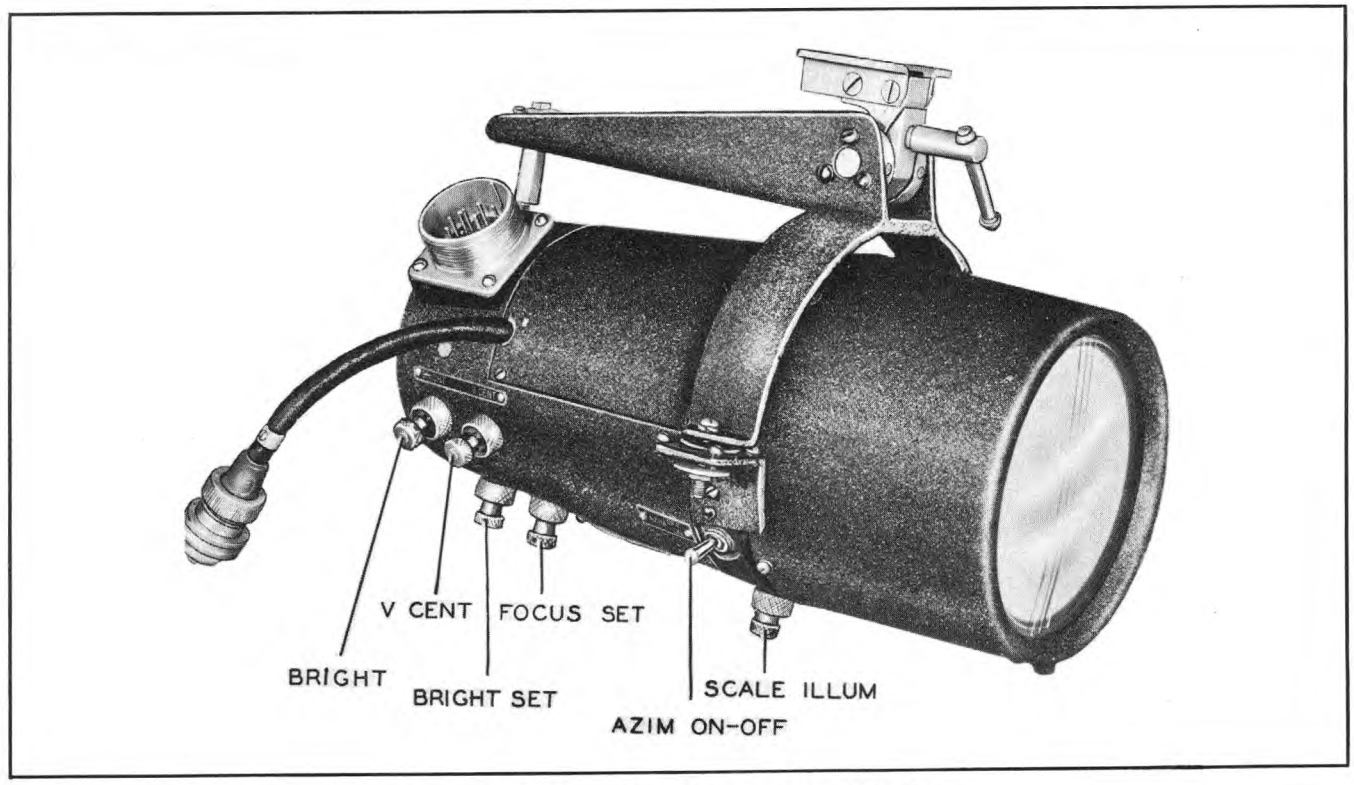


Figure 1-11. Indicator ID-3/APQ-5—Side View

SAFETY NOTICE

This equipment employs high voltages which are dangerous and may be fatal if contacted. Exercise extreme caution in using this equipment.

SECTION II
INSTALLATION AND ADJUSTMENT

CAUTION

Capacitor Unit MX-1/APQ-5 or MX-12/APQ-5A should be removed from an aircraft on the ground if the temperature within the aircraft exceeds 54°C (155°F).

1. INSTALLATION.

a. PRELIMINARY PROCEDURE.—Indicator Equipment AN/APQ-5 is packed in two cartons. The major units are packed in one carton while Adapter Kit MX-30/APQ-5A with spare parts is packed in the other carton. Indicator Equipment AN/APQ-5B is packed in two boxes, one containing group A parts (cable components, racks and mountings) and one containing group B parts (units and adapter kits). Unpack the equipment and make tests as indicated below.

(1) Remove equipment from packing cartons and clean with dry air.

(2) Carefully inspect equipment for visible damage that might have occurred during shipment.

(3) Check to see that all the tubes are seated tightly in the proper sockets.

(4) Perform Bench Test and Calibration in accordance with section II of *Handbook of Maintenance Instructions for Indicator Equipment AN/APQ-5 or AN/APQ-5B.*

b. INSTALLATION OF MAJOR ASSEMBLIES OF INDICATOR EQUIPMENT AN/APQ-5.—For convenience, those units which are used directly by the operator are compactly arranged at his station. The location of the various other units will be determined by the type of aircraft in which they are installed. All units, with the exception of the compensator, are enclosed in dust covers. These protect the equipment and serve to prevent the operator from coming in contact with high voltage.

(1) SYNCHRONIZER SN-1/APQ-5 AND MOUNTING MT-34/APQ-5.—The synchronizer may be located out of arms' reach of the operator as its controls require adjustment only when lining up and testing the system. However, since adjustment of these controls requires observation of the indicator and operation of the control unit and tracking unit, locate it with this in mind. The synchronizer is provided with an ATR-type mounting which permits the unit to be readily moved for maintenance. (See fig. 2-1.)

(2) CONTROL BOX C-6/APQ-5 AND MOUNTING MT-19/APQ-5.—Locate the control box within arms' reach of the operator, but as its controls do not require continuous adjustment, any location which permits access to the controls and a view of the dials and warning pilot light may be used. The control box is provided with snap slides; its mounting has countersunk holes for No. 10 flathead machine screws for attachment to the airplane. (See fig. 2-2.)

(3) CONTROL BOX C-23/APQ-5 AND MOUNTING MT-49/APQ-5.—The control box is attached to its mounting plate with four screws while the mounting plate is secured to the supporting surface by four No. 10 flathead screws. Since this control box is connected between Control Box C-6/APQ-5 and Tracking Unit C-7/APQ-5, locate it between these units within convenient reach of the operator. (See fig. 2-3.)

(4) TRACKING UNIT C-7/APQ-5 AND MOUNTING MT-17/APQ-5.—Locate this unit aft of the stabilizer above the operator's knees, or to the left of the stabilizer so that the operating knobs may be conveniently grasped by the operator and the dials and associated index marks may be easily seen. The unit is provided with a snapslide base and mounting plate with countersunk holes for No. 10 flathead machine screws for attachment to the airplane. (See fig. 2-4.)

(5) INDICATOR ID-3/APQ-5 AND MOUNTING MT-18/APQ-5.—Mount the indicator so that the operator can conveniently place his face against the visor to view the cathode-ray tube while grasping the operating knobs of the tracking unit and the knobs of the turn control system. To facilitate this, the indicator unit mounting permits the indicator unit to be tilted approximately

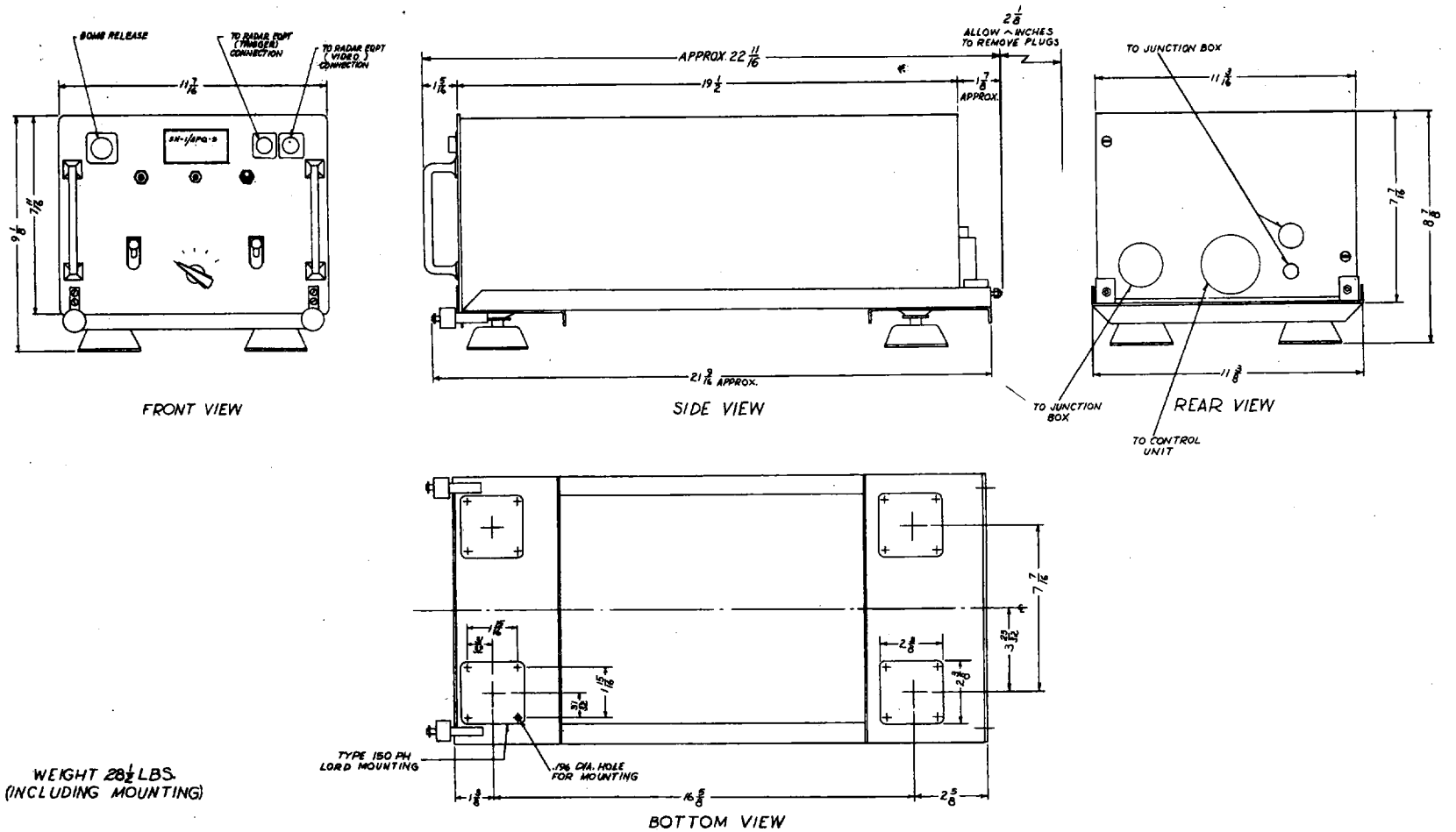


Figure 2-1. Synchronizer SN-1/APQ-5—Outline Dimensions

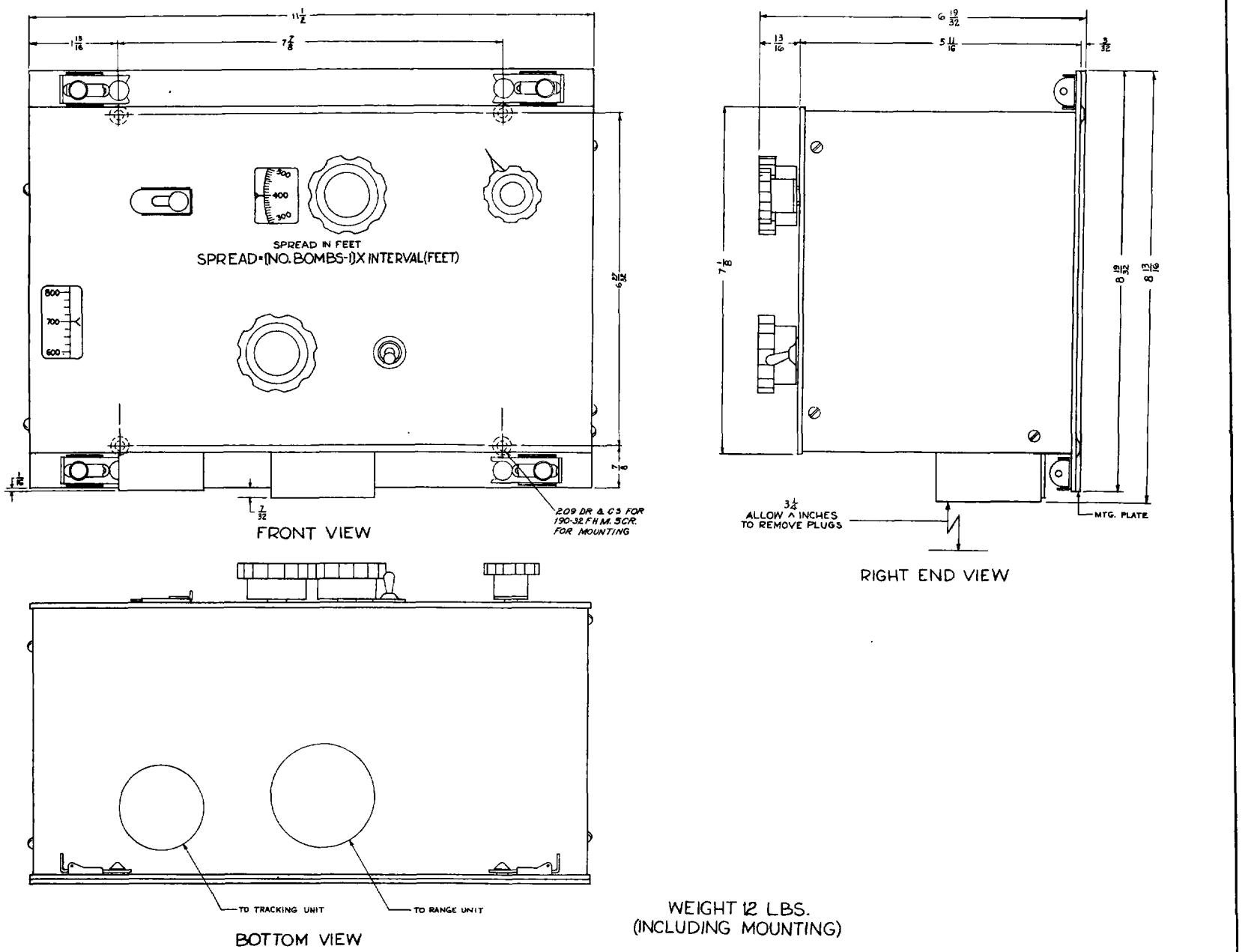


Figure 2-2. Control Box C-6/APQ-5—Outline Dimensions

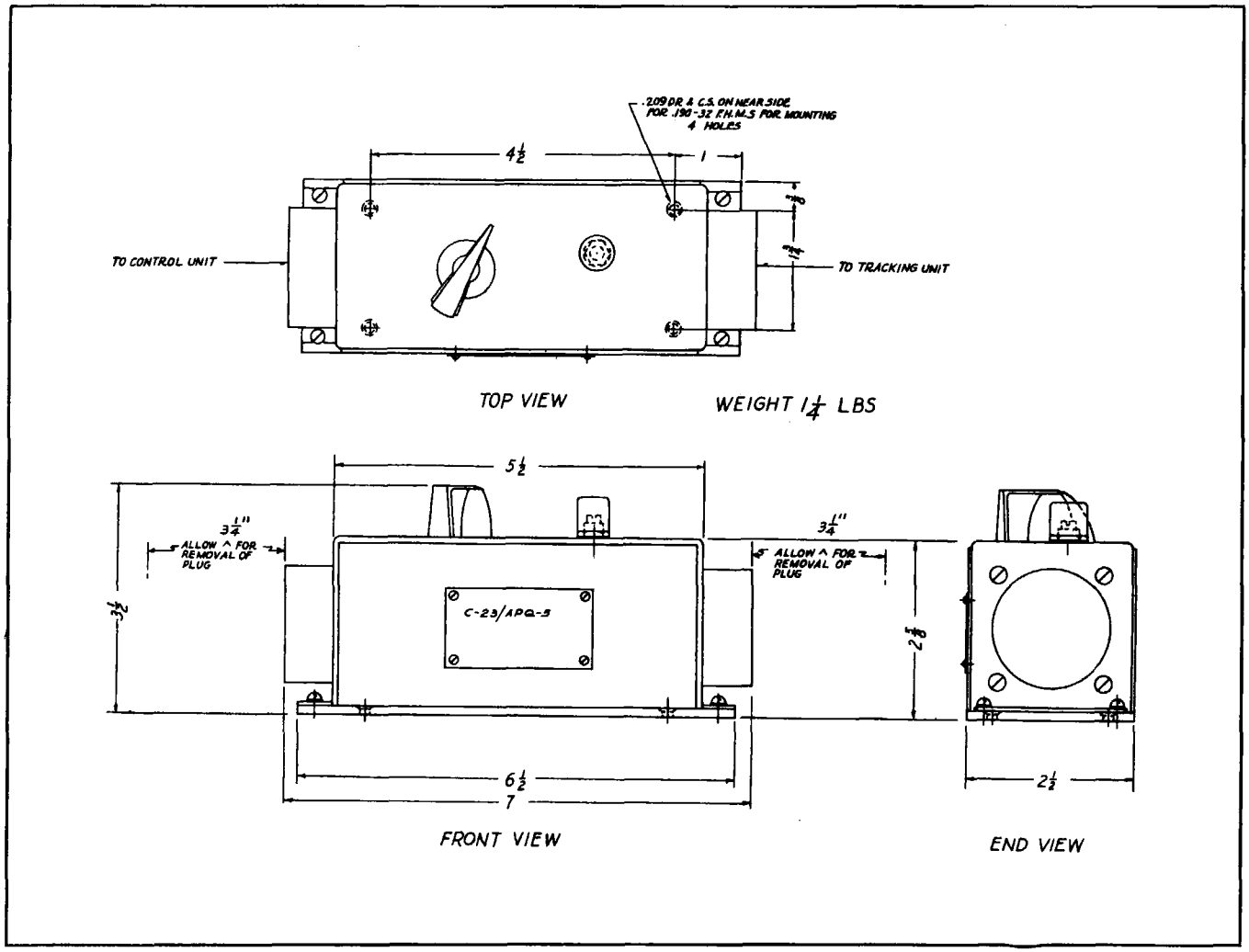


Figure 2-3. Control Box C-23/APQ-5—Outline Dimensions

30 degrees above or below horizontal. It may be desirable to swing the indicator to the left or right when not in use, but brackets for this purpose must be provided by the using service. (See fig. 2-5.)

(6) RECTIFIER FP-2/APQ-5 AND MOUNTING MT-357-B.—The rectifier unit may be located at a distance from the operator as its controls, which regulate the output voltage, require adjustment only when lining up the system. It is provided with an ATR-type mounting which permits the unit to be readily removed for maintenance. (See fig. 2-6.)

(7) JUNCTION BOX J-10/APQ-5A, CAPACITOR UNIT MX-12/APQ-5A, AND MOUNTING MT-42/APQ-5A.

(a) The junction box and capacitor unit are separate units. Locate the junction box centrally with respect to the other units to which it connects. This is to minimize the lengths of cables required.

