NAVSHIPS 900171

ELECTRONIC INSTALLATION PRACTICES MANUAL

CHAPTER 10

FLEXIBLE RF TRANSMISSION LINES AND FITTINGS

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NAVSHIPS 900, 171

ELECTRONIC INSTALLATION PRACTICES MANUAL

This manual is intended for the use of the electronic installation worker. It may be used as a reference book on installation practices or in training beginners in Naval electronic installation work.

Subject matter in this text is intended as supplementary to, but not superseding existing and applicable specifications.

Appreciation is extended to the various Naval Shipyards, Commercial Firms, Service Representatives and Manufacturers who were contacted and without whose cooperation this manual would not be possible.

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SECTION 10-1

GENERAL DESCRIPTION

1. INTRODUCTION.

This section deals with flexible radio frequency transmission lines of the coaxial type. A coaxial cable (often referred to as "coax") is a two-conductor cable, one conductor of which is concentrically contained within the other. Remember that both conductors are essential to efficient operation of the cable. Figure 10-1 shows the basic construction of a coaxial cable. For completeness, twin conductor flexible cable and connectors between flexible RF transmission lines and rigid lines are also treated in this Chapter.

2. CONSTRUCTION.

a. INNER CONDUCTOR. – The inner conductor may be either solid or stranded and may be made of unplated copper, tinned copper, silver-plated copper, or stranded silver-coated copper. Special resistance alloy is occasionally used for special cables.

b. DIELECTRIC. – The dielectric insulating material is usually Polyethylene or Teflon. Neoprene and other rubber-like materials are occasionally used but are preferred only for pulse cables, due to greater dielectric loss.

c. OUTER CONDUCTOR. – The outer conductor is generally braided copper; it may be tinned, silver-plated, or bare. The outer conductor is chosen to give the best electrical qualities consistent with maximum flexibility. It may consist of one, two or three separate braids.

d. JACKET. – The protective insulating jacket is usually a synthetic plastic material (vinyl resin). Neoprene rubber is generally used on pulse cable. Silicone rubber jackets are now being introduced for high temperature applications. Low temperature, non-contaminating types for -40° flex are also being made available.

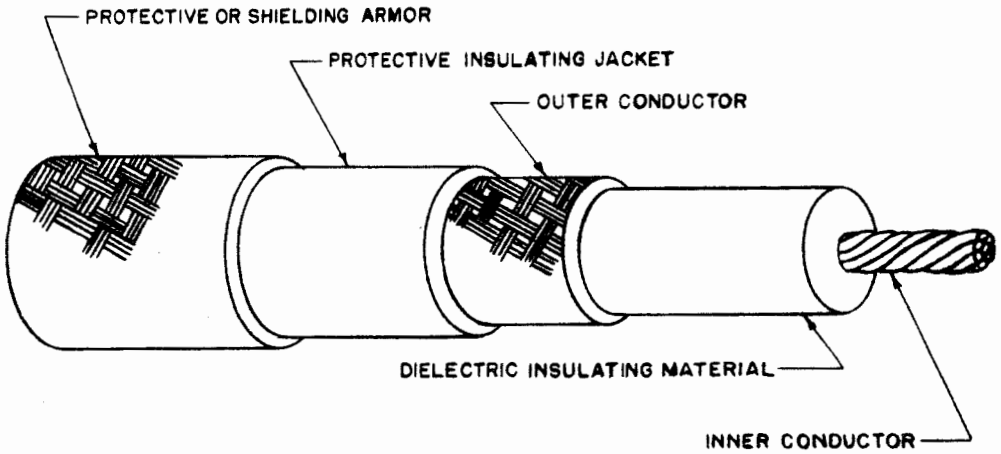


Figure 10-1. Flexible Transmission Line Cable Construction

e. ARMOR.–The protective or shielding armor is primarily braided aluminum or sometimes galvanized steel, similar to that used on power cables. Armor may or may not be used, depending on the application.

CAUTION

Although coaxial RF cables may look like power cables, they require special handling and careful installation procedures. Know the cables. Be able to recognize these types before starting to work with them. Know their limitations. Remember that the finest piece of electronic equipment is useless if the transmission cables to the equipment are not functioning properly.

3. CLASSIFICATION BY DIELECTRIC.

For ease of identification, flexible RF cables will be classified by their dielectric and the peculiarities of each. The three types of dielectric are Polyethylene, Teflon and synthetic rubber.

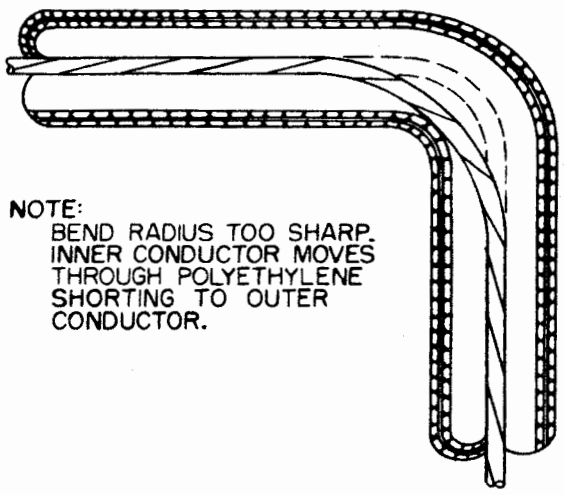


Figure 10-2. Effect of Bad Installation

NOTE:
STUFFING TUBE TOO TIGHT.
OUTER CONDUCTOR MOVES,
CHANGING CHARACTERISTICS
OF CABLE AND POSSIBLY
EVENTUAL SHORT.

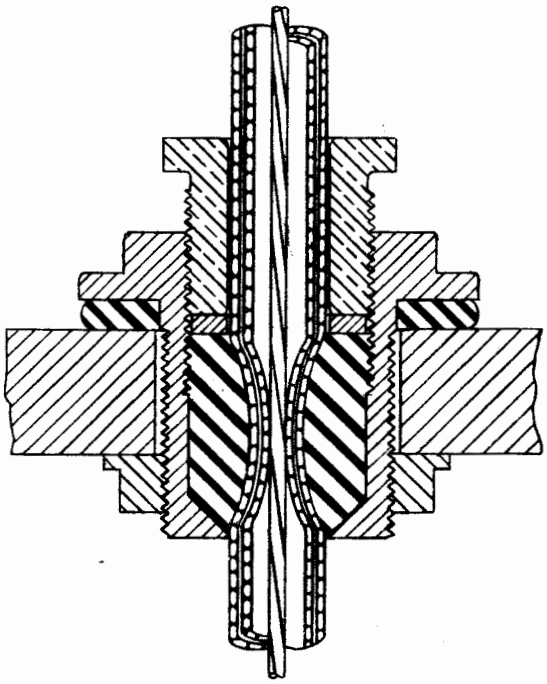


Figure 10-3. Effect of Bad Installation

a. POLYETHYLENE. – Polyethylene is a grey, translucent material. It will flow at about 185°F (85°C) and will remain flexible to about –40°F (–40°C). Although it is tough under general usage, it will flow when subjected to heavy pressure for a period of time. Keep this in mind when making bends or tightening a stuffing tube. What may look like a good installation today, may become faulty shortly afterward because the Polyethylene was subjected to undue pressure. Avoid installation practices that may apply point pressure to Polyethylene. Figures 10-2 and 10-3 show effects of bad installation.

b. TEFLON.–Teflon is a white opaque plastic material. It will withstand temperatures up to 500°F (250°C). It is about as flexible as Polyethylene at low temperatures. Teflon has a peculiar quality in that nothing will stick to it and no solvents exist. The varnishes and tapes used with other type cables will not stick to Teflon. The only way to keep moisture out of Teflon-insulated cables and their connectors is to follow exactly the recommended installation methods and use only the specified varnishes. Teflon is primarily a high-temperature material. It will produce the desired results only if high-temperature fittings are used with it in heat zones. When installing Teflon-insulated cable in heat zones where temperature reaches or exceeds 185°F (85°C) make sure all fittings have Silicone rubber gaskets and Teflon inserts. Silicone rubber gaskets may be identified by their normally orange or white color. Silicone is never black.

c. SYNTHETIC RUBBER.–Neoprene is a black synthetic rubber. It is very flexible and physically will withstand temperatures up to 257°F (125°C). It has high power loss at high frequencies; so it should never be used with cables carrying RF energy. However, it is very useful in transmitting high voltage DC pulses. Due to its flexibility and ability to "stick" to metals, it forms very tightly around the conductors and minimizes corona (high voltage breakdown of air surrounding a conductor).

4. PREFERRED TYPES

Tables 10-1, 10-2 and 10-3 show preferred types of flexible RF transmission cables. They may be used as an aid in choosing the proper type cable for a given application. Information given includes the following:

a. Proper choice of cable for various RF applications.

b. Maximum voltage for cable test purposes.

c. Attenuation for determination of length of run.

d. Power handling capabilities.

e. Cable diameters for hanger spacing and determination of minimum bend radius.

f. Impedance characteristics and special consideration on choice of fittings.

TABLE 10-1. 50 OHM CABLE

The following polyethylene, 50 ohm cables are preferred for all installations carrying radio frequency power and will use standard 50 ohm connectors:

Armored Cable	Outside Diameter Inches	Unarmored Equivalent	Outside Diameter Inches	Max. Peak Operating Volts	100 mc		1000 mc		3000 mc		Above 3000 mc
					Att. db/ 100ft	Max. Input Watts	Att. db/ 100ft	Max. Input Watts	Att. db/ 100ft	Max. Input Watts	
		RG-58/U	.195	1900	4.2	200	16	64	32	27	
RG-10/U	.475	RG-8/U	.405	4000	2.1	850	9.0	190	18	95	
-	-	RG-9/U (double shielded)	.420	4000	2.0	850	8.5	190	17	95	Use Waveguide
RG-74/U	.615	RG-14/U	.545	5500	1.4	1300	6.2	260	13	125	
RG-18/U	.945	RG-17/U	.870	11,000	.85	3150	4.2	540	10	260	

The following Teflon 50 ohm cables are preferred types to be used only in heat zones where the temperature reaches, or exceeds, 185°F (85°C) and will use standard 50 ohm connectors with Silicone rubber gaskets.

Where only a portion of a coaxial cable run will be in an area where the temperature reaches, or exceeds, 185°F (85°C), an unbroken length of the Teflon type cable shall be used only in that portion of the run exposed to the high temperature.

Armored Cable	Outside Diameter Inches	Max. Peak Operating Volts	100 mc		1000 mc		3000 mc		Above 3000 mc
			Att. db/ 100 ft	Max. Input Watts	Att. db/ 100 ft	Max. Input Watts	Att. db/ 100 ft	Max. Input Watts	
RG-116/U	.475	4000	2.0		7.6		15.0		Use Waveguide
RG-118/U	.780	22,000							

TABLE 10-2. 70 OHM AND TWIN CONDUCTOR CABLES

The following Polyethylene 70 ohm cables are preferred types and will be used on video carrying applications. These cables will also use 50 ohm connectors:

Armored Cable	Outside Diameter Inches	Unarmored Equivalent	Outside Diameter Inches	Max. Peak Operating Volts	100 mc		Above 100 mc
					Att. db/ 100 ft	Max Input Watts	
RG-12/U	.475	RG-11/U	.405	4000	2.1	650	Not considered video application
RG-35/U	.945	-	-	10,000	.7	2400	
-	-	RG-13/U (double shielded)	.420	4000	2.1	650	

The following twin conductor cables are preferred types only when the use of twin conductor cables cannot be avoided. It is recommended they be avoided wherever possible since they require use of small twin and large twin UHF connectors neither of which is impedance matched.

Armored Cable	Outside Diameter Inches	Unarmored Equivalent	Outside Diameter Inches	Maximum Peak Operating Voltage	Approximate Impedance Ohms
RG-111/U	.490	RG-22A/U	.420	1000	95
RG-131/U	.710	RG-130/U	.625	3000	95

TABLE 10-3. 50 OHM CABLES FOR DC PULSE CARRYING APPLICATIONS

The following 50 ohm cables are preferred for DC pulse carrying applications.

Armored Cable	Outside Diameter	Unarmored Cable	Outside Diameter Inches	Max. Peak Operating Volts	Remarks
RG-74/U	.615	-	-	5500	Preferred for all applications below 5000 volts.
-	-	RG-64/U	.495	8000	Preferred to RG-27 or 28/U for voltage below 8000 volts.
RG-27/U	.675	RG-28/U	.805	15,000	For high voltage installations only.
-	-	RG-88/U	.490 Max.	8000	For extreme radio noise conditions.

Special purpose cable will always be specified for a particular equipment.

The following are preferred types: RG-21/U - Special high attenuation cable
RG-62/U , 71/U - Small size low capacitance cable
RG-63/U , 79/U - Medium size low capacitance cable
RG-65/U - High Impedance video cable

SECTION 10-2

INSTALLATION HANDLING OF SOLID DIELECTRIC CABLES

1. INTRODUCTION.

As noted before, solid dielectric cables will flow under pressure depending on temperature, the pressure and the time. The tendency to flow can be reduced by proper handling and installation practices. Some of the considerations in planning a typical installation are given in this section.

2. LOCATION OF CABLE RUN.

Individual cables should be run separately. Wherever possible and practicable, install them along different or well separated paths to reduce the probability of battle damage to several cables. Pulse cables should be run separately, whenever possible, to reduce coupling which will cause radio interference. (Treatment of pulse cables to minimize radio noise is taken up in more detail under Chapter 19, GROUNDING, and Chapter 20, SHIELDING.)

Wherever possible, avoid high temperature locations such as hot air intakes, steam pipes, stacks and unprotected spots exposed to stack gases, resistor banks (battery charging compartments, galleys and galley vents, uptake spaces, and machinery spaces). If it is necessary to run cables through these spaces, they should not be run overhead; temperatures are greater in overhead locations.

3. CHOOSING THE LENGTH OF CABLE.

Attenuation (power loss) in a line increases with length. Therefore, the shorter the line, the less attenuation and the more efficient it is as a transmission line. Lay out the runs with this in mind. Remember, however, to avoid the high temperature locations even if it means a longer cable run. Where installations in high temperature locations are unavoidable, an unbroken length of high temperature cable such as Teflon should be installed in that portion of the run exposed to the high temperature.

It is best to start a run with a length of cable longer than needed. This safety factor allows for errors in measurements and judgement and for accidents such as nicking conductors and cutting the insulating jacket when finishing cable ends. If the cable length is too short, a longer cable of the proper length should be run. Splicing is an emergency measure only. If splicing is necessary, the procedures described in Section 10-3 should be followed.

When connecting a cable between a bulkhead and a piece of equipment which is rigidly mounted, the cable may be clamped to the bulkhead in the shortest possible length. If the equipment is shockmounted, allow enough cable to permit unrestricted motion of the equipment. In most cases, 18 inches is a sufficient cable length between the transmitter and the bulkhead. It is usually mounted to the bulkhead in a horizontal plane after a short vertical run from the transmitter. This dimension will vary with the size of the equipment and the location of the output point of the transmission line. Where the shock-mounted equipment is used, it is recommended that the cable be wrapped with friction tape for a distance of three or four inches from a point under the last cable clamp in the direction of the equipment. This will ease the bending of the cable at that

point and reduce the possibility of cable deformation because of constant vibration. The cable should be wrapped with tape, just above the transmitter connection, since it is subjected to wear at this point.

When connecting cables to equipment which slide out for maintenance purposes, allow sufficient cable length so that the equipment may be withdrawn and operated during maintenance, thus eliminating the use of patch cords.

When making cable runs which require equal lengths for electrical balance, the cables should be marked every ten feet before making the run. This marking will enable the installation worker to allow for differences in length due to bends. The cable run can thus be made to match exactly in physical length from the start to the termination.

Since the electrical characteristics of cables vary, it is necessary to balance the cables electrically. This may be done by use of a capacitance-resistance bridge. In order to allow for variations in electrical length the cable should be left considerably longer at the termination than is necessary for cutting into the equipment. This allows the person checking electrical balance to cut each cable to give the required performance.

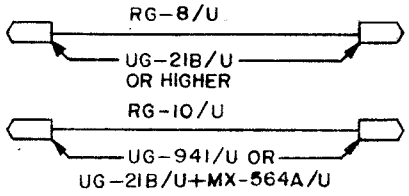
4. MAKING BENDS.

Flexible coaxial cables are only flexible in that they will assume a bend radius. They will not stretch or compress. Keep this in mind when planning installations on mast runs to antennas, etc. Masts and pedestals are subject to vibration and expansion. Always make sure that vibration and expansion does not place a strain along the length of the cable and on the connectors. This also applies to crossing expansion joints in decks. Make sure cable has enough slack to eliminate strain. If necessary, hangers for cables crossing expansion joints may be staggered slightly to provide flexibility. Coaxial terminations into antenna fittings should be made with a bend prior to entering fitting.

Ordinarily the number of connectors should be kept to a minimum to keep down transmission line losses and possible sources of maintenance trouble. Large size connectors shall always be supported so that NO strain exists at the connector. Only in cases where this is not practicle and where vibration is very severe the following method of terminating large coaxial cables such as RG-18/U to relieve fitting strain may be used:

a. Terminate the cable with UG-167B/U or higher about 8 to 10 inches from the antenna or equipment.

b. Make a small patch cord out of RG-8/U or RG-10/U cable so that a complete loop may be formed between the connections.



c. Use this patch cord to couple between the equipment and the RG-18/U.

CAUTION

This method should only be used on matched lines and terminations. Do not use this in terminating to end seals or unmatched antennas because of high standing wave ratios resulting in excessively high voltages. In all cases make sure that the maximum operating voltage of RG-8/U is not exceeded.

Make bends as large as possible. The radius of a bend should always be greater than 10 times the diameter of the cable. This is an easy rule to learn, and one which will pay dividends if practiced.

Avoid bends which are not in accordance with the rule above, especially at points near "kickpipes". Don't bend a cable sharply to get it to a bulkhead; support it by a bracket or curved rod so that the bend radius meets at least the minimum requirement. Make all bends conservative and there will be less trouble. This also applies to patch cords. In many cases, especially submarine work, it is impossible to maintain minimum bend radius. In these cases, use a proper angle adapter to avoid forcing the cable.

5. CABLE STRAPS.

Use prefabricated straps for holding the cables. Never form the strap by hammering it around the cable. Use double toe, loose fitting straps (snug but not too tight). In running the cable up a mast, use back straps, allowing about three eighths of an inch between the mast and the cable. (See Chapter 9, Figure 9-1.) Back straps should also be used in compartments about the vessel which are subject to "sweating" along bulkheads and decks.

6. STUFFING TUBES.

Considerable pressure is often exerted on cables in bulkhead stuffing tubes. Here the tendency to over-tighten the gland nut must be controlled; that is, tighten enough to avoid leaks, but not enough to deform the cable. Special rubber packing is available for use with these cables and stuffing tubes. This packing relieves the cable of stress in compression to some degrees and thus reduces distortion.

REMEMBER: The electrical properties of these solid dielectric coaxial cables depend on the physical dimensions. Anything you do to change them or eventually cause them to change is reducing the efficiency of the system and the ship.

7. PRECAUTIONS FOR GOOD INSTALLATION PRACTICE.

a. DAMAGE OF THE INSULATING JACKET.–When installing cables, make sure that the jacket is not cut or damaged. This is especially true of cables exposed to the weather such as antenna mast runs, etc. Any small cut in the jacket will allow water into the cable. In many cases, this will run the full length of the cable and short the cable at the connector.

b. STRESS ON CABLES.–Avoid using the cable as a tow cord. The more carefully you handle cables and other components, the less you have to repair and replace. When disconnecting coaxial cables, pull on plug, not on the cable, and the connection will remain secure for a long time. Broken braids in the cable will eventually lead to microphonic crackles, static and unsteady signals.

c. ABRASION.– Avoid exposing the cable to points of constant abrasion. This applies to all wires and cables. Use grommets, sleeving, tape, etc., to protect the cables. Points to look out for are: cables coming out of a chassis (they can be cut by sharp metal) and cables going around sharp corners of equipments to cable straps. Constant rubbing will cut through or short out a cable.

SECTION 10-3

SPLICES FOR SOLID DIELECTRIC CABLES

1. INTRODUCTION.

Under most conditions, in cases where a break occurs in a cable or extra length is needed, a new continuous length of cable is run. However, in the event of battle damage or on very short availability, it may be necessary to make a splice in a solid dielectric coaxial cable. Consider making a splice as a last resort only. This section describes two splicing kits which are available in Navy stock.

2. NAVY TYPE NUMBER OF SPLICING KITS.

In order to splice solid dielectric coaxial cables, two splicing kits were made up to handle some common cable types. These are Splicing Kits MX-904/U and MX-907/U.

3. APPLICATIONS.

Kit MX-904/U is used for splicing RG-8/U, RG-9/U, RG-10/U, RG-11/U and RG-12/U cables.

Kit MX-907/U is more complete and is used for splicing RG-17/U, RG-18/U, RG-19/U and RG-20/U in addition to all types that can be spliced with MX-904/U.

4. THE FIVE STEPS IN MAKING A SPLICE.

Instruction books are available with the splicing kits, and since the operations in making the splices are described in detail in this book (NavShips 91200), no attempt will be made here to give the step-by-step operations to be followed. In general, the five steps in making a splice are:

a. The joining of the inner conductors.

b. The application of Polyethylene dielectric over the inner joint and its continuity with the cables insulation.

c. The splicing of the copper shields.

d. The molding of the vinylite jacket.

e. The joining of the outer armor.

The instruction book supplied with the kits gives the operations to be followed for each of these steps. These instructions should be followed. If trouble is experienced in molding the vinylite jacket, careful application of vinyl tape will make a satisfactory jacket splice provided all precautions of waterproofing are taken.

5. ADDITIONAL TOOLS.

The following is a list of tools required for making a splice but not included with the kit.

Tools	Standard Navy Stock Numbers
1 File	G41-F-952
1 Pair 10-ampere soldering tongs or gasoline torch	G41-T-3645
1 Soldering Iron	G41-I-688
1 Hacksaw	G41-F-3394
1 Bottle of carbon tetrachloride or Cyclohexanone	G51-C-775
Standard Electrician's Tools	See Chapter 3, HANDTOOLS

SECTION 10-4

TESTING OF SOLID DIELECTRIC CABLES

1. INTRODUCTION.

In many cases, cables are kept in stock for long periods of time. Although these cables are produced under very rigid specifications and are subjected to all acceptance tests, they may change characteristics due to improper storing or being left exposed in the weather for long periods. For this reason, it is standard practice to check insulation resistance, attenuation (if possible) and dielectric strength of all cables before and after installation. The oily plasticizer in old cables may have dried out, causing the cable to be less flexible with the possibility of cracking.

2. INSULATION RESISTANCE TEST.

a. TEST EQUIPMENT. – For insulation resistance measurements, the equipment used may be standard constant voltage type 500 volt megger, and an Insulation Test Set AN/PSM-2 (1000 megohms) (SNSN G17-M-30366-2334). (See Chapter 4, Test Equipment.)

b. POLYETHYLENE AND TEFLON CABLE VALUES. – The insulation resistance values of Polyethylene and Teflon cable should be as shown below:

Length in Ft	100	200	500	1000
Insulation Resistance in Mehohms	40,000	20,000	8000	4000

c. SYNTHETIC RUBBER CABLE VALUES. – The insulation resistance measurements of synthetic rubber cables should be as shown below. Note that temperature variations affect the insulation resistance. Therefore, it is useful to note the temperature at which tests are made for comparison to tests made in the past or to be made in the future.

