AN-08-30AXT2-2

HANDBOOK

OF

OPERATING INSTRUCTIONS

FOR

MODEL AN/AXT-2 AIRCRAFT RADIO EQUIPMENT

RESTRICTED

(For Official Use Only)

Approved 18 October 1944

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LIST OF REVISED PAGES ISSUED

NOTE: A heavy black vertical line, to the left of the text on revised pages, indicates the extent of the revision. This line is omitted where more than 50 percent of the page is revised.

This issue contains no revision.

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LIST OF ILLUSTRATIONS

FAILURE REPORTS

"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 Forces Regulation No. 15-54, listing:

1. Station and organization.
2. Nameplate data (type number and serial number, or complete nomenclature if nameplate is not attached to equipment).
3. Date and nature of failure.
4. Airplane 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 forward in accordance with the latest instruction of the Bureau of Aeronautics. In addition to other distribution required, one copy shall be furnished to the Bureau of Ships and to the Resident Inspector of Naval Material, RCA Victor Division of Radio Corporation of America, Camden, N. J. Such reports of failure shall include:

1. Reporting activity.
2. Nameplate data (type number and serial number, or complete nomenclature if nameplate is not attached to the equipment).
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."

DESTRUCTION OF ABANDONED MATERIAL 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!

SAFETY NOTICE

THIS EQUIPMENT EMPLOYS HIGH VOLTAGES WHICH ARE DANGEROUS AND MAY BE FATAL IF CONTACTED BY OPERATING PERSONNEL. EXTREME CAUTION SHOULD BE EXERCISED WHEN WORKING WITH THE EQUIPMENT.

CONTRACTUAL GUARANTEE

The equipment including all parts and spare parts, except vacuum tubes, batteries, rubber and material normally consumed in operation, is guaranteed for a period of one year from the date of delivery of the equipment to an acceptance by the Government with the understanding that all such items found to be defective as to material, workmanship or manufacture will be repaired or replaced, f.o.b. any point within the continental limits of the United States designated by the Government, without delay and at no expense to the Government; provided that such guarantee will not obligate the Contractor to make repair or replacement of any such defective items unless the defect appears within the aforementioned period and the Contractor is notified thereof in writing within a reasonable time and the defect is not the result of normal expected shelf life deterioration.

To the extent the equipment, including all parts and spare parts, as defined above, is of the Contractor's design or is of a design selected by the Contractor, it is also guaranteed, subject to the foregoing conditions, against defects in design with the understanding that if ten per cent (10%) or more of any such said item, but not less than two of any such item, of the total quantity comprising such item furnished under the contract, are found to be defective as to design, such item will be conclusively presumed to be of defective design and subject to one hundred per cent (100%) correction or replacement by a suitably redesigned item.

All such defective items will be subject to ultimate return to the Contractor. In view of the fact that normal activities of the Naval Service may result in the use of equipment in such remote portions of the world or under such conditions as to preclude the return of the defective items, for repair or replacement without jeopardizing the integrity of Naval communications, the exigencies of the Service, therefore, may necessitate expeditious repair of such items in order to prevent extended interruption of communications. In such cases the return of the defective items for examination by the Contractor prior to repair or replacement will not be mandatory. The report of a responsible authority, including details of the conditions surrounding the failure, will be acceptable as a basis for affecting expeditious adjustment under the provisions of this contractual guarantee.

The above one year period will not include any portion of time the equipment fails to perform satisfactorily due to any such defects, and any item repaired or replaced by the Contractor will be guarantee anew under this provision.

In some cases it has been found necessary to make substitution of original materials. However, all necessary factors have been maintained, so that replacements can be made, and wherever spare parts are involved in the substitutions, the spares are identical to the parts mounted in the equipment. If it is found that the latter cannot be met, special instructions will be issued and supplied for all shipments so affected.

Handbook of Operating Instructions

for

MODEL AN/AXT-2

AIRCRAFT RADIO EQUIPMENT

SECTION I

GENERAL DESCRIPTION

1. GENERAL.

The AN/AXT-2 equipment is a radio transmitting system for use in and by aircraft. This equipment may be used in conjunction with a suitable receiver to provide a complete radio system.

2. PURPOSE OF HANDBOOK.

The purpose of this Handbook is to provide INSTALLATION, ADJUSTMENT, and OPERATION Instructions for the AN/AXT-2 equipment.

3. EQUIPMENT.

The AN/AXT-2 equipment consists of Conversion Unit, Radio Transmitter, Dynamotor, Filter-Junction Box, Switch-Box, connecting cables and antenna. The Conversion Unit generates video and synchronizing signals. These signals modulate the Radio Transmitter, the output of which is radiated by the transmitting antenna. The Filter-Junction Box facilitates connection of the units and the Switch-Box provides a convenient means of turning the equipment off and on. The Dynamotor supplies the units with the required voltage.

4. POWER REQUIREMENTS.

The equipment operates from storage batteries supplied with the equipment, and draws approximately 27 amperes at the nominal voltage of 26.5 volts.

5. EQUIPMENT SUPPLIED.

Quan. per Equip.	Name of Unit	Army and Navy Designation	Dimensions in Inches See Footnote No. 1			Weight in Lbs. See Footnote No. 2
			Width	Depth	Height	
1	Conversion Unit	PH-522/AXT-2	9 13/32	23 15/16	11 3/4 *†	39 1/2*
1	Conversion Unit Shock Mount	CRV-10168				2 1/2
1	Radio Transmitter	T-61/AXT-2	12 13/64	18 1/32	9 31/32*	26*
1	Radio Transmitter Shock Mount	CRV-10167				2
1	Dynamotor	DY-25/AXT-2	12	6 1/2	9 3/8	23 1/2*
1	Dynamotor Shock Mount	CRV-10166				2 1/4
1	Filter-Junction Box	J-60/AXT-2	8 33/64	7 27/32	5 9/64*	8*
1	Filter-Junction Box Mounting Plate	CRV-10174				1/2
1	Switch Box and Plug	SA-34/AXT-2	2 5/16	4 7/8	1 15/16	1/2
1	Transmitter Antenna Assembly	CRV-66AFX, CRV-66AFY, CRV-66AFZ, CRV-66AGA, CRV-66AGB, CRV-66AEJ, CRV-66AEK, CRV-66AEL, CRV-66AEM, or CRV-66AEN See Footnote No. 3	22 3/8	7	13 1/16	2
1	Set Cables and Plugs (Assembled)	Nos. 1, 2, 3, 4, 5, 6, 8, and 10		See Figure 4-1		9 1/4
2	Storage Batteries	BB-201U	4 7/8	10 7/8	8	37

Footnote No. 1—See appropriate installation drawings for additional vibration and cable clearances.

Footnote No. 2—Weights are approximate due to possible substitution of material. Approximate total weight of equipment including cables and antenna is 185 lbs.

Footnote No. 3—Antenna supplied corresponds to frequency channel to which Transmitter is adjusted.

*—Includes shock mount or mounting plate.

†—If Direction Indicator is used, add 3 29/32".

6. TABULATION OF EQUIPMENT REQUIRED BUT NOT SUPPLIED.

a. Source of power for Conversion Unit filter and associated cable.

b. Source of power for heaters and associated cable. See Section II, Par. 7.

c. Remote Master switch, if used, and associated cable. See Section II, Par. 6.

d. Battery Compartment or mounting.

SECTION II

INSTALLATION AND ADJUSTMENT

1. PREPARATION FOR USE.

a. GENERAL. — Each piece of equipment has been inspected at the factory and carefully adjusted for maximum performance before shipment. However, slight changes in components, alteration of adjustments or actual damage may occur during shipment and the equipment should be inspected, checked and adjusted, if necessary, before it is placed in service. Instructions concerning such checks and adjustments are beyond the scope of this Handbook but are described in detail in the Handbook of Maintenance Instructions covering the AN/AXT-2 equipment. In the event that the Handbook of Maintenance Instruction covering the AN/AXT-2 equipment is not available, the ATK-ARK or ATJ-ARJ Handbook of Maintenance Instruction may be used. In general the AN/AXT-2 equipment is similar to the ATJ and ATK equipments.

b. BATTERIES. — The batteries supplied as part of this equipment are shipped in a partly charged condition. Before being placed in service, they must be filled with suitable electrolyte and charged as follows:

(1) Unscrew and remove the vent plugs from the cells.

(2) Fill each cell with electrolyte of 1.280 specific gravity.

Suitable electrolyte may be prepared from sulphuric acid of any specific gravity higher than 1.280 by mixing acid with approved water in the proper proportion. Figure 2-1 indicates the proper proportion. To use the chart, proceed as follows:

(a) Determine the specific gravity of the sulphuric acid available.

(b) Locate this specific gravity indication along the bottom scale of the chart.

(c) Project a vertical line upwards to the curve.

(d) Read "parts of water" on scale at left.

For example: 1 part of 1.835 sulphuric acid should be mixed with approximately 2¾ parts of water or 1 part 1.400 sulphuric acid should be mixed with approximately ½ part of water. The chart is based on a temperature of 60° F. (15.5° C.) for both water and acid before mixing. However, reasonable variations from this temperature are not important.

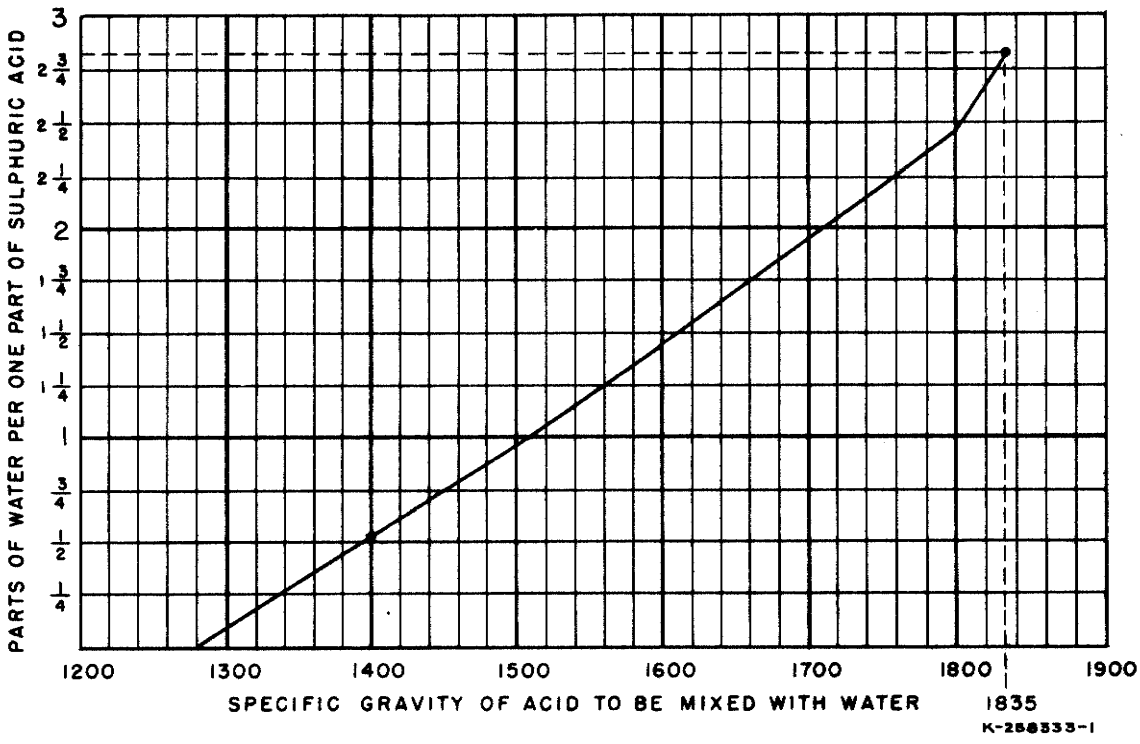


Figure 2-1—Preparation of Battery Electrolyte.

CAUTION

In mixing electrolyte, always pour the acid into the water. IT IS DANGEROUS TO POUR THE WATER INTO THE ACID. The electrolyte should be mixed in and poured from a container which will not be attacked by the acid. Suitable containers are made of glass, hard rubber, lead, etc.

Considerable heat is generated when acid and water are mixed together to produce electrolyte. The temperature of the electrolyte must not exceed 90° F. (32.2° C.) when it is poured into the cells because heat is again generated when the electrolyte comes in contact with the battery plates.

When acid and water are mixed together, a contraction takes place so that the volume of the resulting mixture is somewhat less than the sum of the acid and water volume separately.

Fill each cell with electrolyte up to ⅜" above the protector on top of the separators. Approximately 13.5 liquid ounces (400 CC's) of electrolyte are required to fill each cell or approximately 3 quarts (2.8 liters) per battery of seven cells.

(3) Allow the battery to stand at least 1 hour after filling it with electrolyte. If the level of the electrolyte has fallen, add more electrolyte to restore it to the proper level. Replace vent plugs in cells. If any of the electrolyte has been spilled on the battery during filling, it should be removed with a cloth dampened with a solution of baking soda and water.

(4) A freshening charge should be given the battery before it is placed in service. The charging rate should be 2½ amp. Make certain that the positive terminal of battery (marked POS. or +, or painted red) is connected to the positive side of the charge circuit and that the negative terminal of battery (marked NEG. or –, or painted black) is connected to the negative side of the charge circuit.

(5) Charge until four consecutive hourly readings show no rise in specific gravity for the lowest cell. If the charging rate is maintained at 2.5 amperes, the time required to charge the battery will be at least 18 hours. Lower charging rates will require a corresponding longer time. If the surrounding air temperature exceeds 110° F. (43.3° C.), the charging rate should be reduced below 2.5 amperes.

(6) After charging has been completed, the specific gravity should be between 1.275 and 1.300. If the specific gravity is not between 1.275 and 1.300 or if the level of the electrolyte is not ⅜" above the protectors on top of the separators, remove part of the solution and add approved water or electrolyte as required. Charge for an hour in order to mix the solution before testing again.