(b) The capacitor unit will usually be mounted under the navigator's table on the left-hand side, leaving about 4 inches between the unit and the side of the airplane for the removal of the cables. The capacitor unit is attached with snapslide fasteners to its mounting plate while the mounting plate is secured to the supporting structure with four No. 10 flathead screws. (See figs. 2-7 and 2-8.)

CAUTION

Remove the capacitor unit when the airplane is on the ground and the temperature in the airplane exceeds 68°C (155°F).

(8) COMPENSATOR CN-1/APQ-5.—Mount the compensator on the right-hand side of the stabilizer. The mounting bracket is mounted on the side of the stabilizer with the screws already furnished for attaching the side plate, while the compensator index is mounted in place of the existing index, using the same screws. (See fig. 2-9.)

(9) JUNCTION BOX J-1/APQ-5 AND CAPACITOR UNIT MX-1/APQ-5.—In earlier models of this equipment, Capacitor Unit MX-1/APQ-5 is combined with the junction box and with the precision capacitors mounted on a removable tray. Remove the capacitor unit from the airplane when it is on the ground when the temperature exceeds 68°C (155°F). To permit removal of the

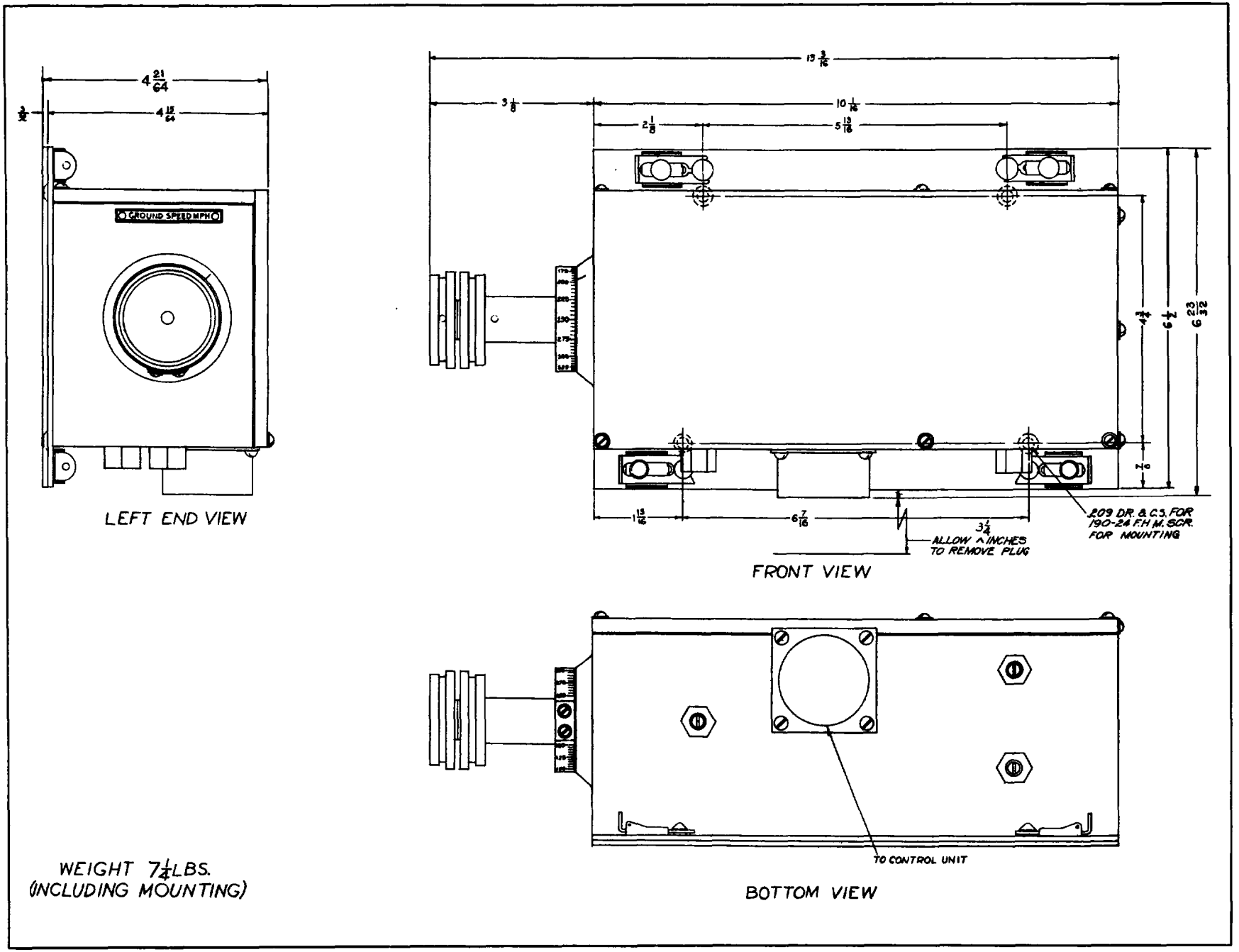


Figure 2-4. Tracking Unit C-7/APQ-5—Outline Dimensions

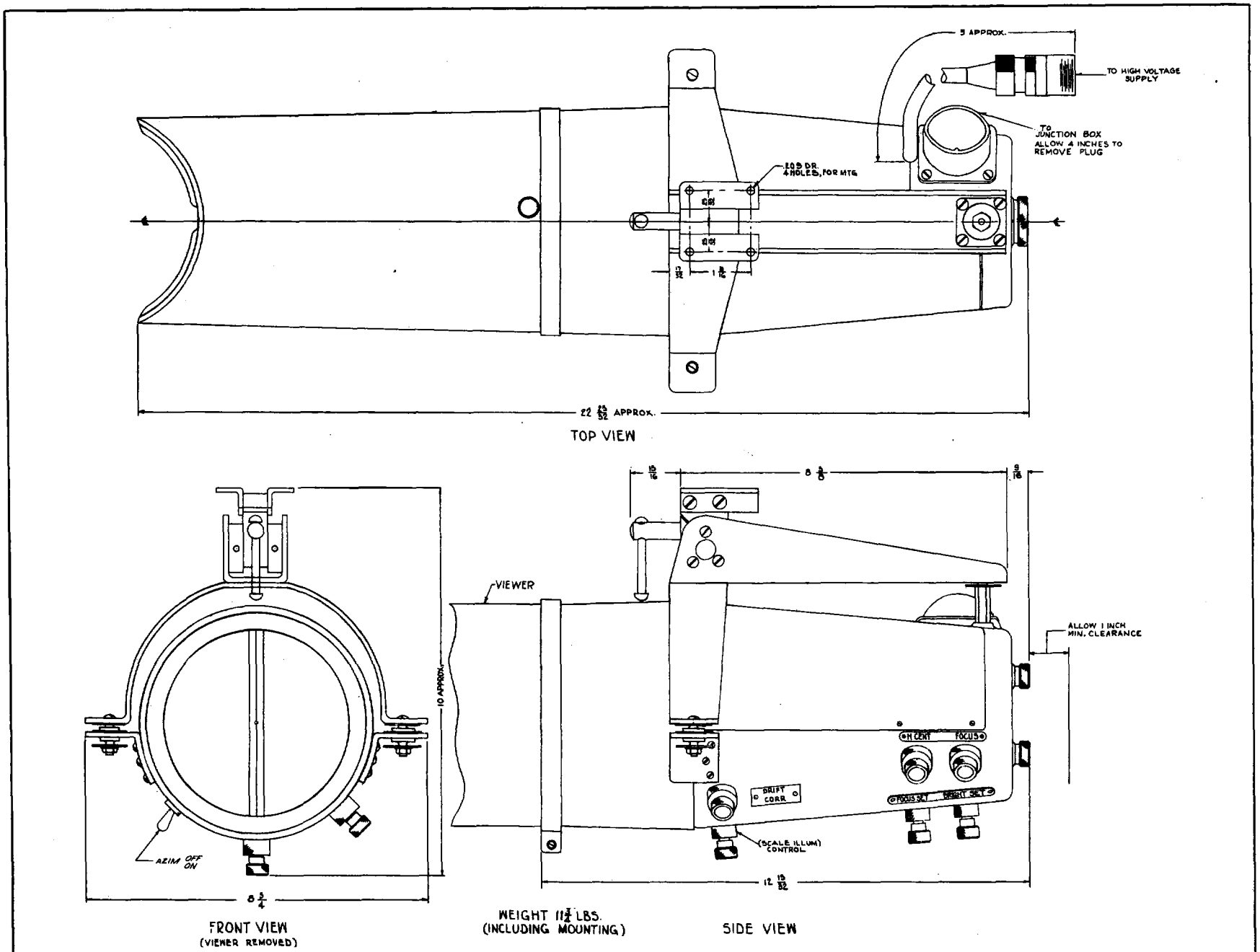


Figure 2-5. Indicator ID-3/APQ-5—Outline Dimensions

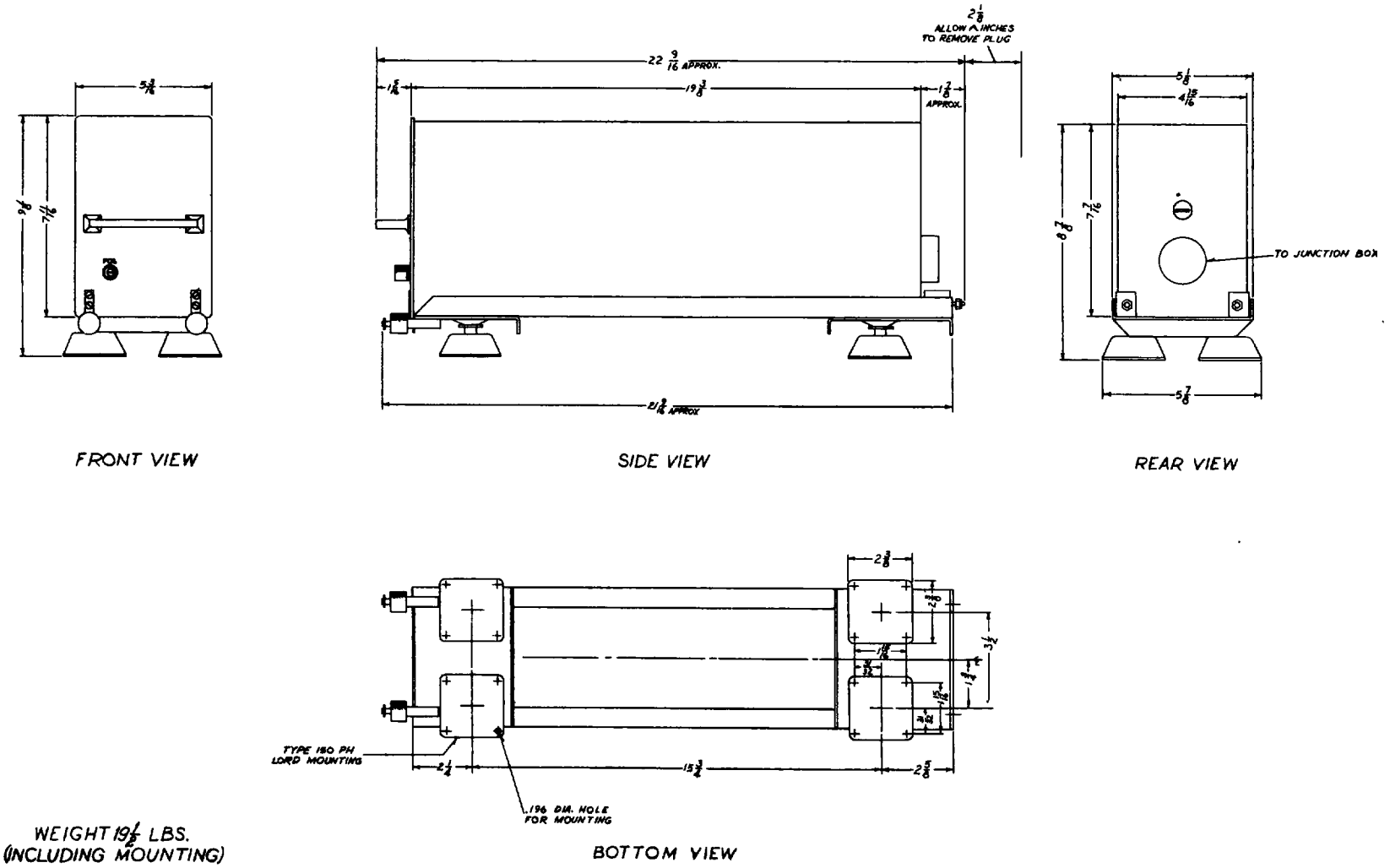


Figure 2-6. Rectifier PP-2/APQ-5—Outline Dimensions

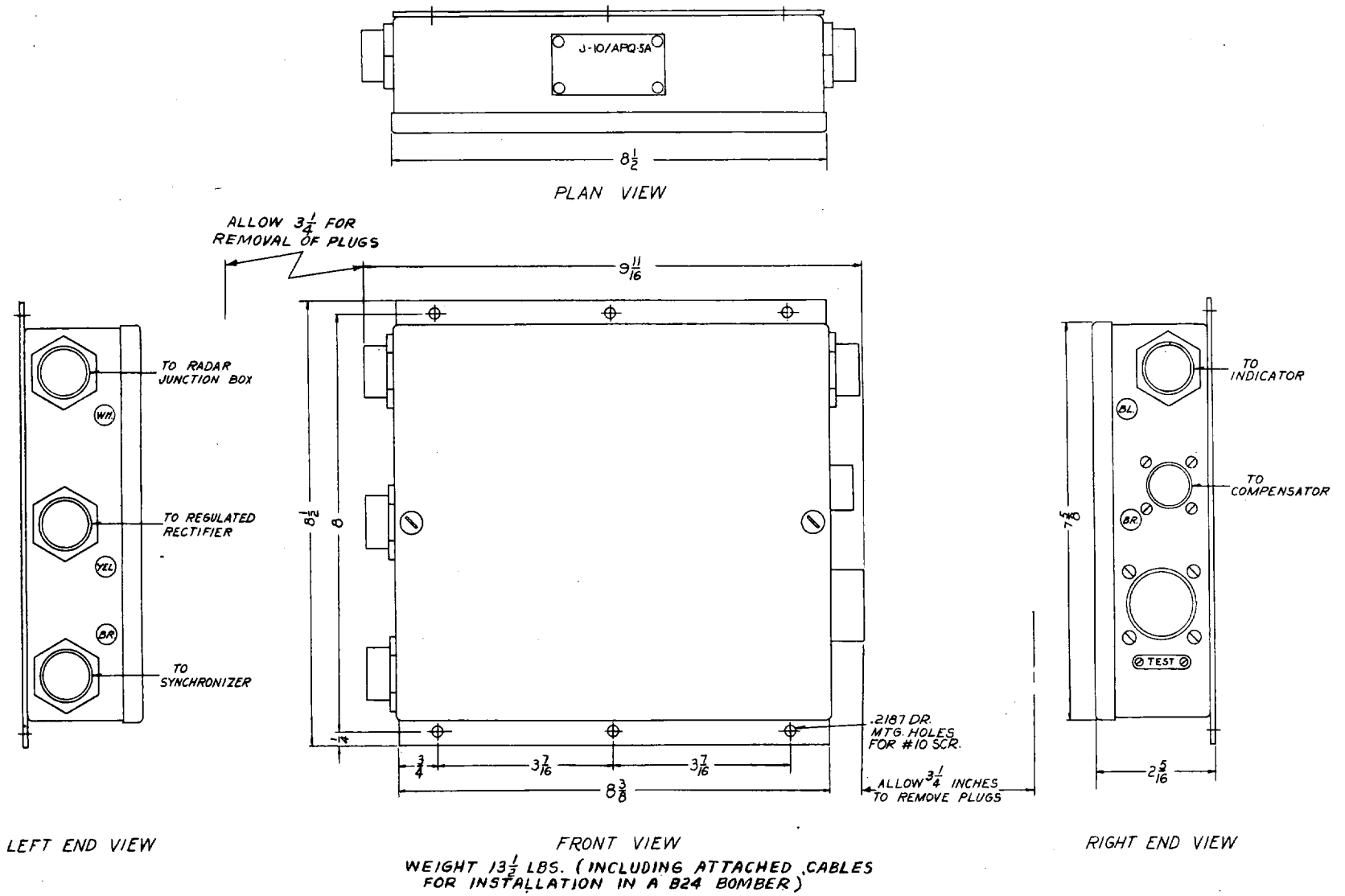
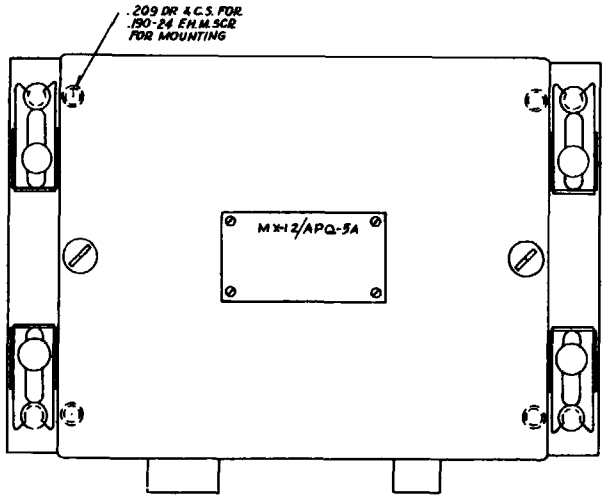
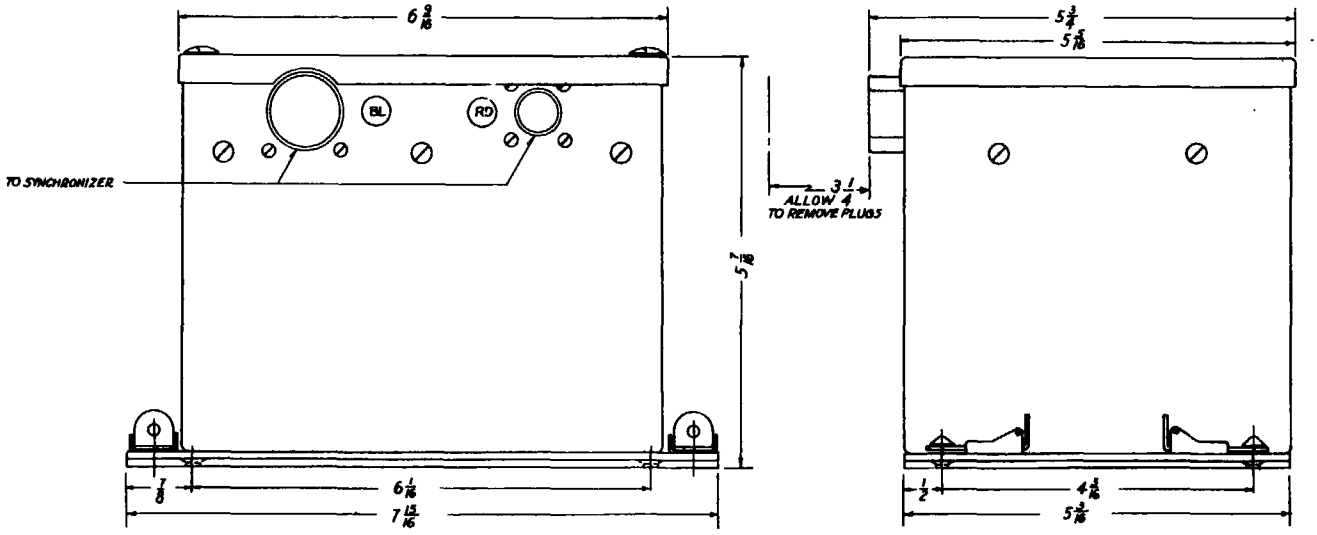


Figure 2-7. Junction Box J-10/APQ-5A—Outline Dimensions



TOP VIEW



FRONT VIEW

SIDE VIEW

WEIGHT 8 1/2 LBS. (INCLUDING MTGS.)