Length in Feet	Insulation Resistance in Megohms	
	$60^{\circ}F$ ($15^{\circ}C$)	$68^{\circ}F$ ($20^{\circ}C$)
10	50,000	35,000
100	5,000	3,500
1000	500	350

While values below these will probably do for low frequency applications, the values given are necessary for proper cable operation at radar frequencies. It is useful to run this test with the connectors attached, while moving the cable slightly.

NOTE

The insulation resistance of coax connectors alone should read infinite on a megger and will not affect cable readings when installed properly.

d. TEST JIGS. – Many coaxial fittings are small and not readily accessible. Ordinarily, two men are necessary to operate the megger satisfactorily - one to hold the megger leads so they won't short and one to crank the megger and note the dial reading. However, a jig may be constructed to enable one man to use the megger alone. This will also eliminate incorrect readings often obtained when the leads are held by hand. The methods is to fabricate special adapter fittings into which the cable to be checked may be inserted, and onto which the megger leads may be easily clamped. These adapters are made from ordinary cable fittings, modified as shown in Figure 10-4.

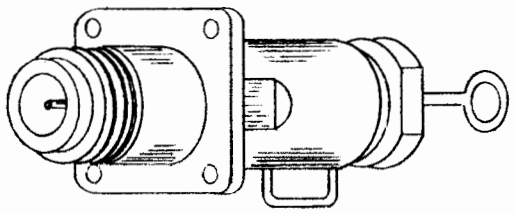


Figure 10-4. Megger Adapter Made From Type UG-19B/U Jack

A fitting is chosen which will mate with the cable fitting on the cable under test. A lug in the form of a half-loop is soldered onto the outer conductor of the adapter. A wire is fastened to the inner conductor of the adapter, extending a few inches outside the adapter. This wire is then bent and soldered at the end to form a loop. Thus, two lugs are provided (one to the outer conductor and one to the inner conductor). The megger leads will easily clamp onto these lugs, with little danger of shorting out. The technician merely plugs the cable into the adapter, clamps on the megger leads, turns the megger crank, and obtains his reading.

It may be convenient to have several of these adapters on hand to check coaxial cables with various types of fittings. If many checks are to be made, it may be helpful to build a panel with a variety of adapters permanently fastened in place (see Figure 10-5).

When using these adapters, be sure that the adapters have no leaks or shorts; otherwise, a good cable may read bad. These adapters should be checked regularly with the megger (with no fitting inserted) to insure accurate results.

3. DIELECTRIC STRENGTH TESTS.

a. VALUES. – For dielectric strength measurements, the working values should be greater than those listed for a particular cable in Table 10-1.

IMPORTANT: Apply only that voltage listed for the particular cable. Once the cable is broken down it is useless, because the insulation is burned, and the insulation resistance goes down to a low value.

b. EQUIPMENT. – The equipment used for this test is a standard 10,000 volt, 60 cycle transformer with a meter, calibrated for the range, inserted in the primary circuit of the transformer. Observe all the precautions required when working with high voltages.

c. TEST PROCEDURES. – Tests should be performed as follows:

(1) LOW OPERATING VOLTAGES. – When testing lines equipped with low voltage connectors, remove the connector before making the test, cut back the jacket at a rate of one-half inch per 1,000 volts expected to be applied, comb the braid out, form a pigtail, and connect to the ground terminal of the transformer. Connect the high voltage lead from the transformer to the inner conductor of the cable. Stand back to examine the work. Make sure that there is sufficient clearance between the two terminals, and that no other metal or other conducting surfaces are in the vicinity, then apply the necessary voltage. Bring the voltage up to the required value at the rate of 200-300 volts per second for voltages up to 2,000 volts, and 500 volts per second for cables taking higher voltages.

(2) HIGH OPERATING VOLTAGES. For cables which are operating at high voltages and which are equipped with connectors designed for those voltages, the procedure is different if it is desired to test the cable and connector as an assembly. Make up a test connector and cable assembly to mate the assembly to be tested. Treat the cable on the test assembly as described above, allowing the

one-half inch per 1,000 volts, plug the test assembly into the cable assembly to be tested, and then handle as above. It is necessary that the test assembly be made with extreme care.

If corona is present, it may be due to a faulty connector, a bad assembly, a small air space in the connector, a loose connector, a loose tape wrapping, etc. It should be noted that ceramic type plugs usually operate with some corona between the inner and outer contacts along the ceramic inserts. This corona does not produce any bad effects except potential noise (if the assembly is not tight) because the ceramic materials used are not damaged by corona. Rubber, however, soon breaks down under corona. Therefore, it is important that great care be taken and that proper installation practices are observed when installing pulse cables and connectors.

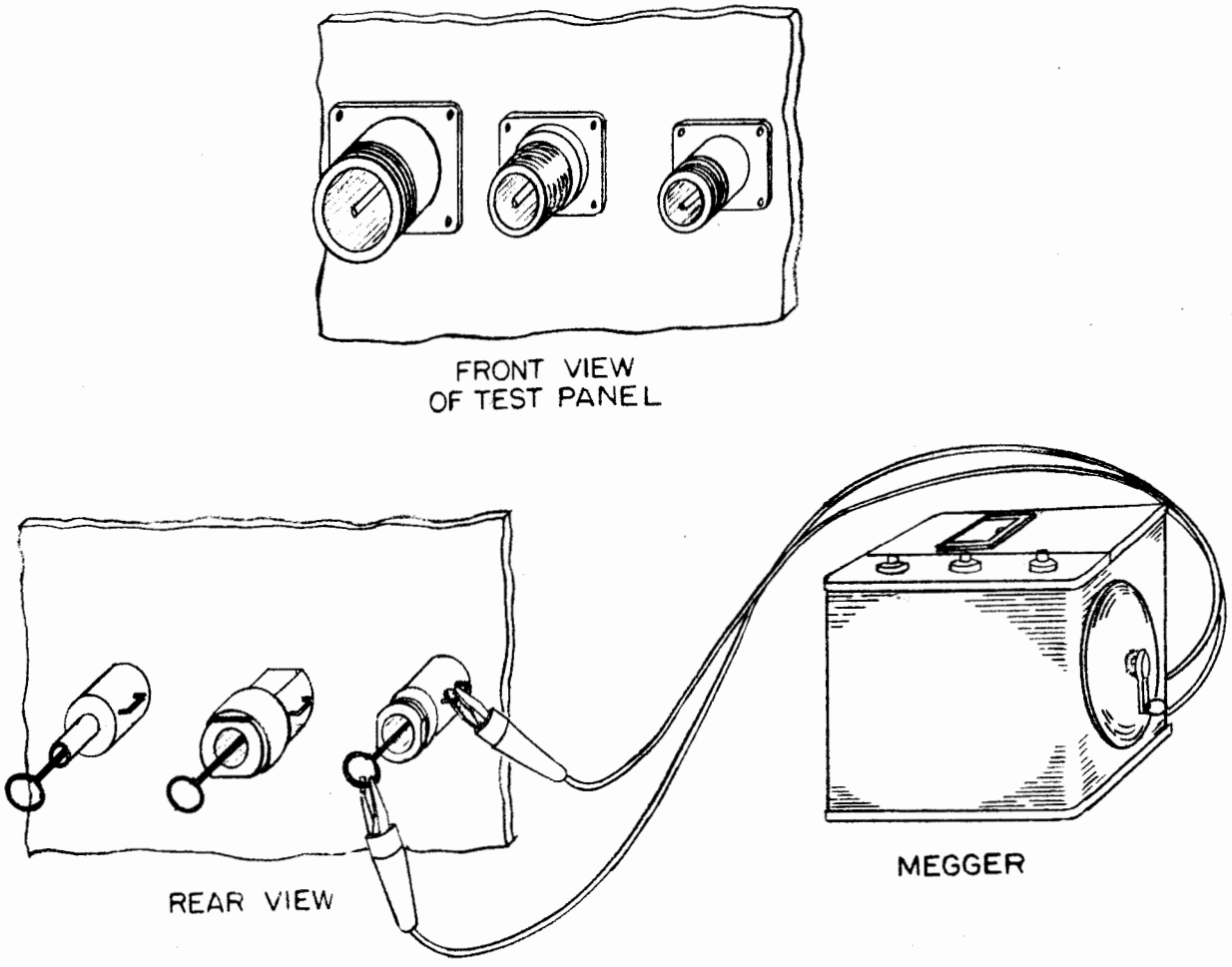


Figure 10-5. Insulation Resistance Test Panel

SECTION 10-5

INSTALLATION OF FITTINGS

1. INTRODUCTION

The proper installation of fittings on coaxial cable cannot be stressed too highly. Most faults in electronics installations appear at the cables and fittings; however, fittings will perform satisfactorily, electrically and mechanically, for the life of the equipment when properly installed.

a. **PREFERRED INSTALLATIONS.**— Standard installations for the types N, BNC, C, LC, LT, QDL and QDS, pulse series and twin UHF are shown in Tables 10-4 to 10-11. For quick reference to cables and adapters see pages 10-141 thru 10-146.

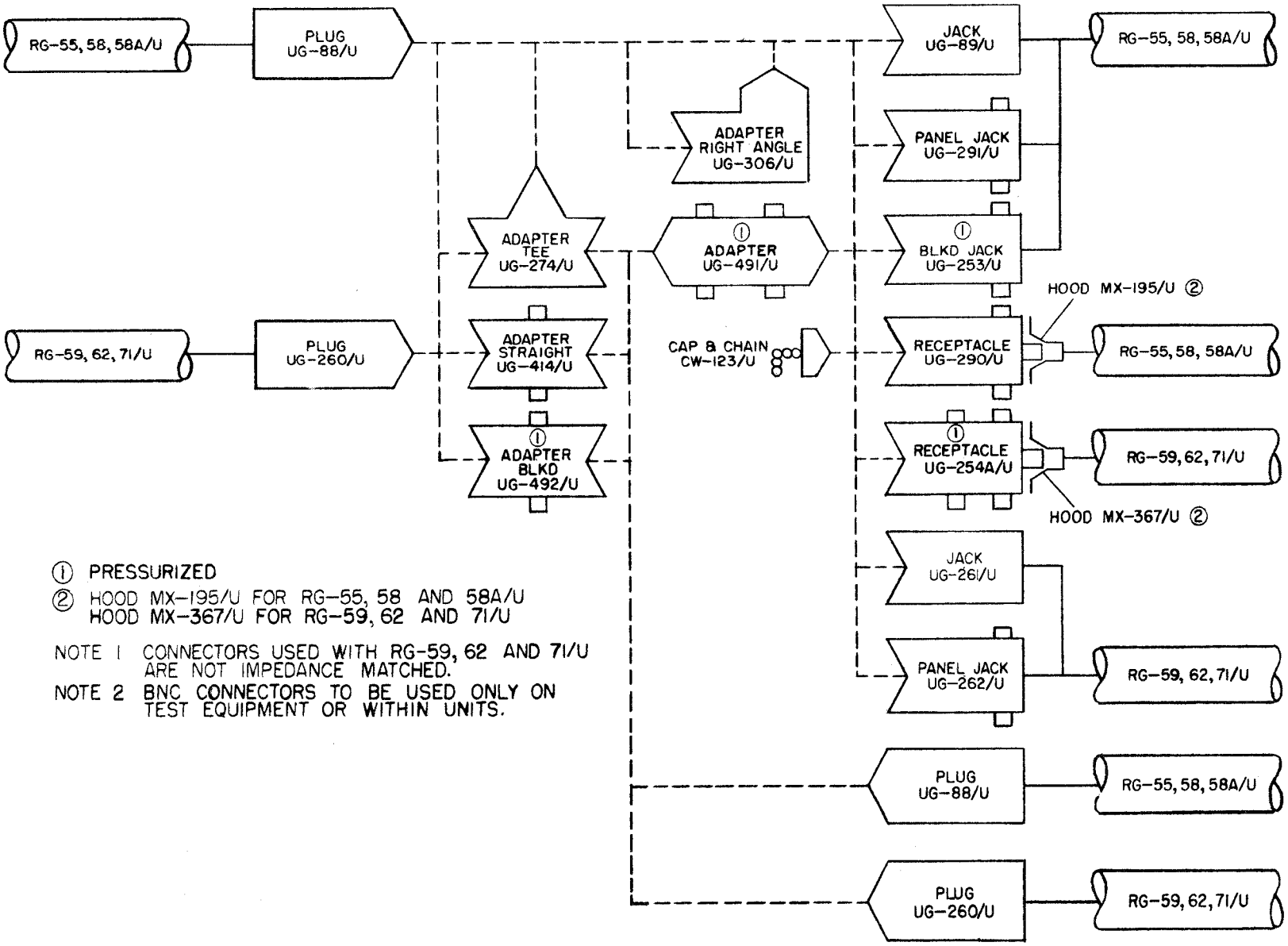
b. **INSTALLATION OF FITTINGS.** – The installation of a fitting in a flexible transmission line is as exacting as the characteristics of the cable itself. Like cables, fittings have definite impedance, voltage breakdown, attenuation, insulation resistance and weatherproofing characteristics. Improper installation may change any or all of these characteristics. In nearly all cases, the proper fitting for a particular job will be given to the installation worker. Most fittings have operating voltage ratings lower than the maximum voltage rating of the cable on which they are installed. The operating voltage of a line is generally not listed on installation prints. The installation worker should remember that the fitting may be operated at its peak voltage. A sloppy installation which passes on one job may break down on the next. In general, the installation made carefully and according to best practices will never have to be replaced.

c. **SHOP WORK.**—The best installation work can be done in the shop. If a little planning is used on a cable installation, one or more fittings on the run can be assembled in the shop. Shop temperatures are usually such that the dielectrics of the cable are very pliable and easy to cut. Jigs, vises and tools are available and need not be carried up the mast or across the yard. Power is available for use of soldering irons or soldering tongs. The cable can be coiled and rotated so all sides are readily accessible to ease the work. Tools, such as spanner wrenches, can be used with a full 360° swing. Also, a bad cut would not result in a new cable run.

d. **INSTALLATION BEFORE PAINTING.** – Always try to install RF fittings before the cable is painted. Paint binds the armor to the cable so that bubbling the armor back for cutting is very difficult. Often paint which has run to the lower side of the cable increases the diameter of the cable. This makes gland nuts and washers very difficult to put on. Scraping of paint on coaxial cables may injure the jacket or armor. Armor which has been painted cannot be thoroughly cleaned, resulting in bad ground connections. If fittings cannot be installed before a bulkhead or compartment is to be painted, tape the cable for a distance of about a foot or more from the point where the fitting is to be installed.

e. **CORRECT TOOLS.** - Use the correct tool for the job. Do not try to save time by using a tool that is not intended for the operation. Do not use hacksaws to remove the dielectric from the inner conductor. This results in ragged cuts on the dielectric and possible cutting of the inner conductor. Do not use pipe wrenches to tighten fittings. While this practice may save a few minutes in in-

TABLE 10-4. STANDARD INSTALLATIONS FOR BNC SERIES



① PRESSURIZED

② HOOD MX-195/U FOR RG-55, 58 AND 58A/U
HOOD MX-367/U FOR RG-59, 62 AND 71/U

NOTE 1 CONNECTORS USED WITH RG-59, 62 AND 71/U ARE NOT IMPEDANCE MATCHED.

NOTE 2 BNC CONNECTORS TO BE USED ONLY ON TEST EQUIPMENT OR WITHIN UNITS.

TABLE 10-5. STANDARD INSTALLATIONS FOR TYPE N SERIES

① THESE CONNECTORS MUST HAVE SILICONE RUBBER GASKETS WHEN USED WITH RG-116/U AND RG-118/U IN HEAT ZONE.

② ARMOR CLAMP MX-564A/U MAY BE USED WITH THESE WHEN ARMORED CABLES ARE USED.

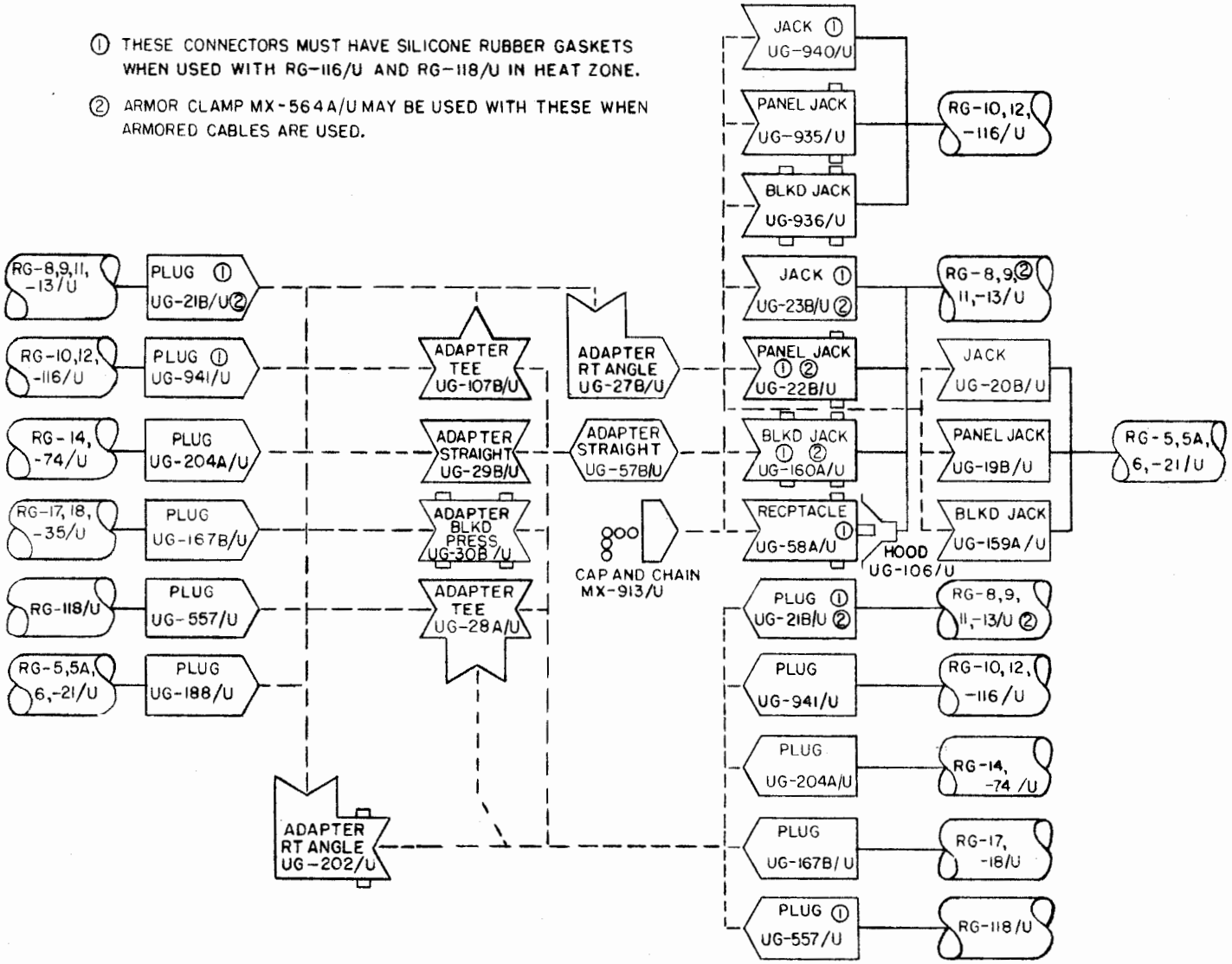
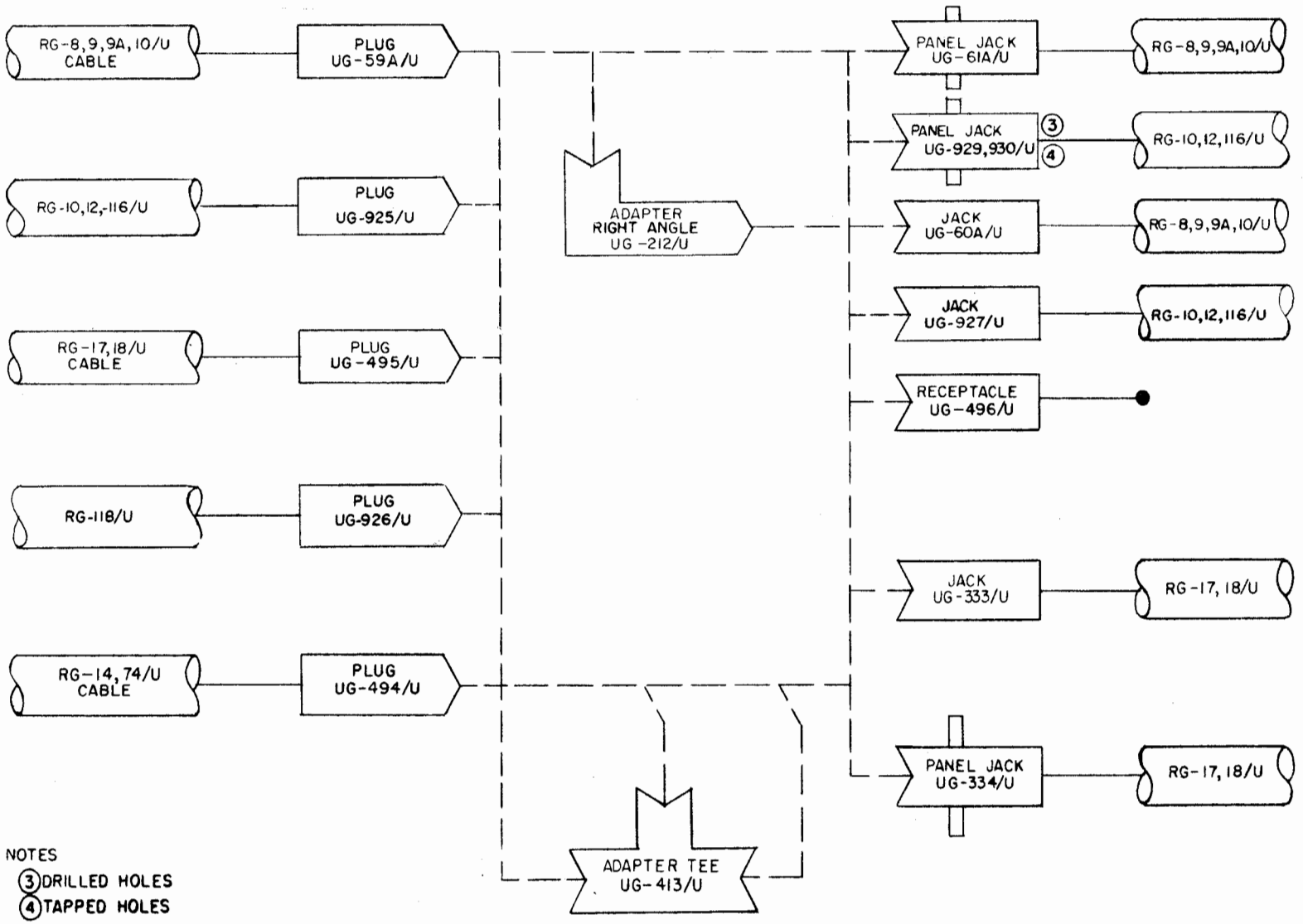