(7) The maximum energy capacity of the battery is based upon an electrolyte temperature of 80° F. (26.6° C.) at the beginning of discharge, specific gravity between 1.275 and 1.300 corrected to 80° F. (26.6° C.), and proper electrolyte level.

2. VIBRATION, TEMPERATURE AND HUMIDITY CONSIDERATIONS.

The results obtained from this equipment depend to a large degree upon the installation. While the equipment is designed to operate under severe conditions of vibration, temperature and humidity, careful attention must be given to the location and protection of the units in order to obtain the most satisfactory operation.

Shock mounts are provided for each of the major units of the equipment. The purpose of these mounts is to cushion the units against shocks and to reduce the vibration transmitted to the units from the aircraft structure. Under no circumstances should these mounts be omitted from any of the units. Excessive vibration may cause fracture of conductors or dislodgment of components and cause the equipment to become inoperative. The Conversion Unit is more sensitive to vibration than any of the other units. Under operating conditions, vibration of the Conversion Unit should not exceed 5/1000 inch and vibration of the Transmitter Unit should not exceed 10/1000 inch. If vibration is excessive, more elaborate shock mounts may be required than those furnished with the equipment.

The acoustic noise to which the units are subjected is also of great importance. Air vibrations are transmitted to the elements of the vacuum tubes inside the units and if these vibrations are of sufficient intensity, interference patterns appear. The acoustic noise level, in the range between 150 and 4,000 cycles per second, should not exceed about 105 DB at the Conversion Unit and about 115 DB at the Transmitter. If the noise level is excessive, special housings may be required.

Since a considerable amount of power is dissipated inside the units, it is important to provide sufficient ventilation to keep the temperature rise within safe limits. The temperature of the air entering the vents of the units should not exceed plus 50° C. (122° F.) and should not fall below minus 10° C. (plus 14° F.).

The equipment is designed to operate under high humidity conditions but is not designed to operate while exposed to the elements. Housings must always be provided to protect the equipment if operation in an exposed location is contemplated.

3. LOCATION OF UNITS IN AIRCRAFT.

The various units should be located in such a way as to avoid the necessity for cables longer than those supplied with the equipment. Figure 4-1 indicates the length of each cable supplied.

The units must be mounted with sufficient clearance to permit them to rock freely on their shock mounts without striking adjacent objects. The clearance should also be sufficient to permit removal of the units as well as their respective cables, plugs, covers, etc. The necessary clearances are indicated

on the installation diagram covering each unit as follows:

	Width	Depth	Height
Conversion Unit (Fig. 4-2)	17 3/8	29 1/4	12 1/4*
Transmitter (Fig. 4-3)	13 3/4	23 1/8	10 1/2
Dynamotor (Fig. 4-4)	12	7	9 3/4
Filter-Junction Box (Fig. 4-5)	8 33/64	14	5 9/64
Switch-Box and Plug (Fig. 4-6)	2 5/16	6 3/4	5 3/4

*If Direction Indicator is used, add 3 29/32".

4. INSTALLATION OF UNITS.

a. CONVERSION UNIT AND TRANSMITTER.

(1) Drill one set of sixteen mounting holes and another set of four clearance holes in the mounting surface of the aircraft at each location in accordance with Figure 4-2 (Conversion Unit) or Figure 4-3 (Transmitter).

(2) Remove the shock mount from the unit as directed on the appropriate installation drawing.

(3) Fasten each shock mount foot securely to the mounting surface by means of four 8-32 plated machine screws, flat washers and elastic stop nuts (mounting materials not furnished by equipment manufacturer).

(4) Replace the unit on its shock mount and manually tighten the two clamping screws.

b. DYNAMOTOR.

(1) Drill one set of sixteen mounting holes and another set of four clearance holes in the mounting surface of the aircraft in accordance with Figure 4-4.

(2) Remove the shock mount from the unit as directed on the installation drawing (Figure 4-4).

(3) Fasten each shock mount foot securely to the mounting surface by means of four 8-32 plated machine screws, flat washers and elastic stop nuts (mounting materials not furnished by equipment manufacturer).

(4) Replace the unit on the shock mount and fasten the four snap slide fasteners.

(5) Secure the four fasteners with safety wire.

c. FILTER-JUNCTION BOX.

(1) Drill four holes in the mounting surface of the aircraft in accordance with Figure 4-5.

(2) Remove the mounting frame as directed on the installation drawing (Figure 4-5).

(3) Fasten the mounting frame securely to the mounting surface by means of four 1/4-20 plated machine screws, flat washers and elastic stop nuts (mounting materials not furnished by equipment manufacturer).

(4) Replace the unit on the mounting frame and fasten the two snap slide fasteners.

(5) Secure the two fasteners with safety wire.

d. SWITCH-BOX.

(1) Drill four holes in the mounting surface of the aircraft in accordance with Figure 4-6.

(2) Fasten the Switch-Box securely to the mounting surface by means of four 8-32 plate machine screws, flat washers and elastic stop nuts (mounting materials not furnished by equipment manufacturer).

e. BATTERIES.

(1) GENERAL. — The special storage batteries should be mounted in a clamping arrangement suitable to the particular installation. Due regard should be given to heating, ventilation, spillage of electrolyte, and service accessibility. The cable terminal lugs should be connected with the long black lead to the negative battery terminal and the shorter white lead to the positive battery terminal.

f. GROUNDING. — Each one of the shock mounts should be grounded to the frame of the aircraft. If the mounting screws do not contact the frame of the aircraft, a separate connection should be made by means of a good r-f conductor.

5. LOCATION AND INSTALLATION OF ANTENNA.

a. GENERAL. — A separate antenna is provided for each frequency channel to which the Transmitter may be adjusted and each antenna is stamped with a number indicating the frequency band on which it is designed to operate. The antenna designation must correspond to the channel on which the Transmitter is to be operated.

b. LOCATION. — The transmitting antenna is illustrated in Figure 4-7. This antenna is normally mounted on the upper (top) surface of the aircraft and so located that the radiator is in a vertical position when the aircraft is in horizontal flight. In general, the antenna assembly should be mounted as far as possible from other objects and antennas and high enough so that all or most of the aircraft is below a horizontal plane passing through the ground rods.

The location should be such as to permit the shortest possible length of transmission line from the Transmitter to the antenna that is consistent with the above requirements. The loss in this transmission line is approximately 4 DB per 100 feet. A length of 25 feet, therefore, causes a loss of 1 DB and rereduces the power radiated by the antenna to about 80% of the power produced by the Transmitter. A length of 50 feet would reduce the power radiated to about 63%, etc. The effective range of the equipment is reduced as the radiated power is reduced.

c. MOUNTING. — On installations in which the antenna assembly is to be mounted above the metallic surface of the aircraft, the distance between the ground rods and the metallic surface should be approximately equal to the shortest distance from the ground rods to the tip of the vertical radiator. If the aircraft surface is non-metallic, a metal plate or screen approximately two feet in diameter should be provided below the ground rods and spaced as indicated above.

A suitable method of mounting the antenna is to insert the matching section in a split sleeve or cylindrical socket which is then clamped firmly around

the matching section. The required approved mounting device must be available at the point of installation (not supplied by equipment manufacturer). The mounting sleeve or socket should be rigidly fastened to the aircraft structure and precautions taken against loosening due to vibration by utilizing properly plated machine screws of ample size, flat washers, lock-washers and nuts. If any wood or similar substance is present, properly plated flat washers and elastic stop nuts should be used. The paint on the matching section should not be removed and intermittent grounding should not occur at this point.

The reflector portion of the antenna assembly increases the radiated signal in the horizontal direction opposite to the side on which the reflector is located. Therefore, the antenna assembly should be rotated in relation to the aircraft to obtain the desired direction of radiation before fastening the clamping or mounting device. Example: To obtain maximum radiated signal from the tail of the aircraft, mount the antenna assembly with the radiator toward the tail and the reflector toward the front of the aircraft.

6. PROVISION FOR REMOTE CONTROL.

If remote control of the AN/AXT-2 equipment is desired, a two-conductor cable is required from P802 in the Switch-Box (See Figure 4-1) to a remote master switch. The entire equipment is then controlled by the remote switch. Neither the cable nor the remote switch is supplied as a part of the AN/AXT-2 equipment. The cable used for this purpose must be capable of conducting approximately one ampere at the nominal voltage of 26.5 volts and the d-c resistance should not exceed two ohms.

7. HEATER CONNECTION.

Electrical heaters are provided in proximity to the Conversion Unit to reduce fogging under varying conditions of temperature and humidity. Provision is made to supply these heaters from a source of power other than the batteries furnished as part of the AN/AXT-2 equipment until such time as the equipment is placed in operation. However, when the equipment is turned on, the heaters are automatically switched from the external source of power to the batteries supplied with the equipment.

If it is not desirable to supply the heaters from an external power source, change the position of the link shown in Figure 2-2 to connect terminals eight and nine instead of terminals nine and ten. When the link is connected between terminals eight and nine, power for the heaters is supplied from the batteries which are furnished as part of the AN/AXT-2 equipment and the heaters are energized only when the equipment is turned on.

8. INSTALLATION OF CABLES.

a. GENERAL. — The various units must be connected together by cables in accordance with Figure 4-1. All of these cables are fabricated to a given length and completely assembled ready for use as supplied by the manufacturer. All cables must be routed or protected so that they will not be rubbed,

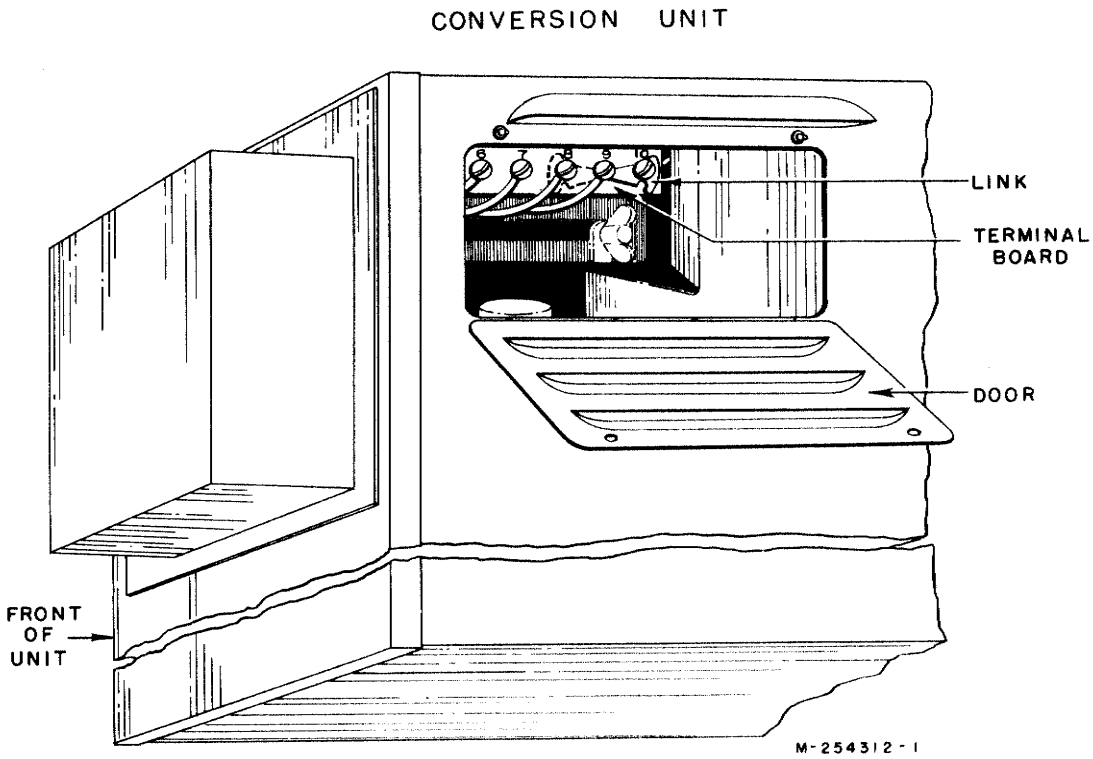


Figure 2-2—Heater Power-Supply Transfer Link.

scraped, crushed, or otherwise damaged by other cables or objects. The minimum banding radius of each cable is also given in Figure 4-1. All plug connector rings should be screwed up tightly by hand.

9. STARTING AND STOPPING THE EQUIPMENT.

The equipment may be placed in operation either by closing the remote master switch (not furnished with AN/AXT-2 equipment) or by withdrawing the plug from the Switch-Box. The equipment may be turned off either by opening the remote master switch or by replacing the plug in the Switch-Box with the remote master switch open or with no cable connected to the plug.

b. Place the AMPL. PLATE switch in the OFF position.

WARNING

The AMPL. PLATE switch must never be moved from the ON to the OFF position while the Transmitter is energized. Whenever it becomes necessary to operate the Transmitter with the AMPL. PLATE switch in the OFF position, it should be placed in the OFF position before the Transmitter is energized. Neglect of this warning may result in tube failure.

Apply power to the equipment (withdraw plug from Switch-Box) and observe the meter without depressing the meter button. If the meter does not go off scale, proceed with step c. **However, if the meter does go off scale, it is probable that the oscillator is not functioning and power should be removed from the equipment immediately (plug replaced in Switch-Box) to prevent damage to the tubes.** With power removed, turn OSC. FIL. clockwise one or two full turns. Apply power. If the meter still goes off scale, remove power; turn OSC. FIL. clockwise one or two additional full turns and again apply power. If the meter still goes off scale with any adjustment of OSC. FIL., refer to the Handbook of Maintenance Instruction. However, if these adjustments cause the meter to read less than full scale, adjust OSC. FIL. for minimum meter current.

c. Adjust AMPL. FIL. as far as it will go in a clockwise direction but do not force.