Figure 2-8. Capacitor Unit MX-12/APQ-5A—Outline Dimensions

capacitor unit, an unobstructed space about 12 inches square in required above or below the unit, depending on how it is mounted.

c. INSTALLATION OF MAJOR ASSEMBLIES OF INDICATOR EQUIPMENT AN/APQ-5B.—The installation of Indicator Equipment AN/APQ-5B is completed at an installation depot. The operator normally has no duties in connection with either the installation of the equipment or its adjustment, except under emergency conditions and in checking the equipment immediately prior to flight.

(1) SYNCHRONIZER SN-8/APQ-5B.—This unit replaces Synchronizer SN-1/APQ-5 and will be mounted in a similar position.

(2) CONTROL BOX C-82/APQ-5B.—The control box replaces Control Box C-6/APQ-5 and will be mounted in a similar position.

(3) TRACKING UNIT C-83/APQ-5B.—This tracking unit replaces Tracking Unit C-7/APQ-5B.

(4) REMAINING MAJOR ASSEMBLIES.—All remaining major assemblies of Indicator Equipment AN/APQ-5B are identical to those in Indicator Equipment AN/APQ-5 and will be installed in the same manner.

d. CABLING.

(1) Interconnecting cables to all of the indicator equipment units except the junction box and wires between Tracking Unit C-83/APQ-5B and Control Box C-82/APQ-5B of Indicator Equipment AN/APQ-5B, are fitted with AN type plugs. (See figs. 5-1, 5-2, 5-3.)

(2) Each cable can be identified by a metal band attached to each end. The jacks into which the cables connect in the various equipment units can also be identified by the color on each jack, or adjacent to it, corresponding to the proper cable color. There are some duplications of colors, but these occur on cables of different sizes so that no error can be made on the cable connections. Table 2-1 below is a cabling check chart for Indicator Equipment AN/APQ-5 while table 2-2 is for Indicator Equipment AN/APQ-5B.

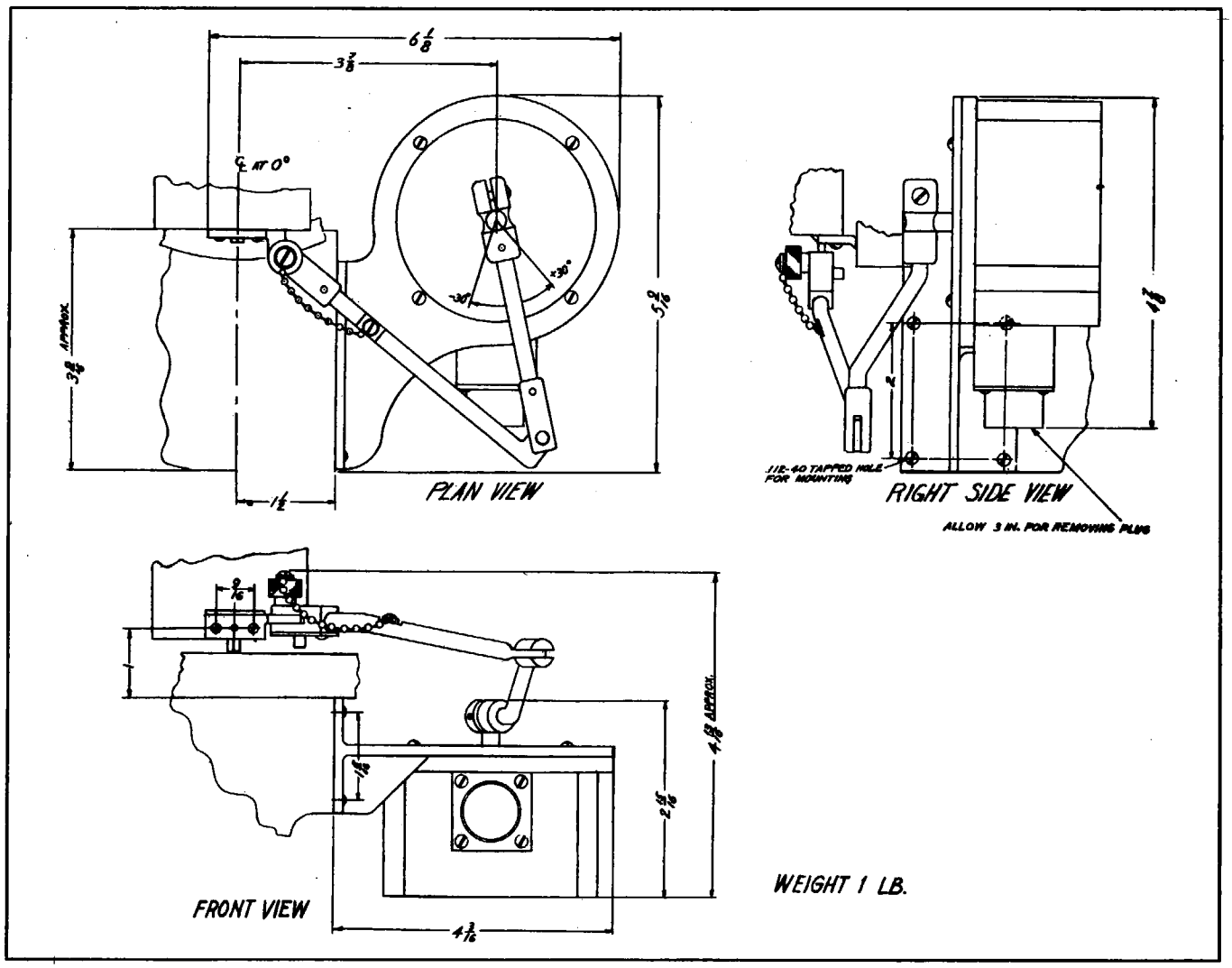


Figure 2-9. Compensator CN-1/APQ-5—Outline Dimensions

TABLE 2-1. CABLING CHECK CHART FOR INDICATOR EQUIPMENT AN/APQ-5

Cable Number	*Color Coded*	*From*	*To*
3	Red	Control Box C-7/APQ-5	Control Box C-23/APQ-5
4	Brown	Junction Box J-10/APQ-5A	Compensator CN-1/APQ-5
5	White	Control Box C-7/APQ-5	Synchronizer SN-1/APQ-5
7	Red	Synchronizer SN-1/APQ-5	Capacitor Unit MX-12/APQ-5A
9	Brown Orange	Synchronizer SN-1/APQ-5	Radar equipment
10	Lavender	Synchronizer SN-1/APQ-5	Radar equipment
11	Green	Synchronizer SN-1/APQ-5	Release
12	Blue	Synchronizer SN-1/APQ-5	Capacitor Unit MX-12/APQ-5A
13	Yellow	Radar equipment	Indicator ID-3/APQ-5
16	Red	Control Box C-23/APQ-5	Tracking Unit C-7/APQ-5
17	Yellow	Junction Box J-10/APQ-5A	Rectifier PP-2/APQ-5
18	White	Junction Box J-10/APQ-5A	Radar equipment
19	Blue	Junction Box J-10/APQ-5A	Indicator ID-3/APQ-5
20	Brown	Junction Box J-10/APQ-5A	Synchronizer SN-1/APQ-5

TABLE 2-2. CABLING CHECK CHART FOR INDICATOR EQUIPMENT AN/APQ-5B

Cable Number	*From*	*To*
1	Junction Box J-10/APQ-5A	Synchronizer SN-8/APQ-5B
2	Junction Box J-10/APQ-5A	Rectifier PP-2/APQ-5
3	Control Box C-82/APQ-5B	Tracking Unit C-83/APQ-5
4	Junction Box J-10/APQ-5A	Compensator CN-1/APQ-5
5	Control Box C-82/APQ-5B	Synchronizer SN-8/APQ-5B
6	Junction Box J-10/APQ-5A	Synchronizer SN-8/APQ-5B
7	Synchronizer SN-8/APQ-5B	Capacitor Unit MX-12/APQ-5A
8	Junction Box J-10/APQ-5A	Radar Equipment
9	Synchronizer SN-8/APQ-5B	Radar Equipment
10	Synchronizer SN-8/APQ-5B	Radar Equipment
11	Synchronizer SN-8/APQ-5B	Release
12	Synchronizer SN-8/APQ-5B	Capacitor Unit MX-12/APQ-5A
13	Indicator ID-3/APQ-5	Radar Equipment

2. ADJUSTMENTS.

All adjustments that are to be made by the operator are described under section III. Do not attempt any other adjustments except under emergency conditions, as this equipment will be tested and adjusted at regular intervals by a specially trained radio maintenance crew.

3. AFTER-INSTALLATION INSPECTION.

a. Make certain that all units are securely mounted. Check all cable connectors for tightness and that locking rings are tight. Also check the fuses in junction box to see that none are blown or missing and that a full complement of spares is in place.

b. Place the system in operation as outlined in section III, paragraph 2.*c.* and 2.*d.*

c. Turn off the equipment.

SECTION III
OPERATION

CAUTION

DO NOT operate while on the ground unless an auxiliary power supply is connected. Attempted operation for a period of time as short as 2 minutes may ruin the airplane battery.

1. TO START AND STOP THE EQUIPMENT.

Before applying any power to either system, uncouple the AB computor and position the controls as follows:

a. TO START THE EQUIPMENT.

(1) Position controls as follows:

Control	*Position*
"BRIGHT"	Fully Counterclockwise
1-6	Zero
2-3	65
2-4	"S"
1-1 ("ON-OFF" switch)	"OFF"
3-2	"OPER"
3-3	"C"
3-1	"A"

(2) Check that associated radar equipment is "ON" —*this is important.*

(3) Place the "ON-OFF" switch on the control box to "ON".

(4) Rotate "BRIGHT" control on the indicator clockwise until sweep appears.

(5) Stop radar antenna with the antenna facing forward (zero azimuth).

(6) Narrow trace to a sharp, fine line with "FOCUS" control.

(7) Place switch 2-4 to the "S" position.

(8) Throw the "AZIM ON-OFF" switch located on the indicator to "OFF" and place the drift scale at zero reading.

(9) Center the trace on the screen by means of "H CENT" control on the indicator.

(10) Remove the AN connector plug from Compensator CN-1/APQ-5 and make certain there is no movement of the trace. Replace the plug.

(11) With antenna rotating and the "AZIM ON-OFF" switch in "ON" position, adjust intensity on position "S" of 2-4 with "BRIGHT SET" control.

(12) Throw switch 2-4 to "T" position and reset intensity (if necessary) using the "BRIGHT" control.

(13) Position sweep vertically on the screen with the "V CENT" control.

b. TO STOP THE EQUIPMENT.

(1) The procedure for stopping is identical for Indicator Equipments AN/APQ-5B and AN/APQ-5. Refer to table 3-3 for the correspondence of controls.

(2) Position controls as follows:

Control	*Position*
Switch 3-3	"C"
Switch 3-2	"OPR"
Switch 2-4	"S"
1-1 (Power Switch)	"OFF"
Power switch on associated radar	"OFF"
"Bright"	Fully counterclockwise

CAUTION

Do not turn the equipment off before the end of the mission. If it should be turned off before such time, the equipment must be allowed 15 minutes in which to warm up before it is used again.

2. OPERATION.

a. GENERAL CHARACTERISTICS.

(1) Operation of these equipments, as described in the following paragraphs, assumes careful pre-flight maintenance by the maintenance crew. When using Indicator Equipment AN/APQ-5B, the operator under normal conditions should not be required to make screw driver adjustments. When using Indicator Equipment AN/APQ-5, the only screw driver adjustment the operator should make under normal operating conditions is in the "RANGE ZERO" adjustment (7-5) on Control Unit C-6/APQ-5. This adjustment may be made without special testing facilities. If, after completely carrying out and checking the procedures of paragraph 2.*c.* or 2.*d.*, below, the indicator displays are not satisfactory, consult section IV which describes certain emergency measures which can be carried out by the operator.

TABLE 3-1. LOCATION OF CONTROLS (INDICATOR EQUIPMENT AN/APQ-5B)

Unit	*Army Designation*	*Figure*
Control Box	C-82/APQ-5B	3-1
Tracking Unit	C-83/APQ-5B	3-2
Synchronizer	SN-8/APQ-5B	3-3
Indicator	ID-3/APQ-5	3-4
Rectifier (adjustment only)	PP-2/APQ-5	3-9

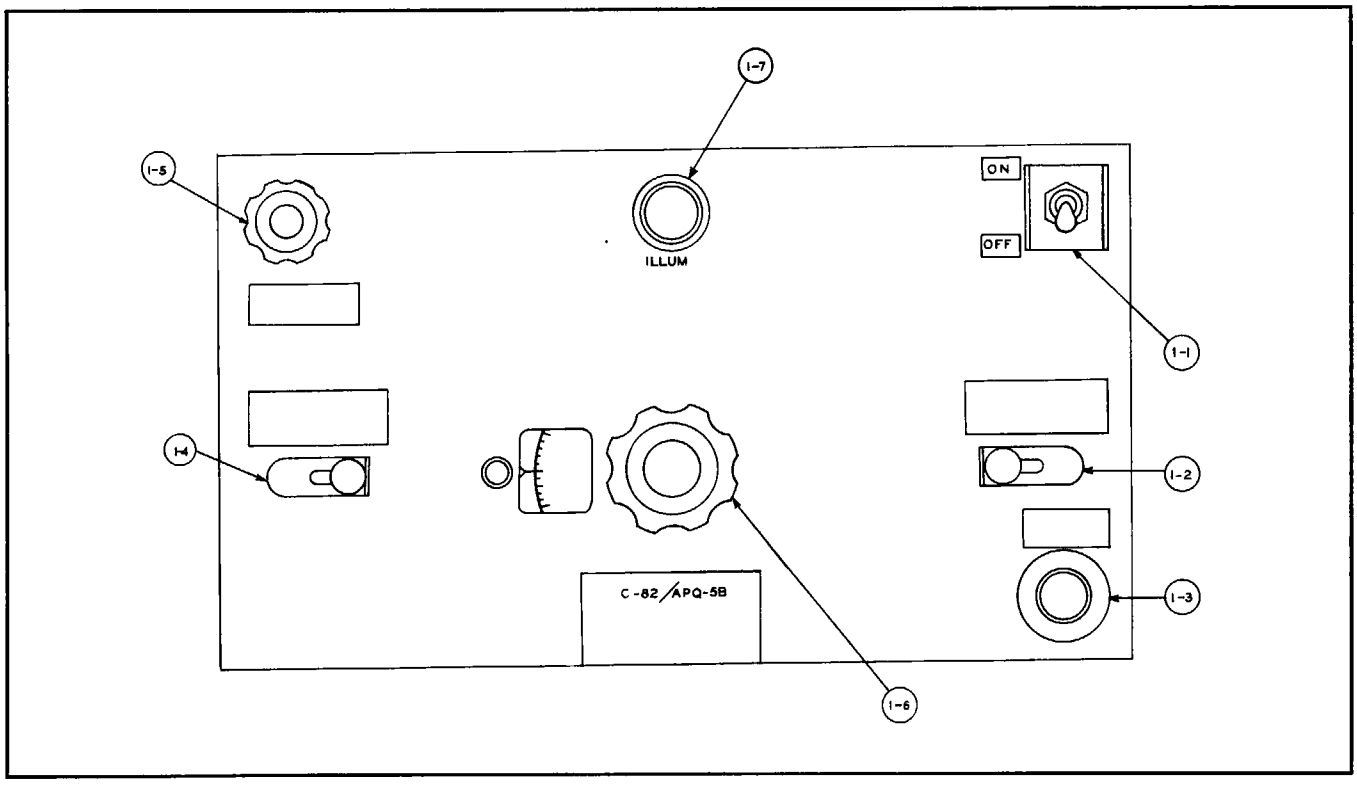


Figure 3-1. Control Box C-82/APQ-5B—Front Panel

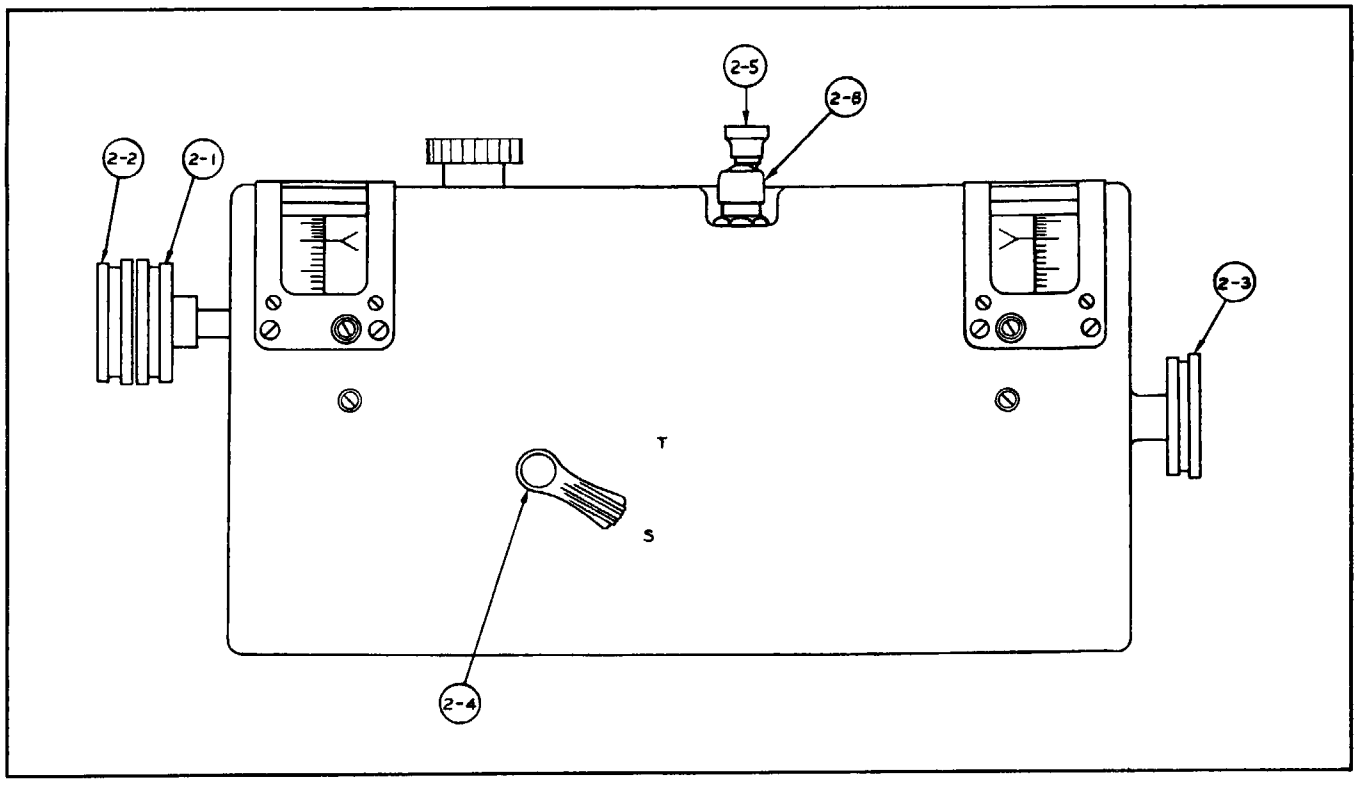


Figure 3-2. Tracking Unit C-83/APQ-5B—Front Panel

TABLE 3-2. LOCATION OF CONTROLS (INDICATOR EQUIPMENT AN/APQ-5)

Unit	*Army Designation*	*Figure*
Tracking Unit	C-7/APQ-5	3-5
Control Box	C-23/APQ-5	3-6
Control Unit	C-6/APQ-5 (mod)	3-7
Synchronizer	SN-1/APQ-5 (mod)	3-8
Indicator	ID-3/APQ-5	3-4
Rectifier (adjustment only)	PP-2/APQ-5	3-9

(2) For certain procedures the operation of the equipment is semi-automatic, reducing the duties of the operator to a minimum. For all other procedures, additional duties are required of the operator. For further details refer to instructions in section III, *Handbook of Maintenance Instructions for Indicator Equipment AN/APQ-5* or to tactical instruction issued by the using service.

b. PRECAUTIONS DURING OPERATION.