TABLE 10-6. STANDARD INSTALLATIONS FOR TYPE HN SERIES



NOTES
(3) DRILLED HOLES
(4) TAPPED HOLES

TABLE 10-7. STANDARD INSTALLATIONS FOR TYPE C SERIES

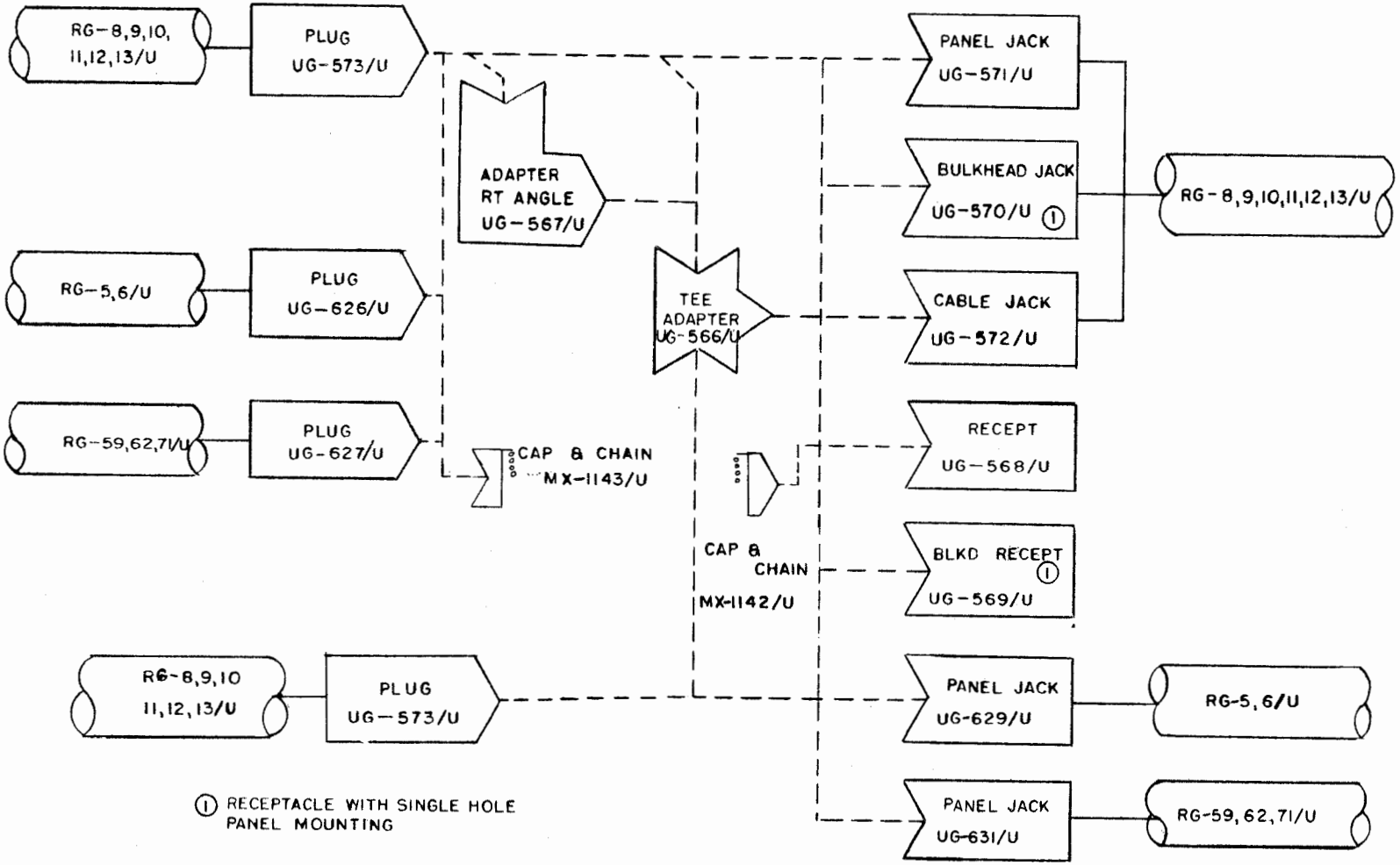
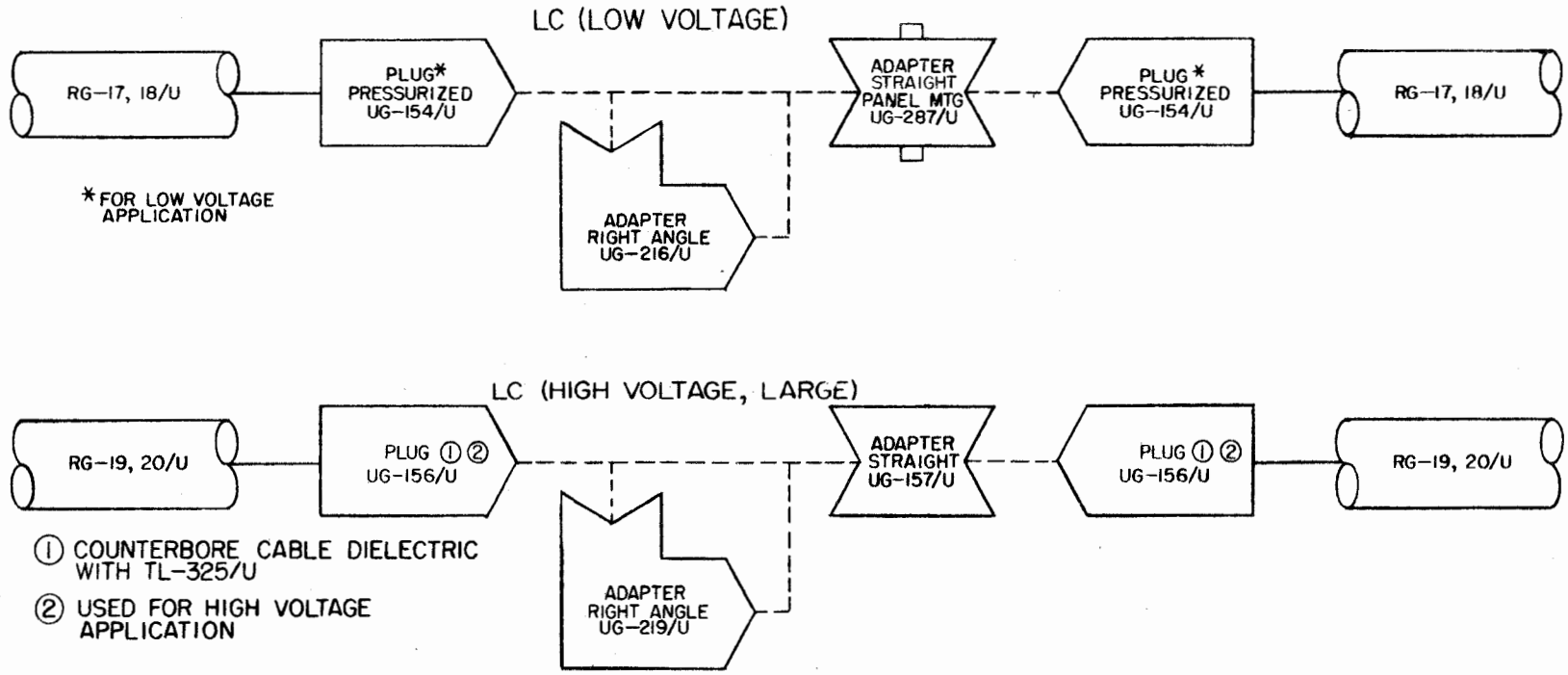
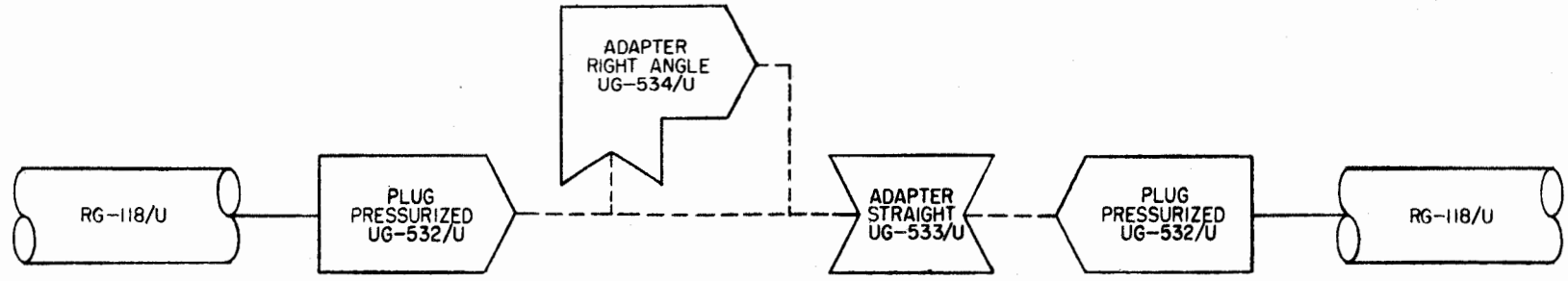


TABLE 10-8. STANDARD INSTALLATIONS FOR TYPE LC AND LT SERIES



NOTE: ALL LC CONNECTORS USE DIELECTRIC COMPOUND ON MATING SURFACE.



LT SERIES

NOTE: TO ADAPT LT TO LC USE UG-586/U OR UG-587/U. UG-587/U HAS MOUNTING PLATE.

TABLE 10-9. STANDARD INSTALLATIONS FOR PULSE SERIES

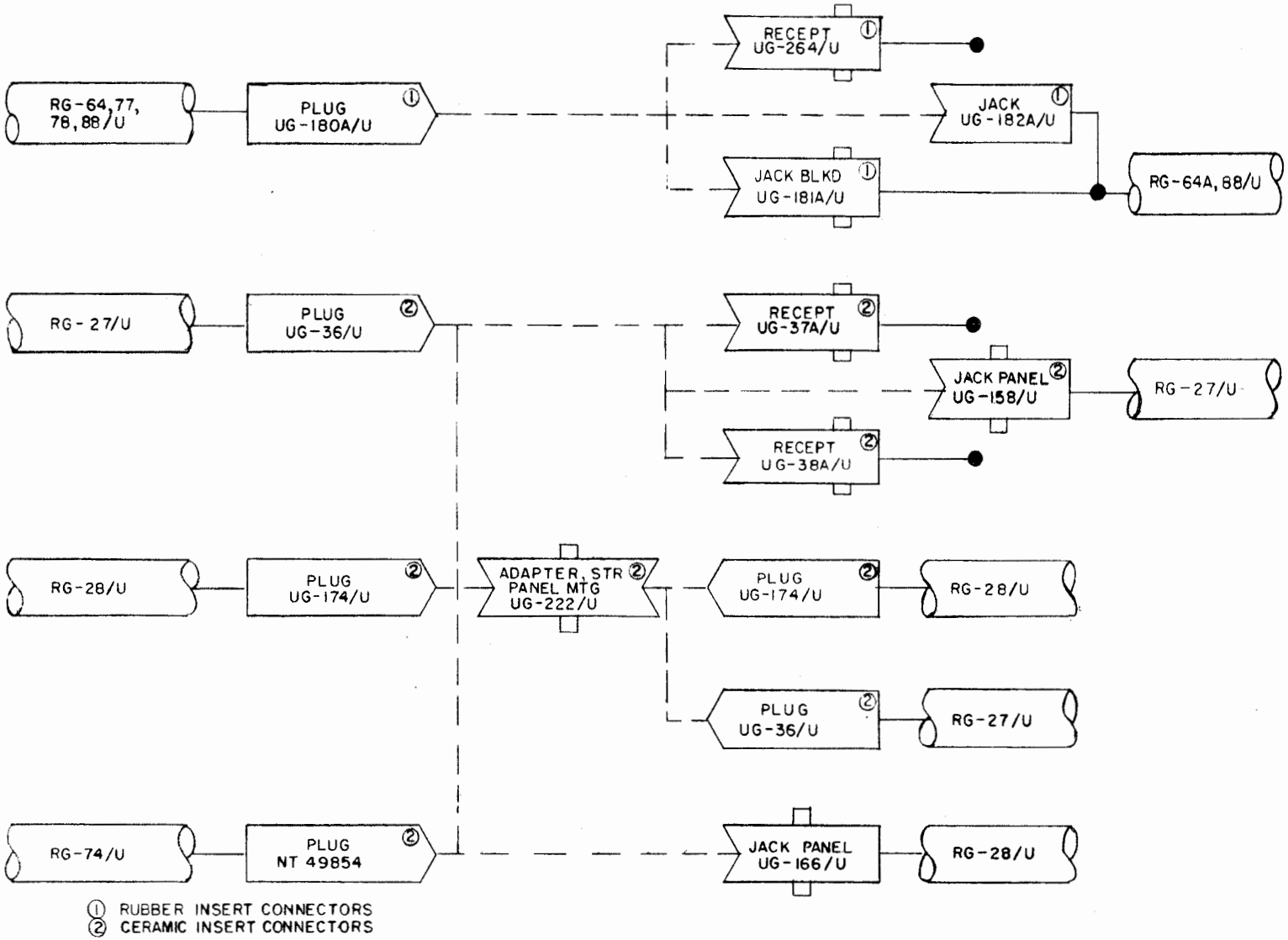


TABLE 10-10. STANDARD INSTALLATIONS FOR QDL (QUICK DISCONNECT, LARGE) AND QDS (QUICK DISCONNECT, SMALL) SERIES

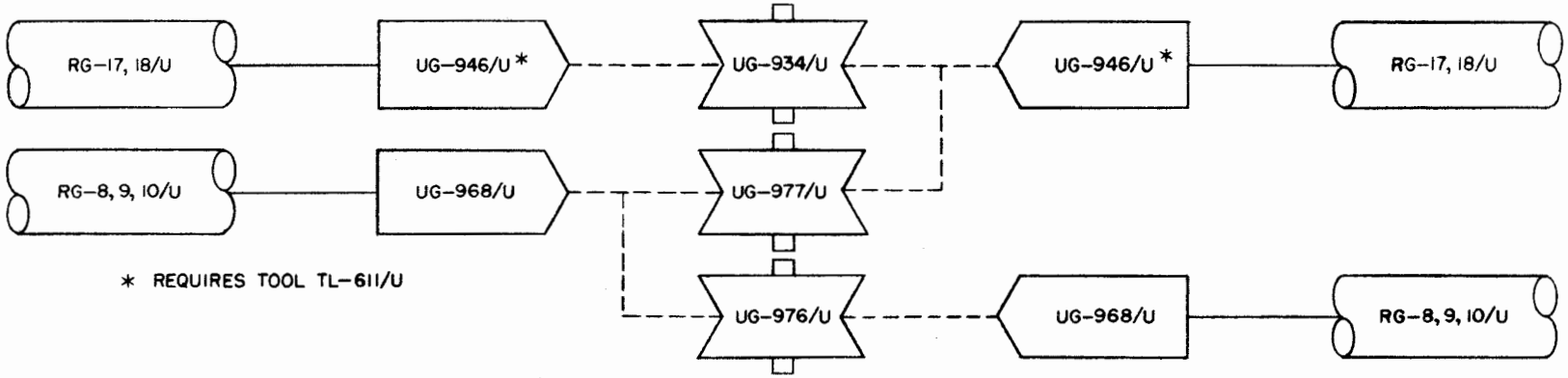
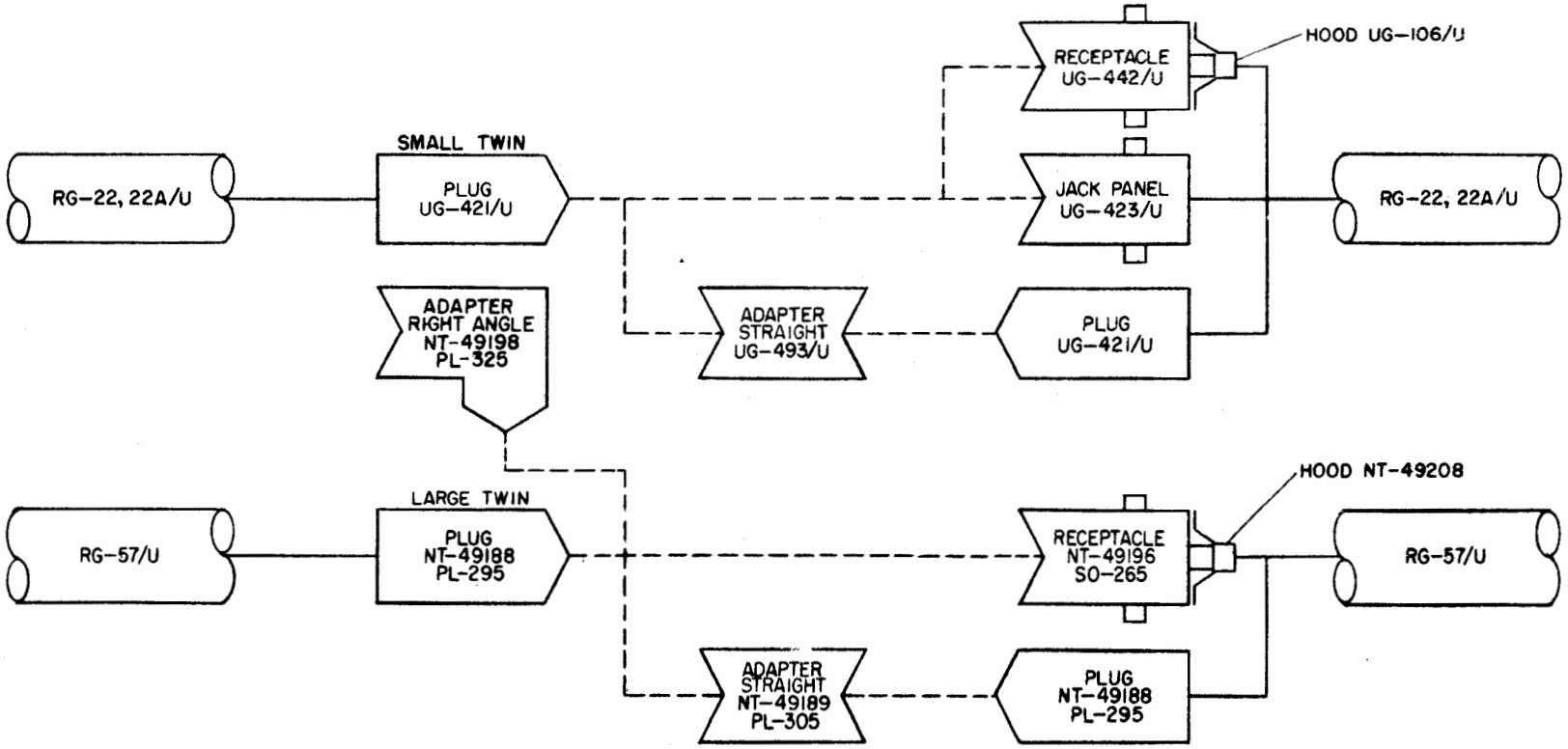


TABLE 10-11. STANDARD INSTALLATIONS FOR TWIN TYPE UHF SERIES



stalling the fitting, it usually results in the failure of the part. Misuse of tools shows up in the quality of the work. Follow recommended practices. Although at times they may seem a little longer, the final result will prove the merits of the method.

2. INSTALLATION PROCEDURES.

These are discussed in the same order that they are encountered when preparing a cable for the installation of a fitting.

a. USE OF TEMPLATE. – A flat, 1/16-inch thick, bakelite template can be made up as a guide in the assembly of cables to connectors (see Figure 10-6). Templates can be made up for the most widely used assemblies and carried in a tool box. The small hole at the end of the template is used to fasten a sample of the cable and/or connector for quick means of identification. In addition, the template acts as a guide to proper lengths of cuts.

b. CUTTING THE ARMOR. – With the necessity of reducing radio noise interference, the armor has become an important part of the electrical system of cable installation. Therefore, it is important that it be treated with the same care given the inner braid. The correct way to cut armor is to push it back slightly so that it bubbles away from the cable. A sharp diagonal cutter is used to cut the armor strands. Use the tip of the diagonals and make small cuts around the cable. Do not try to speed the job by taking a large bite. This will only make the cutting difficult and result in a ragged cut. It is important that this cut be clean and square since it is used in many installations as a reference point for the preparation of the rest of the cable.

c. CUTTING THE INNER SHIELD. The inner shield should be treated in the same manner as the armor. Since the strands are generally smaller and of soft copper wire, a scissors can be used for cutting. In installations where the braid is fanned back against a washer, the scissors can be used very effectively in trimming the braid.

A small, sharp pair of diagonals should be available for trimming braid. Large diagonals, used for rough work, become notched and lose their effectiveness for cutting fine braid wire.

d. CUTTING THE DIELECTRIC.

(1) THE KNIFE METHOD. – The dielectric should be cut with a sharp knife and as evenly as possible. To prevent nicking of the inner conductor, cut completely around the dielectric to about a distance of 1/16 inch or 1/32 inch from the inner conductor. The dielectric is then grasped with gas pliers and twisted; the uncut dielectric will shear loose. The dielectric then may be pulled off. If a long length of dielectric is left, it need only be pulled forward enough to allow cutting of the center conductor to desired length. When working with stranded cable, never twist the dielectric opposite

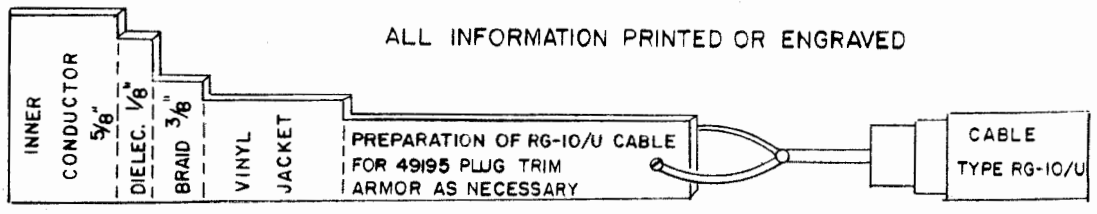


Figure 10-6. Template For Use In Preparing Cable Assemblies

to the winding of the strands. In almost all cases, the strands will be wound clockwise looking into the end of the cable.

(2) THE "HEAT STRIPPER" METHOD. – The second method of cutting through the dielectric is by use of a "Heat Stripper" as shown in Figure 10-7. An edged "V" (with a 1/8 inch wire slot in the bottom of the V) is fashioned on the end of a piece of copper strip and secured around the heating portion of an ordinary soldering iron. The cable insulation to be stripped is laid in the "V" and rotated. The heat stripper melts a clean break that permits the end insulation to be easily removed with a slight pull. This method can also be used for lateral cuts on jackets, etc.