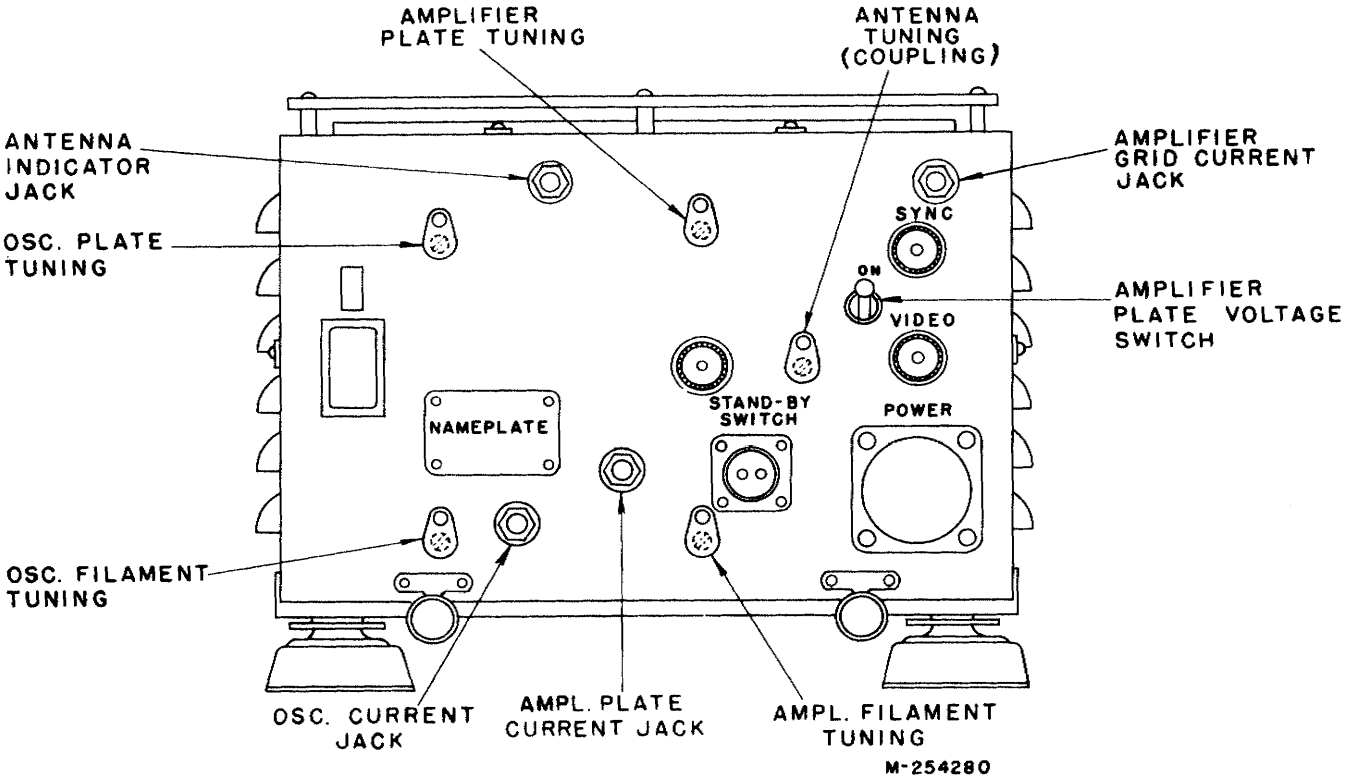


Figure 2-3—Radio Transmitter T-61/AXT-2, Controls

10. CHANGING FREQUENCY CHANNEL.

This paragraph covers the adjustment of a Transmitter to operate on a different frequency channel than that to which it was previously adjusted. During this procedure, the Transmitter output should be connected either to the transmitting antenna corresponding to the frequency channel to which the Transmitter is to be adjusted or to a suitable dummy load. Refer to Figure 2-3 and proceed as follows:

a. Disconnect the video and sync cables from the Transmitter and insert the test meter (CRV60058 or I-206) into the OSC. CURRENT jack on the front panel.

d. Alternately adjust OSC. PLATE towards the frequency channel on which it is desired to operate and OSC. FIL. for minimum meter current until the desired channel is reached. The correct scale reading for each channel is indicated on the card mounted below the scale. Do not permit the current to exceed 130 milliamperes at any time. The last adjustment of OSC. FIL. for minimum current should result in a meter reading of between 80 and 120 milliamperes.

e. Turn OSC. FIL. clockwise until the meter reading increases six milliamperes above the previous reading.

f. Transfer the test meter to the AMPL. CURRENT jack and turn the AMPL. FIL. adjustment counter-clockwise until the meter indicates ten milliamperes.

g. Transfer the test meter to the ANTENNA INDICATOR jack and adjust AMPL. PLATE for a maximum meter reading.

h. Transfer the test meter to the AMPL. CURRENT jack and adjust AMPL. FIL. to obtain a meter reading of one milliampere.

i. Turn AMPL. FIL. clockwise ten full turns.

j. Insert the test meter into the AMPL-GRID CURRENT jack on the front panel and place the AMPL. PLATE switch in the ON position.

k. Tune the Power Amplifier Plate circuit to resonance by means of the AMPLIFIER PLATE adjustment. Resonance is indicated by maximum meter current.

l. Alternately adjust ANTENNA TUNING and AMPLIFIER PLATE, to obtain a meter reading of between 9 and 10 milliamperes at precise resonance of the Power Amplifier plate circuit as indicated by maximum meter current.

m. Reconnect the video and sync cables. The meter reading should increase approximately 1.5 millamperes above the reading obtained in step *l.*

n. Transfer the test meter to the ANT. INDICATOR jack and retune AMPL. PLATE slightly to obtain the maximum current indication on the meter.

o. Transfer the test meter to the AMPL. CURRENT jack. The meter should indicate between 90 and 130 milliamperes. Remove the test meter.

11. PRE-FLIGHT ADJUSTMENT OF TRANSMITTER.

Due to variations in antennas, it is necessary to make a slight readjustment of the Transmitter before flight. After final bench adjustment of the Transmitter has been completed in accordance with the Handbook of Maintenance Instruction and after the Transmitter has been installed in the aircraft, proceed as follows:

a. Disconnect the video and sync cables from the Transmitter and insert the test meter (CRV-60058 or I-206) into the AMPL-GRID CURRENT jack on the front panel.

b. Place the AMPL. PLATE switch in the ON position and apply power to the equipment (withdraw plug from the Switch-Box).

c. Tune the Power Amplifier plate circuit to resonance by means of the AMPLIFIER PLATE adjustment. Resonance is indicated by maximum meter current.

d. Alternately adjust ANTENNA TUNING and AMPLIFIER PLATE, to obtain a meter reading of between 9 and 10 milliamperes at precise resonance of the Power Amplifier plate circuit as indicated by maximum meter current.

e. Reconnect the video and sync cables. The meter reading should increase approximately 1.5 millamperes above the reading obtained in step *d.*

f. Transfer the test meter to the ANT. INDICATOR jack and retune AMPL. PLATE slightly to obtain the maximum current indication on the meter.

g. Transfer the test meter to the AMPL. CURRENT jack. The meter should indicate between 90 and 130 milliamperes. Remove the test meter.

12. PREPARATION OF CABLES.

a. GENERAL. — Fabrication of replacement cables or repairs to cables should be carried out in accordance with the following instructions and with reference to the cable preparation charts; Figures 4-9 to 4-13 inclusive.

b. CUTTING CABLE TO REQUIRED LENGTH. — The cable should be held in the hand and cut with a hacksaw. Do not tightly clamp cables in a vise while cutting. To do so may injure the insulation in multi-conductor cables or greatly impair the transmission characteristics of co-axial cables. The use of large side-cutting pliers to cut the cable may injure the conductor ends. Inexperienced personnel should leave about one inch of additional length on each end of the cable to allow for possible injury to the cable ends during cutting.

c. CUTTING RUBBER OR PLASTIC INSULATION. — Use a single-edged razor blade to cut rubber or plastic insulation. If a razor blade is not available, use a sharp thin-bladed knife. The knife blade should be dipped in water before each cut to keep the knife blade from binding on the insulation.

d. CLEANING CONDUCTOR ENDS. — Use a small piece of sandpaper or the back of a knife blade.

e. TINNING AND CUTTING METALLIC SHIELDS. — Tin the metallic shields before cutting to dimensions, except where the shield is to be bent and then soldered (i. e., soldering to a soldering ferrule). Be sure the soldered portion extends beyond both sides of the point where the shield is to be cut. Use a sharp thick-bladed knife and carefully cut the shield. Usually the shield will break free without the necessity of cutting all the way through the shield.

f. TINNING CONDUCTORS. — The use of a soldering pot to tin-dip the conductor ends is preferable to the use of a soldering iron.

g. INSTALLING THE SOLDERING FERRULE. — Hold the cable loosely in an ordinary vise as

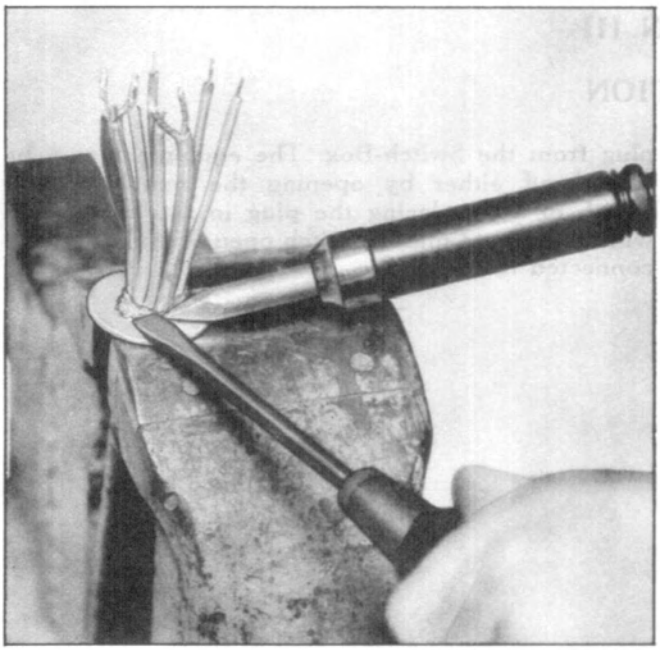


Figure 2-4—Installing Soldering Ferrule.

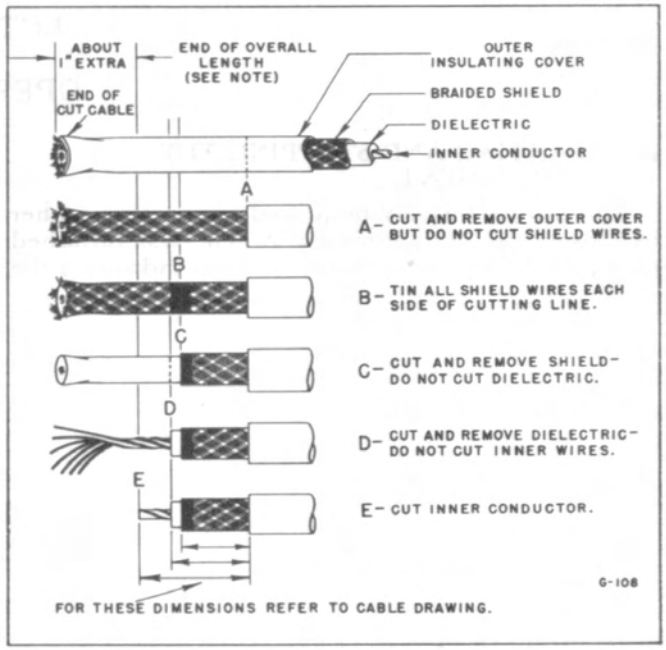


Figure 2-6—Preparing Co-axial Cables.

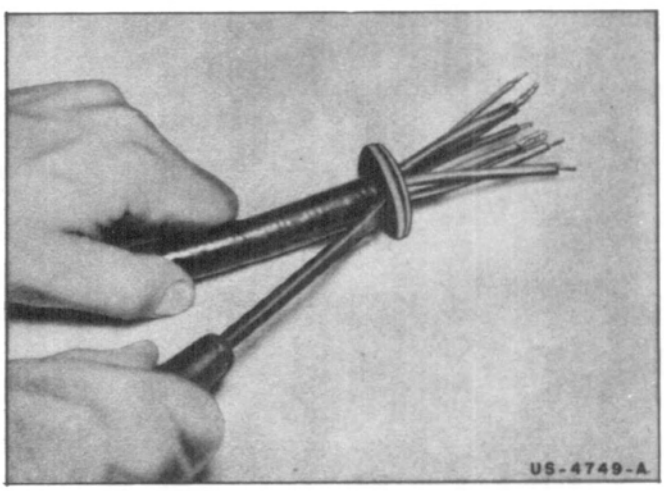


Figure 2-5—Installing Rubber Washer.

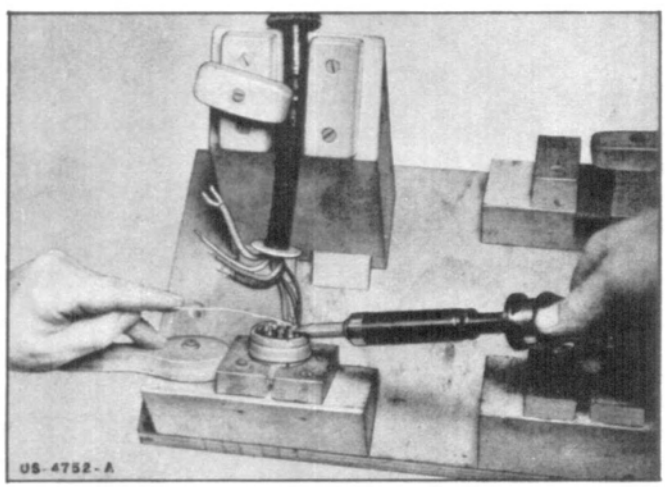


Figure 2-7—Installing Plug Body.

shown on Figure 2-4. The shield strands are held down and in place by the screwdriver as shown while being soldered.

h. INSTALLING THE RUBBER WASHER. — The rubber washer should be forced down and in between the soldering ferrule and the end of the sheath as shown on Figure 2-5.