(1) Turn the equipment off immediately if abnormal operation is observed.

(2) Do not remove covers, change tubes, make adjustments inside the equipments, or disconnect connectors with the equipment turned on. In the event that the junction box cover is to be removed for any reason, or if the indicator covers or cords are to be removed, the inverter and the associated radar set *must* first be stopped.

(3) Keep the average intensity on the indicator as low as possible for satisfactory performance. Intense stationary spots on the indicator screen may burn the material on the face of the cathode ray tube.

(4) If the aircraft power-supply system should fail during operation, turn off the equipment immediately, following the procedure outlined in paragraph 1.*b.*, this section. After the trouble has been remedied, the equipment may again be put into operation.

(5) If the equipment has been turned off and allowed to cool, sufficient warm-up time must be allowed before it is used.

(6) If at any time during operation the indicator lamp should give any indication when switch 2-4 is rotated from "S" to "T", immediately depress button 1-3, or rotate switch 1-3 back to position "S" and try again

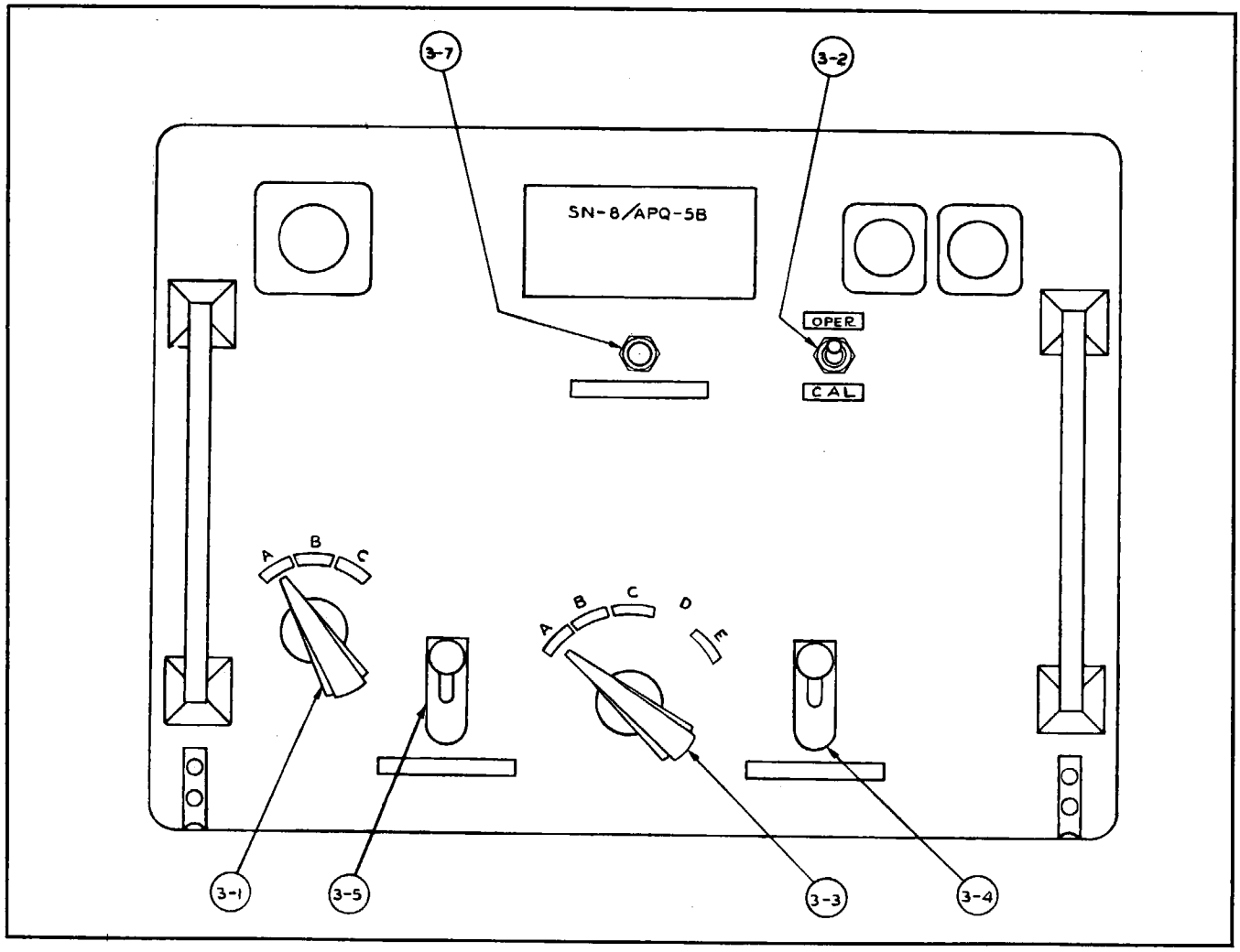


Figure 3-3. Synchronizer SN-8/APQ-5B—Front Panel

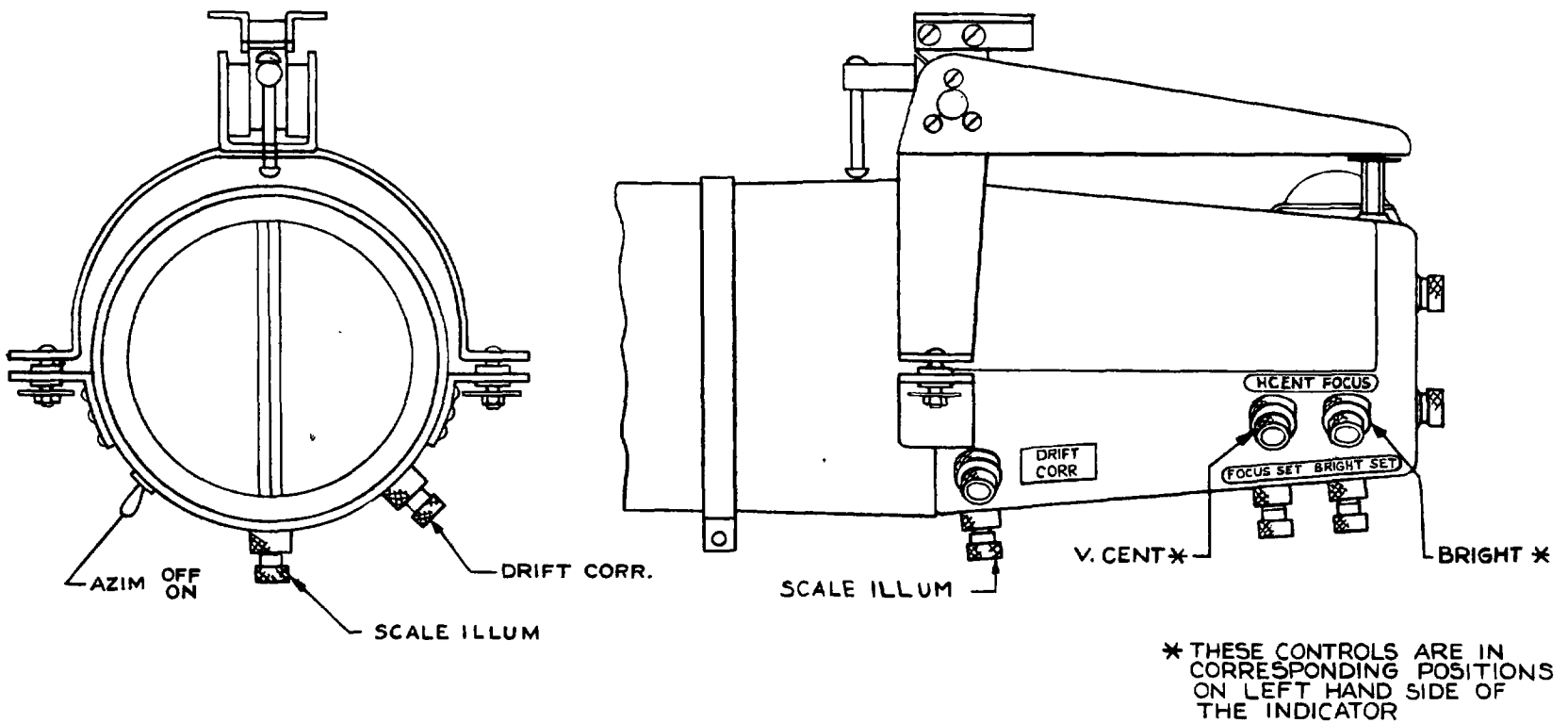


Figure 3-4. Indicator ID-3/APQ-5—Front and Side Views

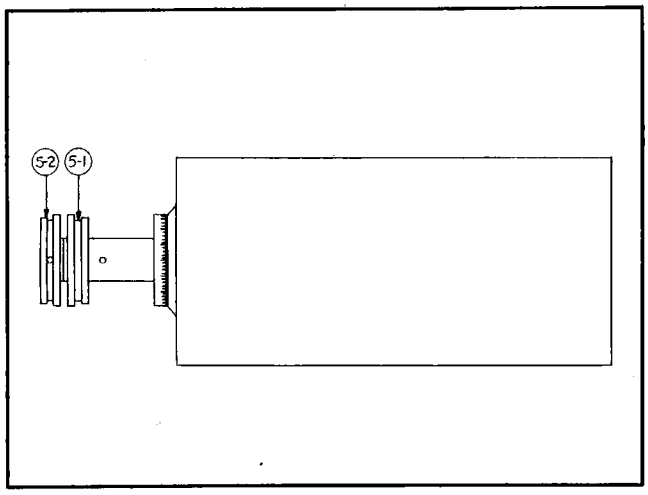


Figure 3-5. Tracking Unit C-7/APQ-5—Front Panel

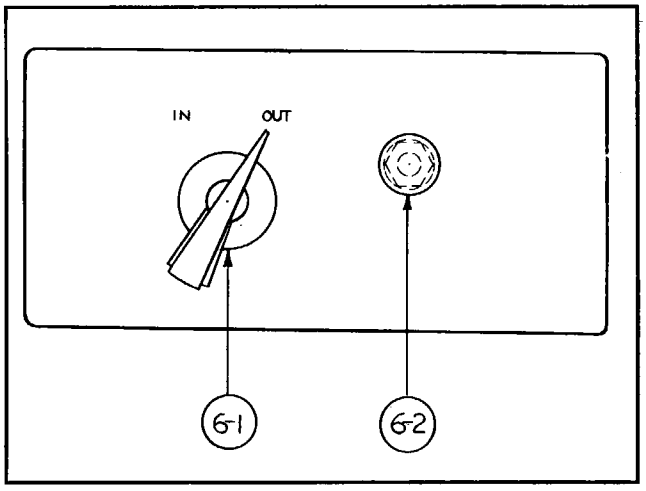


Figure 3-6. Control Box C-23/APQ-5—Front Panel

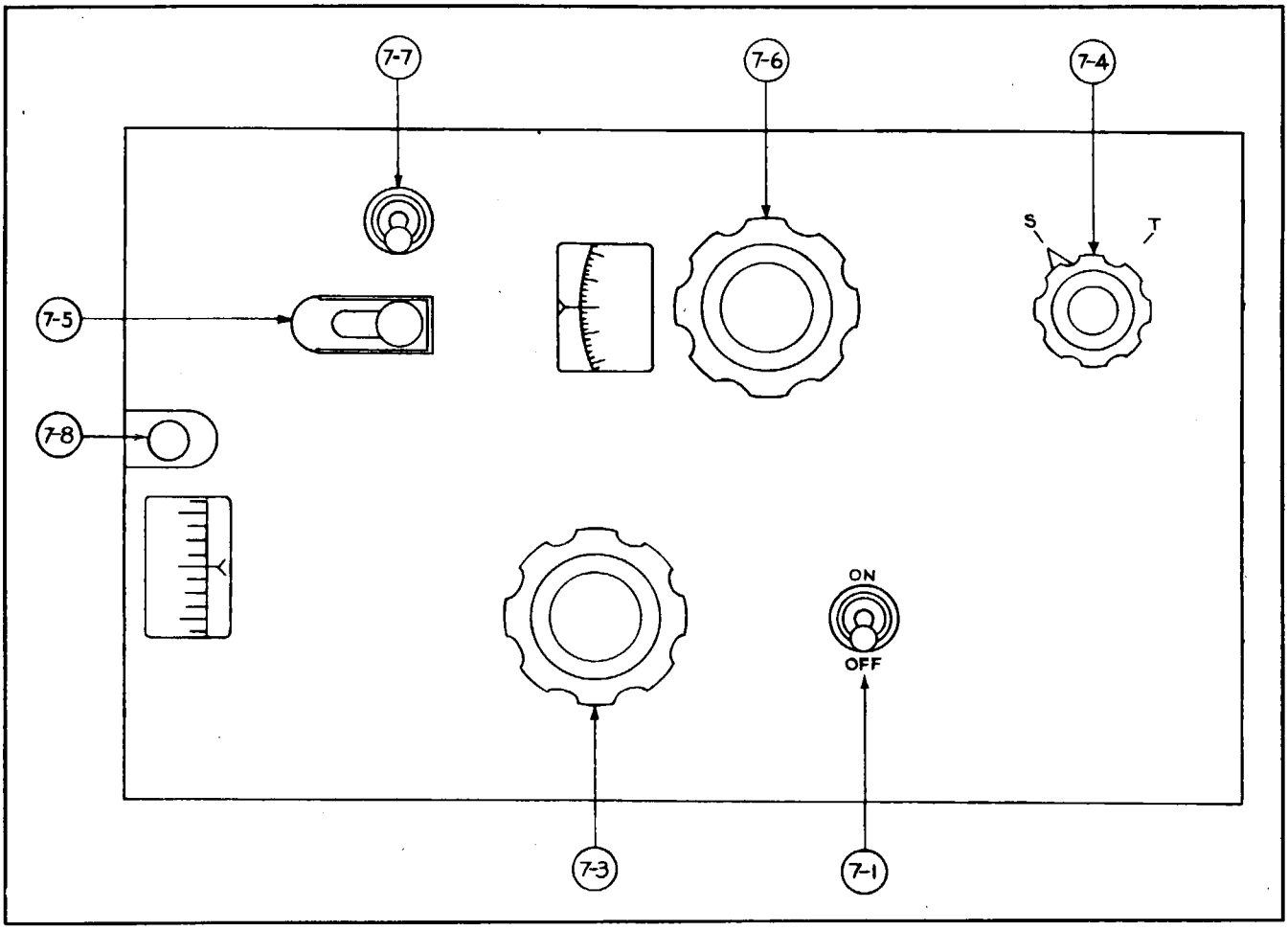


Figure 3-7. Control Box C-6/APQ-5—Front Panel

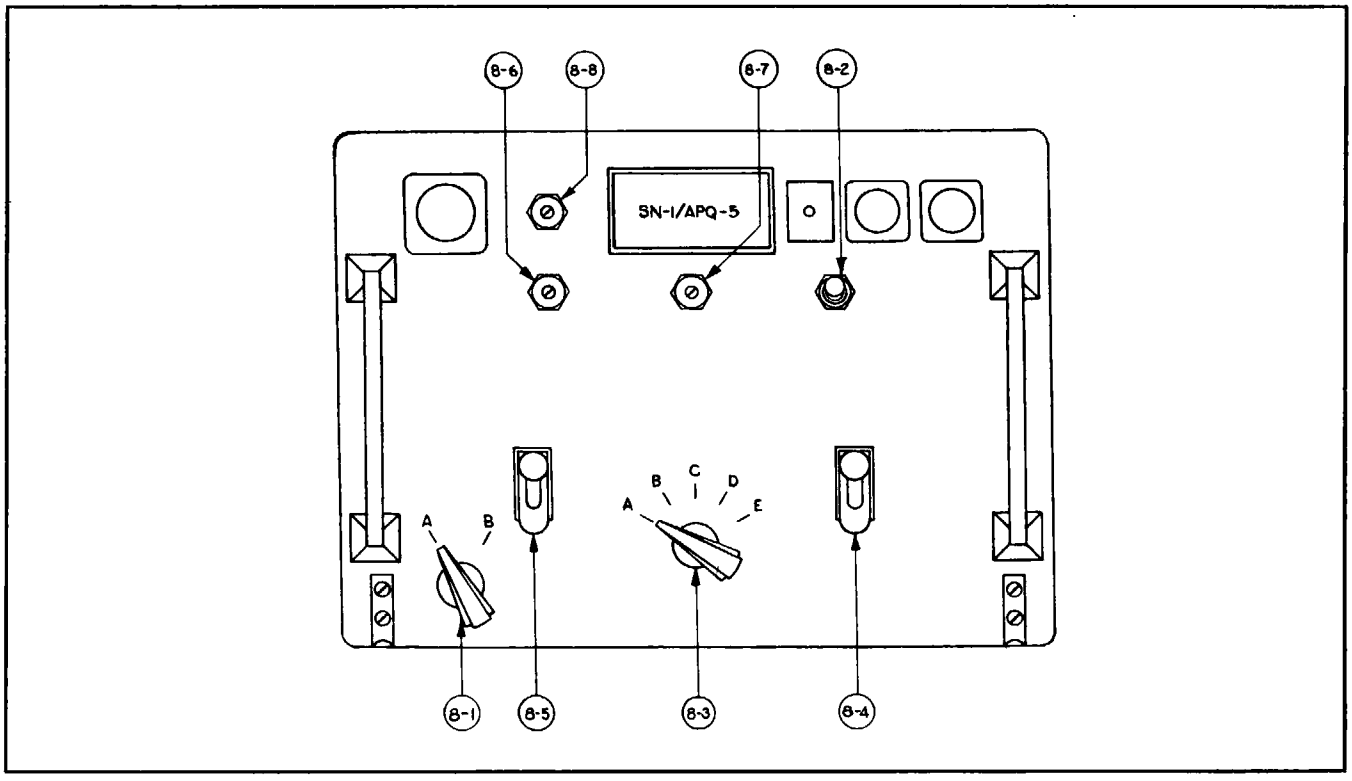


Figure 3-8. Synchronizer SN-1/APQ-5—Front Panel

until no visual indication is obtained with this operation.

(7) Do not attempt adjustments of any of the screw driver controls, except those covered by the instructions in this handbook.

(8) The procedure outlined in this section, paragraphs 2.*c.*(13) through (28), should be repeated at approximately 30-minute intervals during flight. However, when it is being adjusted according to this procedure, knob 1-5 should not be disturbed. If the setting of this knob is accidentally altered, it must immediately be readjusted in accordance with the above mentioned procedure.

(9) Keep the scale illumination as low as will permit visibility of the inscribed vertical lines on the indicator. If the intensity is too high, the display will be obscured.