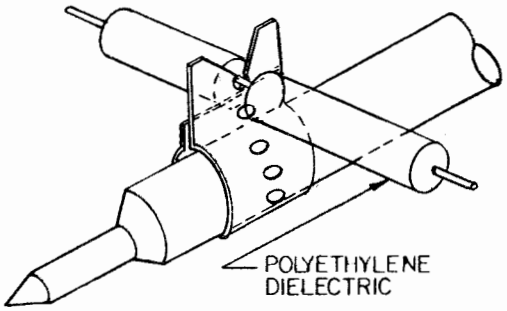
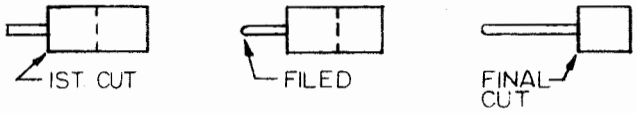


Figure 10-7. Heat Stripper

Facing of dielectric cuts should always be made with a sharp knife. In many cases tapers and counterbores are necessary which require special tools. Extreme care should be taken in using these tools. Small filings scraped from the inner conductor, often embed themselves in the dielectric making them very difficult to remove. Where the cable is subjected to high frequency voltage, these particles form a short circuit across the face of the dielectric so they must be removed.

e. REMOVING BURRS. – In removing burrs from the center conductor, always file away from the dielectric. Make sure that no filings fall into the connector or on the dielectric. Try to make cuts on the inner conductors as clean as possible. By reducing the filing necessary, the chances of shorts due to small copper particles falling into the connector can be reduced also. Small burrs can be removed with sand paper or crocus cloth. Make sure that no metallic forms of abrasive, such as emery cloth, are used.

A good method to use is to cut back the dielectric only enough for filing. After filing is completed, cut dielectric to final length.



f. SOLDERING. – Make sure that all surfaces to be soldered are clean and tinned. Many connectors have untinned parts made of brass or copper that require soldering. Oxidation of these parts makes soldering very difficult. Do not wait until the connector is assembled to find out that it can not be soldered due to oxidation. Thoroughly clean all parts to be soldered, whether plated or not plated. All bare soldering surfaces should be tinned before assembly. If a part is to be tinned that requires close tolerance, the excess solder can be shaken off while still hot. Another method is to quickly wipe the part with a cloth before the solder cools. NEVER USE ACID FLUXES ON ELECTRONIC CONNECTORS. If the part is thoroughly cleaned, rosin flux will do the job.

g. CONTACT PINS. – Unless a few necessary precautions are taken, the soldering of contact pins can give much trouble. First, always tin the center conductor before the contact pin is put

on. Second, puddle a small amount of solder in the contact pin before it is put on the inner conductor. REMEMBER: The less heat that is applied to the cable, the smaller are the chances that the polyethylene will melt or distort. If both contact pin and center conductor are well tinned, only a small amount of heat is necessary to sweat them together. A job done in this manner does not need the addition of solder. Both hands are left free; one to hold the iron and one to hold the contact pin. In many cases, power will not be available and a prestolite torch or an alcohol torch - Dreadnaught No. 1 or No. 2 (No. 2 preferred)- must be used. Keep the heat very low and pin point it on the part to be soldered. Do not leave the flame on the pin any longer than absolutely necessary. Do not apply solder into the flame. Melt the solder by contact with the part to be soldered. The Triton Soldering Tongs, or equivalent, is a very useful tool (where 110 volts AC is available). These tongs can be held in the palm of the hand and used as pliers to hold the pin. A small switch allows the same hand to turn it on or off. It does not leave solder on the contact surface as a tinned soldering iron would. It applies fast, direct heat to the contact, thus reducing the possibility of melting the dielectric. Be sure to clean all excess solder off of a pin. Use a small knife for this. Try not to remove any of the silver plating from the pin when scraping off excess solder. Do not use a file.

After the assembly is complete, the position of the contact pin should always be checked for relative position in the connector. If the assembly was made properly, the pin will correspond to the positions shown in Figure 10-8. It is important that these pins are in their proper position to maintain the correct impedance match in the connector. When the pins are properly positioned, they join to form a continuous inner conductor through the fitting. Improperly positioned

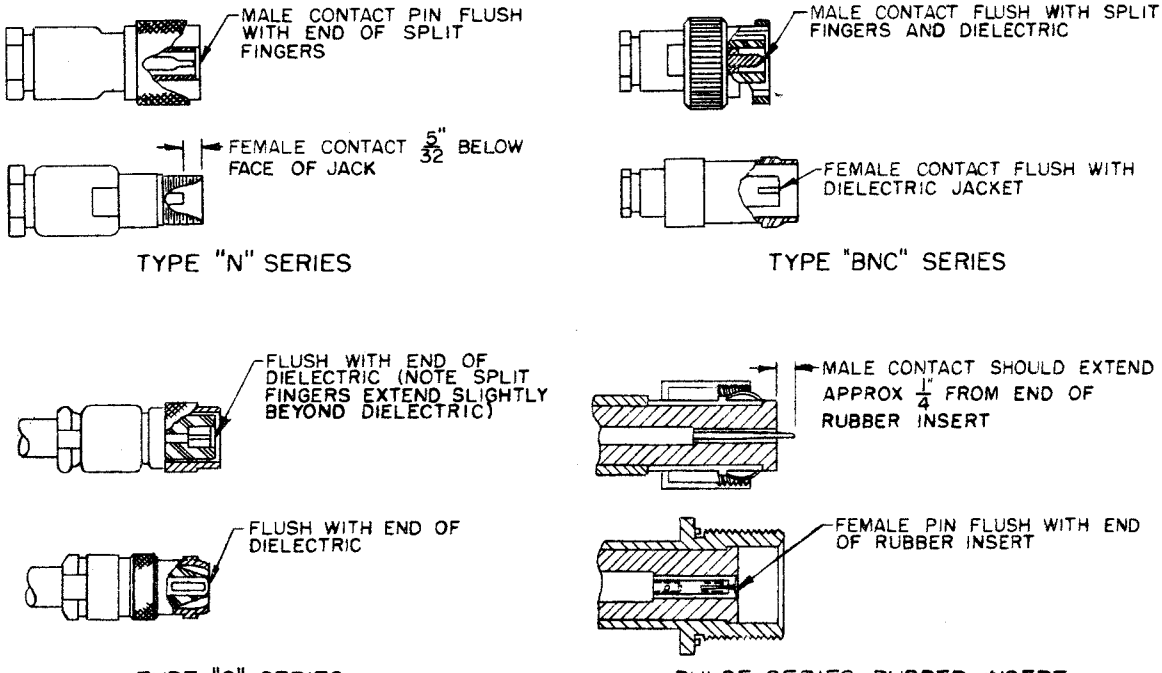


Figure 10-8. Correct Positioning of Contact Pins

pins will result in intermittent connections, impedance mismatch, voids in the mating dielectric surfaces, etc. For types LC and LT, make sure that the pin is cut as shown in the assembly of instructions for the particular jack it is to be used in. Certain pressurized fittings require special pin lengths and will be discussed in the assembly instructions.

h. GROUNDING OF ARMOR TO FITTINGS. - Since the proper grounding of the armor is very important for radio noise reduction as pointed out previously, methods given in the installation instructions should be carefully followed. All the preferred type fittings used in installation work have means for grounding the armor to the fittings. Type "N" fittings for use with RG-10/U and equivalent size cables, must use an armor clamp which replaces the gland nut. The preferred armor clamp is the MX-564A/U. However, a new series of connectors, which are supplied with armor clamp in place of gland nut, has been issued under UG-( )/U type numbers. (See 900 series shown in Table 10-17, Section 10-6.) The MX-564A/U is basically the same as the MX-564/U except that it has been improved to make installation much easier by allowing a less critical armor cut and increased contact surface.

The following methods for armor clamping of "N" series connectors should be used only in emergencies where armor clamps are not available.

NOTE

UG-21/U, UG-22/U and UG-23/U connectors are obsolete and should not be used except in emergencies.

(1) SEIZING WITH WIRE.-The connector is assembled in the usual manner with the armor pushed back out of the way. After the connector has been assembled and all nuts tightened securely, the armor is pushed forward and trimmed flush with the end of the connector. The armor is then seized tightly with No. 20 bare tinned copper wire. In the UG-21, 22, 23/U connectors, the wire is brought up over the end of the connector. The armor, wire and connector are then soldered. Be careful not to apply too much heat or the cable may be damaged. The disadvantage of this method is that when aluminum armor is encountered, soft solder will not adhere to it. For UHF connector installation constructions refer to Section 10-6.

(2) JIG AND VISE METHOD. - A second method requires the use of a jig and vise as shown in Figure 10-9. As an example, the method shown is for RG-10/U cable. A tinned sleeve of about 1/2 inch ID and 1/32 inch wall thickness and 1-1/4 inch long is slipped over the armor before the assembly is made. The connector is then assembled in the usual manner with the armor and sleeve pushed back out of the way. After the assembly is complete and tightened; slip the armor forward and trim it just behind the connector. Next slip the sleeve forward over the armor and butt it against the connector. The cable is then put in the jig blocks and this assembly is placed in a vise. Tighten the vise to give a tight contact between armor and sleeve and then remove the cable from the vise and solder the sleeve to the connector. A typical jig construction is shown in Figure 10-9.

The advantage of this method is that aluminum armor, as well as steel armor, can be grounded securely. It also acts to relieve any strain on the cable within the connector due to flexing. It has a disadvantage in that the use of jig blocks and vise makes a mast or shipboard assembly awkward.

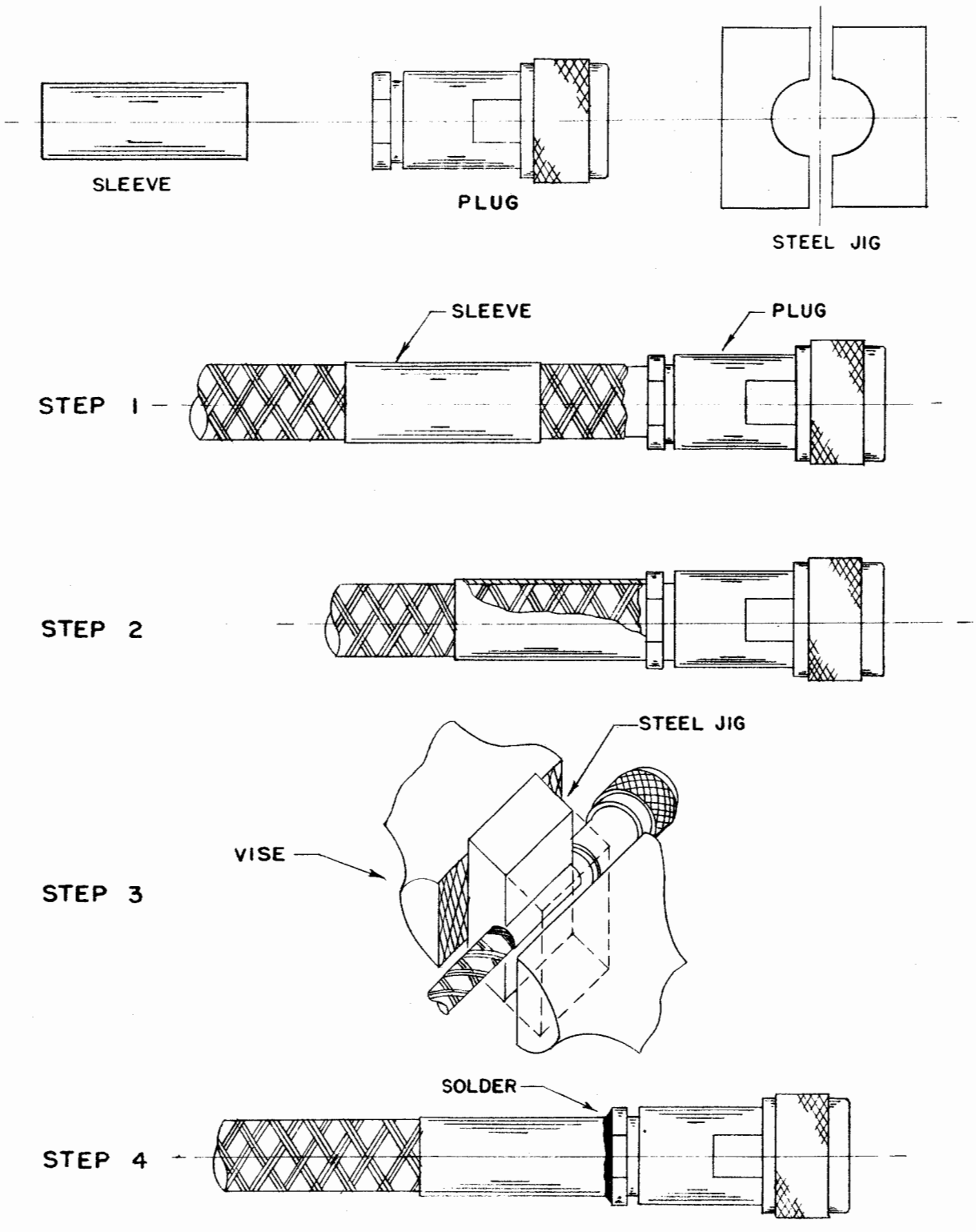
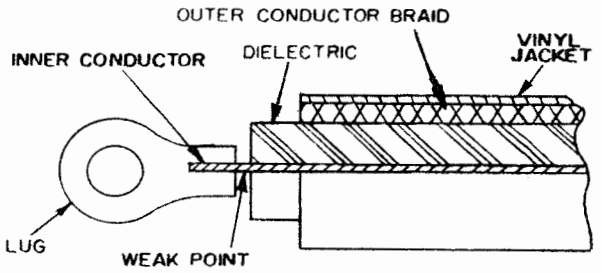


Figure 10-9. Emergency Armor Grounding Method (When Proper Armor Clamp Unavailable)

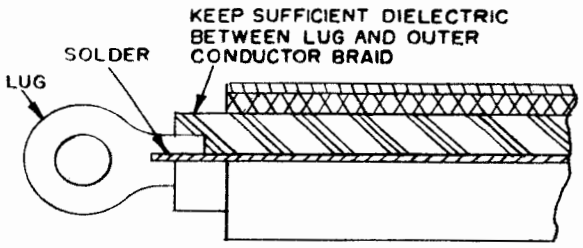
i. **TERMINATING COAX LEADS.** – When coaxial leads are terminated with lugs at terminal strips of radio and radar equipments, a weak spot may develop at the inner conductor. Flexing and vibration may cause the inner conductor to break off at this point. A method giving the lug and conductor added support is as follows:

A solder lug type 20-14 (SNSN G17-L-14325) or equivalent is slipped over the inner conductor and heated with a soldering iron. As the lug becomes warm, it can be forced under the Polyethylene insulation so that when it cools off, it will have the added support of the insulation. (See Figure 10-10.) Next, the inner conductor is soldered to the lug in the usual manner. Make sure that the inner conductor is well bonded and secure to the solder lug. Use the smallest lug that will fit over the wire so that a good layer of Polyethylene remains between the lug and the outer conductor braid. When the termination is completed, it should be checked with a 500 volt megger before being used.

j. **END SEAL WRENCH.** – Figure 10-11 shows an end seal socket wrench which can be made up to ease the installation of Navy type 62111 end seals. Since the nut is almost as large as the opening into which the end seal must fit, wrenches cannot be used. Use of water pump pliers, or similar tools, often cause broken or damaged porcelain insulators. A socket wrench made up as shown in Figure 10-11 can be turned with a 1/4 inch drive socket until tight. Final tightening can be done with a 5/8 inch box wrench or an adjustable cresent wrench. Similar tools can be made up to ease installation of other fittings in places where lack of space limits the use of common tools.



CONVENTIONAL METHOD



PREFERRED METHOD

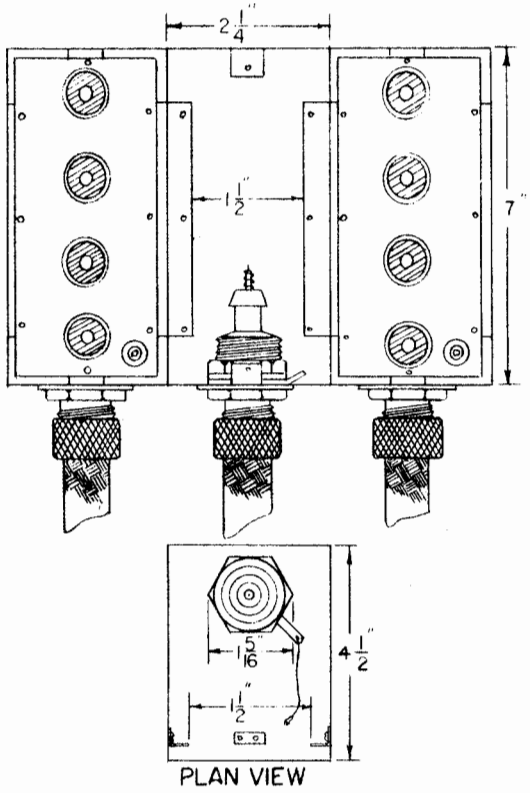
Figure 10-10. Lug Termination Methods

NOTE

The MX-498/U end seal is considered superior for inside receiving applications.

k. **STRAIN RELIEF CLAMPS FOR JONES PLUGS.** – To reduce trouble in continual shorting and breaking of cables on Jones plug NT 49458 used on several fire control radars, the following method is recommended. After the Jones plug is made up in the conventional way, an Amphenol No. 10H/1774-311145 clamp is slipped over the cable and plug and tightened. (See Figure 10-12.) The forward end of the clamp is placed over the insulation and when tightened, clamps the outer rubber insulation and the copper shield to the sleeve of the Jones plug. This holds the cable shield and insulation firmly to the plug sleeve and

NAVY TYPE 62111 END SEAL, SHOWING THE LIMITED SPACE INTO WHICH THE TOOL USED TO SECURE THE END-SEAL NUT MUST BE INSERTED.



END-SEAL SOCKET TO FACILITATE SECURING AND REMOVING THE END-SEAL IN NAVY 62111 END SEAL

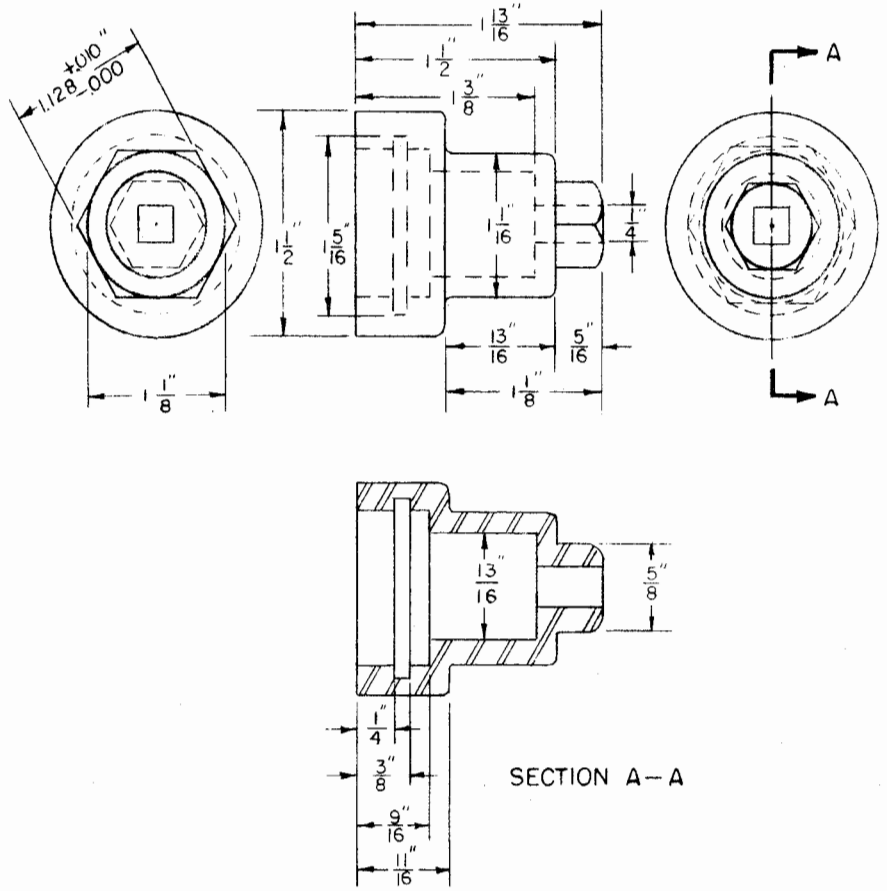


Figure 10-11. End Seal Socket Wrench

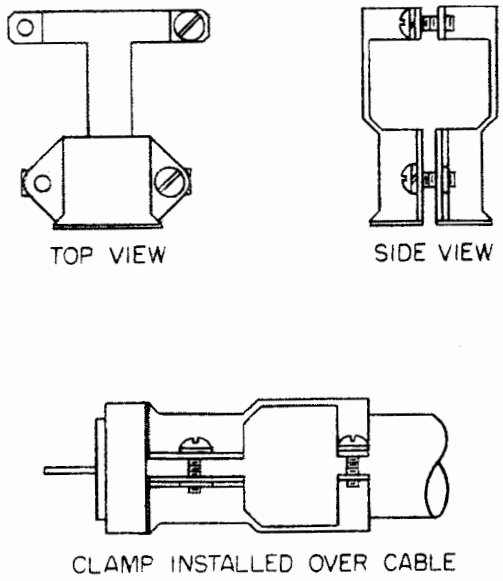


Figure 10-12. Strain Relief Clamp for Jones Plug

causes the stresses and strains from the cable to be transferred to the plug itself rather than to the soldered joint between the cable shield and plug sleeve. Jones plugs should be replaced with standard RF connectors wherever possible.

3. INSULATING AND WATERPROOFING.

The compounds and materials commonly associated with flexible transmission lines and their fittings for the purposes of insulating and waterproofing are discussed below.

a. DIELECTRIC COMPOUND.- Dielectric Compound, ANA Spec AN-C-128, (see page 10-32 for stock numbers) is a vaseline-like dielectric compound having physical and electrical qualities suited to transmission lines and fittings. Its properties include; water resistance, water repellency, constant viscosity with respect to temperatures, low dielectric constant, high dielectric strength, high arc resistance, no tracking characteristic after arc, and high insulation resistance.

(1) SUGGESTED APPLICATIONS. - Dielectric Compound shall be used in the following applications:

(a) Applied to the threads of all connectors which are exposed during installation. In such cases, do not depend on the Dielectric Compound alone as giving protection against weather. All necessary weatherproofing precautions considered good practice must still be used. As applied to threads, Dielectric Compound is a lubricant and should be treated as such.

(b) Where it is desired to prevent moisture from entering a connector, the inner contact surfaces should be coated with the compound only as specified in Section 10-6. This applies to all high voltage connectors, multi-contact connectors, UHF connectors, Jones plugs, and Cannon plugs. THIS SHOULD NOT BE DONE TO TYPE "N" CONNECTORS, UG-21B/U, UG-167A/U, UG-552/U, ETC. When the air space in the center of Type "N" connectors is filled with Dielectric Compound, an impedance mismatch occurs in the connector resulting in a power loss.

(c) The compound may be used on any dielectric mating surfaces. This gives a considerable increase in dielectric strength at the junction. This is especially true in the case of the Type LC and LT connectors.

(d) The compound should be used in all ceramic pulse type connectors such as the UG-36/U, etc. Figure 10-13 shows an adapter which may be made from an Alemite No. 1980 Screw Fitting, Standard Navy Stock No.G45-F-448-200,

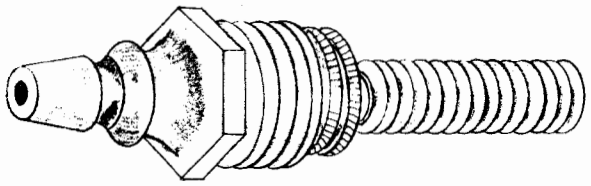


Figure 10-13. Grease Gun Adapter for 10-32 Screw Hole

or equivalent, by removing the ball check. Drill a 1/16 inch hole longitudinally through the center of a 1/2 inch long, 10-32 steel screw. Silver solder the screw head to the fitting outlet. Before using, see that the passage hole through the adapter is clear. The compound may then be applied with an Alemite Grease Gun, Standard Navy Stock No. G41-G-1344-35 or equivalent.