The rubber bushing can be moved along the sheath more easily if the sheath has first been dusted with talc or soapstone.

i. INSTALLING THE PLUG BODY. — The cable and the plug body should be held in such a manner that both hands are free. One method, using a jig to hold the cable while soldering the conductors to the plug body, is illustrated in Figure 2-6. However, a satisfactory expedient is to hold the plug body in a vise and loop the cable over a box or similar object.

To prevent the possibility of loose conductor strands shorting to adjacent terminals, a small piece of spaghetti may be slipped over each conductor before soldering the conductors to the plug body. After soldering has been completed, wipe off all connections with alcohol or acetone to remove excess soldering flux.

j. PREPARING CO-AXIAL CABLES. — Figure 2-7 illustrates one method of preparing co-axial cables. The dielectric should not be overheated or pressed out-of-round. Tin-dipping the conductor end is preferable to the use of a soldering iron.

k. CABLE TESTING. — After a cable has been assembled, make a continuity check and a voltage breakdown test between conductors and the shield. The voltage applied during the breakdown test should be twice the normal voltage on the cable plus 500 volts. The source of test voltage should be of high impedance so the cable will not be injured if a breakdown occurs.

SECTION III

OPERATION

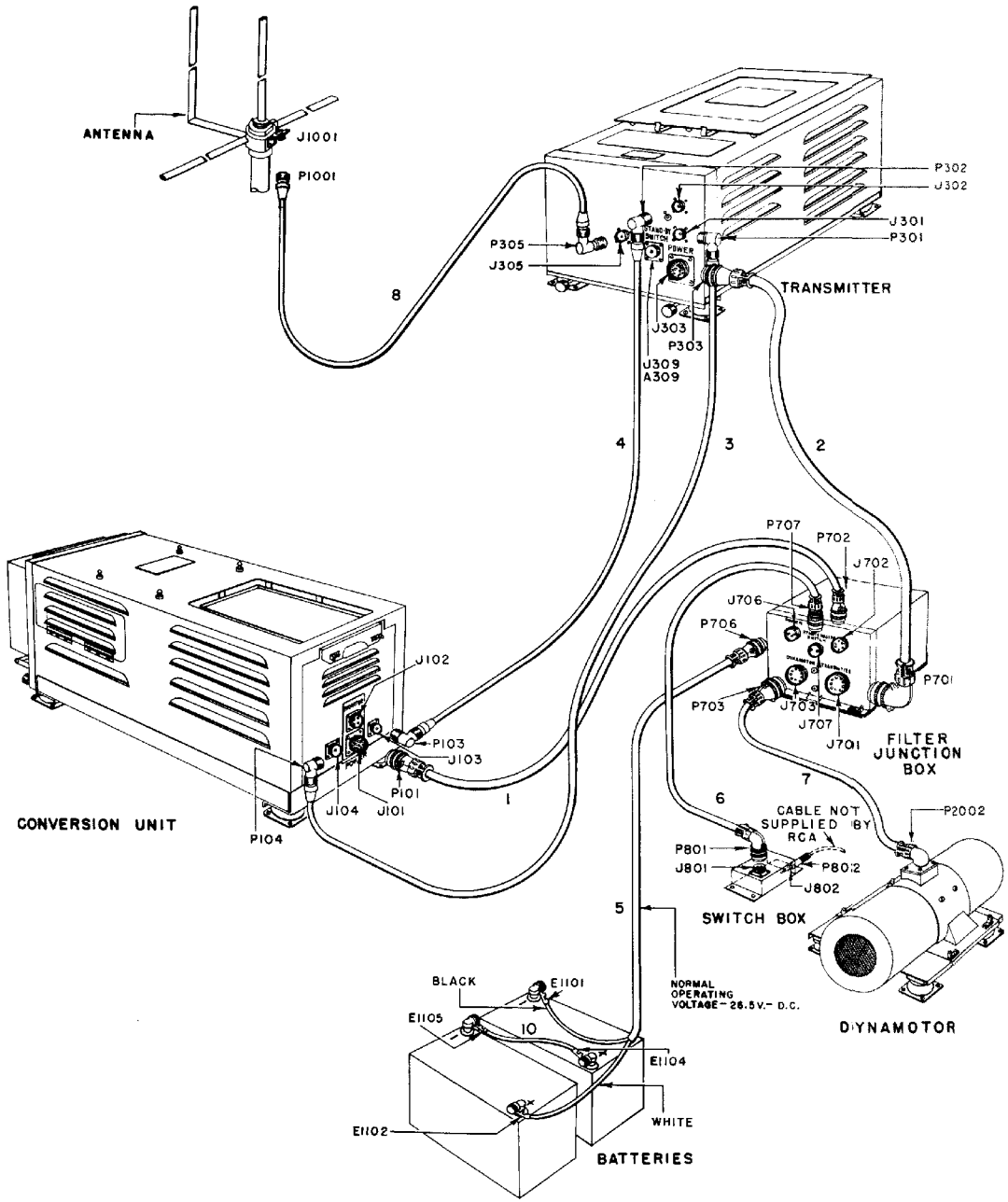
1. STARTING AND STOPPING THE EQUIPMENT.

The equipment may be placed in operation either by closing the remote master switch (not furnished with AN/AXT-2 equipment) or by withdrawing the plug from the Switch-Box. The equipment may be turned off either by opening the remote master switch or by replacing the plug in the Switch-Box with the remote master switch open or with no cable connected to the plug.

SECTION IV

SUPPLEMENTARY DATA

1. DRAWINGS.



CABLE NO.	CONNECTION BETWEEN	LENGTH	OUTSIDE DIA. (INCHES)	BENDING RADIUS (INCHES)	WEIGHT—LBS. (INCLUDING FITTINGS)
1 CA-3001	CONVERSION UNIT AND FILTER-JUNCTION BOX	73"	.590	5.9	1 3/4
2 CA-3002	TRANSMITTER AND FILTER-JUNCTION BOX	30 1/2"	.790	7.9	2 1/4
3 CA-3003	CONVERSION UNIT AND TRANSMITTER	6'	.405	4.0	3/4
4 CA-3004	CONVERSION UNIT AND TRANSMITTER	6'	.405	4.0	3/4
5 CA-3005	FILTER-JUNCTION BOX AND BATTERIES	60"	.585	5.9	1 1/2
6 CA-3006	FILTER-JUNCTION BOX AND SWITCH BOX	37"	.310	3.1	1/2
7 CA-3007	DYNAMOTOR AND FILTER-JUNCTION BOX	38"	.645	6.5	PART OF DYNAMOTOR
8 CA-3008	TRANSMITTER AND ANTENNA	10'	.405	4.0	3/4
10 CA-3010	BATTERY JUMPER	18"	.290	2.9	1/4

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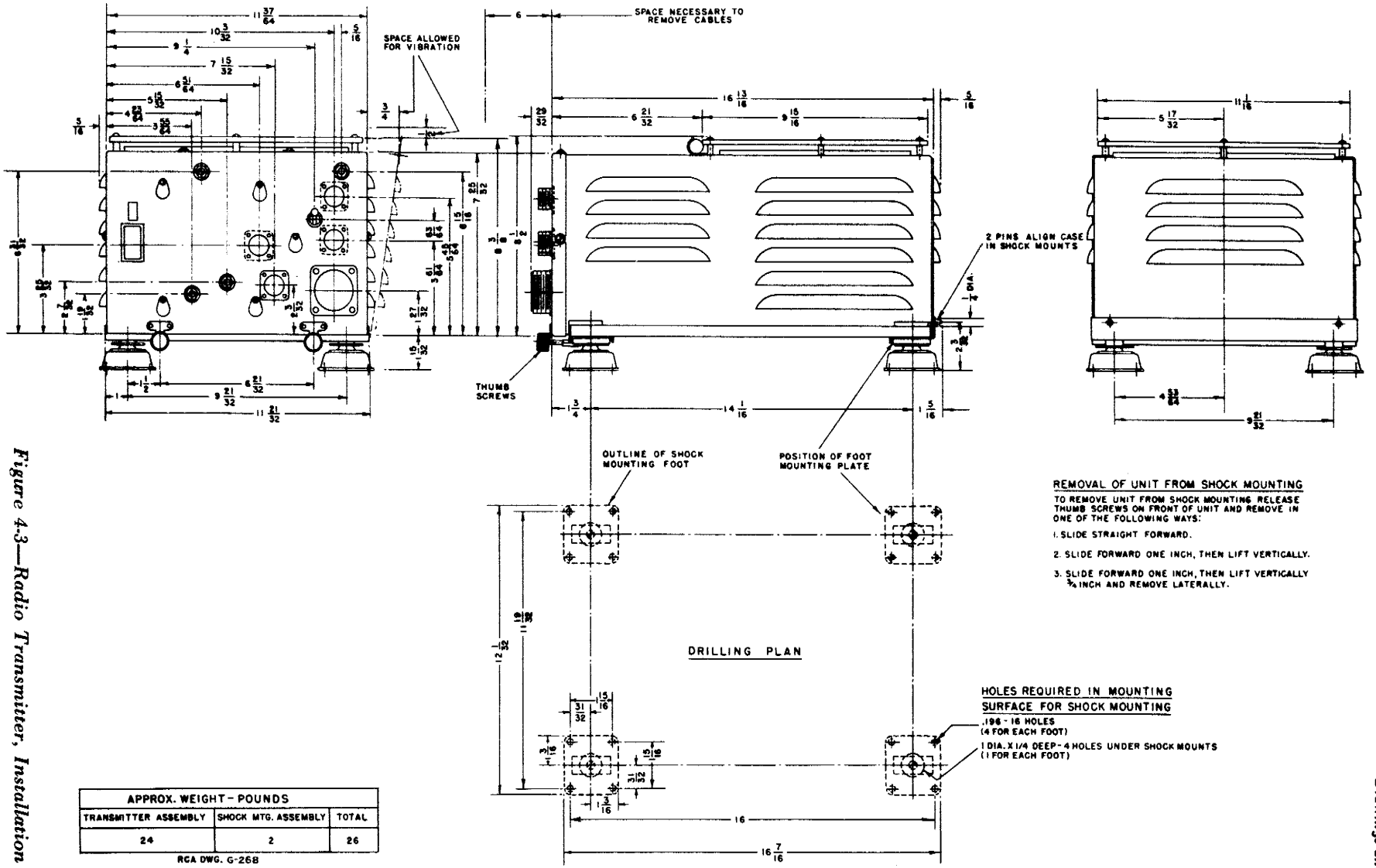
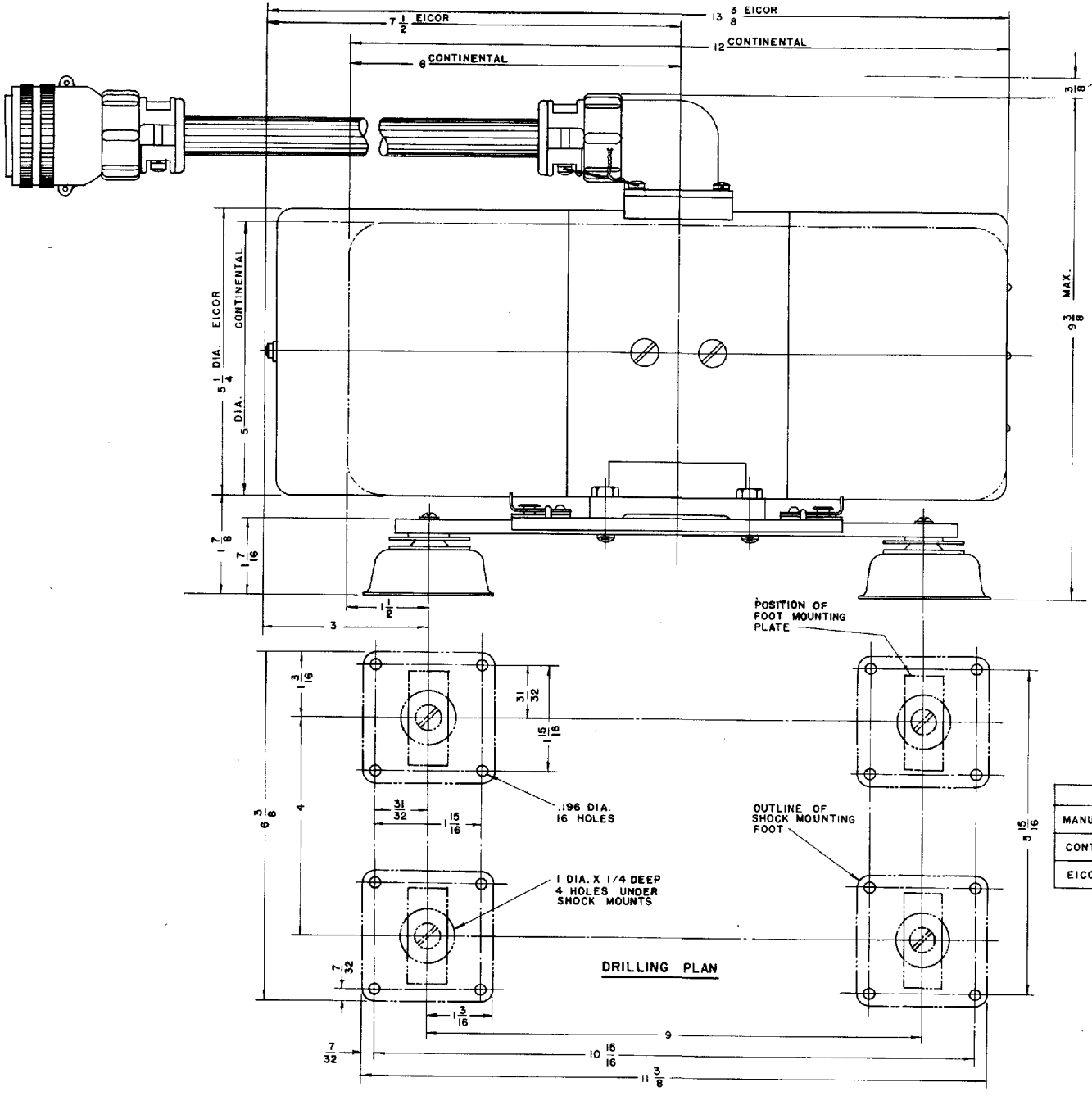
Figure 4-1—Equipment Connection Chart and Cable Data.