(10) The illumination of the dial scales on Indicator Equipment AN/APQ-5B may be varied continuously to suit prevailing light conditions by the "ILLUM" knob 1-7 whereas on Indicator Equipment AN/APQ-5 two preset degrees of brightness are obtainable by the operation of switch 7-7.

c. OPERATION OF INDICATOR EQUIPMENT AN/APQ-5B.

(1) Place the associated radar equipment in operation in accordance with instructions supplied with that equipment.

(2) Position indicator equipment controls as follows:

Control	*Position*
1-1 (Power switch)	"OFF"
1-6	maximum counterclockwise
2-1	400
2-3	2000
2-4	"S"
3-3	"C"
3-2	"OPR"
3-1	"A"
"Bright"	maximum counterclockwise
1-1 (Power switch)	"ON"

(3) Adjust and check the associated radio set for satisfactory operation in accordance with the instructions for that set.

(4) Having allowed at least 15 minutes for the equipment to warm up, adjust the indicator "SCALE ILLUM" knob to make the inscribed vertical lines visible. Do not use excessive illumination which might obscure the display.

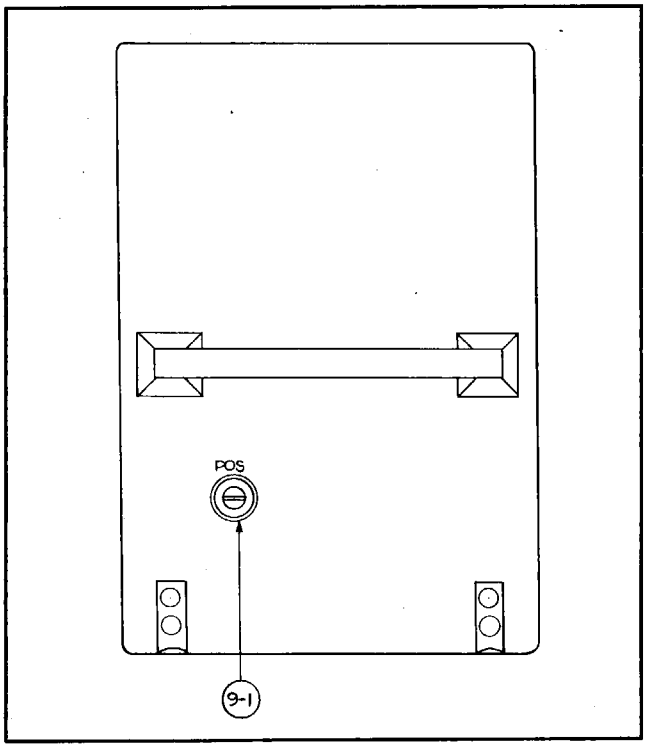


Figure 3-9. Rectifier PP-2/APQ-5—Front Panel

(5) Check that the "AZIM" switch on the indicator is in the "ON" position.

(6) Adjust the "BRIGHT" knob on the indicator to give satisfactory display intensity.

(7) Rotate knob 2-2 to its approximate mid-position and note that the normal display is present in its entirety.

(8) If necessary, adjust the "FOCUS" knob and trim the "BRIGHT" knob on the indicator for a clearly defined display.

(9) Set the indicator drift on zero and throw the "AZIM" switch to "OFF."

(10) Adjust the "H CENT" knob to center the indicator display.

(11) Restore the "AZIM" switch to "ON."

(12) If the display is not centered satisfactorily, or if the sides of the indicator tube interfere with the top of the display, adjust the "V CENT" knob on the indicator for the normal condition.

(13) Throw switch 3-2 to the "CAL" position, and rotate switch 3-3 to position "A."

(14) Rotate switch 2-4 to position "T."

Note

If at any time in the operation of this equipment lamp 2-8 on the tracking unit gives an indication when switch 2-4 is rotated from position "S" to position "T," depress button 1-3 or rotate switch 2-4 back to position "S" and try again.

(15) Advance dial 1-6 slowly until the lamp on the tracking unit gives an indication.

(16) Return dial 1-6 to its maximum counterclockwise position and return switch 2-4 to position "S."

(17) Repeat the procedure of (14), (15), and (16), above, several times, noting each time the setting of dial 1-6 which causes the lamp on the tracking unit to give an indication. If the average of these readings is not zero, adjust knob 1-5 and continue this procedure until an average of three or four successive readings of dial 1-6 is essentially zero.

CAUTION

After setting knob 1-5, do not accidentally change this setting. Any accidental change in this adjustment will necessitate recalibration.

(18) Repeat steps (13) and (17) at approximately 30-minute intervals while this equipment is in operation. Owing to changing temperature conditions, it may be found necessary to readjust knob 1-5 when repeating this procedure for the second time. If the knob should require an appreciable readjustment during later checks, the operator should report this fact to the maintenance personnel at the end of the patrol.

(19) Rotate switch 2-4 to position "T," knob 2-2 to the middle of its range, and throw switch 3-2 to the "OPR" position.

(20) When the full display becomes visible, hold button 2-5 depressed (or rotate switch 3-3 to position "E").

(21) Rotate knob 2-2 as dictated by convenience, and observe carefully that no appreciable motion should occur in the display over an interval of approximately 1 minute. For further details on this check refer to section III, the *Handbook of Maintenance Instructions for Indicator Equipment AN/APQ-5B.*

(22) Rotate knobs 2-1 and 2-3 to positions appropriate to the tactical procedure in use for the particular patrol.

(23) Rotate knob 2-2 to its maximum clockwise position.

(24) Rotate switch 2-4 to position "S."

(25) Check that switch 3-3 is in position "C" and that switch 3-2 is in the "OPR" position.

(26) Rotate switch 3-1 to that position which is appropriate to the tactical procedure in use.

(27) Rotate dial 1-6 to a setting appropriate to the tactical procedure in use.

(28) Do not throw power switch 1-1 to the "OFF" position until the patrol has been completed.

d. OPERATION OF INDICATOR EQUIPMENT AN/APQ-5.—The general procedure for operation is the same as that for Indicator Equipment AN/APQ-5B. The location of the corresponding controls differs between the two equipments, however, as indicated in table 3-3, below.

TABLE 3-3. CORRESPONDENCE OF CONTROLS

Indicator Equipment AN/APQ-5B		*Indicator Equipment AN/APQ-5*	
Switch	1-1	Switch	7-1
Screw Driver adj	1-2	None	
Button	1-3	None	
Screw Driver adj	1-4	Not accessible	
Knob	1-5	Screw Driver adj	7-5
Dial	1-6	Dial	7-6
Knob	1-7	Switch	7-7
Knob	2-3	Knob	7-3
Switch	2-4	Switch	7-4
Knob	2-2	Knob	5-2
Knob	2-1	Knob	5-1
Button	2-5	None	
Switch	3-1	Switch 8-1 and Switch 6-1	See Note
Switch	3-2	Switch	8-2
Switch	3-3	Switch	8-3
Screw Driver adj	3-4	Screw Driver adj	8-4
Screw Driver adj	3-5	Screw Driver adj	8-5
Knob	2-6	Screw Driver adj	8-6
Screw Driver adj	3-7	Screw Driver adj	8-7
None	Sc	Screw Driver adj	8-8

Note

In Indicator Equipment AN/APQ-5, switch 6-1 must be in the "IN" position whenever switch 8-1 is in position "A." Switch 6-1 must be in the "OUT" position whenever switch 8-1 is in positions "B" or "C." In the procedures of subparagraph *c.*, above, whenever switch 3-1 is referred to, it should be interpreted as referring to switches 8-1 and 6-1 as noted above.

All other controls and adjustments are located on apparatus common to the two systems.

(1) As indicated on the previous tables, the various positions of the individual switches correspond directly. All specified dial readings correspond for the two systems.

(2) Observe that the indicator lamp appears on the tracking unit in Indicator Equipment AN/APQ-5B while it appears on the control unit in Indicator Equipment AN/APQ-5 system.

(3) Observe that button 1-3 is not provided in Indicator Equipment AN/APQ-5. The alternative procedure is to operate switch 7-4 lock to position "S" momentarily and then return it to "T" position.

(4) Observe that knob 1-5 in Indicator Equipment AN/APQ-5B replaces the screw driver adjustment 7-5 in Indicator Equipment AN/APQ-5.

(5) Observe that button 2-5 in Indicator Equipment AN/APQ-5B is not provided in Indicator Equipment AN/APQ-5 system. The alternate procedure mentioned in paragraph 2.*c.*,(23), *above,* must be used in all cases in Indicator Equipment AN/APQ-5.

3. DEFENSE AGAINST RADAR JAMMING.

a. GENERAL.—Jamming is the intentional generation by the enemy of radio signals designed to reduce the efficiency of radars, and to surprise, confuse and panic the radar operators. The anti-jamming information given below applies to the associated radar equipment used with Indicator Equipment AN/APQ-5 or AN/APQ-5B. This is true because the signal path is through the radar equipment and hence any preventative measures must be applied at that point.

b. TYPES OF JAMMING LIKELY TO BE EMPLOYED BY THE ENEMY. *(See figure 3-10.)*

(1) CW.—Figure 3-10 shows a series of photographs of CW jamming effects of different intensities. Weak CW (part* A) brightens a small sector of the PPI display corresponding to the region in which the jammer is located. Stronger CW (part B) increases the brightness and width of the jammed sector and overloads the receiver making the target echo difficult or impossible to see. Other small sectors may be jammed by pickup by the side lobes of the antenna. Very strong CW (part* C) may block off the i-f or video sections of the receiver causing a sector to be blacked out so that nothing appears at all.

(2) MODULATED CW.—This produces, in general, the same effects on a PPI display as CW except that certain types of modulation may produce patterns in the jammed sector. Parts* D and E of figure 3-10 show an example of very strong jamming of this type. (Photographs do not give a true picture of the jamming because the movement of the patterns cannot be shown.) Interference from nearby radars working in the same frequency band is shown in parts F and G.

(3) WINDOW.—This is the code name for metallic foil strips which are dropped from planes or projected from surface vessels and allowed to fall slowly to earth. During their fall they produce echoes on radar sets

*All references to parts refer to parts of figure 3-10.

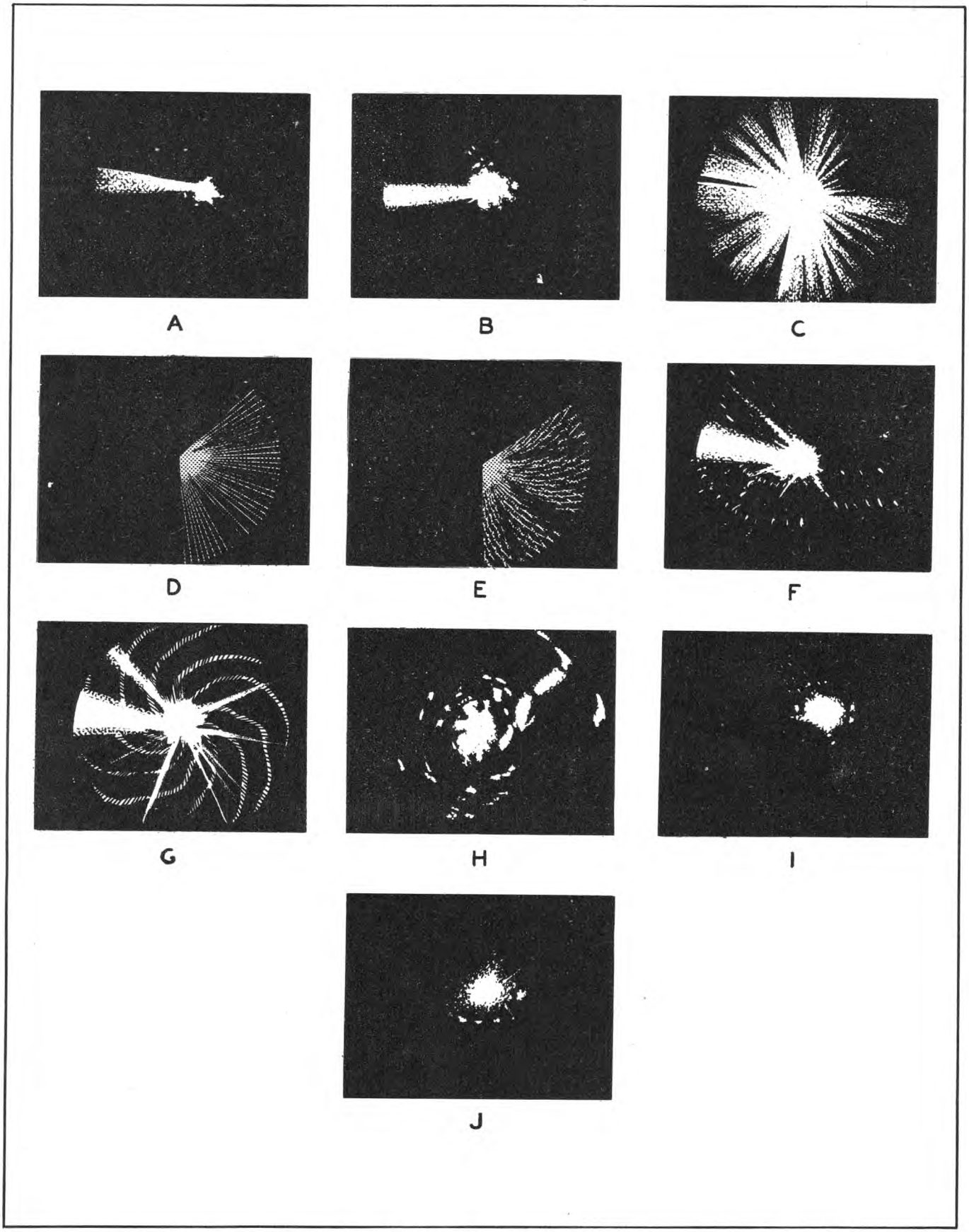


Figure 3-10. Indications of Jamming

which are operating close to the frequency that the foil is tuned to. These echoes can be confused with, and cover up echoes from targets. The path of the plane dropping the foil can easily be seen. (See part* F.)

c. RECOGNIZING LOCAL INTERFERENCE.—Jamming will usually come from one or, at most, only a few bearings. If trouble is experienced equally around the whole 360 degrees the chances are that it is not jamming but local interference or set trouble. The set can actually jam itself if the video or i-f sections of the receiver break into self-oscillation. This usually produces bright sectors, small or large, which have sharply defined edges.

d. REPORTING JAMMING.—The fact that the enemy is jamming is more important than its effect on the radar. It must be reported immediately to the commanding officer.

e. ANTI-JAMMING PROCEDURE.

(1) Keep calm and think about what you are doing.

(2) Concentrate on following the target echo. This is usually easy if the target is not in the same direction as the jammer. If the target echo is obscured temporarily, remember the approximate position and direction of travel of the target on the PPI.

(3) It is much more difficult to jam a radar at short range than at long range. If the target has a jammer to screen itself, there is always a minimum angle inside of which the target is no longer screened and can be picked up by the radar. However, the radar receiver is likely to be overloaded by the signal at this short range, making the target echo impossible to see through the jamming, if the receiver gain is not reduced as described below.

(4) Reduce the receiver gain gradually from normal and watch the jammed area carefully for a target indication. At the same time adjust the brightness control of the PPI to the position which gives the best contrast between the target echoes and the jamming. This is a very useful procedure and will improve the ratio of target echo to jamming strength by reducing any overloading of the receiver by the jamming signal. (See part* I of fig. 3-10.)

(5) Switch the AFC off and slowly turn the manual local-oscillator frequency control to both sides of the normal position. On one side it may be possible to tune out the jamming more than the target echo, since jamming is rarely on the exact radar frequency. However, with some sets, lack of the AFC may reduce the sensitivity so much that little improvement is obtained.

(6) The appearance of spurious echoes covering the area surrounding a target echo may mean that window is being used to screen the target. Reducing the receiver gain will often help in distinguishing the target echo.

(7) Keep the set operating even if no information may be obtained from it. It is keeping an enemy jammer busy and may thus protect another radar. Do not let the enemy know that his jamming is effective by going off the air.

* All references to parts refer to parts of figure 3-10.

SECTION IV
EMERGENCY OPERATION AND REPAIR

WARNING
5000 VOLTS

Indicator Equipments AN/APQ-5 and AN/APQ-5B employ dangerously high voltage. Be extremely careful when working with Indicator ID-3/APQ-5. Turn off all switches on this and on the associated radio set before removing any connectors. *Practice safety first.*

1. TROUBLE SHOOTING IN FLIGHT.

a. GENERAL.

(1) Inoperative conditions such as failure to obtain the oscilloscope traces, failure of the release relay to operate, irregularities or inaccurate pulsing which make correct adjustment or calibration impossible may be produced by circuit or apparatus troubles. The above failures may frequently be caused by:

(a) Incorrect position of control knobs and switches.

(b) Failure of power supply caused by a blown fuse or open switch.

(c) Poor contacts at the cable connection when plugs are not screwed firmly into the jacks.

(d) Poor contacts due to loosely-seated vacuum tubes.

(2) Many times such troubles can be detected by careful visual inspection of the apparatus for broken cables, defective plugs, foreign material, or anything unusual.

Note

It is suggested that the above troubles be corrected by the operator. More complex troubles should be referred to maintenance personnel.

b. NORMAL SWITCH POSITIONS.—If the normal sweep lines do not appear on the indicator screen, the operator should make sure that all the controls are in correct position, as follows:

(1) "ON-OFF" power toggle switch on the control unit in the "ON" position.

(2) Switch 3-3 in the "C" position.

(3) Switch 3-2 in the "OPER" position.

(4) Switch 2-4 in the "S" position.

(5) "BRIGHT" knob turned clockwise to produce sufficient intensity of oscilloscope beam.

(6) The "AZIM ON-OFF" switch on the indicator must be in the "ON" position and the radar spinner must be rotating to produce the azimuth sweep that will cause the normal sweep lines to appear on the screen. However, with the "AZIM OFF-ON" switch turned "OFF," the marked lines should appear as brightened spots on the vertical trace on the screen.

(7) If knob 2-2 of the tracking unit is in its extreme clockwise position, it may cause a range line to be off the screen at the top. Turning this knob counterclockwise will bring the line on the screen.

(8) The radar transmitter must be in operation and the spinner rotating to obtain target images.

(9) Check to see that the cables from the associated radar are properly connected to Synchronizer SN-1/APQ-5 or SN-8/APQ-5B.

2. REPAIR AND ADJUSTMENT IN FLIGHT.

a. CABLE CONNECTORS.— High voltage connectors, particularly the adjoining rubber faces of the plugs and jacks, must be kept clean. Should such a connector fail, it will be charred by the arc and cannot usually be used again by merely tightening the connector. (See sec. V, par. 2.*c.*)

b. FUSES.

CAUTION

Turn off the associated radio set as well as the indicator equipment before removing covers or replacing fuses.

(1) The two fuses directly protecting this equipment are located in the associated junction box. Note that either Junction Box J-10/APQ-5A (see fig. 4-1) or Junction Box J-1/APQ-5 (see fig. 4-2) may be used.

(2) In either case to reach the fuses remove the cover plate of the junction box. Both fuses in each box have the same rating. Two spare fuses are held in clips inside the cover plate.

3. ASSOCIATED RADAR EQUIPMENT OPERATION.

a. These indicator equipments operate in conjunction with an associated radar set. Faulty operation of the associated set will cause improper functioning of the indicator equipment. Therefore, whenever improper operation is noted check the associated radio set before applying any emergency measures to the indicator equipments.

b. The associated radar set should be checked and any troubles remedied in accordance with the procedure specified for that set.