(e) The compound may be used on rubber gaskets of connectors and on adapters to pressurized systems. For gaskets, apply a small amount with the fingers. This acts as a gasket lubricant and allows the gasket to seat properly in the connector. This is also true in pressurized systems. Do not, however, depend on the compound to stop leaks; the gasket is made for that purpose.

NOTE

Dielectric Compound should not be applied to Polyethylene dielectric which is bent and under stress. Under these conditions the Polyethylene will crack, causing voltage breakdown.

(2) STOWING.–When stowing Dielectric Compound be sure that containers are not left open. Dust, metallic particles, etc., will destroy its electrical characteristics. When coated on dielectric surfaces under these conditions, a low resistance path is made across the face of the connector causing low voltage breakdown.

For ease of carrying and keeping the compound clean, the 8 oz tube should be used. In bulk form, it may be applied by a pump type, hand grease gun as used for petroleum lubricants. The cartridges are made to fit in a standard grease gun such as the Alemite Grease Gun, Standard Navy Stock No. G41-G-1344-35.

b. SILICONE RUBBER.–With the introduction of Teflon for high temperature work, Silicone rubber, Type 250 or equal, is being used as a gasket material for RF connectors. It will withstand very high temperatures. It does not, however, have the toughness and elasticity of synthetic rubber, and its abrasive qualities are quite poor. For these reasons, the gaskets must be handled with care, especially when being removed or put into the connector. Always lubricate them with a small amount of Dielectric Compound before use. Silicone rubber may be recognized by its color. It will be either white or pink. Old types normally are a reddish brown, never black. It will not soften under a flame but will char to an ash-like powder.

c. CONDUCTING RUBBER.–Conducting rubber is used to prevent corona and is found on pulse cables such as RG-25/U, RG-26/U, and RG-62/U. These cables have a layer of black conducting rubber about 1/32 inches thick which must be removed when the connector assembly is made. Pulse cables such as RG-25A/U, RG-26A/U, RG-64A/U and RG-77/U are newer types and have replaced the conducting rubber with a red insulating rubber. (See Figure 10-14.) When removing conducting rubber, be sure the removal is complete. The insulating rubber under it should be scraped clean with the edge of a knife to remove all traces of the insulating rubber. If the

conducting rubber is not removed, arc-over will occur between the conducting rubber and the inner conductor.

d. VINYL TAPES. –Vinyl tapes, used alone over a connector, cannot be considered sufficient waterproofing. This is especially true when the taping is started at the armor. Moisture may enter under the armor and work its way under the tape to the connector. Vinyl tape should always be used with the recommended insulating materials for a particular cable or connector. Vinyl tape may be requisitioned from GSSO, Philadelphia, under Standard Navy Stock No. G17-T-1745-60 for a 3/4 inch roll.

e. INSULATING VARNISHES. – There are two types of insulating varnishes now being used on connectors and coaxial cable.

For high temperature installation of Teflon connectors and cables, Insulation Compound No. 741, made by National Products, Inc., is recommended. This compound has a shrinking quality when drying. Although it does not stick directly to Teflon, it forms a tight, waterproof, flexible jacket over it. This material supersedes Vinyl Resin Varnish, Standard Navy Stock No. G 51-K-16150-50.

For general work, Electrical Insulating Varnish, JAN-V-1137, Grade CA, is used. See Table 10-12 for procurement information. This varnish should be applied to the outside of assembled connectors to a point at least four inches from each connector after wiping off any excess Dielectric Compound.

There are many methods of applying varnish to connectors. One method which has proved very successful, is to wrap the end of the connector with Waterproofing Paper, Grade C, Type 1, or equivalent. The connector is then dipped into the insulating compound and suspended by the cable, connector face down, and allowed to dry. The waterproofing paper is removed from the end when the connector is ready for use.

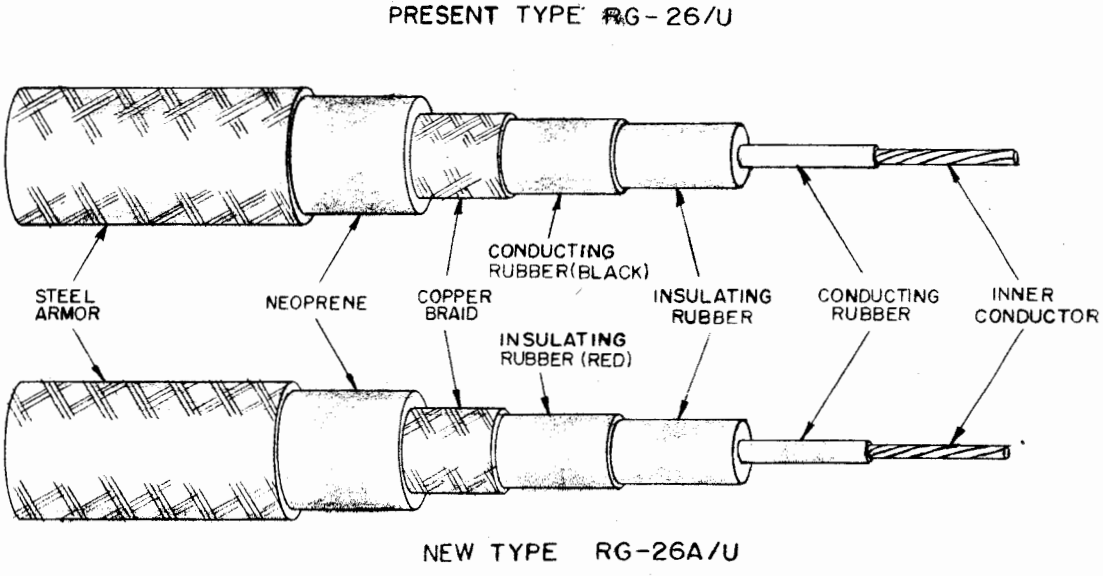


Figure 10-14. Differences Between Old and New Pulse Cables

TABLE 10-12. INSULATING AND WATERPROOF MATERIALS FOR RF CABLES AND CONNECTORS

Material Specification Grade or Class	Obtain From	Ordering Information	
		Standard Navy Stock Number	Size
Insulating Varnish JAN-V-1137 * Type N Grade CA	GSSO	G52-V-1240 G52-V-1245 G52-V-1255 G52-V-1260	1 pint can 1 quart can 1 gallon can 5 gallon can
Dielectric Compound AN-C-128 (Dow Corning No. 4)	ESO ASO	N52-C-3096-790 N51-C-5194-1500 N51-C-5194-1550 R52-C-3109-110 R52-C-3109-125	8 oz tube 10 lb can 50 lb can 8 oz cartridge 10 lb can
Synthetic Resin Tape MIL-T-15126 *** Type VF (Vinyl)	GSSO	G17-T-1745-60 ** G17-T-1745-200 G17-T-1745-250 G17-T-1745-300	3/4 in. width ** 1 in. width 1-1/4 in. width 1-1/4 in. width
Insulating Compound No. 741 National Products, Inc.			

* Formerly 52-V-13
** Preferred size
*** Formerly 17-T-78

This gives weather protection until the equipment is installed and a permanent connection is made. By dipping in this manner, the insulating varnish penetrates around the gland nut and armor. The waterproofing paper is used to keep the insulating varnish out of the electrical parts of the connector and keeps the threaded portions clear and free for installation. When permanent installation is made, varnish should be applied to complete the waterproofing.

In addition to the above method, any of the present methods of applying insulating varnish such as by spraying or brushing may be used. After the varnish has dried on a connector assembly, cover the entire varnished area with several layers of type VF (Vinyl) synthetic resin tape with a 50% overlap between turns.

4. PRESSURE-PROOF HULL FITTINGS.

a. GENERAL DESCRIPTION. - The extreme depths to which modern submarines submerge put severe demands on the hull fittings. Silver–soldered joints on fittings such as those used on RG-81/U and RG-82/U hull fittings can no longer be considered pressure-proof. For this reason, all fittings in the field using silver–soldered connections to RG-81/U and RG-82/U are to be considered obsolete and should not be used. All pressure-proof hull fittings should have O-rings, reinforced grommets or molded grommets to form the pressure seal. The preferred pressure-proof hull fittings are welded into place on the hull. Surfaces which form the seals are very finely machined surfaces approaching a polished finish. They are so designed that the submarine is protected no matter what type of damage occurs to the cable outside the hull. This also eliminates the use of shear valves within the submarine.

b. INSTALLATION PRECAUTIONS. - Care must be taken that welders arcs, rough handling, etc., do not mar these surfaces. Figure 10-15 shows a plug which may be inserted into the fitting in the shop before the fitting is welded into the hull. This type of plug serves the following purposes:

(1) General protection of machined surfaces.

(2) Closes hull fitting until cable is installed.

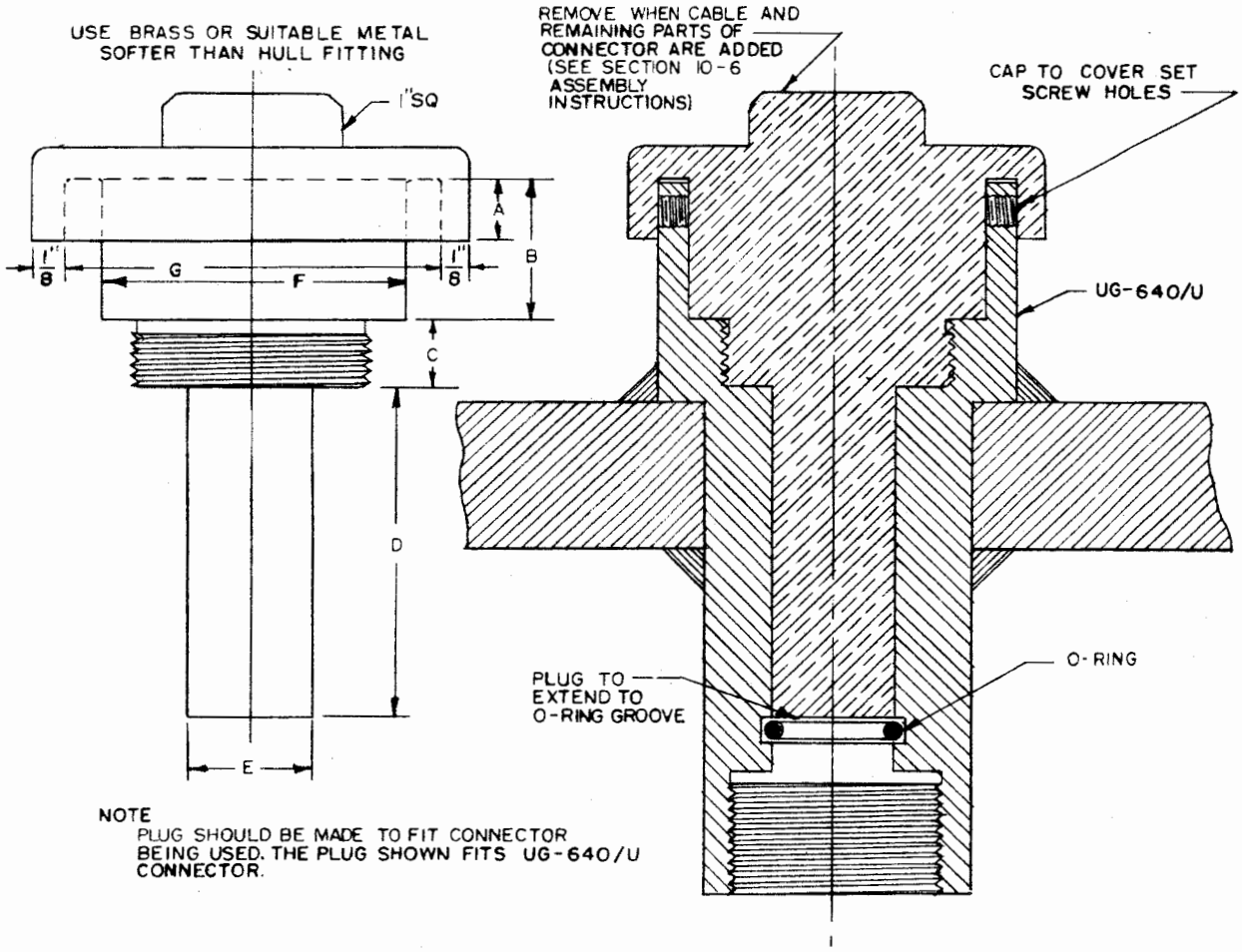
(3) Protects set screw holes from welders arcs.

(4) Enables O-ring in fitting to be easily inserted from inboard side. This is especially convenient in the small size cable fittings.

CAUTION

Make sure all parts are removed from the hull fitting before it is welded into place. These should be removed in the shop since these fittings have many parts which are small and can be easily lost and replacement can cause much delay; all parts should be put in a box or suitable container and labelled for the particular fitting and job. Do not substitute parts for these fittings. Always replace lost parts with parts made to original specifications. If a part is replaced, the complete fitting must be pressure tested before being used.

It is recommended that all hull fittings in pressure areas be X-rayed to detect flaws in the fitting and in the welds after the final installation. This practice has been used very successfully in several yards. The appropriate activity in the



CONNECTOR	A	B	C	D	E	F	G	THREAD
UG-640/U								
UG-665/U	9/32"	3/4"	9/32"	2 1/4"	.378"	1.365"	1.635"	1-14 NF-2
UG-672/U	9/32"	3/4"	9/32"	2 5/32"	.482"	1.365"	1.635"	1-14 NF-2

Figure 10-15. Protective Plug and O-Ring Jig for UG-640/U Connector

yard should be contacted for performing this test and interpreting the results.

c. O-RING.–An O-ring is a precision molded synthetic rubber ring with circular cross-section. In order that the submarine be fully protected against high pressure leaks, every O-ring in the fitting must be functioning properly.

The O-ring is placed in a very accurately machined groove. It has the quality of increasing its seal as pressure is applied. This is due to the fact that it has a certain amount of mobility in the O-ring groove. At surface pressures the O-ring seal depends on its seating in the groove. It is therefore important that the machined surfaces forming the O-ring seat are not marred. At high pressures, the O-ring is flattened by the pressure increasing the seal. Because of this mobility in the O-ring, no lacquers or other varnishes should ever be used on O-rings or O-ring surfaces. Dielectric Compound is the only lubricant that should be used on O-rings and threads of pressure-proof hull fittings. They are designed so that no other waterproofing is necessary. Genuine O-rings are color coded and may be identified by this marking. These are the only ones that should be used. Since O-rings must bear against the dielectric of the cable for pressure seal in most fittings, the dielectric should be treated carefully. If the dielectric does not fit into the connector, check the diameter. The fittings have been designed around cable made to Navy specifications. It is possible, however, that out-of-tolerance cable will be found in the yard. If the plug in Figure 10-15 is used, the O-ring which seats against the dielectric can be put in from the inboard end before the plug is removed.

d. REINFORCED GROMMETS. – The reinforced grommet was developed to eliminate point squeezing of the cable in tightening a gland nut. It consists of a vinyl grommet with a brass ring molded in the center of the grommet. This is the only packing gland that should be used on flexible coaxial transmission lines on submarines outside the hull. This includes all stuffing tubes in the free-flood area. Older specifications call for a vinyl cement to be used between the vinyl jacket and the grommet. This cement should not be used in the newer fittings. Where lubrication is necessary, a small amount of Dielectric Compound may be used. Lacquers, cements and varnishes will not help the pressure-seal at high pressures.

TABLE 10-13. CABLE AND FITTING INSTALLATION DATA

JAN Type	Weight lb/ft	Stuffing Tube Size	Minimum Bend Radius (inches)	Uses Connector Types ** (in order of preference)
RG-8/U RG-8A/U*	0.106	B	5	N, C, HN, UHF
RG-9A/U RG-9B/U*	0.150	B	5	N, C, HN, UHF
RG-10/U RG-10A/U*	0.146	B	5	N, C, HN, UHF
RG-11/U RG-11A/U*	0.096	B	5	N, C, HN, UHF
RG-12/U RG-12A/U*	0.141	B	5	N, C, HN, UHF
RG-13/U RG-13A/U*	0.126	B	5	N, C, HN, UHF
RG-14/U RG-14A/U*	0.216	C	6	N, HN, UHF
RG-17/U RG-17A/U*	0.460	G	10	LC, N, HN
RG-18/U RG-18A/U*	0.585	J	10	LC, N, HN
RG-19/U RG-19A/U*	0.740	K	12	LC
RG-20/U RG-20A/U*	0.925	L	12	LC
RG-21/U RG-21A/U*	0.087	A	4	N, UHF

* Improved non-contaminating, low-temperature, synthetic resin jacket.

** Refer to Tables 10-4 thru 10-11.

TABLE 10-13. CABLE AND FITTING INSTALLATION DATA (CONT'D)

JAN Type	Weight lb/ft	Stuffing Tube Size	Minimum Bend Radius (inches)	Uses Connector Types** (in order of preference)
RG-22A/U RG-22B/U*	0.151	B	5	UHF
RG-25/U	0.205	C	6	Pulse Connector Rubber or Ceramic Insert
RG-26/U	0.189	C	6	Pulse Connector Rubber or Ceramic Insert
RG-27/U	0.304	D	7	Pulse Connector Ceramic Insert
RG-28/U	0.370	F	9	Pulse Connector Ceramic Insert
RG-35/U RG-35A/U*	0.525	J	10	LC, HN *** Special
RG-57/U RG-57A/U*	0.225	D	7	UHF
RG-63/U RG-63B/U*	0.0832	B	5	N, C, HN, UHF
RG-64/U	0.205	B	5	Pulse Connector Rubber Insert
RG-65/U RG-65A/U*	0.096	B	5	N (revised)
RG-74/U RG-74A/U*	0.310	C	7	N, HN
RG-78/U RG-78A/U*		A	4	Pulse Connector Rubber Insert

* Improved non-contaminating, low-temperature, synthetic resin jacket.

** Refer to Tables 10-4 thru 10-11.

*** Will physically fit LC, and HN connector types but are not matched with associated connectors.

TABLE 10-13. CABLE AND FITTING INSTALLATION DATA (CONT'D)

JAN Type	Weight lb/ft	Stuffing Tube Size	Minimum Bend Radius (inches)	Uses Connector Types** (in order of preference)
RG-79/U RG-79B/U*	0.136	B	5	N
RG-87A/U		B	5	N (Silicone gasket)
RG-88/U RG-88A/U		B	5	Pulse Connector Rubber Insert
RG-111/U RG-111A/U*	0.146	B	5	UHF
RG-116/U		B	5	N (With Silicone gaskets)
RG-118/U	0.610	F	8	LT, N

* Improved non-contaminating, low-temperature, synthetic, resin jacket.

** Refer to Tables 10-4 thru 10-11.

SECTION 10-6

ASSEMBLY INSTRUCTIONS

NOTE: This index is not a complete list of UG types but contains the commonly used fittings for which assembly instructions are necessary.

INDEX

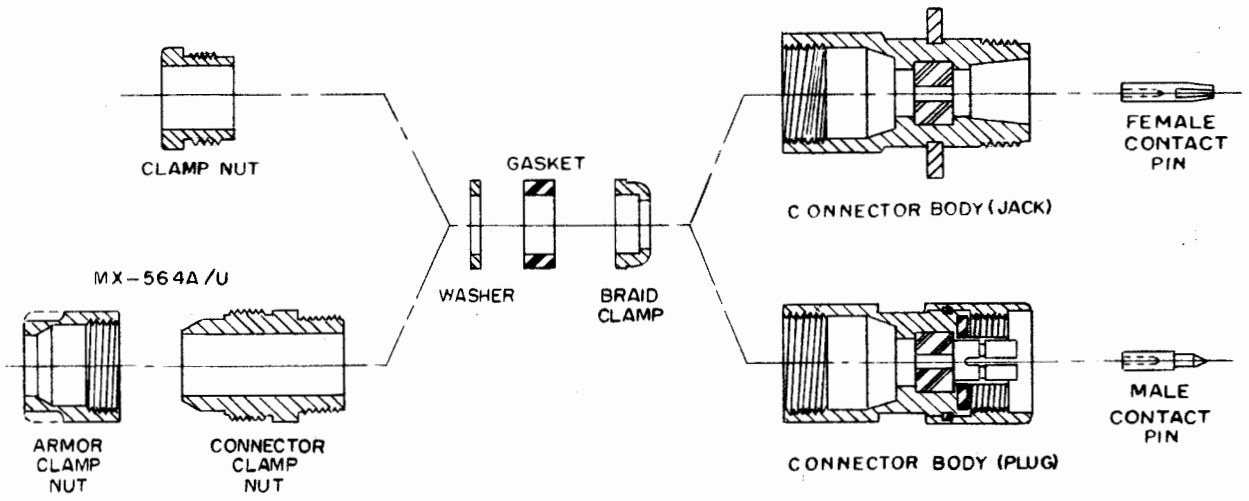
ASSEMBLY INSTRUCTIONS

RF CONNECTOR, TYPE N SERIES

AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
UG-21A/U	PLUG	RG-8/U
UG-21B/U	PLUG	RG-9/U
* UG-21C/U	PLUG	RG-11/U
UG-22A/U	PANEL JACK	RG-13/U
UG-22B/U	PANEL JACK	with MX-564A/U armor clamp to: RG-10/U
UG-23A/U	JACK	
UG-23B/U	JACK	RG-12/U
UG-160A/U	JACK, BULKHEAD	RG-116/U RG-65/U (see special assembly)
UG-935/U	PANEL JACK	RG-10/U
UG-936/U	JACK, BULKHEAD	RG-12/U
UG-940/U	JACK	RG-116/U
UG-941/U	PLUG	

* Airforce Design

ASSEMBLY INSTRUCTIONS

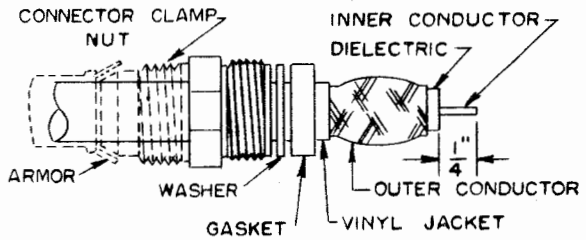


NOTE: For RG-87A/U and RG-116/U Teflon cable. Teflon tape and Silicone varnished glass braid will be treated in the same manner as vinyl jacket referred to for Polyethylene cables. Use only Silicone rubber gaskets for Teflon cable.

NOTE

Dotted lines indicate MX-564A/U components which are used for armored cable installation.

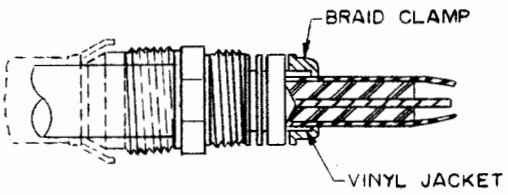
STEP 1. Cut cable to desired length using Connector Body as guide to first cut. Push back armor and slide Clamp Nut and Washer over cable jacket. Cut vinyl jacket with knife, allowing approximately one inch for making assembly. Clamp Nut and Washer may be used as a guide to insure a square cut. Do not damage outer conductor braid. Slide Gasket over jacket and against Washer.