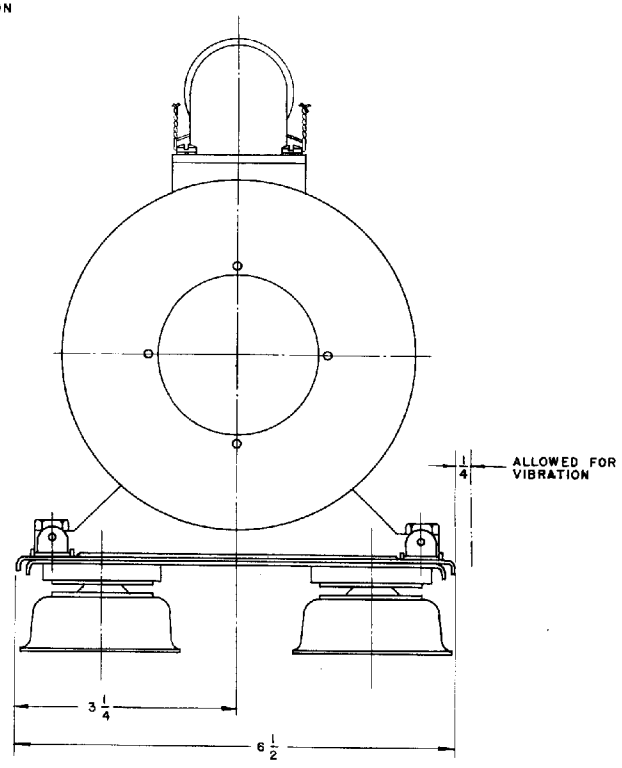


APPROX. WEIGHT - POUNDS		
TRANSMITTER ASSEMBLY	SHOCK MTG. ASSEMBLY	TOTAL
24	2	26

RCA DWG. G-268

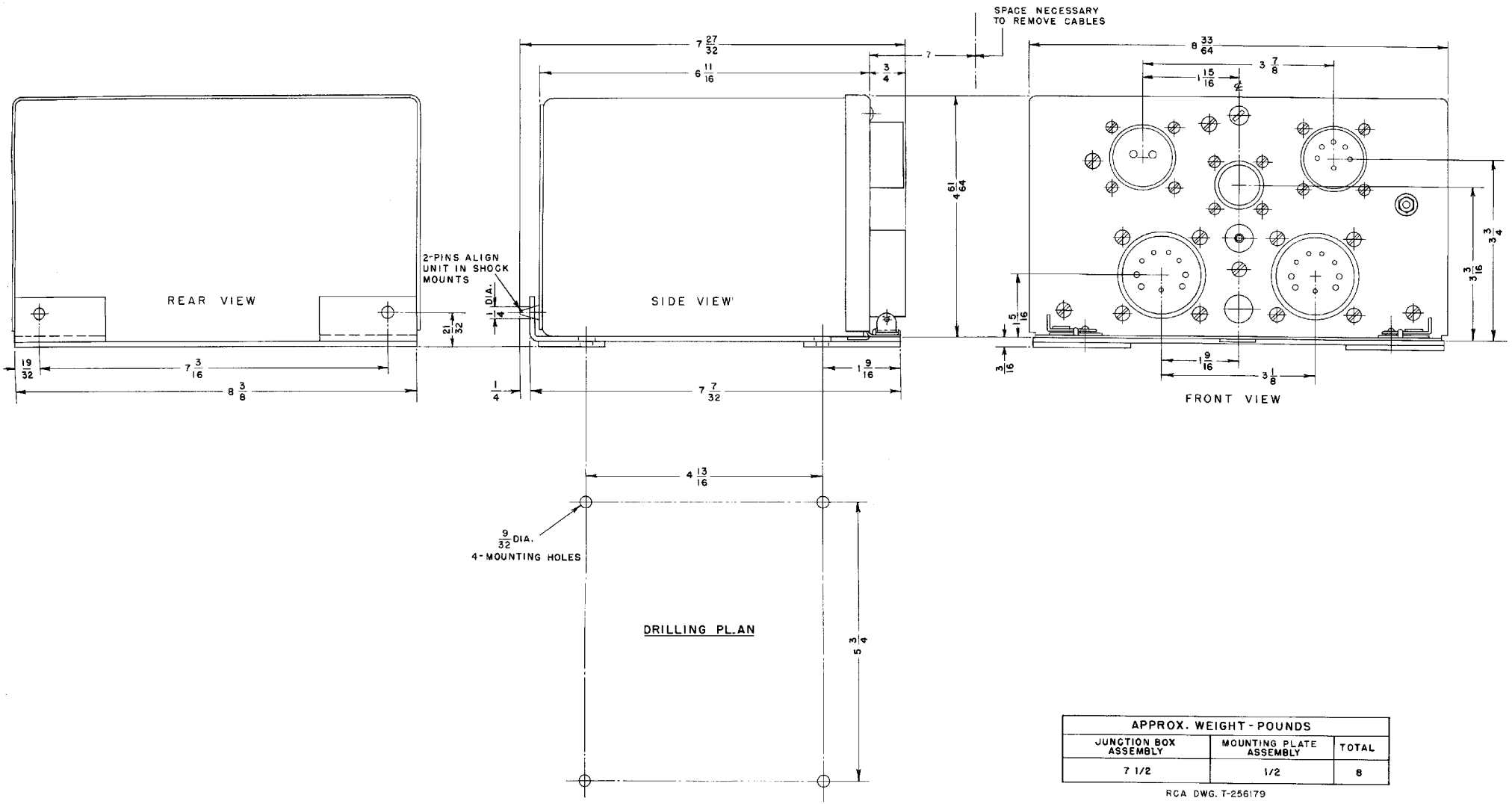
Figure 4-3—Radio Transmitter, Installation Diagram.





APPROX. WEIGHT POUNDS				
MANUFACTURER	DYNAMOTOR ASSEMBLY	MTG. PLATE ASSEMBLY	SHOCK MOUNTING ASSEMBLY	TOTAL
CONTINENTAL	20 1/4	1	2 1/4	23 1/2
EICOR	25	1	2 1/4	28 1/4

Figure 4-4—Dynamotor, Installation Diagram.



APPROX. WEIGHT - POUNDS		
JUNCTION BOX ASSEMBLY	MOUNTING PLATE ASSEMBLY	TOTAL
7 1/2	1/2	8

RCA DWG. T-256179

Figure 4-5—Filter-Junction Box, Installation Diagram.

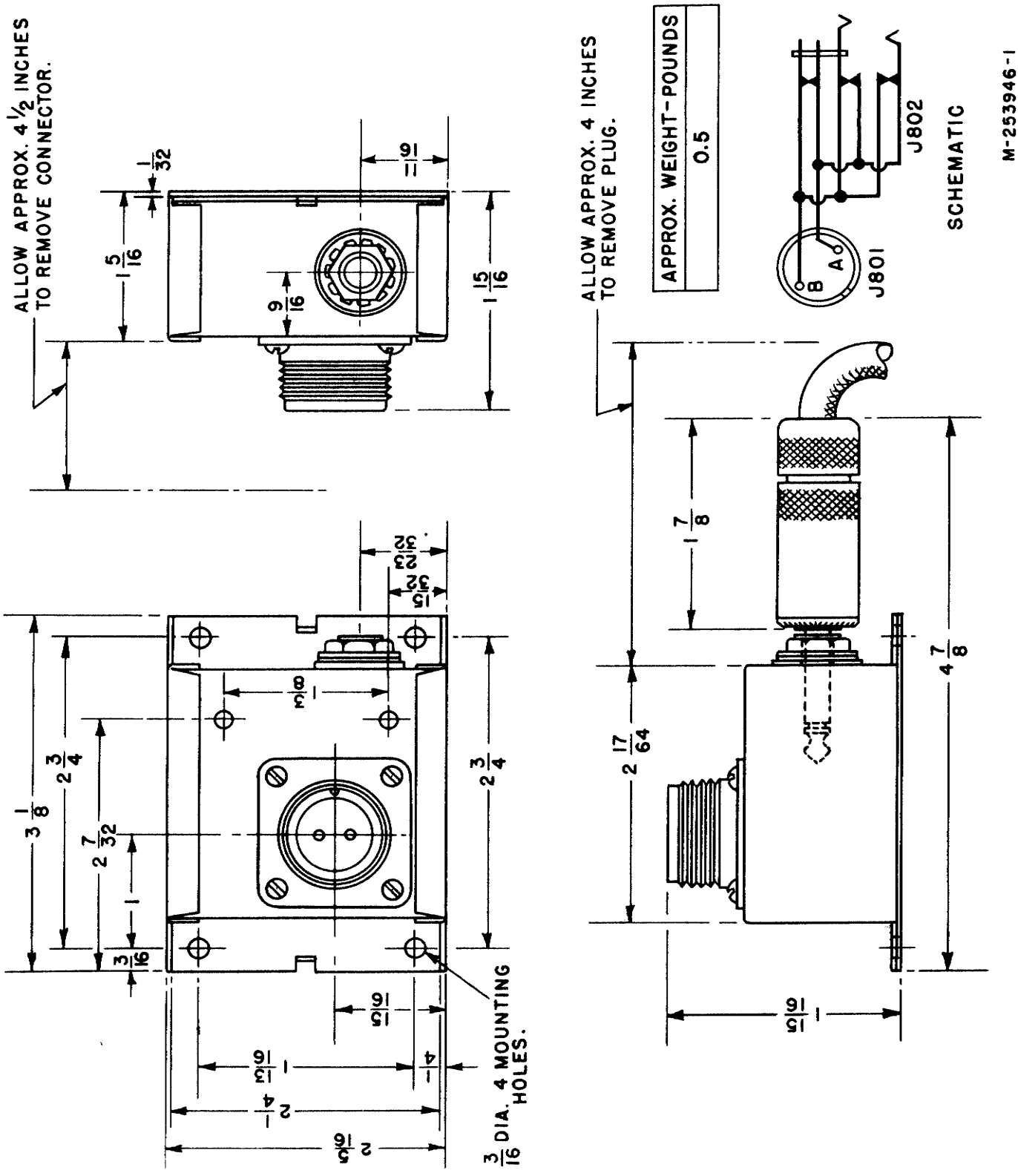


Figure 1-6—Switch-Box, Installation Diagram.

TRANSMITTER ANTENNA ASSEMBLY

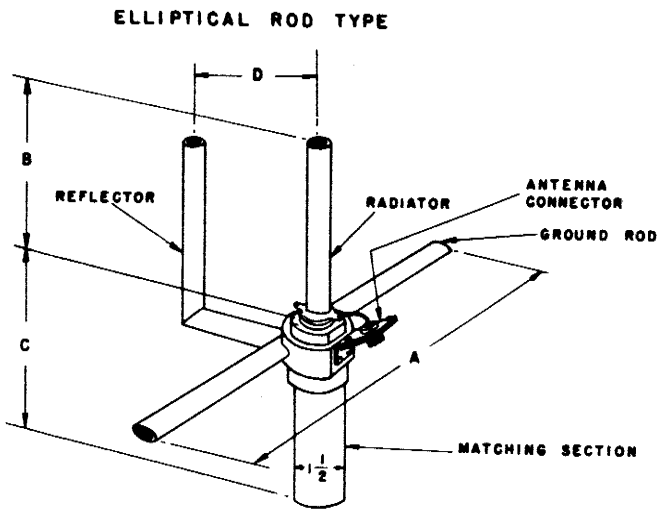


FIGURE A

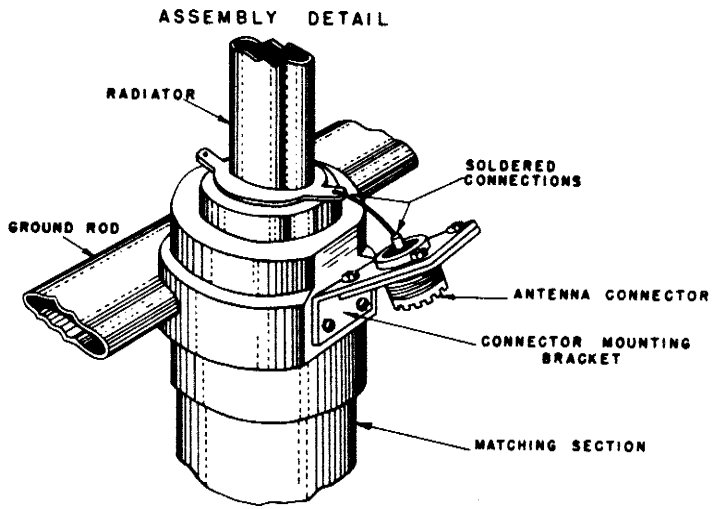


FIGURE B

DESCRIPTION	MODEL	CRV NO.	CHANNELS	DIMENSIONS IN INCHES				WEIGHT IN POUNDS
				A	B	C	D	
TRANSMITTER ANTENNA ELLIPTICAL RADIATOR ELLIPTICAL REFLECTOR & ELLIPTICAL GROUND RODS. (FIGURE A)	AN/AXT-2	66AFX	1	22-3/8	8-5/8	4-7/16	5-5/8	2.2
		66AFY	2	21-7/16	8-1/8	4-7/16	5-3/8	2.1
		66AFZ	3	20-1/2	7-15/16	4-1/8	5-1/8	2.1
		66AGA	4	19-11/16	7-7/16	4-1/8	4-15/16	2.0
		66AGB	5	18-15/16	7-1/8	4-1/8	4-3/4	2.0
		66AEJ	6	18-1/4	6-7/8	4-1/8	4-9/16	1.9
		66AEK	7	17-9/16	6-3/8	4-1/8	4-3/8	1.8
		66AEL	8	17	6-3/16	3-25/32	4-1/4	1.8
		66AEM	9	16-13/32	5-15/16	3-25/32	4-1/8	1.8
		66AEN	10	15-7/8	5-3/4	3-25/32	4	1.8