4. INDICATOR ID-3/APQ-5 OPERATION.

In listing the following troubles and their indicated remedies it is assumed that the associated radio set is functioning properly, that the fuses have been checked, and if necessary, repaired, and that all cables are in good operating condition. The following procedures are based on Indicator Equipment AN/APQ-5B. When using Indicator Equipment AN/APQ-5, refer to table 3-3, section III.

a. ABNORMAL INDICATOR PATTERN.— If the indicator pattern is abnormal, first check that switch 3-2 is in the "OPER" position and that switch 3-3 is in position "C."

b. IMPROPER SWITCH SETTINGS.—When using Indicator Equipment AN/APQ-5, improper functioning will be obtained if switch 6-1 on Control Box C-23/APQ-5 is not rotated to a position which corresponds to that of switch 8-1 on the synchronizer. Whenever switch 8-1 is in position "A," switch 6-1 should be in the "IN" position. Whenever switch 8-1 is in position "B" or "C," switch 6-1 should be in the "OUT" position.

c. NO INDICATION ON SCREEN.

(1) Check trigger cables.

(2) The "BRIGHT" knob on the indicator may be set too low.

(3) The "BRIGHT SET" knob on the indicator may be set too low.

d. SPOTS WITHOUT TRACES ON THE SCREEN. —Check that the "AZIM" switch is in the "ON" position.

e. "BRIGHT" KNOB ON INDICATOR DOES NOT GIVE SUFFICIENT INTENSITY CONTROL.— The "BRIGHT SET" knob may be set too low.

f. INDICATOR WILL NOT FOCUS SATISFACTORILY WITH ADJUSTMENT OF THE "FOCUS" KNOB.— Check "FOCUS SET" control.

g. NO SIGNAL INDICATION ON THE SCREEN.

(1) Knob 2-6 may be set too low.

(2) The associated radio set may be improperly adjusted.

(3) The "H-CENT" knob on the indicator may be set improperly.

h. SIGNAL TRACE INTENSITY MARKEDLY DIFFERENT FROM THE REST OF THE DISPLAY.

(1) The associated radio set may be improperly adjusted.

(2) Knob 2-6 may be improperly set.

i. INDICATOR DISPLAY INCOMPLETE.

(1) Vary the setting of knob 2-2.

(2) Check the position of switch 2-4.

Note

In the event that any emergency adjustments or repairs have been made during a patrol, upon return immediately notify the maintenance personnel of the trouble and of the remedy applied.

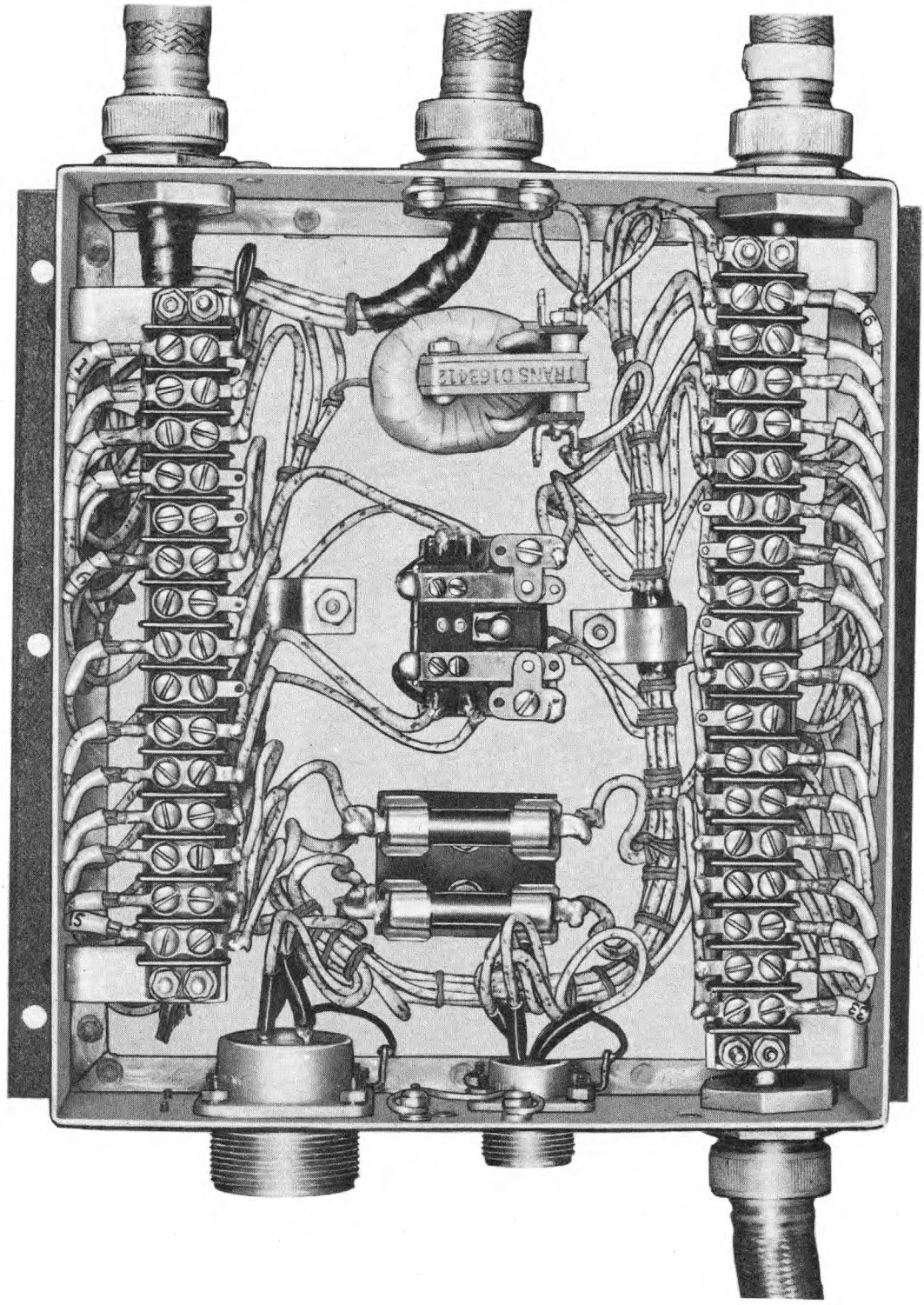


Figure 4-1. Junction Box J-10/APQ-5A—Interior, Top

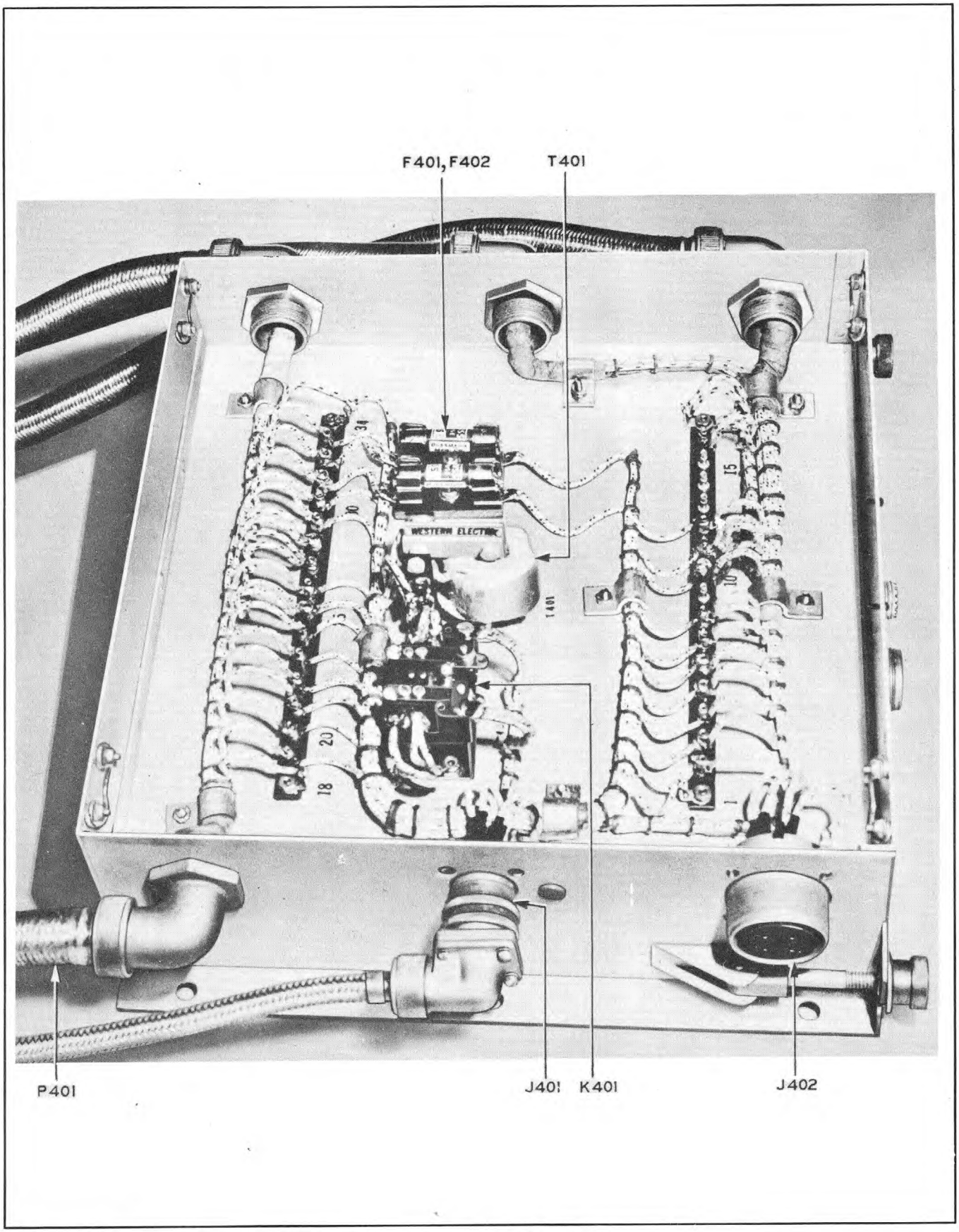


Figure 4-2. Junction Box J-1/APQ-5—Interior, Top

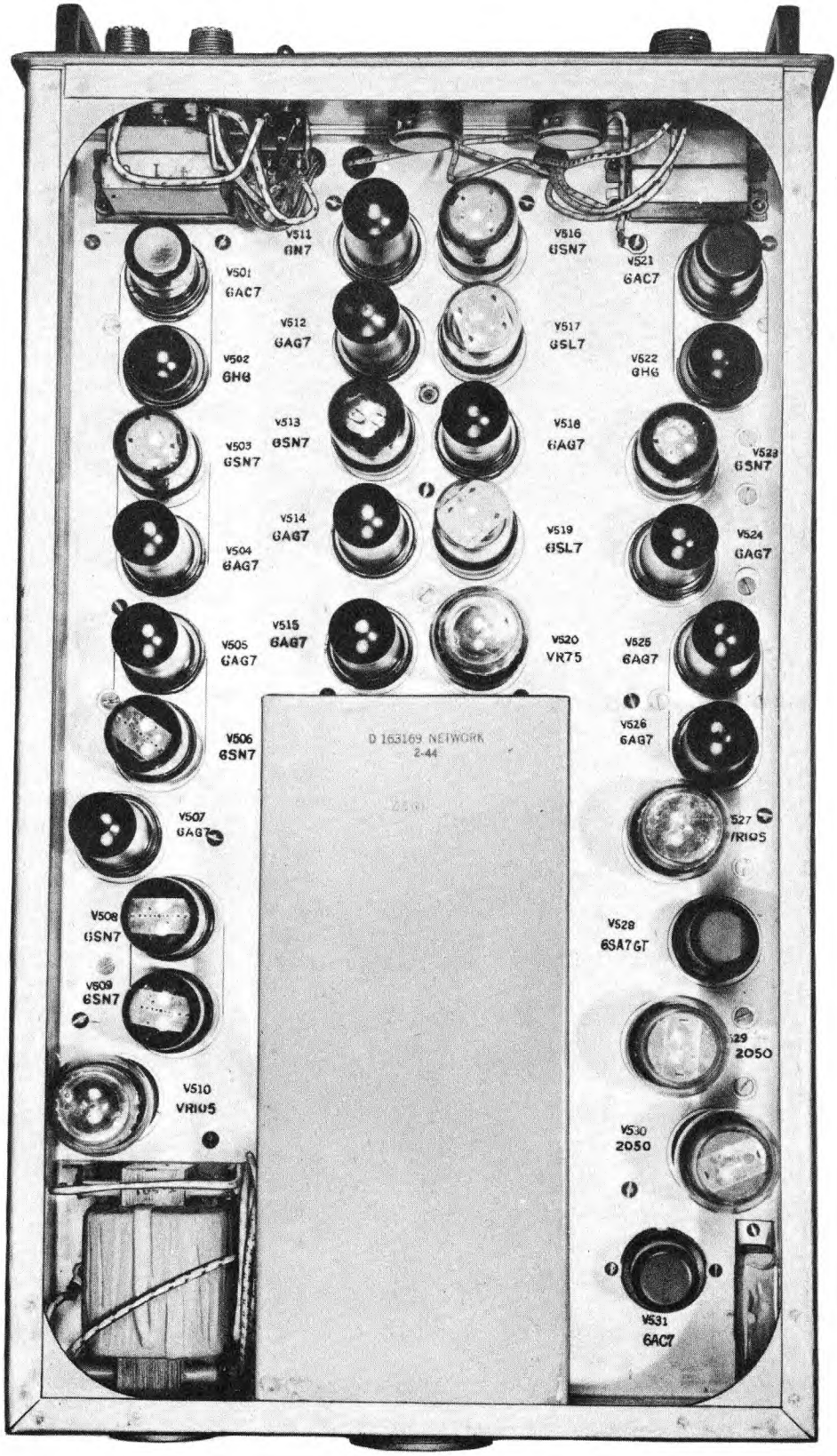


Figure 4-3. Synchronizer SN-8/APQ-5—Interior Top View

SECTION V
SUPPLEMENTARY DATA

1. GENERAL.

The following additional information is included for the guidance of using personnel. The measures described shall be applied only when sanctioned by the local maintenance authority.

2. WATERPROOFING AND CARE OF PLUGS AND CABLES.

Considerable trouble has been experienced from water getting into cables and plugs and thereby causing short circuits and arcing. Improper care of plugs and connectors will result in the necessity of replacing the cables. To waterproof these plugs and cables proceed as follows:

a. LOW VOLTAGE CABLES.

(1) Inspect all soldered connections.

(2) Wash both the front and back faces of the plug thoroughly with carbon tetrachloride. Make sure that the plug is completely dried.

(3) Coat both the front and back faces with Dow-Corning No. 4 Ignition Sealing Compound, heavy grade, Stock No. 7300-223100, Class 07 AF Stock. Apply liberal amounts around soldered connections and in such places where it will serve as a moisture seal.

b. HIGH VOLTAGE CABLES.— To eliminate flashover in high voltage cable connectors, treat the rubber surfaces with the ignition sealing compound specified above.

(1) Remove the rubber section of the connector from the metal shell and wash in carbon tetrachloride. Thoroughly dry.

(2) Coat all rubber surfaces with the ignition sealing compound and reassemble the plug.

(3) Apply an additional coating of about 1/16-inch thickness on the face of the connector. Tighten the connector firmly with hand pressure.

c. HIGH VOLTAGE CABLES WHICH HAVE FLASHED OVER.—To treat high voltage cable connectors which have flashed over, follow the procedure given in (2) above, first scraping away any carbonized rubber and other foreign matter from the connector face. Connectors repaired in this manner will give indefinite service.

d. WATERPROOFING WIRING.— Good use can be made of the ignition sealing compound to waterproof wiring which may be affected by moisture. Washing with carbon tetrachloride and treating with the sealing compound offers good protection if normal care is taken to keep the equipment dry.

CAUTION

Exercise care when handling high voltage cable connectors. When inserting and removing connectors, grasp the metal coupling. Do not pull or push on the cable proper. Avoid sharp bends at the connector to prevent failure at the point where the shield is grounded to the connector as many failures have been experienced at this point. *Under no condition shall the connector be handled until the power is "OFF."*