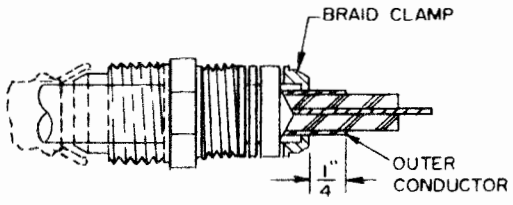
STEP 2. Push back outer conductor braid. Cut and remove approximately 1/4 inch of dielectric.

NOTE

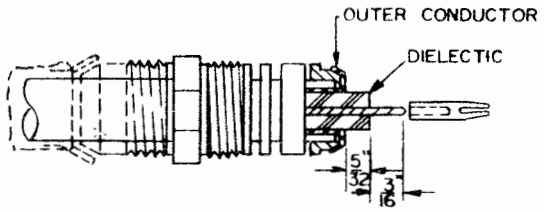
Do not nick, bend or otherwise damage inner conductor.



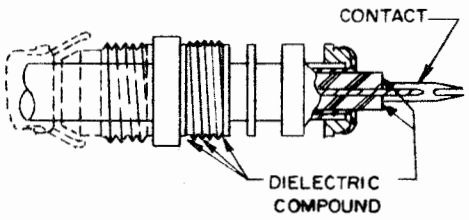
STEP 3. Pull outer conductor braid forward and taper to a point. Slide Braid Clamp over braid and against vinyl jacket so that jacket fits snugly against internal shoulder of Clamp.



STEP 4. Cut off outer conductor braid 1/4 inch from Braid Clamp. Do not damage dielectric.



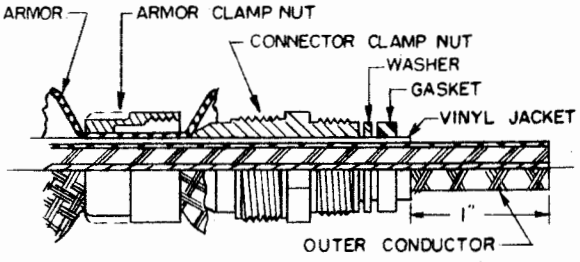
STEP 5. Unbraid ends of outer conductor and fan straight back over tapered portion of Clamp. Trim braid flush with outermost part of clamp bevel so that no strands extend over outside diameter of flange of Braid Clamp. Braid wires should not cross each other. Cut off dielectric sharp and square, 5/32 inch from point where braid bends back over clamp. This dimension is critical. Be careful not to nick, bend, or otherwise damage the conductor. Cut off inner conductor 3/16 inch from end of dielectric.



STEP 6. Check to make sure Contact fits over inner conductor and snugly against dielectric. Tin inner conductor with soft solder. Slide center Contact over end of inner conductor and soft solder in place. Remove all excess solder and flux. Make certain Contact is square and at right angles with dielectric. Apply a small amount of Dielectric Compound to end of dielectric and over threads of Clamping Nut. Push Body over end of cable so that Contact fits through center hole of insulator bead. Push Body onto cable as far as it will go and tighten Clamp Nut.

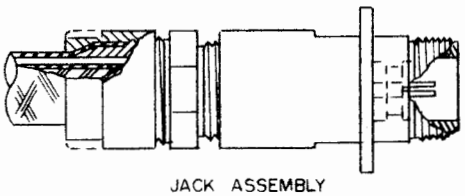
After Assembly is complete, check Contact Pin to make sure it is properly located.

For insulating and waterproofing final assembly, see Section 10-5, Paragraph 3. For RG-116/U cable (Teflon), use only Insulating Compound No. 741 for waterproofing.

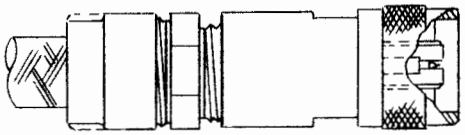


ASSEMBLY WITH MX-564A/U ARMOR CLAMP

For armored cable requiring Armor Clamp MX-564A/U, slide the Armor Clamp Nut over the armor and bubble the armor back as shown. The armor should then be cut and flared and the MX-564A/U Connector Clamp Nut slid over the cable jacket in place of the "N" type Clamp Nut. The remaining assembly instructions are the same as for unarmored cable as described in STEPS 1 through 6.

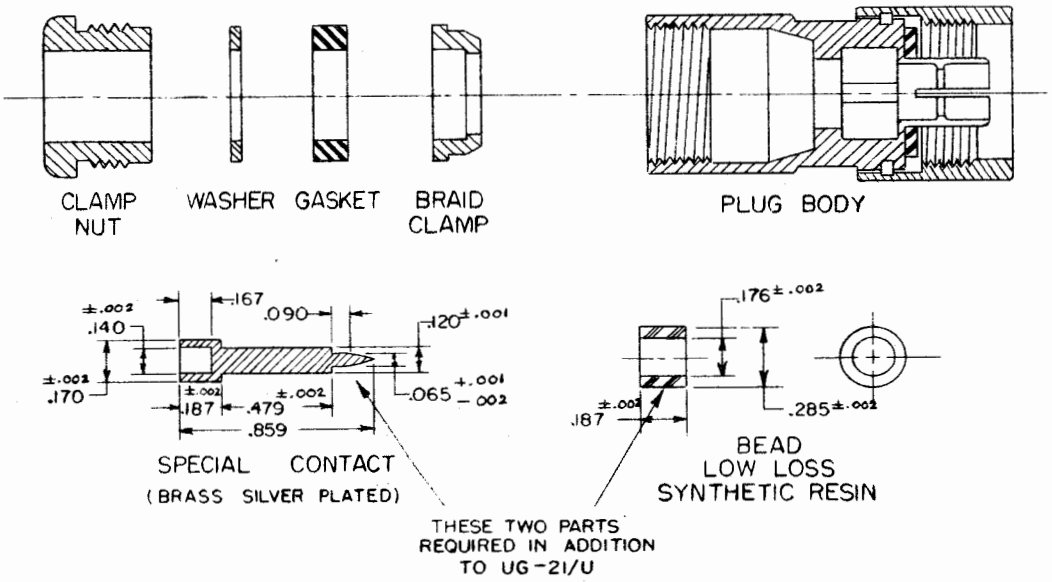


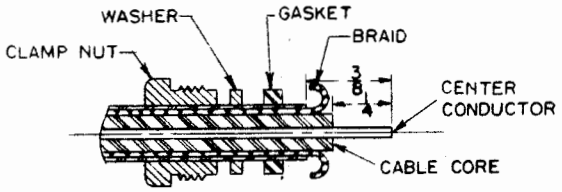
JACK ASSEMBLY
WITH MX-564A/U ARMOR CLAMP



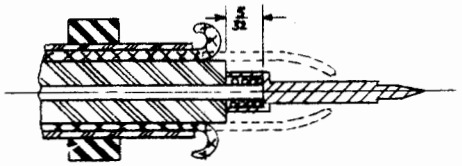
PLUG ASSEMBLY
WITH MX-564A/U ARMOR CLAMP

SPECIAL ASSEMBLY INSTRUCTIONS

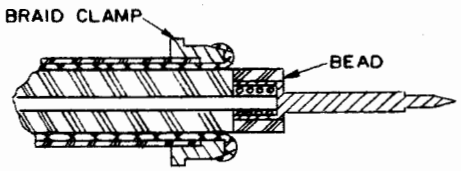




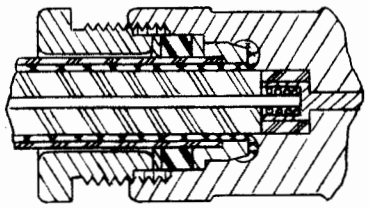
STEP 1. Slide Clamp Nut, Washer and Gasket over cable. Cut cable jacket back 3/8 inch. Fold braid wires back. Cut cable core 1/4 inch from end of center conductor. Be careful not to nick or cut helical center conductor. Unwind helical conductor from inner core. Scrape off conductor insulation from the exposed 1/4 inch, and tin conductor. Rewind tinned conductor on inner core.



STEP 2. Cut off inner conductor 5/32 inch from cable core. Solder Special Contact on inner conductor. Taper braid wires toward inner conductor.



STEP 3. Insert Braid Clamp over braid and against jacket shoulder. Fold back braid wires and trim. Slide Bead over Contact and against cable core.

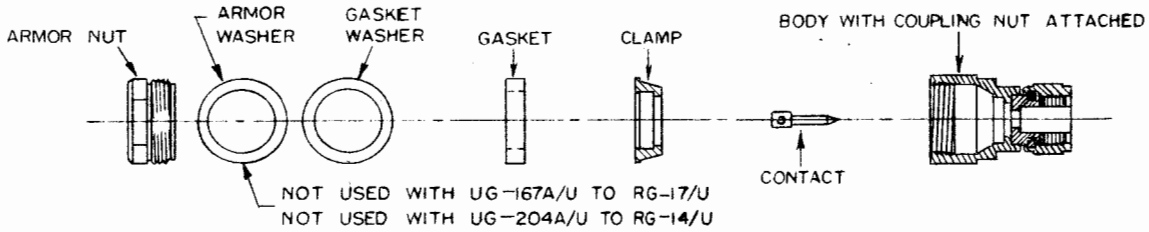


COMPLETE ASSEMBLY

ASSEMBLY INSTRUCTIONS

RF CONNECTOR, TYPE N SERIES

AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
UG-167A/U	PLUG	RG-17/U & RG-18/U
UG-167B/U	PLUG	
UG-204A/U	PLUG	RG-14/U, RG-74/U
UG-557/U	PLUG	RG-118/U



NOTE: For RG-118/U cable, Teflon tape and Silicone varnished glass braid will be treated in the same manner as vinyl jacket referred to for Polyethylene cables.

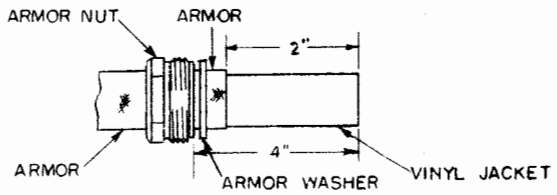
CAUTION

The glass braid fibers of RG-118/U cable are easily damaged. Handle with care.

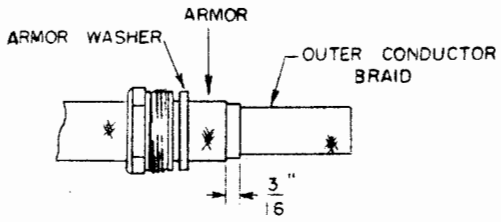
NOTE

If Connector UG-167A/U is used with RG-18/U Cable, the Armor Washer is to be made up with an inside diameter of .960 inch and the Gland Nut should be enlarged to .960 inch inside diameter.

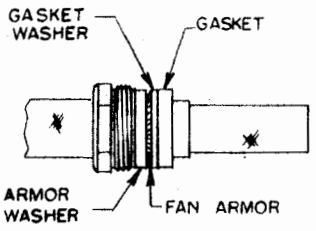
If Connector UG-204A/U is used with RG-74/U Cable, the Armor Washer is to be made up with an inside diameter of .630 inch and outside diameter of .810 inch. The Gland Nut should be enlarged to .630 inside diameter.



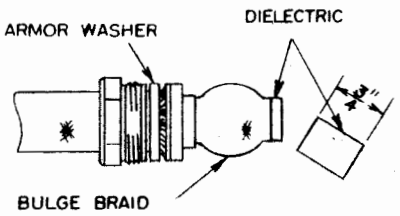
STEP 1. Cut cable to desired length allowing at least 2 inches for making assembly. Slip Armor Nut and Armor Washer over armor and at least 4 inches back from end of cable. Cut armor sharply and squarely 2 inches from end of cable. Point of armor cut may be determined by using Connector Body as a guide and allowing approximately 1/8 inch for fanning the armor. (See complete assembly.)



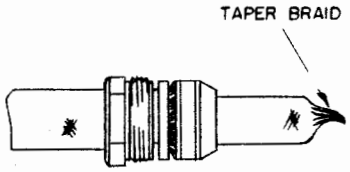
STEP 2. Cut vinyl jacket sharply and squarely 3/16 inch from armor cut. Do not damage copper braid.



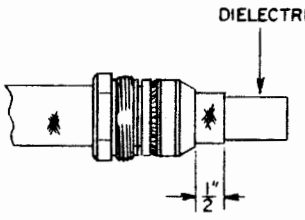
STEP 3. Fan and straighten out 1/8 inch of armor against Armor Washer. Slip Gasket Washer and Gasket over jacket. Trim loose ends of armor flush with outside diameter of Washer.



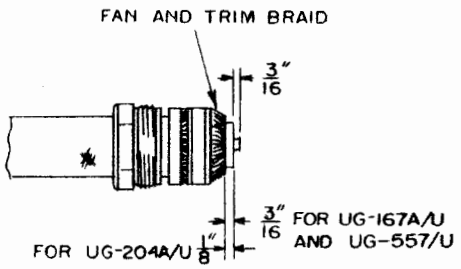
STEP 4. Push back copper braid and cut off about 3/4 inch of dielectric and inner conductor.



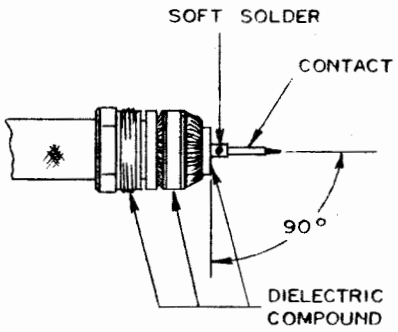
STEP 5. Pull outer conductor braid forward over end of dielectric and taper to a point. Slide Clamp over braid and against jacket so that jacket fits snugly against internal shoulder of Clamp.



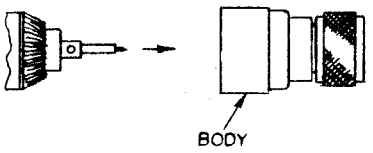
STEP 6. Cut off braid 1/2 inch from Clamp.

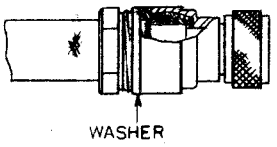


STEP 7. Unbraid ends of outer conductor braid and fan straight back over tapered portion of Clamp. Trim braid flush with outermost part of Clamp bevel so that no strands extend over outside diameter of flange on Clamp. Braid wires should not cross each other. Cut off dielectric 3/16 or 1/8 inch as shown from bend where braid bends back over Clamp. This dimension is critical. Be careful not to nick, bend, or otherwise damage inner conductor. Cut off inner conductor 3/16 inch from end of dielectric.



STEP 8. Check to make sure Contact fits over inner conductor and snugly against dielectric. Tin inner conductor with soft solder. Slide center Contact over end of inner conductor and soft solder in place. Remove all excess solder and flux. Make certain Contact is square and at right angles with dielectric. Apply a thin film of Dielectric Compound to end of dielectric, Gasket and over threads of Armor Nut.





STEP 9. Push Body over end of cable so that Contact fits through center hole of Insulator Bead and braid comes against internal shoulder of Body. Push armor into Body by smoothing bulge in armor. Screw Armor Nut tightly securing armor.

After assembly is complete, check Contact Pin to make sure that it is properly located. See Figure 10-8. For insulating and waterproofing final assembly, see Section 10-5, Paragraph 3. If cable is Teflon, use only Insulating Compound No. 741 for waterproofing.

ASSEMBLY INSTRUCTIONS

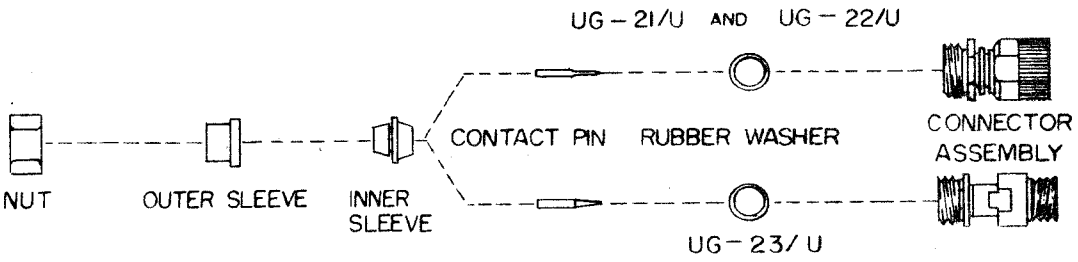
RF CONNECTOR, TYPE N SERIES

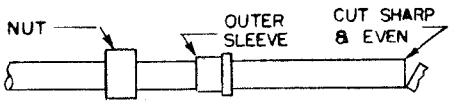
AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
UG-21/U	PLUG	RG-8/U
UG-22/U	PANEL JACK	RG-9/U
UG-23/U	JACK	RG-10/U RG-11/U RG-12/U RG-13/U

NOTE

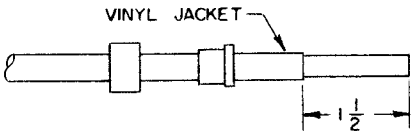
Superseded by "B" and "C" Series. Do not use unless absolutely necessary, and in any case replace with newer type as soon as possible.

ASSEMBLY INSTRUCTIONS

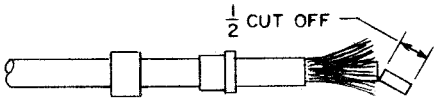




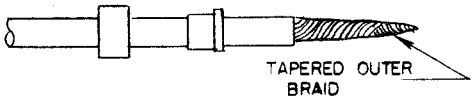
STEP 1. Cut end of cable even. Slide the Outer Sleeve and the Nut over cable.



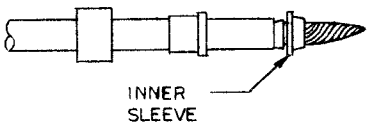
STEP 2. Cut off vinyl jacket 1-1/2 inches from end of cable exposing braid. Be careful not to nick the braid.



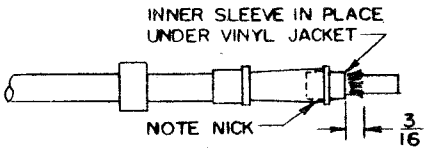
STEP 3. Fan braid out. Cut off insulation and center conductor 1/2 inch (purpose of this is to leave sharp end).



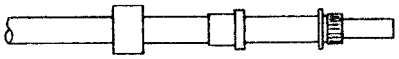
STEP 4. Taper end of braid (as shown). Purpose of this is to slip Inner Sleeve over braid and under the vinyl jacket.



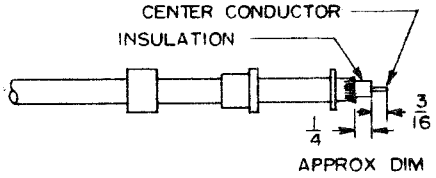
STEP 5. Slide Inner Sleeve over tapered braid and force under outer vinyl jacket.



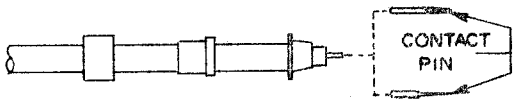
STEP 6. With Inner Sleeve in place, cut braid approximately 3/16 of an inch.



STEP 7. Fold braid back over Inner Sleeve and smooth.



STEP 8. Cut inner insulation approximately 1/4 inch measuring from Inner Sleeve. Remove inner insulation leaving 3/16 inch center conductor exposed. Tin center conductor.

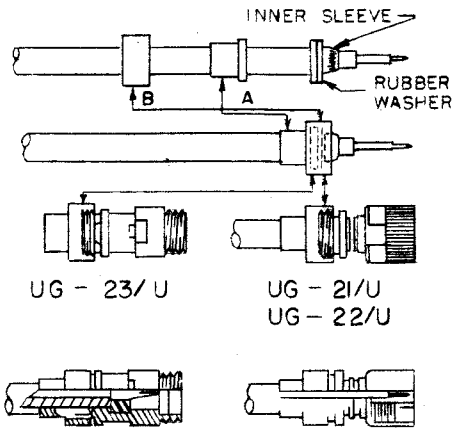


STEP 9. Hold Contact Pin with pliers. Fill hole with solder. Tin center conductor and insert into Pin.

STEP 10. Remove excess solder. Slip Rubber Washer over Inner Sleeve (as shown).

STEP 11. Slide Outer Sleeve "A" and Nut "B" as close as possible in preparation to receiving connector assembly.

STEP 12. Connector Assembly (illustrated). Slide cable into Connector Assembly. Screw Nut into place with a wrench.
IMPORTANT: Do not turn Connector while tightening Nut as this twists the Rubber Washer making the connector or jack non-waterproof.



STEP 13. Completed assembly shown in section.

NOTE: If cable is armored, ground as indicated in Section 10-5, Paragraph 2h.

ASSEMBLY INSTRUCTIONS

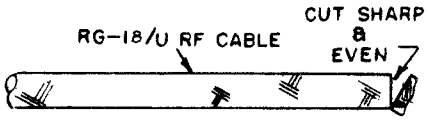
RF CONNECTOR, TYPE N SERIES

AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
UG-167/U	PLUG	RG-17/U RG-18/U
NOTE Superseded by "B" and "C" Series. Do not use unless absolutely necessary, and in any case replace with newer type as soon as possible.		

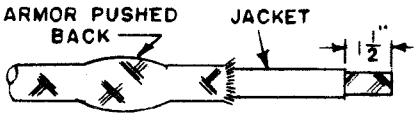
ASSEMBLY INSTRUCTIONS

NOTE

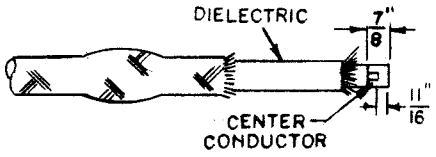
If RG-17/U Cable is used, disregard instructions concerning armor.



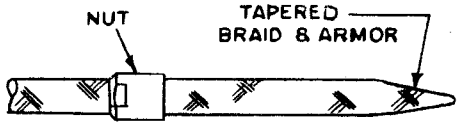
STEP 1. Cut end of cable sharp and even.



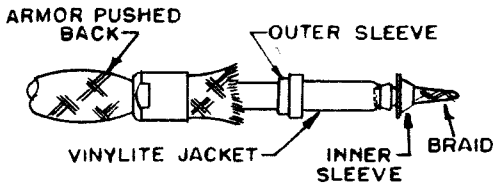
STEP 2. Push armor back out of way. Cut off vinylite jacket 1-1/2 inches from end of cable. Do not nick braid.



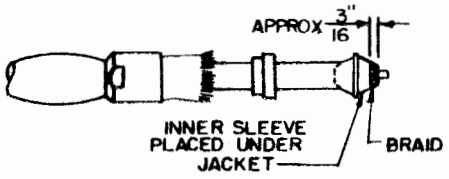
STEP 3. Fan copper braid out (as shown). Cut off dielectric 7/8 inch from end (sharp and even). Do not nick center conductor. Cut off center conductor 11/16 inch from end.