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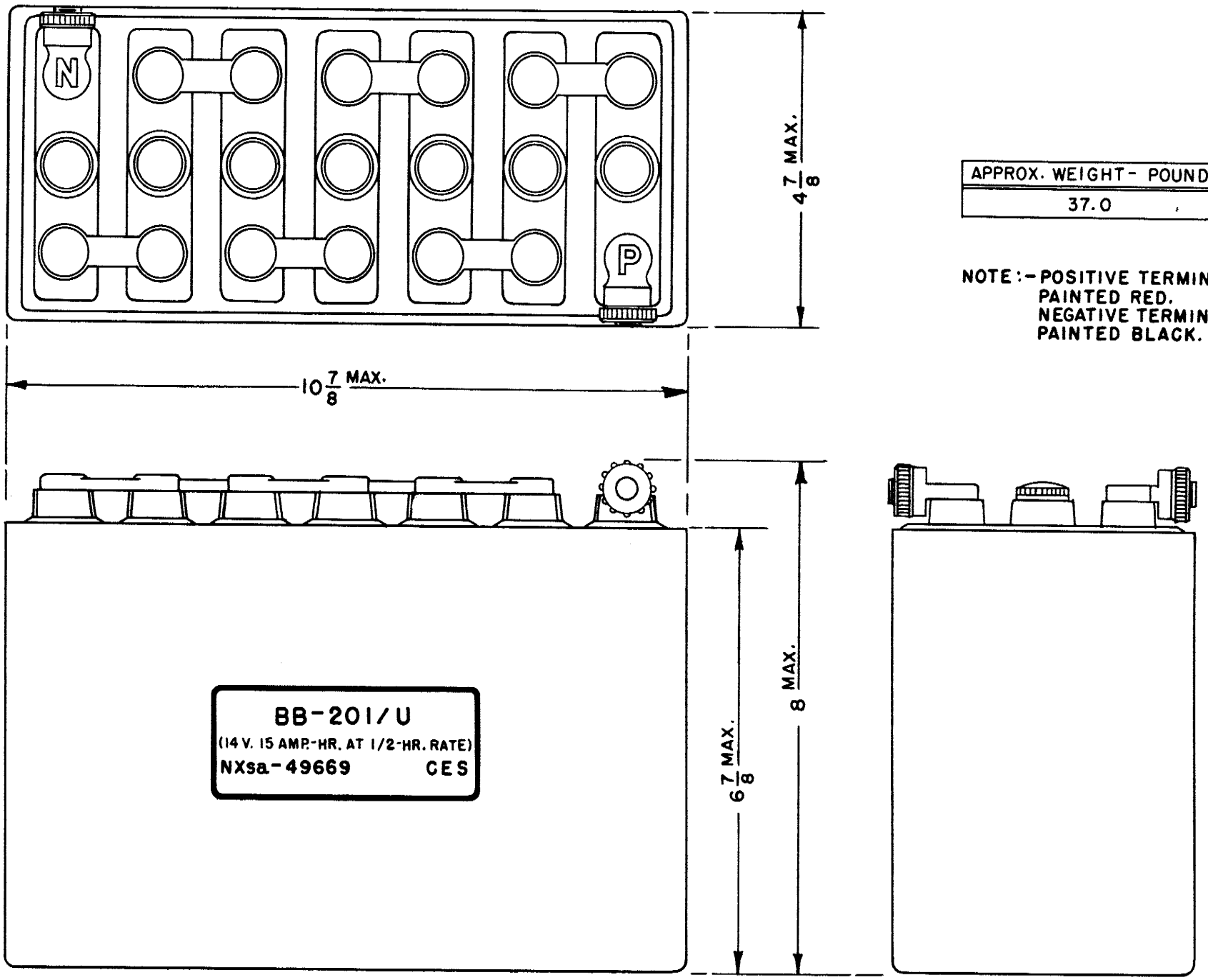
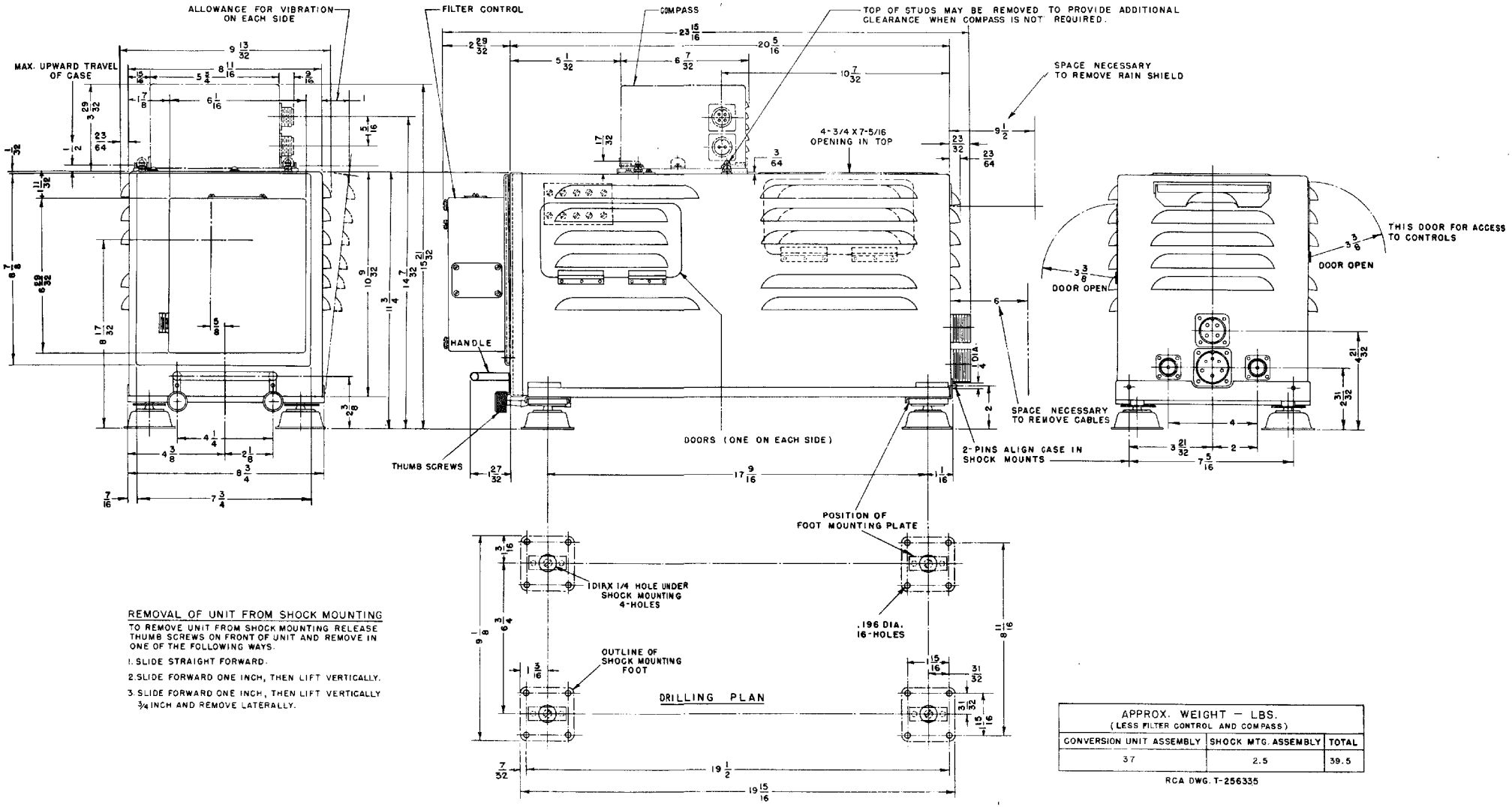
Figure 4-7—Transmitting Antenna Assembly.



APPROX. WEIGHT - POUNDS
37.0

NOTE:-POSITIVE TERMINAL PAINTED RED. NEGATIVE TERMINAL PAINTED BLACK.

Figure 4-8—Storage Battery.



REMOVAL OF UNIT FROM SHOCK MOUNTING

TO REMOVE UNIT FROM SHOCK MOUNTING RELEASE THUMB SCREWS ON FRONT OF UNIT AND REMOVE IN ONE OF THE FOLLOWING WAYS.

1. SLIDE STRAIGHT FORWARD.
2. SLIDE FORWARD ONE INCH, THEN LIFT VERTICALLY.
3. SLIDE FORWARD ONE INCH, THEN LIFT VERTICALLY 3/4 INCH AND REMOVE LATERALLY.

APPROX. WEIGHT – LBS. (LESS FILTER CONTROL AND COMPASS)		
CONVERSION UNIT ASSEMBLY	SHOCK MTG. ASSEMBLY	TOTAL
37	2.5	39.5

RCA DWG. T-256335

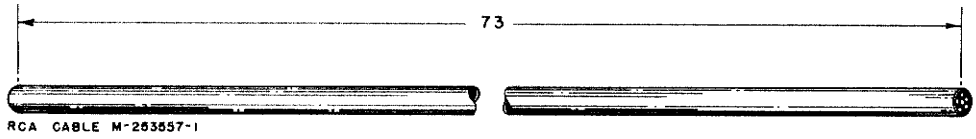
Figure 4-2—Conversion Unit, Installation Diagram.

PREPARATION OF CABLE NO. 1
(FILTER-JUNCTION BOX TO CONVERSION UNIT)

(READ "GENERAL PREPARATION OF CABLES" BEFORE PREPARING THIS CABLE)
ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE MARKED

STEP NO. 1

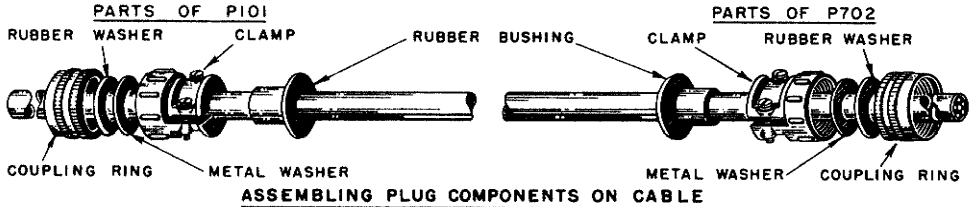
CUT CABLE TO DESIRED LENGTH.



CUTTING THE CABLE

STEP NO. 2

ASSEMBLE THE PLUG COMPONENTS ON CABLE IN ORDER SHOWN. THE SHELLS AND SOLDERING FERRULES ARE INSTALLED IN LATER OPERATIONS.
NOTE: THE RUBBER WASHERS ARE SUPPLIED AS PART OF THE CLAMPS.

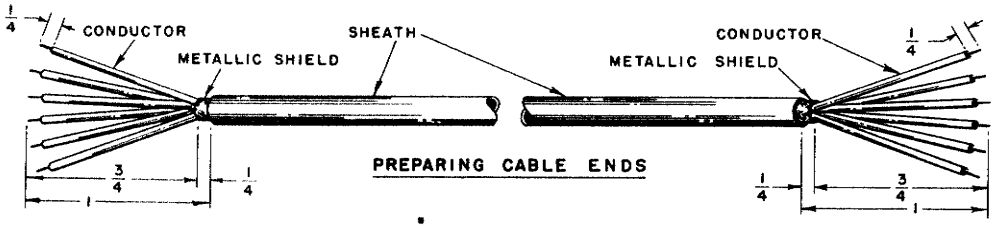


ASSEMBLING PLUG COMPONENTS ON CABLE

STEP NO. 3

PREPARE CABLE ENDS TO EXACT DIMENSIONS AND TIN THE CONDUCTOR ENDS. DO NOT TIN THE SHIELD.

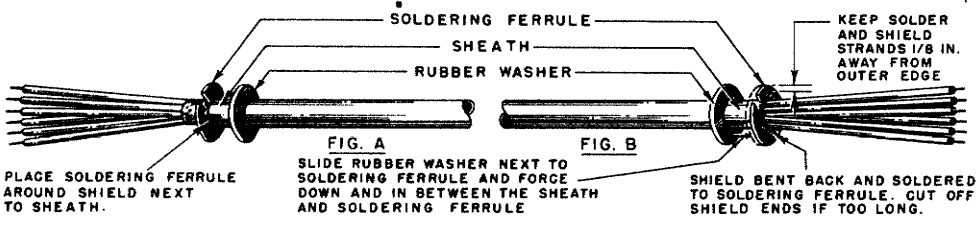
CAUTION: FOR ALL SOLDERING USE ONLY ROSIN FLUX SOLDER.



PREPARING CABLE ENDS

STEP NO. 4

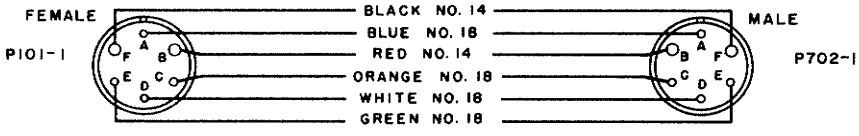
(a) INSTALL SOLDERING FERRULES (ONE ON EACH CABLE END). SEE FIG. A.
(b) BEND THE SHIELD ENDS BACK AND SOLDER TO THE SOLDERING FERRULES. SLIDE RUBBER WASHERS NEXT TO THE SOLDERING FERRULES. SEE FIG. B



INSTALLING SOLDERING FERRULE

STEP NO. 5

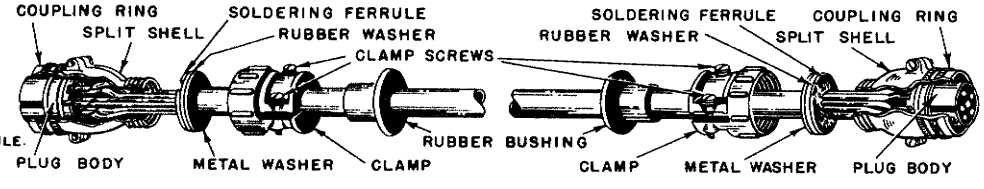
SOLDER CONDUCTORS TO PLUG TERMINALS FOLLOWING THE SCHEMATIC SHOWN AT RIGHT. AFTER SOLDERING WIPE OFF CONNECTIONS WITH ACETONE OR ALCOHOL.