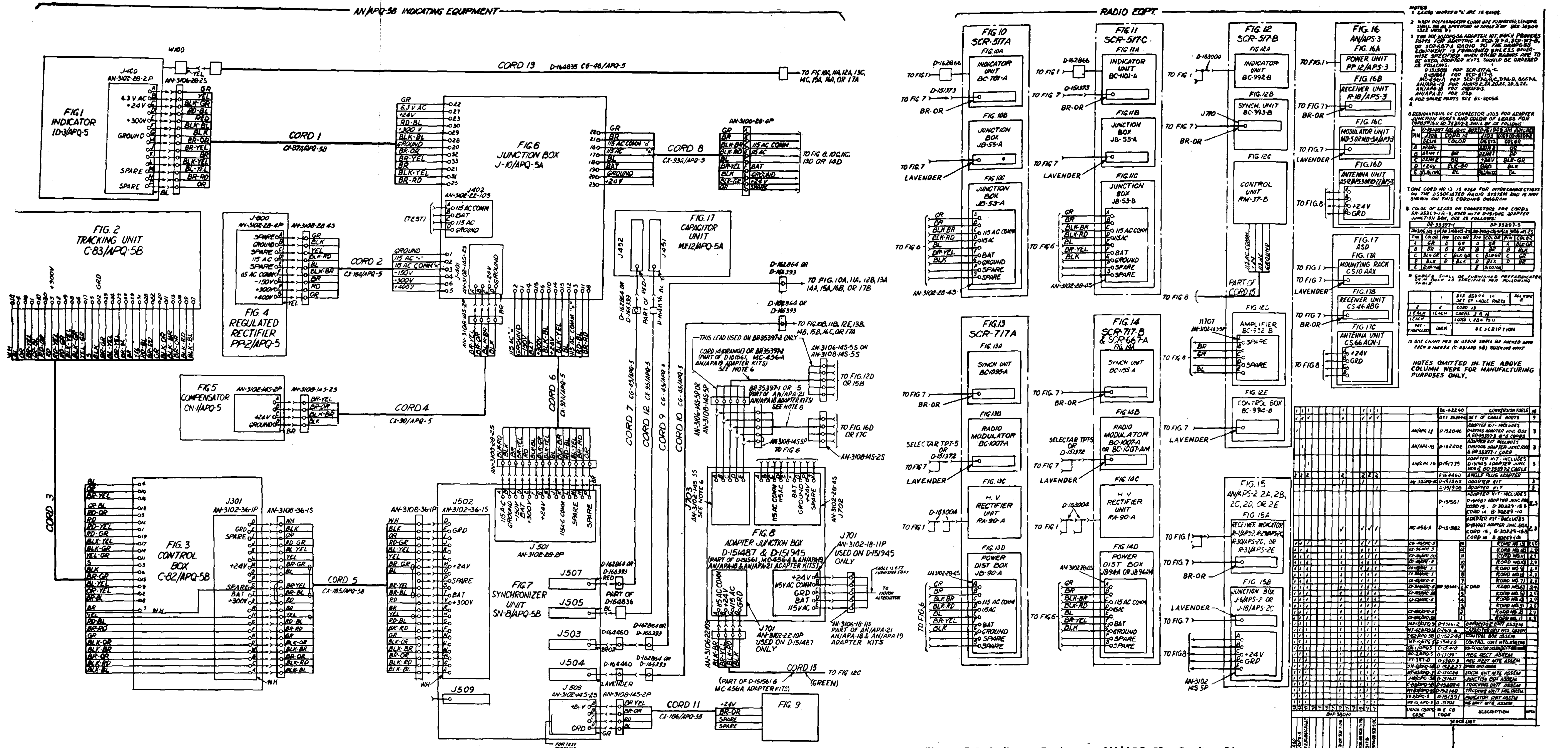
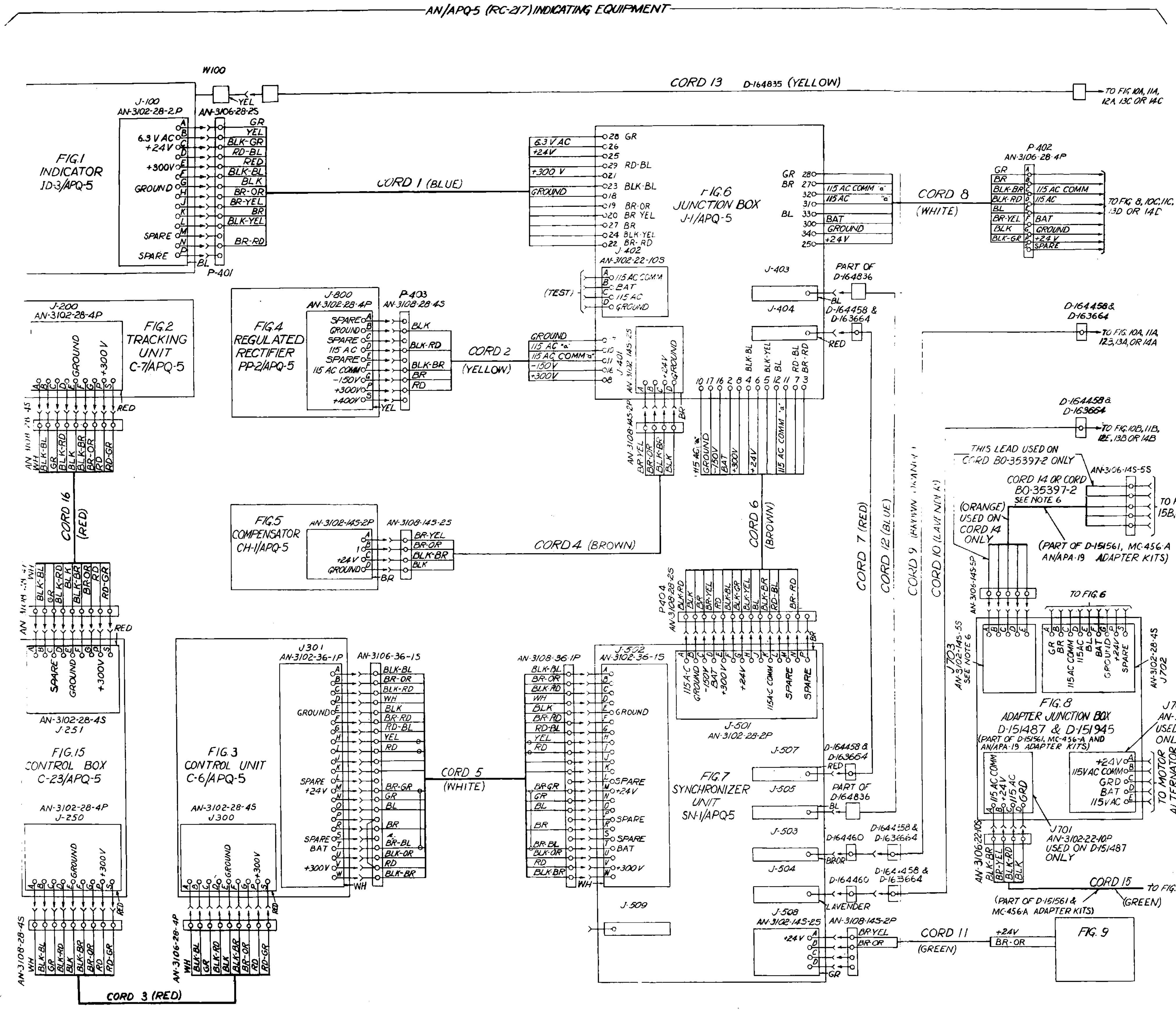
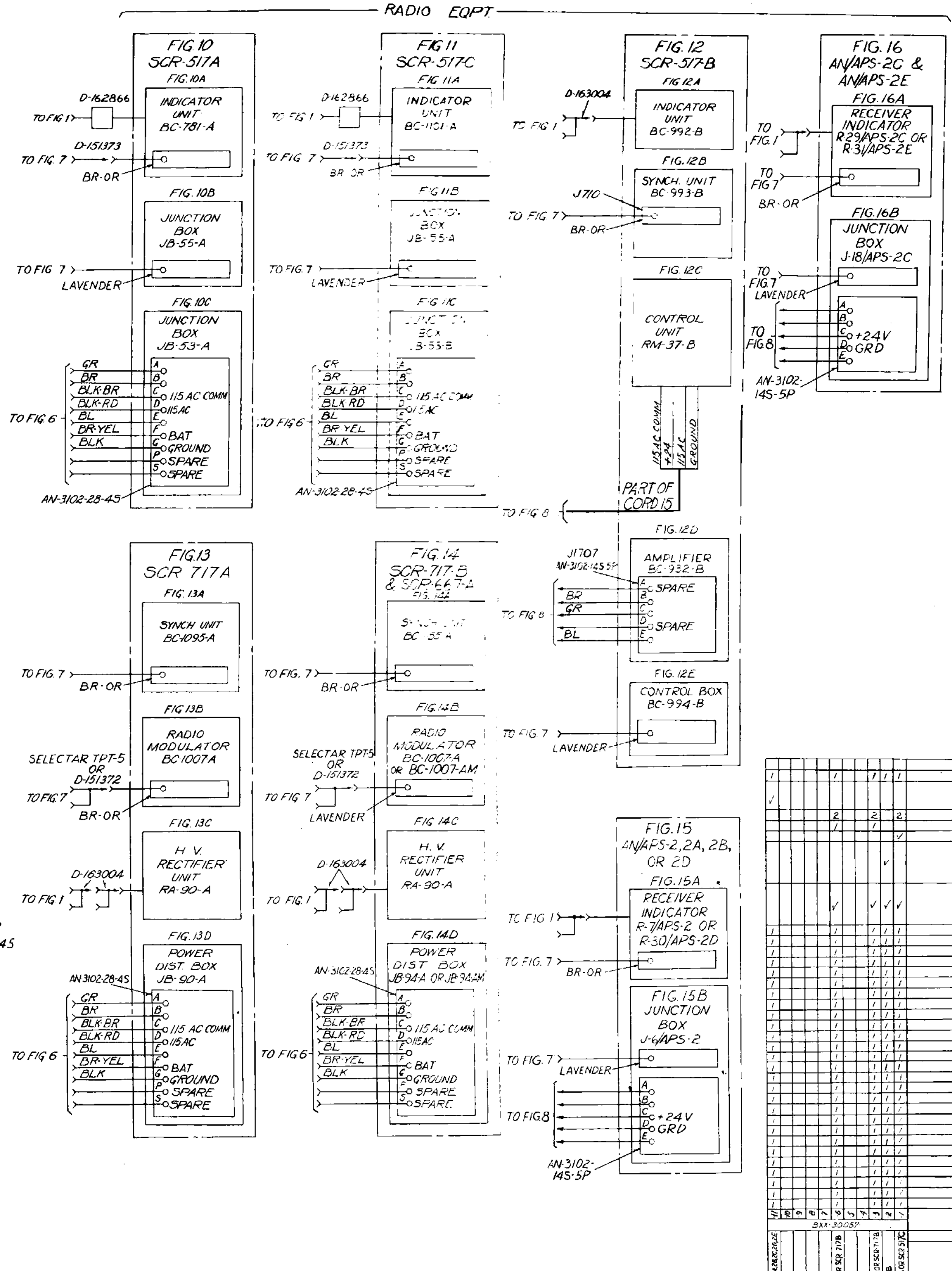


Figure 5-1. Indicator Equipment AN/APQ-5B—Cording Diagram





NOTES:
1. LEADS MARKED "a" ARE 16 GAUGE
2. CORD LENGTH SHALL BE AS SPECIFIED
3. THE MX30/APQ-5A ADAPTER KIT, WHICH PROVIDES PARTS FOR ADAPTING A SCR-717-A, SCR-717-B, OR SCR-667-A RADIO TO THE AN/APQ-5 (RC-217) EQUIPMENT IS FURNISHED UNLESS OTHERWISE SPECIFIED WHEN OTHER RADIOS ARE TO BE USED, ADAPTER KITS SHOULD BE ORDERED AS FOLLOWS:
   D-151508 FOR SCR-517-A, -C
   D-151561 FOR SCR-517-B
   MC-456-A FOR SCR-517-A, -B, -C, SCR-717-A, -B, AND SCR-667-A.
   AN/APA-19 FOR AN/APS-2, 2A, 2B, 2C, 2D, & 2E
6. DESIGNATIONS OF CONNECTOR J703 FOR ADAPTER JUNCTION BOXES AND COLOR OF LEADS FOR CORD SHALL BE AS FOLLOWS:

PIN	D-151487 ADA. JUNC. BOX. J703 DESIG.	D-151487 ADA. JUNC. BOX. CORD 14 COLOR	D-151945 ADA. JUNC BOX J703 DESIG.	D-151945 ADA. JUNC BOX CORD B0-35397-2 COLOR
A	SPARE		AZIM 2	GR
B	AZIM 1	BR	AZIM 1	BR
C	AZIM 2	GR	+24V	BLK-GR
D	+24V	BLK-GR	GRD	BLK
E	BLANKING	BL	BLANKING	BL

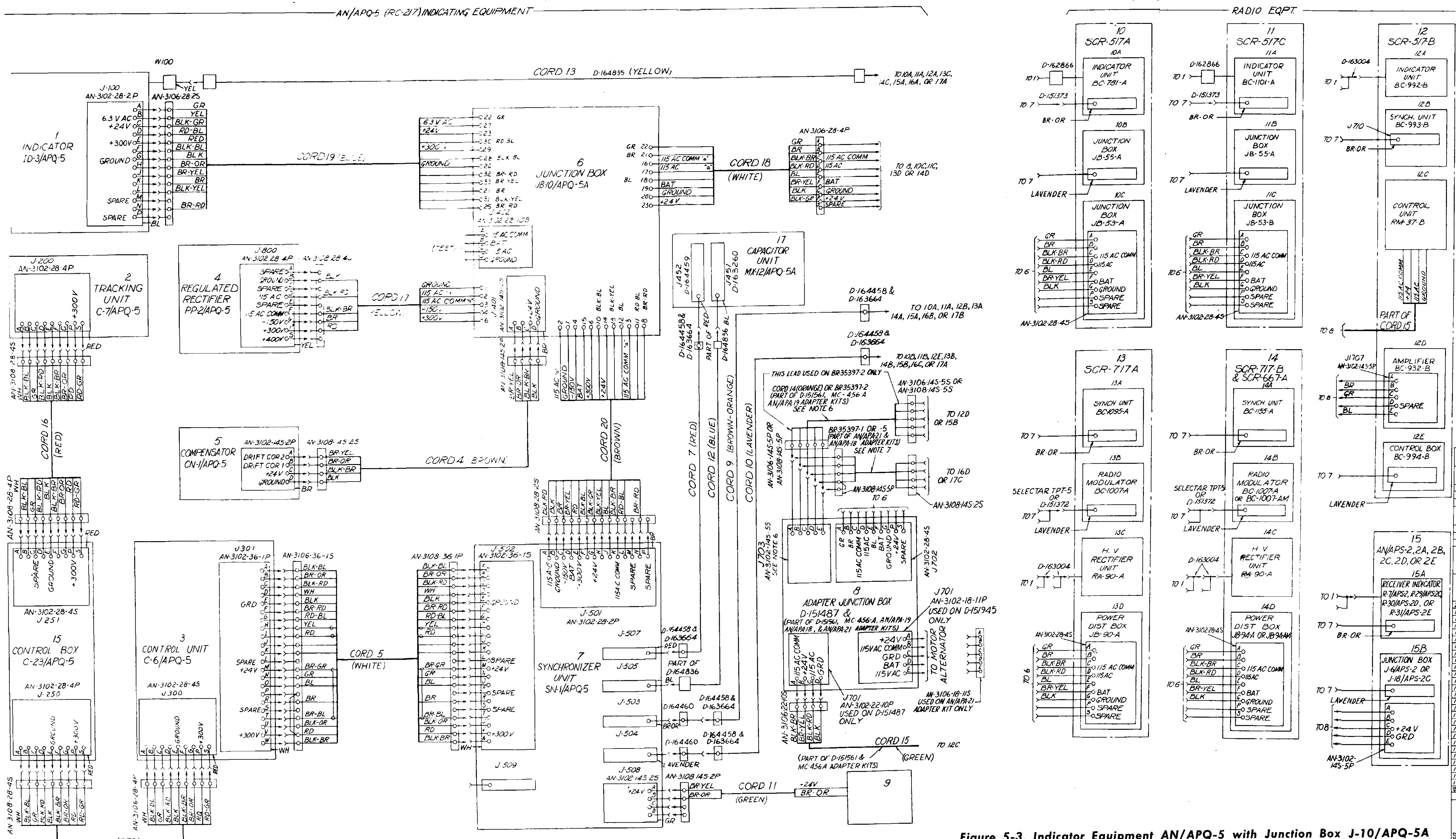
NOTES OMITTED IN THE ABOVE COLUMN WERE FOR MANUFACTURING PURPOSES ONLY.

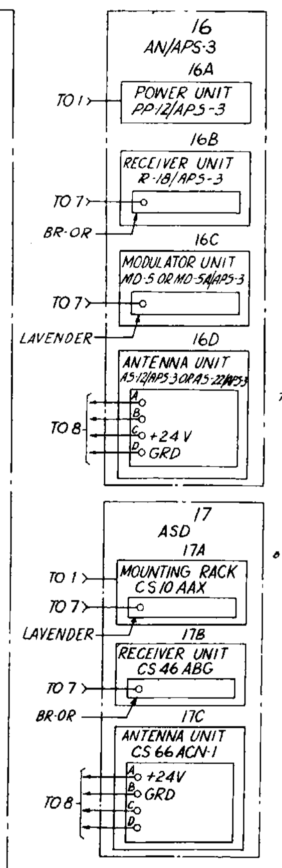
STOCK LIST

SIGNAL CORPS CODE	W.E. CO CODE	DESCRIPTION	NOTES
	BL-32234	ALT. CONVERSION TABLE	
	D-151775	ADAPTER KIT - INCLUDES D-151945 ADAPTER JUNC. BOX & B0-35397-2 CABLE	3
	D-164460	ANGLE PLUG ADAPTER	
	D-151562	ADAPTER KIT	3
	D-151508	ADAPTER KIT	3
	D-151561	ADAPTER KIT - INCLUDES D-151487 ADAPTER JUNC. BOX, CORD 15, B-30229-15 & CORD 14, B-30229-14	2,3
MC-456-A	D-151582	ADAPTER KIT - INCLUDES D-151487 ADAPTER JUNC. BOX, CORD 15, B-30229-15 & CORD 14, B-30229-14	2,3
	B-30229-13	CORDS (CORD NO. 13)	2
	B-30229-12	CORDS (CORD NO. 12)	2
	B-30229-11	CORDS (CORD NO. 11)	2
	B-30229-10	CORDS (CORD NO. 10)	2
	B-30229-9	CORDS (CORD NO. 9)	2
	B-30229-8	CORDS (CORD NO. 8)	2
	B-30229-7	CORDS (CORD NO. 7)	2
	B-30229-6	CORDS (CORD NO. 6)	2
	B-30229-5	CORDS (CORD NO. 5)	2
	B-30229-4	CORDS (CORD NO. 4)	2
	B-30229-3	CORDS (CORD NO. 3)	2
	B-30229-2	CORDS (CORD NO. 2)	2
	B-30229-1	CORDS (CORD NO. 1)	2
	B-30229-16	CORDS (CORD NO. 16)	2
C-23/APQ-5	D-151618	CONTROL BOX ASSEM	
C-6/APQ-5	D-151394	CONTROL UNIT ASSEM.	
MT-19/APQ-5	D-151420	CONTROL UNIT MTG. ASSEM.	
CH-1/APQ-5	D-151410	COMPENSATOR ASSEM. (DRIFT COR. CONT.)	
PP-2/APQ-5	D-151397	REG. RECT. ASSEM.	
FT-357-B	D-150713	REC. RECT. MTG. ASSEM.	
SN-1/APQ-5	D-151396	SYNCH. UNIT ASSEM. (RANGE UNIT)	
MT-43/APQ-5	D-151424	SYNCH. UNIT MTG. ASSEM	
J-1/APQ-5	D-151395	JUNCTION BOX ASSEM.	
C-7/APQ-5	D-151393	TRACKING UNIT ASSEM	
MT-17/APQ-5	D-151421	TRACKING UNIT MTG. ASSEM	
ID-3/APQ-5	D-151391	INDICATOR UNIT ASSEM.	
MT-18/APQ-5	D-151392	IND. UNIT MTG. ASSEM.	

REQ. FOR B25 | REQ. FOR B24

Figure 5-2. Indicator Equipment AN/APQ-5 with Junction Box J-1/APQ-5 and Capacitor Unit MX-1/APQ-5—Cording Diagram





NOTES

1 LEADS MARKED "a" ARE 16 GAUGE.

2 CORD LENGTH SHALL BE AS SPECIFIED.

3 THE MX-30-APQ-5A ADAPTER KIT, WHICH PROVIDES PARTS FOR ADAPTING A SCR-717-A, SCR-717-B, OR SCR-667-A RADIO TO THE AN/APQ-5 (RC-217) EQUIPMENT IS FURNISHED UNLESS OTHERWISE SPECIFIED. WHEN OTHER RADIOS ARE TO BE USED, ADAPTER KITS SHOULD BE ORDERED AS FOLLOWS:
D-151508 FOR SCR-517-A, -C.
D-151561 FOR SCR-517-B.
MC-456-A FOR SCR-517-A, -B, -C, 717-A, -B, & 667-A.
AN/APA-19 FOR AN/APS-2, 2A, 2B, 2C, 2D, & 2E
AN/APA-18 FOR AN/APS-3.
AN/APA-21 FOR ASD.