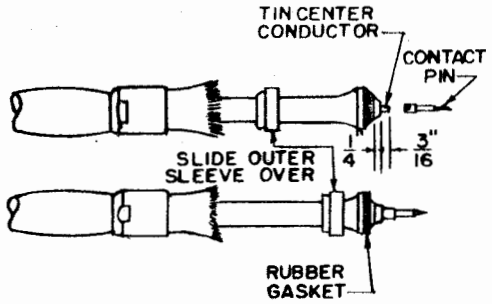
STEP 4. Push armor toward end and taper end of braid and armor as shown. Slide Nut (armor clamp) on over the armor.



STEP 5. Push armor and Nut back. Slide Outer Sleeve on over the vinylite. Slide Inner Sleeve over braid and under vinylite until vinylite jacket touches large rim of Inner Sleeve. If Inner Sleeve goes on tight, twist Sleeve while forcing into position.

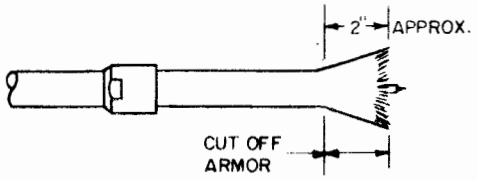


STEP 6. With Inner Sleeve in place, trim copper braid leaving 3/16 inch exposed as shown.

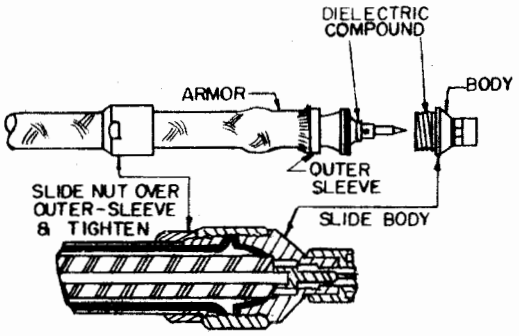


STEP 7. Fold copper braid back over Inner Sleeve and smooth. Dimensions of dielectric and center conductor should be as shown. Tin center conductor, using minimum amount of heat.

STEP 8. Holding Contact Pin with pliers, soft solder Contact Pin to center conductor. Do not use excess solder. Wipe clean. See that end of cable insulation is clean and free of solder, resin and foreign material. Slip Rubber Gasket over Inner Sleeve as shown. Slide Outer Sleeve as close as possible to Inner Sleeve.



STEP 9. Pull armor up as far as possible. Cut off 2 inches from end of armor.



STEP 10. Push armor back and place end of armor half way on the shoulder portion of Outer Sleeve as shown. Be sure Bead is properly placed in Body. Slide Nut over Outer Sleeve. Apply slight amount of Dielectric Compound with fingers to threads, gaskets, and dielectric face. Slide Body into place carefully so that center conductor Contact Pin enters hole in Bead. Cable dielectric should butt against rim in connector Body. Contact Pin should extend slightly beyond the outer end of the end assembly. Properly tighten Body and Nut with wrenches.

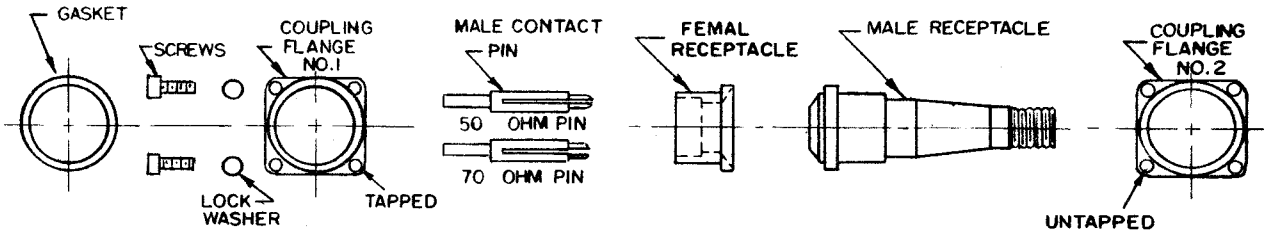
STEP 11. Completed assembly shown in enlarged section.

ASSEMBLY INSTRUCTIONS

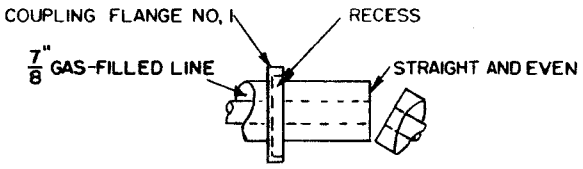
RF CONNECTOR, TYPE N TO RIGID LINE

AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
UG-32/U	ADAPTER, RIGID 50 OHM, 7/8" LINE TO TYPE N	7/8" RIGID LINE
UG-33/U	ADAPTER, RIGID 70 OHM, 7/8" LINE TO TYPE N	

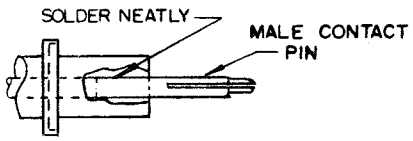
ASSEMBLY INSTRUCTIONS



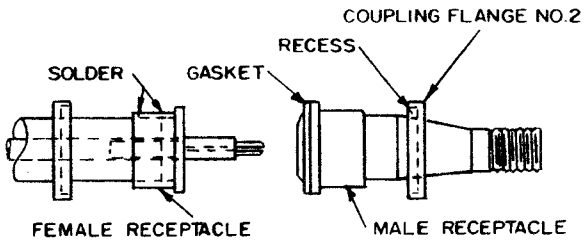
NOTE: UG-32/U couples to 50 ohm rigid line. UG-33/U couples to 70 ohm rigid line.



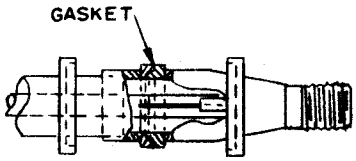
STEP 1. Trim end of gas line at right angles sharp and clean. Remove all filings and burrs. Clean and tin inside of center conductor. Slide Coupling Flange No. 1 onto line.



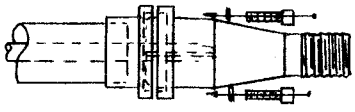
STEP 2. Insert required size Male Contact Pin and solder neatly. Wipe off excess solder. Spread slotted end of Male Contact Pin slightly.



STEP 3. Clean the outside of the outer conductor. Slide the Female Receptacle onto the outer conductor until it shoulders. Solder neatly and wipe off excess leaving a smooth finish. Be sure this joint is air tight. Lubricate the Gasket with small amount of Dielectric Compound. Place the Gasket and Coupling Flange No. 2 on the Male Receptacle as shown.

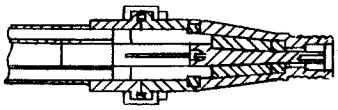


STEP 4. Insert the Male Contact Pin in the Male Receptacle until the Gasket butts against the face of the Female Receptacle.



STEP 5. Slide Coupling Flanges together, insert Screws with one Lock Washer on each, and tighten down evenly.

COMPLETE ASSEMBLY



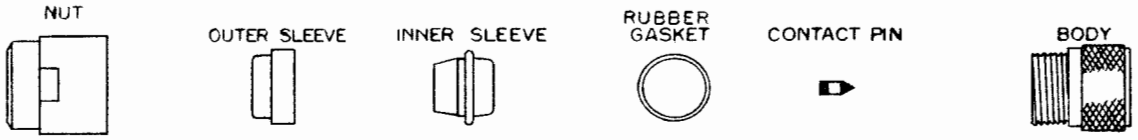
STEP 6. Cross Section of completed assembly is shown. Do not install in any position where temperature may exceed 160°F (71°C).

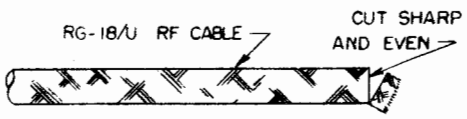
ASSEMBLY INSTRUCTIONS

RF CONNECTOR, SPECIAL TYPE SERIES

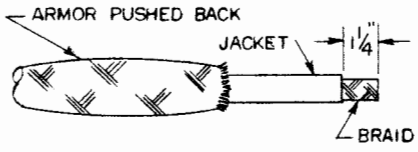
AN or NAVY TYPE	DESCRIPTION	USED WITH
NT 49550	PLUG	RG-17/U
NT 49579	JACK	RG-18/U
NT 49580	JACK	

ASSEMBLY INSTRUCTIONS

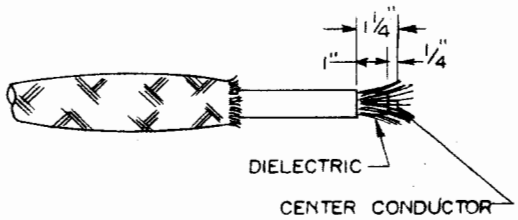




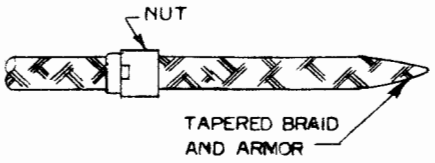
STEP 1. Cut end of cable sharp and even.



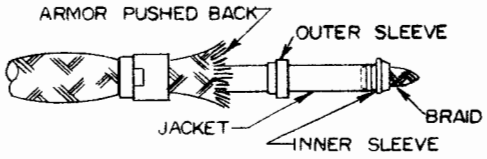
STEP 2. Push armor back out of way. Cut off jacket 1-1/2 inches from end of cable. Do not nick braid.



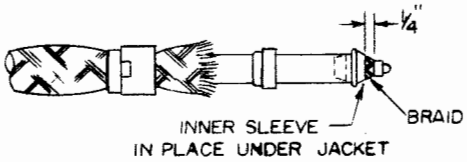
STEP 3. Fan copper braid out as shown. Cut off dielectric 1/4 inch from end (sharp and even). Do not nick center conductor.



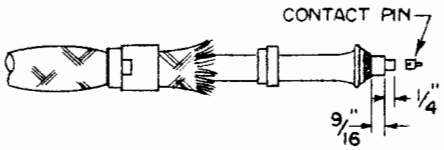
STEP 4. Push armor toward end and taper end of braid and armor as shown. Slide Nut (armor clamp) on over the armor.



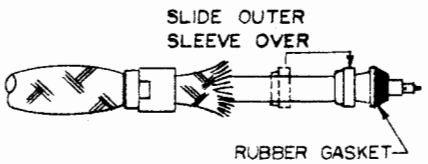
STEP 5. Push armor and Nut back. Slide Outer Sleeve on over jacket. Slide Inner Sleeve over braid and under jacket until jacket touches large rim of Inner Sleeve. If Inner Sleeve goes on tight, twist Sleeve while forcing into position.



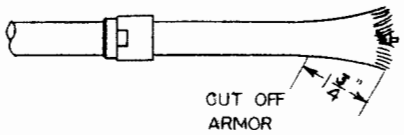
STEP 6. With Inner Sleeve in place, trim copper braid, leaving 1/4 inch exposed as shown.



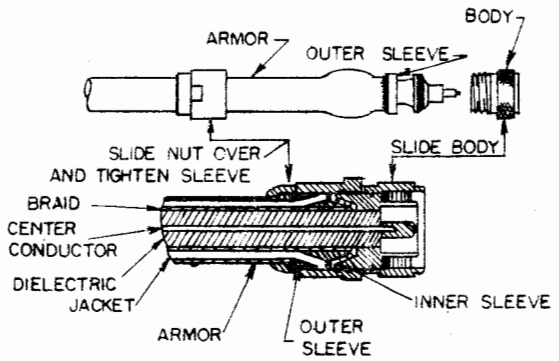
STEP 7. Fold copper braid back over Inner Sleeve and smooth. Dimensions of dielectric and center conductor should be as shown. Tin center conductor using minimum amount of heat.



STEP 8. Holding Contact Pin with pliers, soft solder Contact Pin to center conductor. Do not use excess solder. Wipe clean. See that end of cable insulation is clean and free of solder, resin and foreign material. Slip Rubber Gasket over Inner Sleeve. Slide Outer Sleeve as close as possible to Inner Sleeve.



STEP 9. Pull armor up as far as possible. Cut off 1-3/4 inch from end of armor and trim to suit (approximately 2 inches from end).



STEP 10. Push armor back and place end of armor half way on the shoulder portion of Outer Sleeve as shown. Slide Nut over Outer Sleeve. Slide Body into place and properly tighten Body and Nut with wrenches.

STEP 11. Completed assembly shown in enlarged section.

NOTES: Assembling of types 49550, 49579, 49580 are similar with the exception of the contact pin.

Connector No. 49550 connects directly with types 49551, 49952, 49579, and 49580.

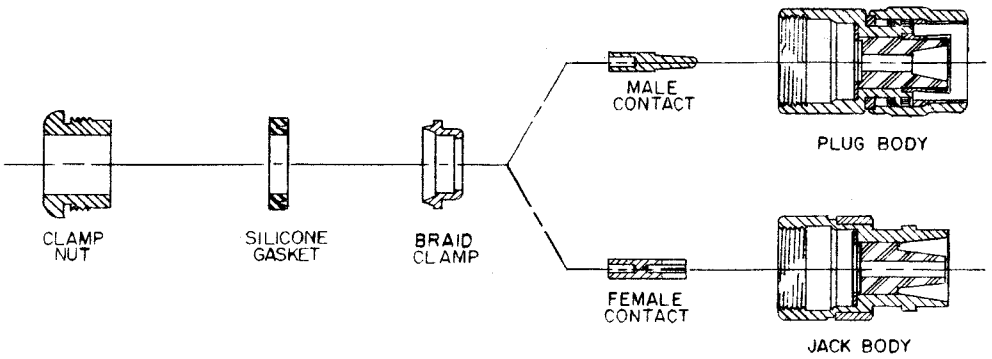
ASSEMBLY INSTRUCTIONS

RF CONNECTOR, TYPE C SERIES

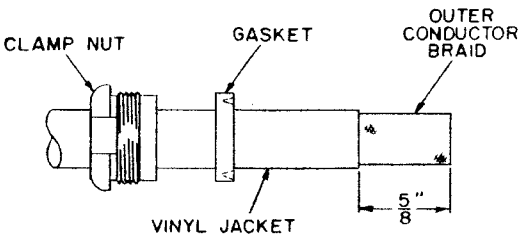
AN or NAVY TYPE	DESCRIPTION	USED WITH
UG-570/U	PANEL JACK BULKHEAD	RG-8/U RG-10/U RG-11/U RG-12/U
UG-571/U	PANEL JACK BULKHEAD, SINGLE HOLE	
UG-572/U	CABLE JACK	RG-13/U
UG-573/U	PLUG	RG-116/U
UG-628/U	PLUG (5000 Volt)	RG-8/U
UG-632/U	PANEL JACK (5000 Volt)	RG-9A/U
UG-626/U	PLUG	RG-5/U
UG-629/U	PANEL JACK	RG-6/U
UG-630/U	PANEL JACK	
UG-633/U	CABLE JACK	
* UG-937/U	BULKHEAD JACK	
* UG-938/U	PANEL JACK	RG-10/U
* UG-943/U	PLUG	RG-12/U
* UG-944/U	CABLE JACK	RG-116/U
* UG-939/U	BLKD JACK (5000 Volt)	
* UG-942/U	CABLE JACK (5000 Volt)	

* MX-1268/U ARMOR CLAMP INCLUDED

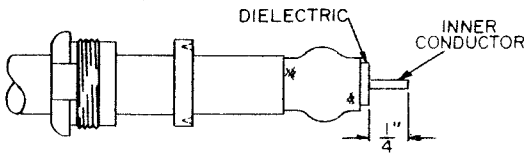
ASSEMBLY INSTRUCTIONS



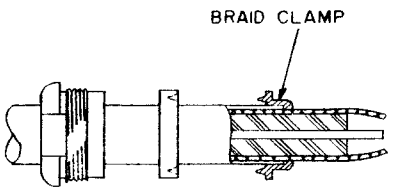
NOTE: For armored cable secure armor as shown in Section 10-6, Paragraph 2h.



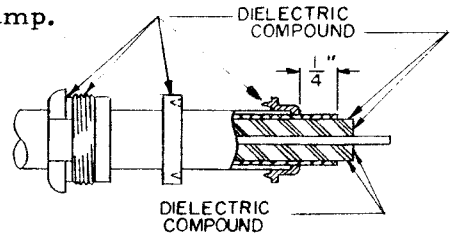
STEP 1. Cut cable to desired length. If cable is armored, push back armor approximately 2 inches and slide Clamp Nut and Gasket over jacket Be careful not to damage Silicone Gasket as it does not have the abrasive or elastic qualities of Neoprene. Cut vinyl jacket sharply and squarely with knife allowing approximately 5/8 inch for making assembly. Do not damage outer conductor braid.



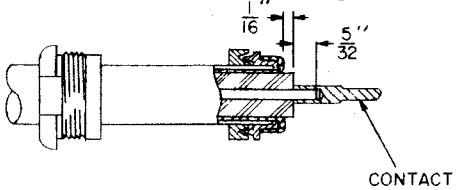
STEP 2. Push back outer conductor braid. Cut and remove approximately 1/4 inch of dielectric. Do not nick, bend, or otherwise damage inner conductor.



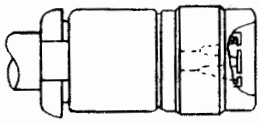
STEP 3. Pull braid forward and taper to a point. Slide Braid Clamp over braid and against jacket so that jacket fits snugly against internal shoulder of Clamp.



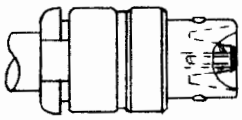
STEP 4. Cut off braid 1/4 inch from Braid Clamp. Do not damage dielectric.



STEP 5. Unbraid ends of outer conductor and fan straight back onto tapered portion of Clamp. Trim braid flush with flange portion of Braid Clamp so that no strands extend beyond outside diameter of flange. Braid strands should not cross each other. Cut off dielectric surface and square 1/16 inch from point where braid bends back over Clamp. This dimension is critical. Be careful not to nick, bend, or otherwise damage the inner conductor. Cut off inner conductor 5/32 inch from end of dielectric.



PLUG ASSEMBLY



JACK ASSEMBLY

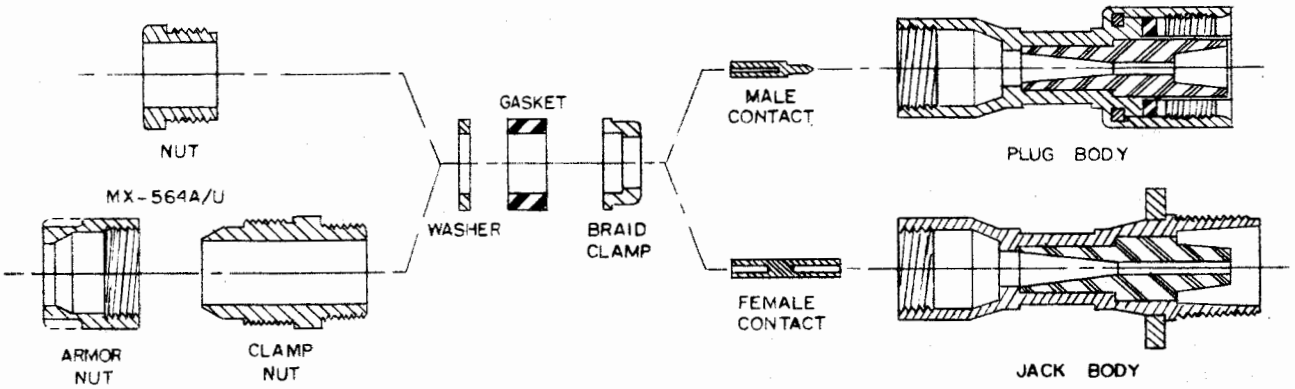
STEP 6. Check to make sure Contact fits over inner conductor and snugly against dielectric. Tin inner conductor with soft solder. Slide Center Contact over end of inner conductor and soft solder in place. Remove all excess solder and flux. Make certain Contact is square and at right angles with dielectric. Apply a small amount of Dielectric Compound to end of dielectric. Silicone Gasket and Clamping Nut threads. Push Body over end of cable so that Contact fits through center hole of insulator bead. Push Body onto cable as far as it will go and tighten Clamp Nut. After assembly is complete, check Contact Pin to make sure that it is properly located. (See Section 5, Paragraph 2h.) For insulating and waterproofing final assembly, see Section 5, Paragraph 3. Use Dielectric Compound on dielectric faces of connectors when they are mated together.

ASSEMBLY INSTRUCTIONS

RG CONNECTORS, NEW TYPE HN SERIES

AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
UG-59C/U	PLUG	RG-8/U
UG-60C/U	JACK	RG-9/U
UG-61C/U	PANEL JACK	RG-11/U
UG-925/U	PLUG	RG-13/U
UG-926/U	PLUG	with MX-564A/U armor clamp to:
UG-927/U	JACK	RG-10/U
UG-929/U	PANEL JACK (DRILL)	RG-12/U
UG-930/U	PANLE JACK (TAP)	RG-116/U

ASSEMBLY INSTRUCTIONS

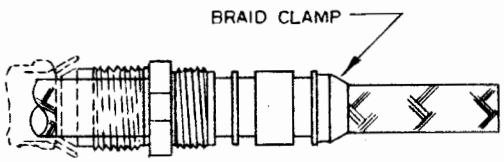


NOTE: For RG-87A/U and RG-116/U Teflon cable. Teflon tape and Silicone varnished glass braid will be treated in the same manner as vinyl jacket referred to for Polyethylene cables. Use only Silicone rubber gaskets for Teflon cable.

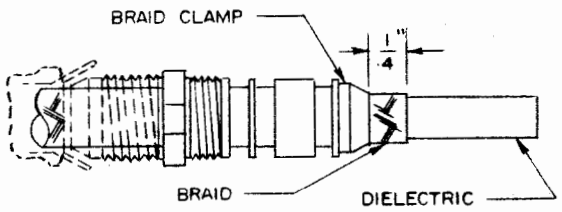
NOTE

Dotted lines indicate MX-564A/U components which are used for armored cable installation.

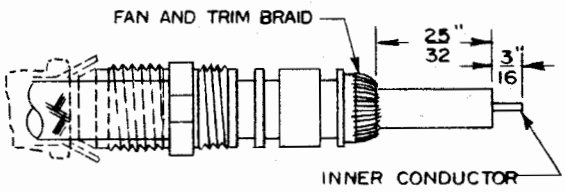
STEP 1. Cut cable sharply and squarely to the desired length. Slip Nut, Washer, and Gasket over jacket and at least 2 inches back from end of cable. Cut jacket with knife sharply and squarely 1-1/4 inches back from end of cable. Do not damage inner conductor braid.



STEP 2. Slip Clamp over outer conductor braid and against jacket so that jacket fits snugly against internal shoulder of Braid Clamp.

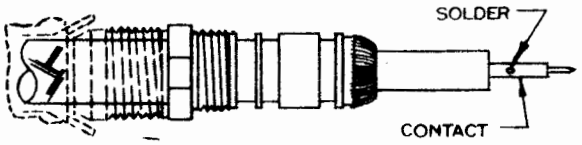


STEP 3. Cut off braid 1/4 inch from Braid Clamp. Do not damage dielectric.