SCHEMATIC

STEP NO. 6

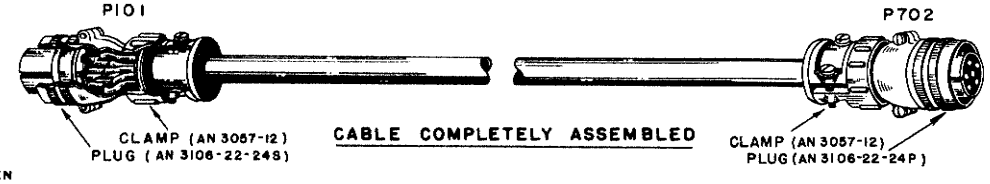
PERFORM THE FOLLOWING OPERATIONS TO BOTH ENDS OF THE CABLE:
(a) SLIDE COUPLING RING ONTO PLUG BODY.
(b) INSTALL BOTH HALVES OF THE SPLIT SHELL.
(c) SLIDE CLAMP OVER THE METAL WASHER, RUBBER WASHER AND SOLDERING FERRULE. SCREW CLAMP ONTO SHELL WITHOUT ALLOWING EITHER PLUG OR CABLE TO TURN WITH THE CLAMP. SLIDE RUBBER BUSHING INTO CLAMP. TIGHTEN SET SCREWS.



ASSEMBLING PLUG

STEP NO. 7

AFTER THE CABLE HAS BEEN ASSEMBLED, MAKE A CONTINUITY AND POLARITY CHECK OF EACH LEAD AND A VOLTAGE BREAKDOWN TEST BETWEEN LEADS AND BETWEEN LEADS AND SHIELD.



CABLE COMPLETELY ASSEMBLED

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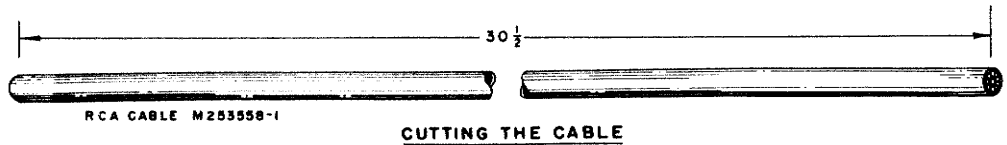
Figure 4-9—Preparation of Cable No. 1.

PREPARATION OF CABLE NO. 2
(FILTER-JUNCTION BOX TO TRANSMITTER)

(READ "GENERAL PREPARATION OF CABLES" BEFORE PREPARING THIS CABLE)
ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE MARKED

STEP NO. 1

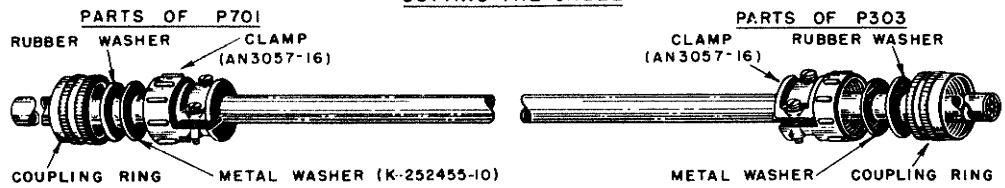
CUT CABLE TO DESIRED LENGTH.



CUTTING THE CABLE

STEP NO. 2

ASSEMBLE THE PLUG COMPONENTS ON CABLE IN ORDER SHOWN. THE SHELLS AND SOLDERING FERRULES ARE INSTALLED IN LATER OPERATIONS.
NOTE: THE RUBBER WASHERS ARE SUPPLIED AS PART OF THE CLAMPS.

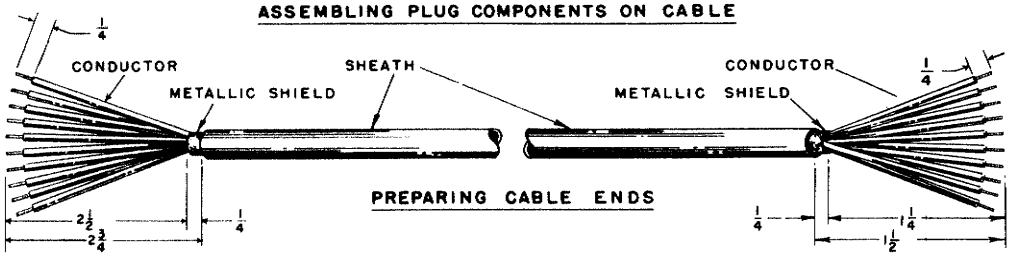


ASSEMBLING PLUG COMPONENTS ON CABLE

STEP NO. 3

PREPARE CABLE ENDS TO EXACT DIMENSIONS AND TIN THE CONDUCTOR ENDS. DO NOT TIN THE SHIELD.

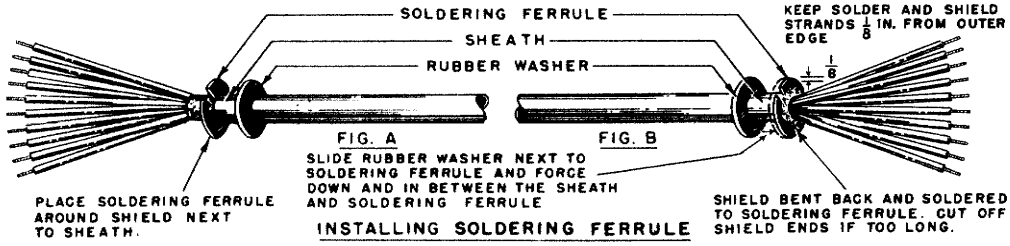
CAUTION: FOR ALL SOLDERING USE ONLY ROSIN FLUX SOLDER.



PREPARING CABLE ENDS

STEP NO. 4

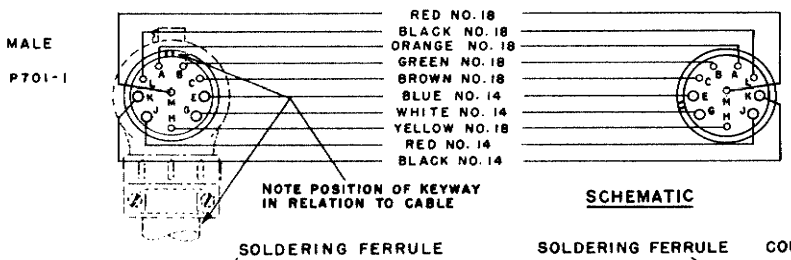
(a) INSTALL SOLDERING FERRULES (ONE ON EACH CABLE END). SEE FIG. A
(b) BEND THE SHIELD ENDS BACK AND SOLDER TO THE SOLDERING FERRULES. SLIDE RUBBER WASHERS NEXT TO THE SOLDERING FERRULES. SEE FIG. B.



INSTALLING SOLDERING FERRULE

STEP NO. 5

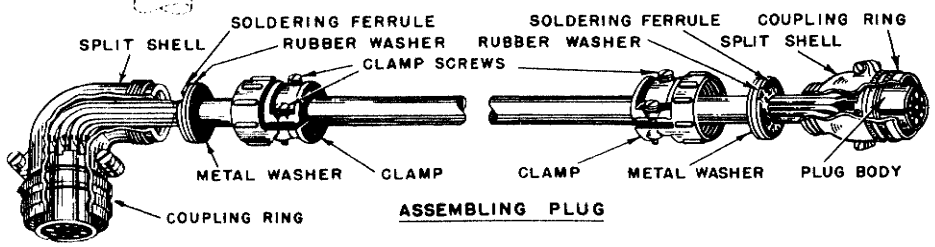
SOLDER CONDUCTORS TO PLUG TERMINALS FOLLOWING THE SCHEMATIC SHOWN AT RIGHT. AFTER SOLDERING WIPE OFF CONNECTIONS WITH ACETONE OR ALCOHOL.



SCHEMATIC

STEP NO. 6

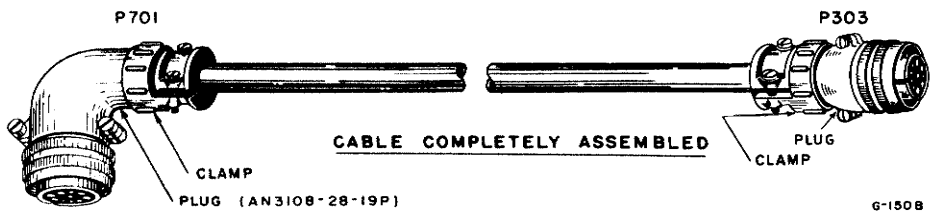
PERFORM THE FOLLOWING OPERATIONS TO BOTH ENDS OF THE CABLE:
(a) SLIDE COUPLING RING ONTO PLUG BODY.
(b) INSTALL BOTH HALVES OF THE SPLIT SHELL.
(c) SLIDE CLAMP OVER THE METAL WASHER, RUBBER WASHER AND SOLDERING FERRULE SCREW CLAMP ONTO SHELL WITHOUT ALLOWING EITHER PLUG OR CABLE TO TURN WITH THE CLAMP. TIGHTEN CLAMP SCREWS.



ASSEMBLING PLUG

STEP NO. 7

AFTER THE CABLE HAS BEEN ASSEMBLED, MAKE A CONTINUITY AND POLARITY CHECK OF EACH LEAD AND A VOLTAGE BREAKDOWN TEST BETWEEN LEADS AND BETWEEN LEADS AND SHIELD.



CABLE COMPLETELY ASSEMBLED

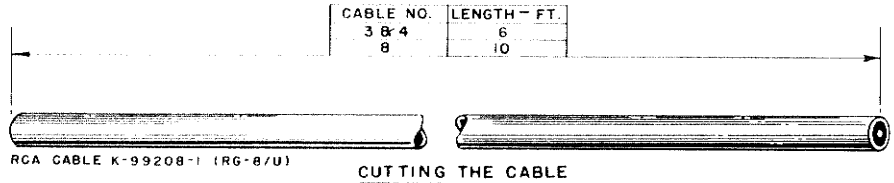
Figure 4-10—Preparation of Cable No. 2.

PREPARATION OF CABLES NO. 3, 4 & 8
(COAXIAL CABLES)

(READ "GENERAL PREPARATION OF CABLES" BEFORE PREPARING THESE CABLES)
ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE MARKED

STEP NO. 1

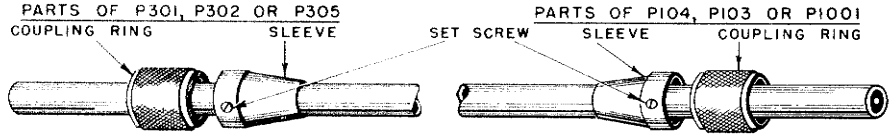
CUT CABLE TO THE CORRECT LENGTH. THE CABLES ARE IDENTICAL EXCEPT FOR LENGTH. RIGHT ANGLE ADAPTERS ARE NOT USED ON ONE END OF CABLES NO. 8 & 14.



CUTTING THE CABLE

STEP NO. 2

ASSEMBLE PLUG COMPONENTS ON CABLE IN ORDER SHOWN. THE PLUG BODIES ARE INSTALLED IN LATER OPERATIONS.

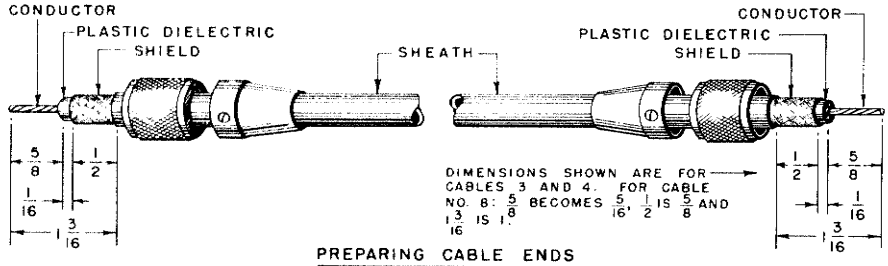


ASSEMBLING PLUG COMPONENTS ON CABLE

STEP NO. 3

PREPARE CABLE ENDS TO EXACT DIMENSIONS. TIN CONDUCTOR ENDS AND SHIELD ON BOTH ENDS OF CABLE. USE ONLY ROSIN FLUX SOLDER.

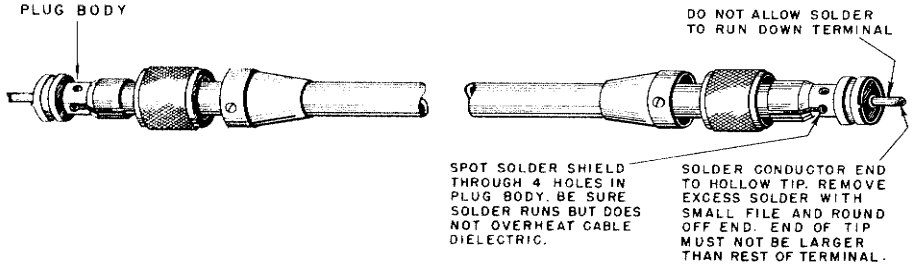
NOTE:– FOLLOW METHOD OUTLINED UNDER "GENERAL PREPARATION OF CABLES".



PREPARING CABLE ENDS

STEP NO. 4

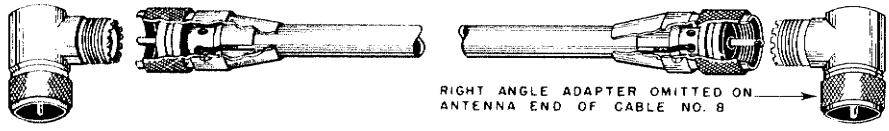
INSTALL THE PLUG BODIES ON CABLE ENDS BY SCREWING THE PLUG BODIES ONTO THE SHEATH UNTIL THE SHEATH IS ABOUT 1/4 INCH INSIDE THE PLUG BODIES. SPOT SOLDER THE SHIELD TO THE PLUG BODIES THROUGH THE FOUR OPENINGS PROVIDED. SOLDER CONDUCTOR LEAD TO TIP. REMOVE EXCESS SOLDER AND ROUND OFF ENDS.