6. DESIGNATIONS OF CONNECTOR J703 FOR ADAPTER JUNCTION BOXES AND COLOR OF LEADS FOR CORD #14 COND BO-35397-2 SHALL BE AS FOLLOWS

PIN	D-151487 ADA JUNC BOX J703 DESIG	D-151487 ADA JUNC BOX CORD 14 COLOR	D-151945 ADA JUNC BOX J703 DESIG	D-151945 ADA JUNC BOX CORD BO-35397-2 COLOR
A	SPARE		AZIM 2	GR
B	AZIM 1	BR	AZIM 1	BR
C	AZIM 2	GR	+24V	BLK-GR
D	+24V	BLK-GR	GRD	BLK
E	BLANKING	BL	BLANKING	BL

7. COLOR OF LEADS ON CONNECTORS FOR CORDS BR-35397-1 & -5, USED WITH D-151945 ADAPTER JUNCTION BOX, ARE AS FOLLOWS:

BR-35397-1 AN-3108-14S-5P PIN	COLOR	AN-3108-14S-2S PIN	COLOR	BR-35397-5 AN-3108-14S-5P PIN	COLOR	AN-3108-14S-2S PIN	COLOR
A	GR	A	GR	A	GR	A	BLK-GR
B	BR	B	BR	B	BR	B	BLK
C	BLK-GR	C	BLK-GR	C	BLK-GR	C	GR
D	BLK	D	BLK	D	BLK	D	BR
E	BLK(STRIP)			E	BLK(STRIP)		

8 ONE CORD NO 13 IS USED FOR INTERCONNECTIONS ON THE ASSOCIATED RADIO SYSTEM AND IS NOT SHOWN ON THE CORDING DIAGRAM.

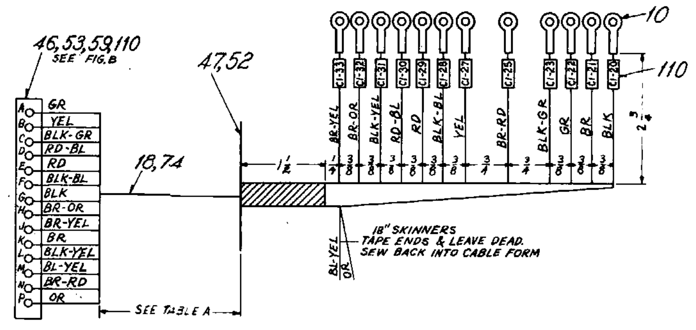
NOTES OMITTED IN THE ABOVE COLUMN WERE FOR MANUFACTURING PURPOSES ONLY.

STOCK LIST

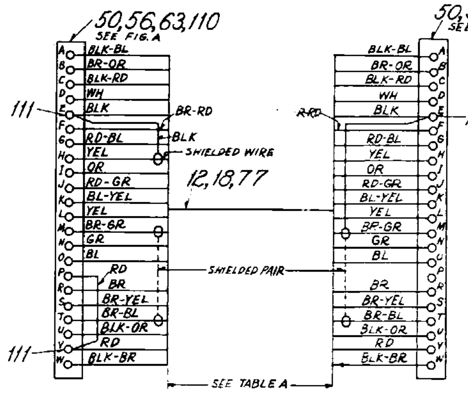
-13 ASD	-12 AN/APS-3	-11 AN/APS-2, 2A, 2B, 2C, 2D, 2E	-10	-9	-8	-7	-6 SCR-717A OR SCR-717B	-5	-4	-3 SCD-717A OR SCR-717B	-2 SCR-517B	-1 SCR-517A OR SCR-517C	SIGNAL CORPS CODE	W.E. CO. CODE	DESCRIPTION	NOTES
/													AN/APA-21	D-152046	ADAPTER KIT - INCLUDES D-151945 ADAPTER JUNC BOX & BR-35397-3, & -5 CORDS	3
	/												AN/APA-18	D-152408	ADAPTER KIT - INCLUDES D-151945 ADAPTER JUNC BOX & BR-35397-1 CORD	3
/	/	/					/			/	/	/	MX-12/APQ-5A	D-151612	CAPACITOR UNIT ASSEM.	
/	/	/					/			/	/	/	MT-42/APQ-5A	D-151616	CAPACITOR UNIT MTG. ASSEM.	
/	/	/					/			/	/	/		BL-32234	ALT. CONVERSION TABLE	
		/											AN/APA-19	D-151775	ADAPTER KIT - INCLUDES D-151945 ADAPTER JUNC. BOX & BR-35397-2 CORD.	3
							2			2		2		D-164460	ANGLE PLUG ADAPTER	
							/			/				D-151562	ADAPTER KIT	3
												/		D-151506	ADAPTER KIT	3
											/			D-151561	ADAPTER KIT - INCLUDES D-151487 ADAPTER JUNC BOX CORD 15, B-30229-15 & CORD 14, B-30229-14	2,3
							✓			✓	✓	✓	MC-456-A	D-151582	ADAPTER KIT - INCLUDES D-151487 ADAPTER JUNC. BOX, CORD 15, B-30229-15 & CORD 14, B-30229-14	2,3
2	2	2					2			2	2	2		B-30229-13	CORDS (CORD NO. 13)	2,8
/	/	/					/			/	/	/		B-30229-12	CORDS (CORD NO. 12)	2
/	/	/					/			/	/	/		B-30229-11	CORDS (CORD NO. 11)	2
/	/	/					/			/	/	/		B-30229-10	CORDS (CORD NO. 10)	2
/	/	/					/			/	/	/		B-30229-9	CORDS (CORD NO. 9)	2
/	/	/					/			/	/	/		B-30229-21	CORDS (CORD NO. 21)	2
/	/	/					/			/	/	/		B-30229-20	CORDS (CORD NO. 20)	2
/	/	/					/			/	/	/		B-30229-19	CORDS (CORD NO. 19)	2
/	/	/					/			/	/	/		B-30229-5	CORDS (CORD NO. 5)	2
/	/	/					/			/	/	/		B-30229-4	CORDS (CORD NO. 4)	2
/	/	/					/			/	/	/		B-30229-3	CORDS (CORD NO. 3)	2
/	/	/					/			/	/	/		B-30229-18	CORDS (CORD NO. 18)	2
/	/	/					/			/	/	/		B-30229-17	CORDS (CORD NO. 17)	2
/	/	/					/			/	/	/		B-30229-16	CORDS (CORD NO. 16)	2
/	/	/					/			/	/	/	C-23/APQ-5	D-151618	CONTROL BOX ASSEM	
/	/	/					/			/	/	/	C-6/APQ-5	D-151394	CONTROL UNIT ASSEM.	
/	/	/					/			/	/	/	MT-19/APQ-5	D-151420	CONTROL UNIT MTG. ASSEM.	
/	/	/					/			/	/	/	CN-1/APQ-5	D-151410	COMPENSATOR ASSEM. (DRIFT COR CONT)	
/	/	/					/			/	/	/	PP-2/APQ-5	D-151397	REG RECT ASSEM	
/	/	/					/			/	/	/	FT-357-B	D-150713	REG RECT MTG ASSEM	
/	/	/					/			/	/	/	SN-1/APQ-5	D-151396	SYNCH. UNIT ASSEM. (RANGE UNIT)	
/	/	/					/			/	/	/	MT-43/APQ-5	D-151424	SYNCH. UNIT MTG ASSEM	
/	/	/					/			/	/	/	J-10/APQ-5A	D-151611	JUNCTION BOX ASSEM	
/	/	/					/			/	/	/	C-7/APQ-5	D-151393	TRACKING UNIT ASSEM.	
/	/	/					/			/	/	/	MT-17/APQ-5	D-151421	TRACKING UNIT MTG. ASSEM	
/	/	/					/			/	/	/	ID-3/APQ-5	D-151391	INDICATOR UNIT ASSEM	
/	/	/					/			/	/	/	MT-18/APQ-5	D-151392	IND. UNIT MTG ASSEM	

BXX-36114 — REQ FOR B25 — REQ FOR B24

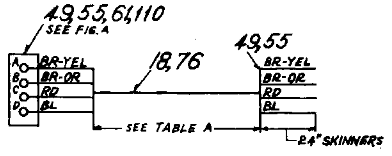
Figure 5-3. Indicator Equipment AN/APQ-5 with Junction Box J-10/APQ-5A and Capacitor Unit MX-12/APQ-5A—Cording Diagram



BXX-38344-1



BXX-38344-5



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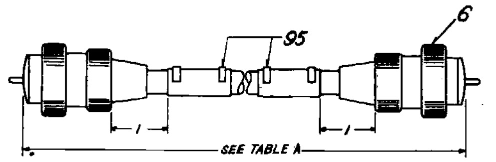
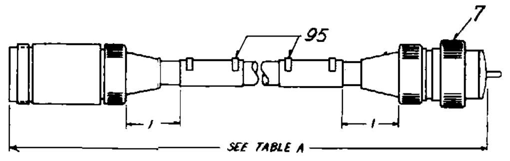
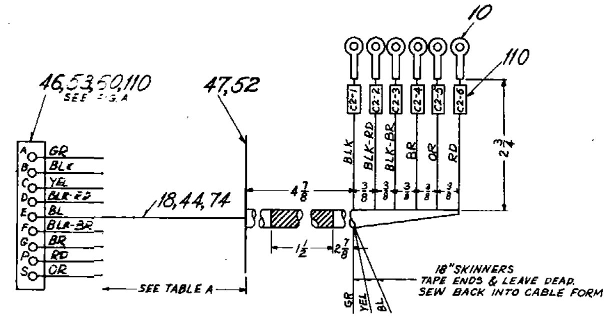


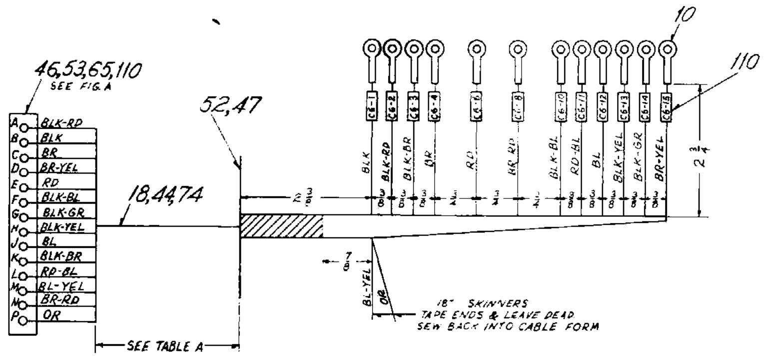
BXX-38344-12



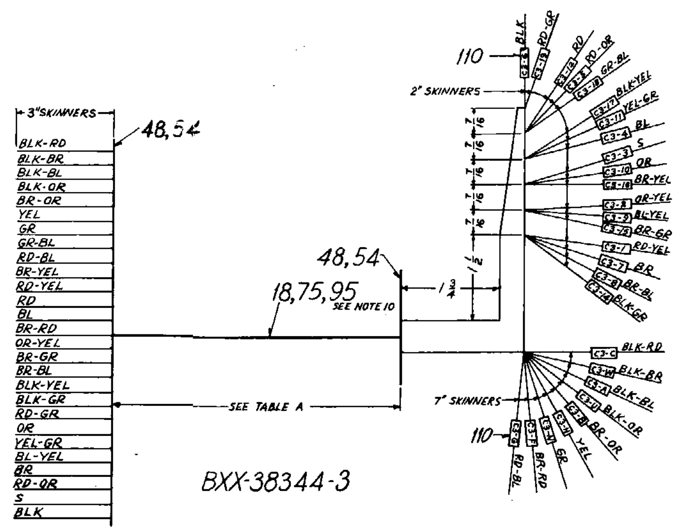
BXX-38344-13



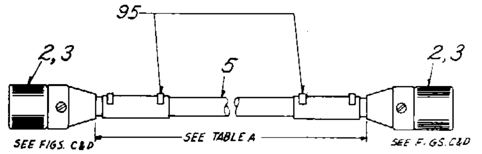
BXX-38344-2



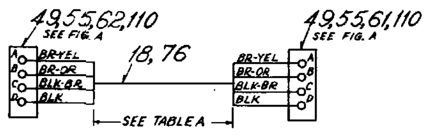
BXX-38344-6



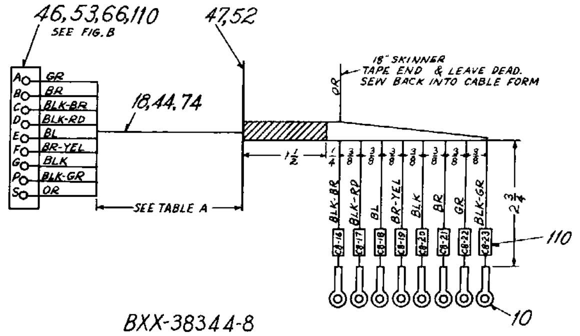
BXX-38344-3



BXX-38344-7, 9, 10



BXX-38344-4



BXX-38344-8

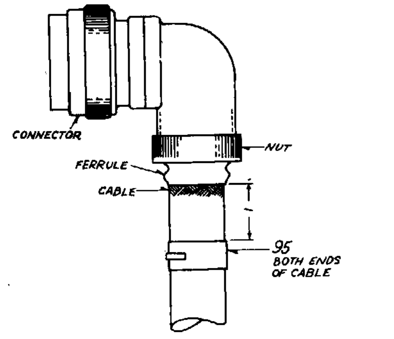


FIG. A

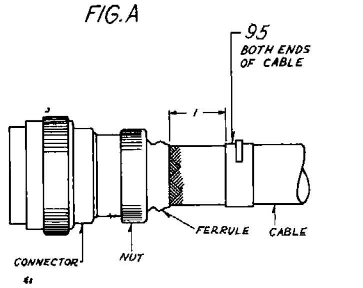


FIG. B

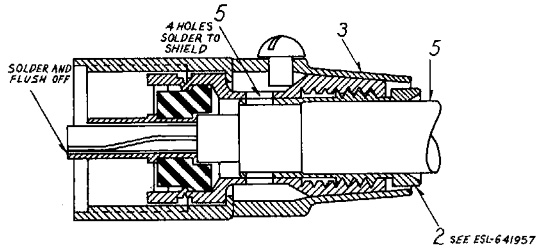


FIG. C
SEE ESL-641957
FOR METHOD OF CONNECTING CORD

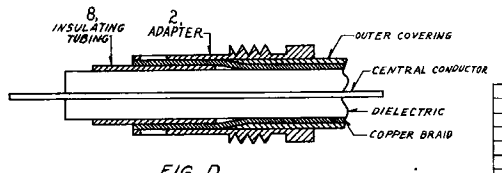


FIG. D
APPLICATION OF INSULATING TUBING

NOTES

1. THESE WIRES SHALL BE COVERED WITH A TINNED COPPER SHIELD BRAID 85% COVERAGE WOVEN OVER THEM SHIELD MAY BE PER KS-8913 EXCEPT THAT OUTER COTTON BRAID AND GRD WIRE SHALL BE OMITTED. SEE CABLE DETAILS.
2. SOLDER SHIELD ALL AROUND AT EACH END TO PREVENT UNRAVELLING.
3. ALL "AN" PARTS SHALL BE OBTAINED FROM AMERICAN PHENOLIC CORP., CHICAGO, ILL.
4. FOR CORDS TERMINATED IN AMPHENOL CONNECTORS THE INSERTS SHOULD NOT TURN IN THE CONNECTOR AFTER ASSEMBLY.
5. LENGTHS OF CORDS NOT OTHERWISE SPEC. SHALL BE MEASURED FROM FERRULE TO FERRULE. & SHALL BE SUBJECT TO THE FOLLOWING TOLERANCES:

UP TO 2'	± 1/4"
2' TO 5'	± 1/2"
5' TO 10'	± 1"
10' & OVER	± 2"

6. HATCHED PART OF CABLE TO BE WRAPPED WITH TWO LAYERS OF WHITE FRICTION TAPE & APPLY ONE COAT OF CLEAR LACQUER.
7. TUBING SHALL BE ORDERED WITH 3/32 IN. BLUE CHARACTERS CONSISTING OF CORD NUMBER AND LETTER OF PIN ON AMPHENOL CONNECTOR OR TERMINAL NUMBER IN JUNCTION BOX, IE: C1-A IS A LEAD-IN CORD 1 ON PIN A OF CONNECTOR. SLIP TUBING OVER WIRE BEFORE SOLDERING. SOLDER WIRES TO PINS OF CONNECTORS OR TO TERMINALS & SLIP TUBING OVER SOLDER CONNECTION AS FAR AS POSSIBLE.

FOR RECORD ONLY
8. TAPE CHARACTERS SHALL BE AS SPECIFIED ON CORD ASSEMBLIES. EACH PIECE OF TAPE SHALL MAKE APPROXIMATELY TWO TURNS & SHALL BE APPLIED SO THAT 2 OR MORE SETS OF CHARACTERS ARE LEGIBLE.

9.

10. ATTACH BAND (ITEM 95) APPROX. 1" FROM FERRULE (ITEM 48) AT EACH END OF CABLE.
11. WHEN BULK CABLING IS SPECIFIED, ALL WIRE AND COAXIAL CABLE SHALL BE FURNISHED AS SPECIFIED IN THE CONTRACT IN MULTIPLES OF THE LENGTHS LISTED.

LENGTHS OF CORDS	W.E. CO.
38'-0"	BXX-38344-13
12'-0"	-12
9'-0"	-11
42'-0"	-10
42'-0"	-9
42'-0"	-8
12'-0"	-7
6'-6"	-6
10'-8"	-5
11'-0"	-4
6'-0"	-3
11'-0"	-2
11'-6"	BXX-38344-1
B24-D	

TABLE A

ITEM	PIECE	NAME
115		
114		
113		
112		
111	#5 X 3/8 L.G.	WHITE VERSIFLEX TUBING SEE NOTE 7
110	#8 X 3/4 L.G.	BURNDY ENG. CO. N.Y.
109		
108		
95	80-43331 (-5, -4, -7, -3, -2, -11); 80-43331; 80-43331 (-10, -13, -6); 80-36965 (-53); 80-43331 (-9, -8)	IDENTIFICATION BAND
94		
80		
79		
78		
77	1 I.D.	AN-WW-C-561 TYPE I FLEXIBLE SHIELDING CONDUIT SEE NOTE 3 & TABLE A
76	3/4 I.D.	
75	3/4 I.D.	
74	5/8 I.D.	
73		
72		
72		
70		
69		
68		
67		
66	AN-3106-28-4P	CONNECTOR (SEE NOTE 3)
65	AN-3108-28-2S	
64	AN-3108-36-1P	
63	AN-3108-36-1S	
62	AN-3108-14S-2S	
61	AN-3108-14S-2P	
60	AN-3108-28-4S	
59	AN-3108-28-2S	
58		
57		
56	AN-3054-24	CONDUIT NUT (SEE NOTE 3)
55	AN-3054-6	
54	AN-3054-12	
53	AN-3054-16	
52	AN-3054-10	
51		
50	AN-3052-16	CONDUIT FERRULE (SEE NOTE 3)
49	AN-3050-6	
48	AN-3050-12	
47	AN-3050-10	
46	AN-3052-10	
44	BLK-BR, BLK-RD	#16 A.W.G. STRANDED WIRE PER KS-8640 SEE TABLE A
18	RD-OR, YEL-GR, BR-GR, OR-YEL, RD-YEL, OR, BL-YEL, RD-GR, YEL, BLK-BL, BR-OR, BLK-RD, WH, BLK, BR-RD, BLK-YEL, RD-BL, BLK-GR, GR, BL, BR, BR-YEL, BLK-OR, RD, BLK-BR, BR-BL, S, GR-BL	NO. 20 AWG STRANDED WIRE PER KS-8640 SEE TABLE A
13	BR-BL, BR-GR PAIR	NO. 20 A.W.G. STRANDED WIRE PER KS-8640 SEE NOTES 1 & 2 & TABLE A
12	YEL	
11		
10	BA-404053	TERMINAL
9		
8		KS-7851 SLEEVING, BLK #6 X 5/8 LONG
7	D-164835	CABLE SEE TABLE A
6	D-164836	CABLE SEE TABLE A
5	RG-59/U	COAXIAL CABLE SEE TABLE A
3	D-166393 OR D-162864	COAXIAL PLUG
2	BA-415503	ADAPTER
1		

BXX-38344 — PREFABRICATED

SEE NOTE 11

Figure 5-4. Indicato Equipment AN/APQ-58—Cord Assemblies and Fabrication Methods