SOLDERING CABLE TO PLUG BODY

STEP NO. 5

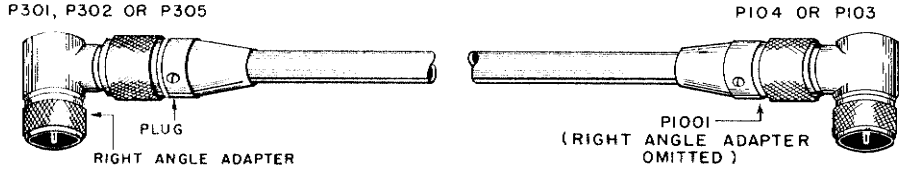
SLIDE THE COUPLING RINGS AND SLEEVES ONTO THE PLUG BODIES. TIGHTEN SET SCREWS ON SLEEVES.



PLUG ASSEMBLY

STEP NO. 6

AFTER THE CABLE HAS BEEN ASSEMBLED MAKE A CONTINUITY CHECK OF BOTH THE CONDUCTOR AND SHIELD. ALSO MAKE A VOLTAGE BREAKDOWN TEST BETWEEN CONDUCTOR AND SHIELD.



CABLE COMPLETELY ASSEMBLED

G-143B

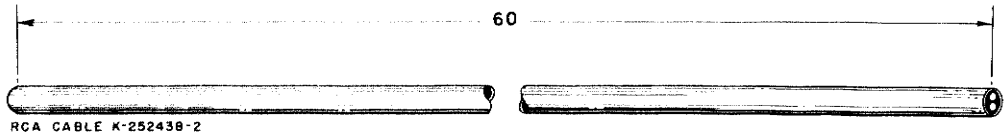
Figure 4-11—Preparation of Cable No. 3, 4 and 8.

PREPARATION OF CABLE NO. 5
(FILTER-JUNCTION BOX TO BATTERIES)

(READ "GENERAL PREPARATION OF CABLES" BEFORE PREPARING THIS CABLE)
ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE MARKED

STEP NO. 1

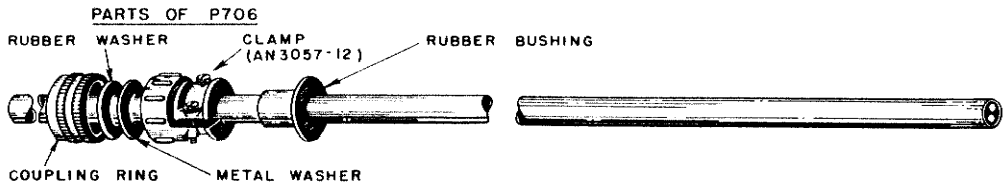
CUT CABLE TO DESIRED LENGTH.



CUTTING THE CABLE

STEP NO. 2

ASSEMBLE THE PLUG COMPONENTS ON CABLE IN ORDER SHOWN. THE SHELLS AND SOLDERING FERRULES ARE INSTALLED IN LATER OPERATIONS.

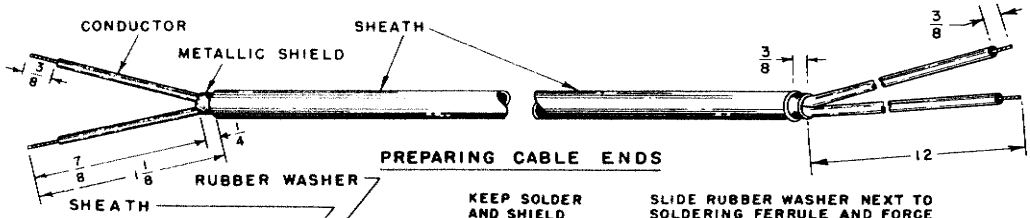


ASSEMBLING PLUG COMPONENTS ON CABLE

STEP NO. 3

PREPARE CABLE ENDS TO EXACT DIMENSIONS AND TIN THE CONDUCTOR ENDS. DO NOT TIN THE SHIELD.

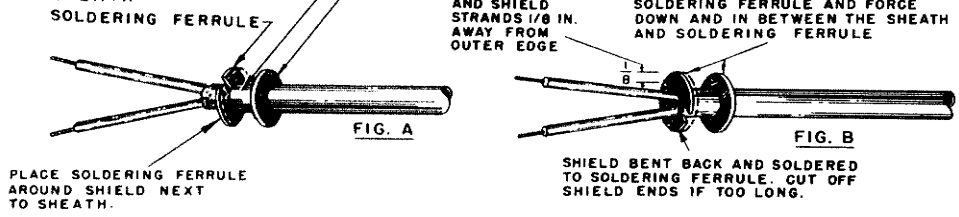
CAUTION: FOR ALL SOLDERING USE ONLY ROSIN FLUX SOLDER.



PREPARING CABLE ENDS

STEP NO. 4

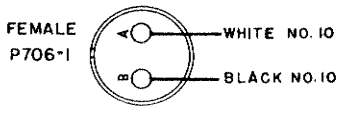
(a) INSTALL SOLDERING FERRULE ON ONE END OF CABLE ONLY (SEE FIG. A).
(b) BEND THE SHIELD END BACK AND SOLDER TO THE SOLDERING FERRULE. SLIDE RUBBER WASHER NEXT TO THE SOLDERING FERRULE (SEE FIG. B).



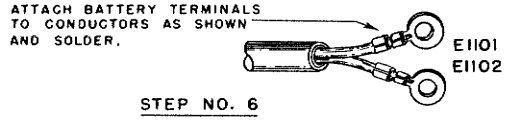
INSTALLING SOLDERING FERRULE

STEP NO. 5

SOLDER CONDUCTORS TO PLUG TERMINALS FOLLOWING THE SCHEMATIC SHOWN AT RIGHT. AFTER SOLDERING WIPE OFF CONNECTIONS WITH ACETONE OR ALCOHOL.



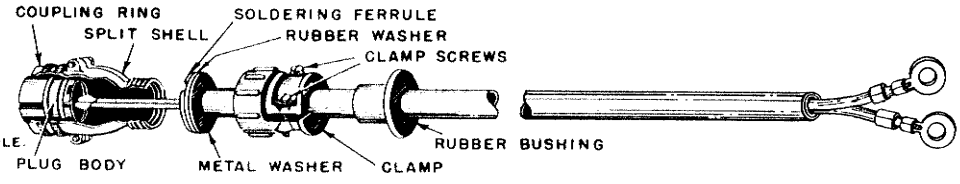
SCHEMATIC



STEP NO. 6

STEP NO. 7

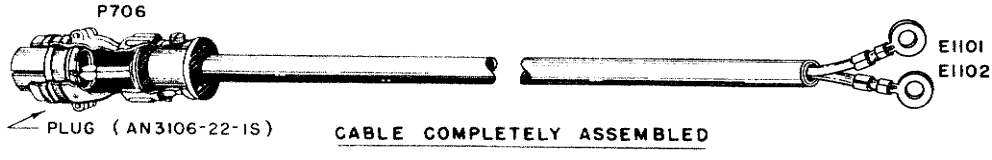
(PERFORM THE FOLLOWING OPERATIONS TO ONE END OF CABLE ONLY).
(a) SLIDE COUPLING RING ONTO PLUG BODY.
(b) INSTALL BOTH HALVES OF THE SPLIT SHELL.
(c) SLIDE CLAMP OVER THE METAL WASHER, RUBBER WASHER AND SOLDERING FERRULE. SCREW CLAMP ONTO SHELL WITHOUT ALLOWING EITHER PLUG OR CABLE TO TURN WITH THE CLAMP. SLIDE RUBBER BUSHING INTO CLAMP. TIGHTEN SET SCREWS.



ASSEMBLING PLUG

STEP NO. 8

AFTER THE CABLE HAS BEEN ASSEMBLED, MAKE A CONTINUITY AND POLARITY CHECK OF EACH LEAD AND A VOLTAGE BREAKDOWN TEST BETWEEN LEADS AND BETWEEN LEADS AND SHIELD.



CABLE COMPLETELY ASSEMBLED

G-151A

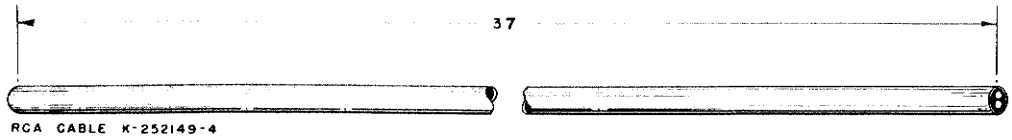
Figure 4-12—Preparation of Cable No. 5.

PREPARATION OF CABLE NO. 6
(SWITCH BOX TO FILTER-JUNCTION BOX)

(READ "GENERAL PREPARATION OF CABLES" BEFORE PREPARING THIS CABLE)
ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE MARKED

STEP NO. 1

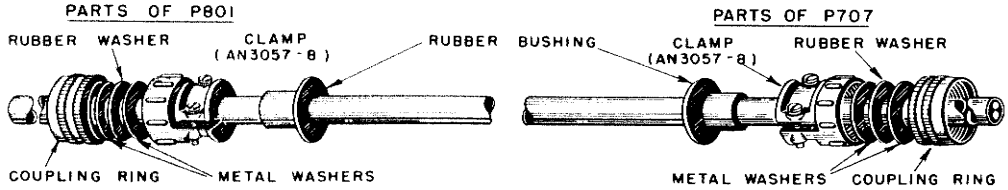
CUT CABLE TO DESIRED LENGTH.



CUTTING THE CABLE

STEP NO. 2

ASSEMBLE THE PLUG COMPONENTS ON CABLE IN ORDER SHOWN. THE SHELLS ARE INSTALLED IN LATER OPERATIONS.

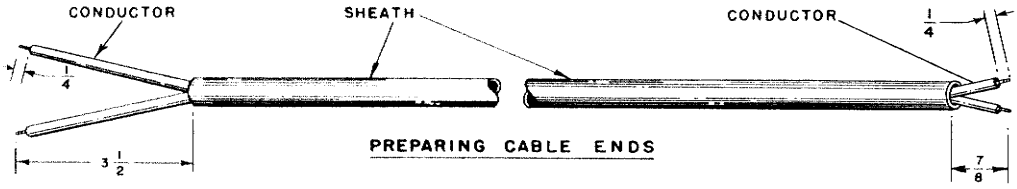


ASSEMBLING PLUG COMPONENTS ON CABLE

STEP NO. 3

PREPARE CABLE ENDS TO EXACT DIMENSIONS AND TIN THE CONDUCTOR ENDS.

CAUTION: FOR ALL SOLDERING USE ONLY ROSIN FLUX SOLDER.



PREPARING CABLE ENDS

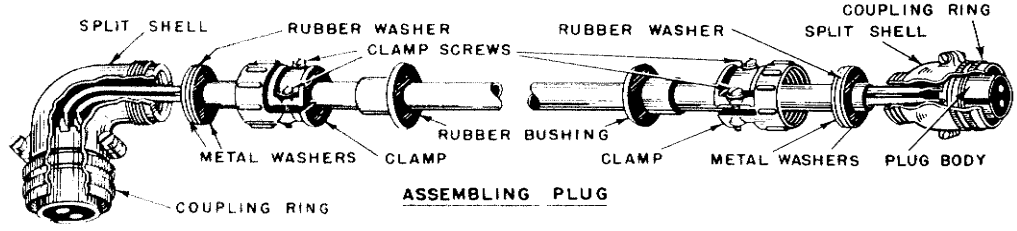
STEP NO. 4

SOLDER CONDUCTORS TO PLUG TERMINALS FOLLOWING THE SCHEMATIC SHOWN AT RIGHT. AFTER SOLDERING WIPE OFF CONNECTIONS WITH ACETONE OR ALCOHOL.

SCHEMATIC

STEP NO. 5

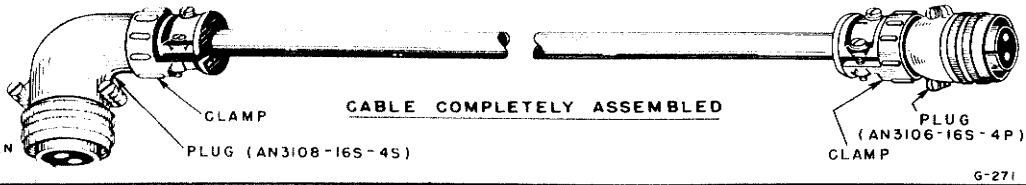
(PERFORM THE FOLLOWING OPERATIONS TO BOTH ENDS OF THE CABLE.).
(a) SLIDE COUPLING RING ONTO PLUG BODY.
(b) INSTALL BOTH HALVES OF THE SPLIT SHELL.
(c) SLIDE CLAMP OVER THE TWO METAL WASHERS AND THE RUBBER WASHER. SCREW CLAMP ONTO SHELL WITHOUT ALLOWING EITHER PLUG OR CABLE TO TURN WITH THE CLAMP. SLIDE RUBBER BUSHING INTO CLAMP. TIGHTEN SET SCREWS.



ASSEMBLING PLUG

STEP NO. 6

AFTER THE CABLE HAS BEEN ASSEMBLED, MAKE A CONTINUITY AND POLARITY CHECK OF EACH LEAD AND A VOLTAGE BREAKDOWN TEST BETWEEN LEADS AND BETWEEN LEADS AND SHIELD.



CABLE COMPLETELY ASSEMBLED

G-271

Figure 4-13—Preparation of Cable No. 6.

SECTION V

EMERGENCY OPERATION AND REPAIR

1. GENERAL.

Repairs to this equipment are beyond the scope of this Handbook. However, if the Dynamotor fails to operate, proceed as follows:

a. Check all cable connections to make sure they are tight.

b. Check battery voltage. Fully charged batteries should read at least 30 volts with no current drain and between 27 and 28 volts with normal current drain.

c. Check continuity of battery cable to Dynamotor by reading voltage at end of cable.