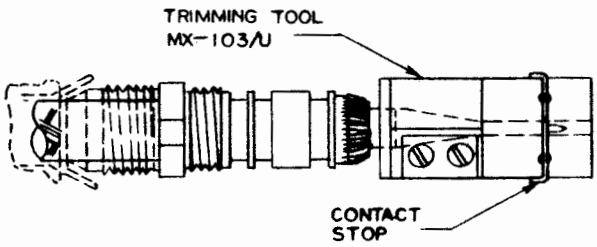


STEP 4. Unbraid ends of outer conductor and fan straight back over tapered portion of Braid Clamp. Trim braid flush with outermost part of Clamp bevel so that no strands extend over the outside diameter of the flange of Braid Clamp.

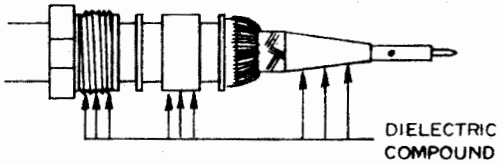
Braid wires should not cross each other. Cut off dielectric 25/32 inch from point where braid bends back over Clamp. Do not nick inner conductor. If assembly has been made properly, 3/16 inch of inner conductor will remain.



STEP 5. Check to make sure Contact fits over inner conductor and snugly against dielectric. Tin inner conductor and soft solder in place. Remove all excess solder and flux. Make certain Contact is squared and at right angles with dielectric.

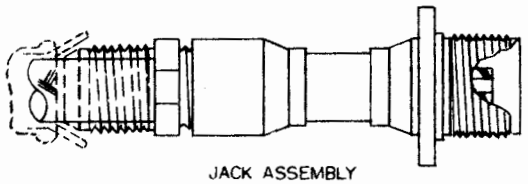


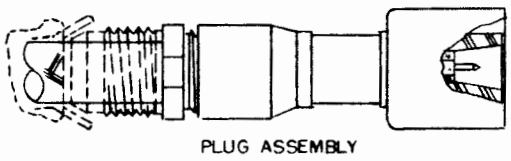
STEP 6. Taper dielectric with MX-103/U Trimming Tool. When tapering dielectric of cable for Plug Assembly, push contact stop of tool to bottom of slot. This will stop cutting when shoulder of Contact butts against the stop. For Jack Assembly, see that stop is at top of slot. Cable will be properly tapered when end of Center Contact is flush with end of Trimmer Body.



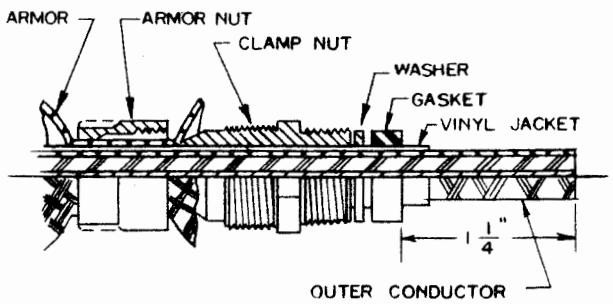
STEP 7. Smear small amount of Dielectric Compound on tapered surfaces of dielectric and insert assembly into Connector Body. Tighten Gland Nut securely. After assembly is complete, check Contact Pins to make sure that they are properly located as shown in final assembly. For insulating and waterproofing final assembly, see Section 10-5, Paragraph 3.

When assembly is mated to another connector, coat surfaces of face dielectric with Dielectric Compound.





For armored cable requiring Armor Clamp MX-564A/U, slide the Armor Clamp Nut over the armor and bubble the armor back as shown. The armor should then be cut and flared and the MX-564A/U Connector Clamp slid over the cable jacket in place of the "HN" type clamp nut. The remaining assembly instructions are the same as for unarmored cable as described in STEPS 1 through 7.



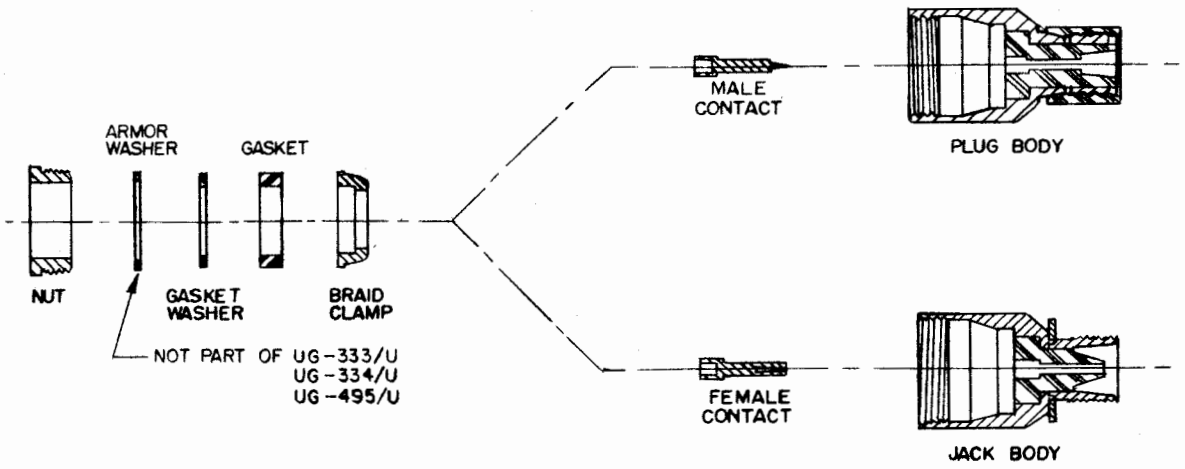
ASSEMBLY WITH MX-564A/U ARMOR CLAMP

ASSEMBLY INSTRUCTIONS

RF CONNECTORS, TYPE HN SERIES

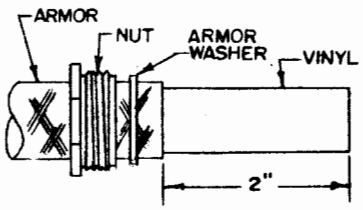
AN or NAVY TYPE	DESCRIPTION	USED WITH
UG-333/U	JACK	RG-17/U RG-18/U
UG-333A/U	JACK	
UG-334/U	PANEL JACK	
UG-334A/U	PANEL JACK	
UG-495/U	PLUG	
UG-495A/U	PLUG	

ASSEMBLY INSTRUCTIONS

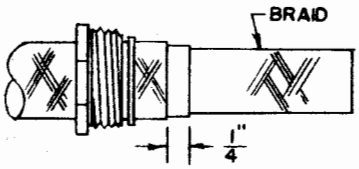


NOTE

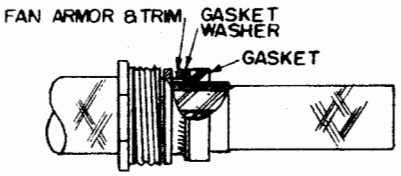
If RG-18/U armored cable is to be used, the Gland Nut of the UG-333/U, UG-334/U, and UG-495/U connectors should be enlarged to .960 inches inside diameter, and a plated steel Armor Washer with an inside diameter of .960 inches is to be made up. If RG-17/U cable is used, these steps are unnecessary.



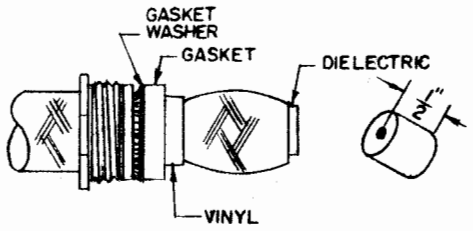
STEP 1. Cut cable to desired length allowing at least 2 inches from armor cut to end of cable for making assembly. Slip Armor Nut and Armor Washer over armor and at least 4 inches back from end of cable. Cut armor sharply and squarely. Point of armor cut may be determined by using Connector Body as a guide and allowing approximately 1/8 inch for fanning the armor.



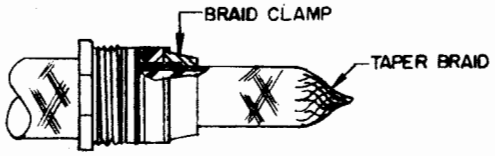
STEP 2. Cut jacket sharply and squarely 1/4 inch from armor cut. Do not damage copper braid.



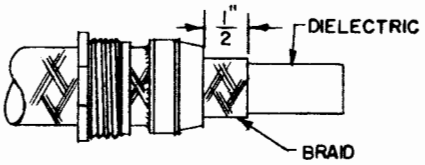
STEP 3. Fan out 1/8 inch of armor against Armor Washer. Slip Gasket Washer and Gasket over jacket. Trim loose ends of armor flush with outside diameter of Gasket Washer.



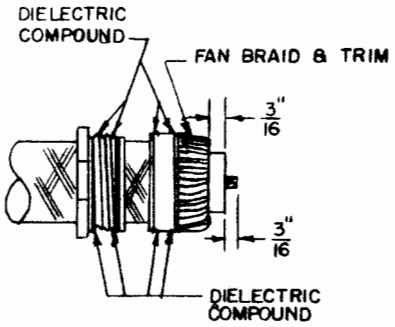
STEP 4. Push back copper braid and cut off 1/2 inch of dielectric and inner conductor.



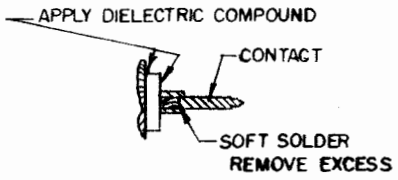
STEP 5. Pull copper braid forward over end of dielectric and taper to a point. Slide Braid Clamp over braid and against jacket so that jacket fits snugly against internal shoulder of Clamp.



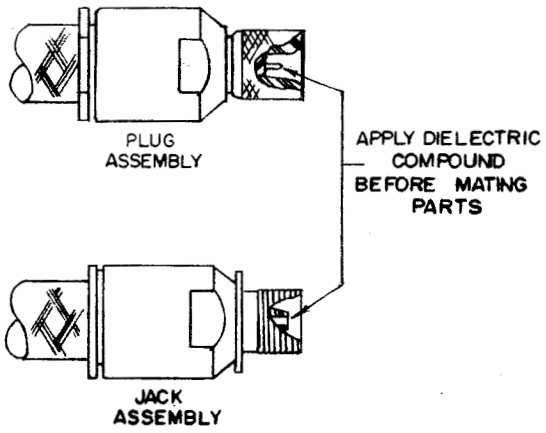
STEP 6. Cut off braid 1/2 inch from Braid Clamp.



STEP 7. Unbraid ends of copper braid and fan straight back over tapered portion of Clamp. Trim braid flush with outermost part of Clamp bevel so that no strands extend over outside diameter of flange on Clamp. Braid wires should not cross each other. Cut off dielectric sharp and square 3/16 inch from bend where braid bends back over Clamp. Be careful not to nick, bend, or otherwise damage inner conductor. This dimension is critical. Cut off inner conductor 3/16 inch from end of dielectric.



STEP 8. Check to make sure Contact fits over inner conductor and snugly against dielectric. Tin inner conductor with soft solder. Slide Center Contact over end of inner conductor and soft solder in place. Remove all excess solder and flux. Make certain Contact is square and at right angles with dielectric. Apply a small amount of Dielectric Compound to end of dielectric, Gasket, and over threads of Armor Nut.



STEP 9. Push Body over end of cable so that Contact fits through center hole of Insulator and braid comes against internal shoulder of Body. Push armor into Body by smoothing bulge in armor. Screw Armor Nut tightly securing armor.

After assembly is complete, check Contact Pin to make sure that it is properly located. For insulating and waterproofing final assembly, see Section 10-5, Paragraph 3.

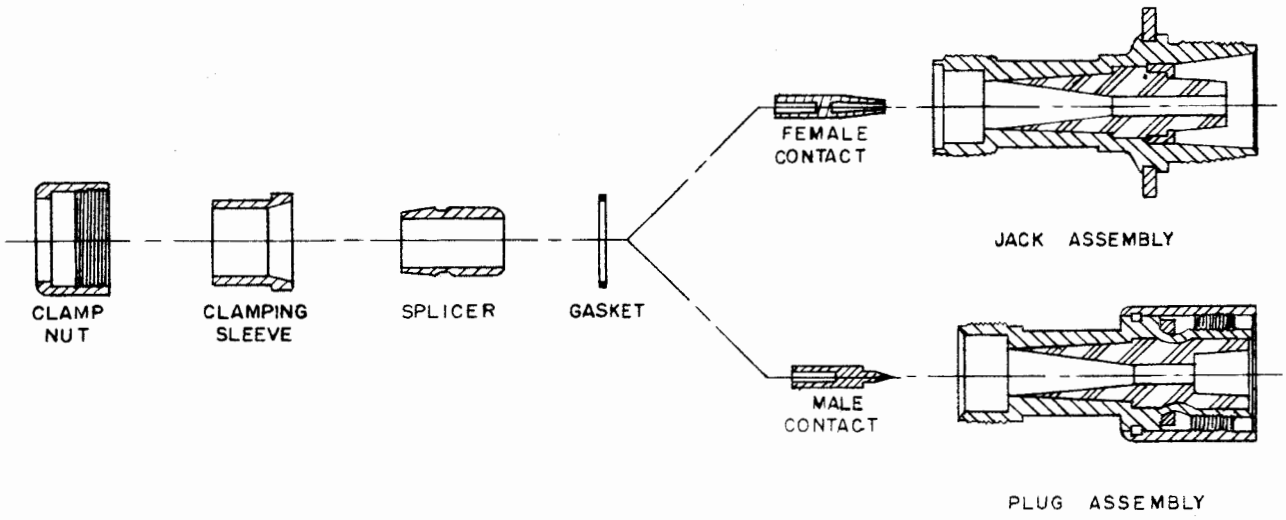
ASSEMBLY INSTRUCTIONS

RF CONNECTOR, "OLD" TYPE HN SERIES

AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
UG-59/U	PLUG	RG-8/U
UG-60/U	JACK	RG-9/U
UG-61/U	PANEL JACK	RG-11/U
		RG-13/U

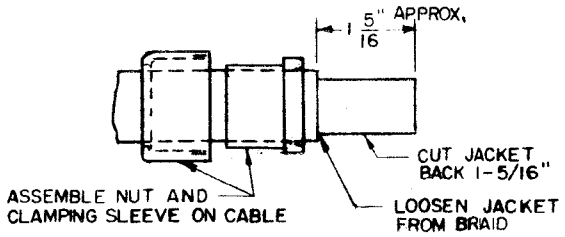
NOTE

Superseded by "B" and "C" Series. Do not use unless absolutely necessary, and in any case replace with newer type as soon as possible.

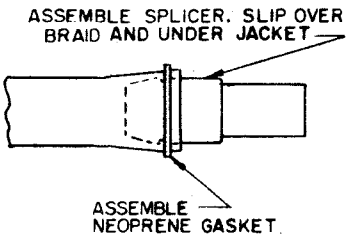


NOTE

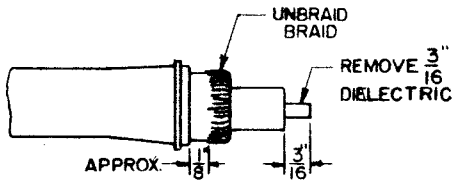
Do not use with armored cables.



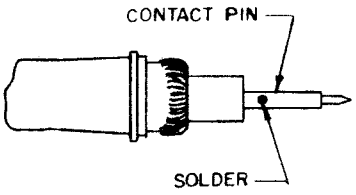
STEP 1. Cut jacket back 1-5/16 inch. Do not damage outer conductor braid. Loosen jacket from braid with dull pointed instrument. Slip Clamp Nut and Clamping Sleeve on cable.



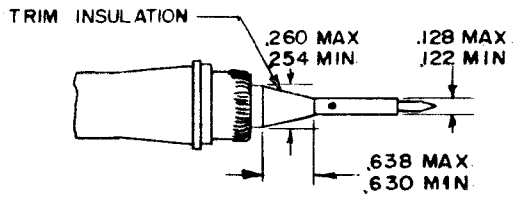
STEP 2. Slip Splicer over braid and under jacket. Assemble Neoprene Gasket.



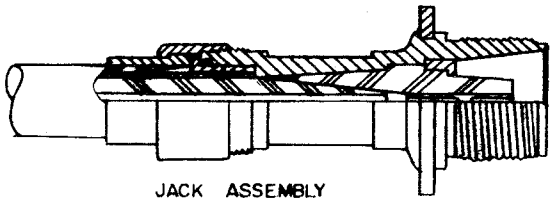
STEP 3. Unbraid braid. Fold back on Splicer and cut off excess length. Remove 3/16 inch of dielectric. Do not nick inner conductor.

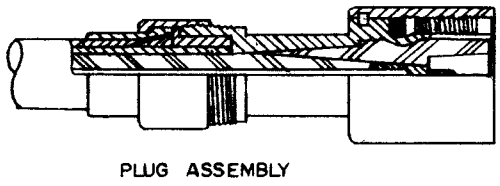


STEP 4. Solder securely thru holes on both sides. Remove excess solder. Use low melting point rosin core solder, preferably 60% tin, 40% lead.



STEP 5. Trim insulation (Polyethylene) with MX-103/U cable trimmer tool. When trimming cable for plug, adjust contact stop to bottom of slot. Trimmer will stop cutting insulation when shoulder of contact butts against stop. When trimming cable for jack, adjust stop to top of slot. Cable will be properly trimmed when end of center contact aligns with end of trimmer body.





STEP 6. The cable equipped with Contact Pin or sleeve shall be pushed in the plug or jack assembly as shown. The Clamping Sleeve shall be pushed forward and the Nut tightened with a wrench. Care shall be exercised to prevent the cable turning in the front assembly while tightening Nut.

The assembly shall be capable of withstanding a 2000 volt AC breakdown test for at least 1/4 second between conductor and braid.

NOTE

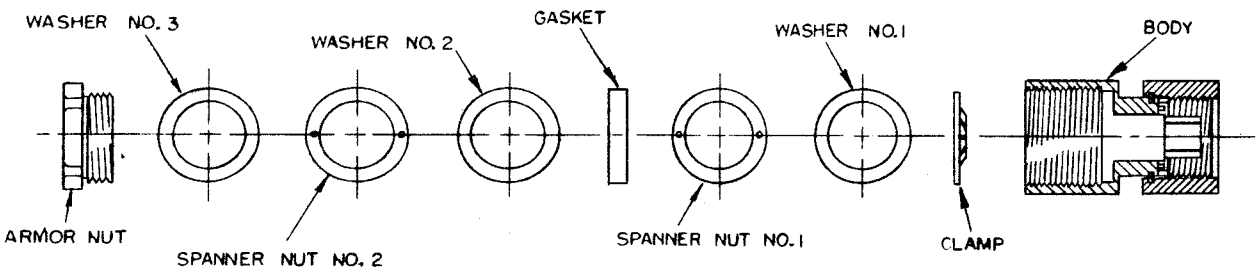
For Dielectric Compound instructions refer to Section 10-5, Paragraph 3a(1).

ASSEMBLY INSTRUCTIONS

RF CONNECTOR, TYPE LC & LT SERIES

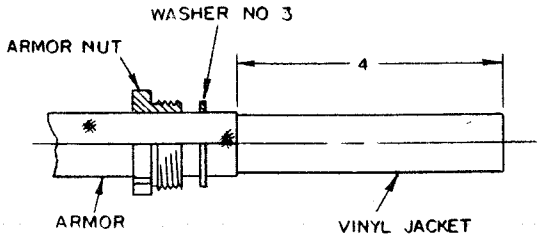
AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
UG-154/U	PLUG	RG-17/U RG-18/U
UG-156/U	PLUG	RG-19/U RG-20/U
UG-532/U	PLUG	RG-118/U

ASSEMBLY INSTRUCTIONS

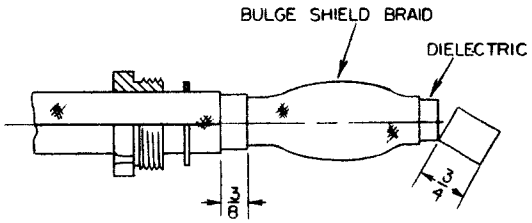


NOTE

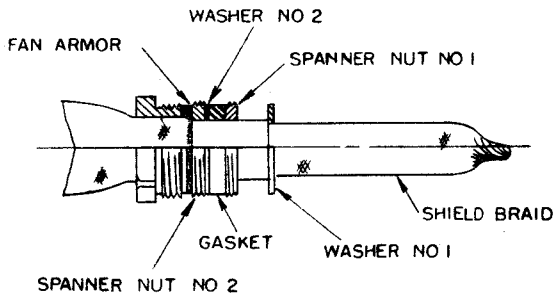
For RG-118/U Teflon cable, the jacket consists of one layer of Teflon tape and a Silicone varnished glass braid. These will be treated in the same manner as the vinyl jacket referred to for Polyethylene cables, except for insulating and waterproofing.



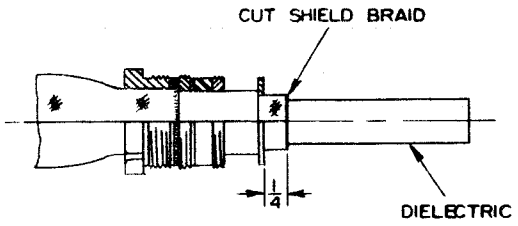
STEP 1. Slip Armor Nut and Washer No. 3 over cable armor. Cut armor sharp and square at desired point allowing approximately 1/4 inch for fanning the armor and using Connector Body to determine first cut. This applies to cable which has been installed in run. Allow approximately 4 inches for making assembly. Cut off remaining cable end.



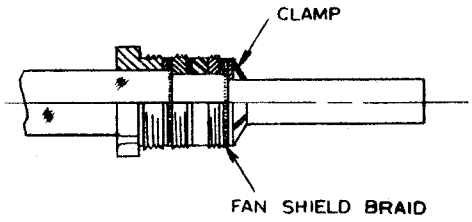
STEP 2. Cut cable jacket sharp and square with knife 3/8 inch from cut of armor. Do not damage conductor braid. Push back shield conductor braid and cut off approximately 3/4 inches of dielectric and inner conductor.



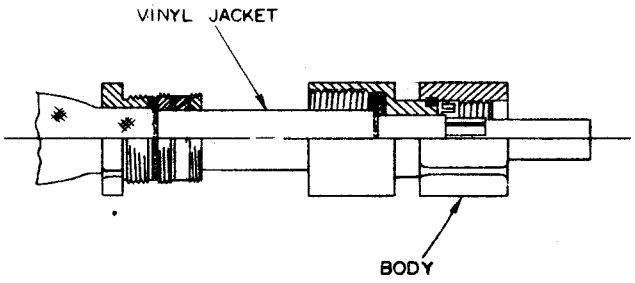
STEP 3. Pull braid forward and taper to a point. Fan 1/4 inches of armor against Washer No. 3 and trim flush with Washer. Slide Spanner No. 2, Washer No. 2, Gasket, and Spanner No. 1 against fanned out armor, pushing armor back to allow parts to slide over jacket. Slide Washer No. 1 over braid and against jacket.



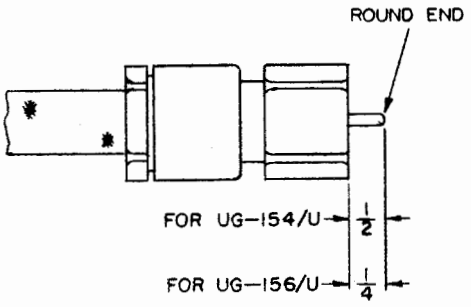
STEP 4. Cut off braid 1/4 inch from Washer and fan against Washer. Trim flush with outside diameter of Washer.



STEP 5. Slide Clamp against fanned out braid. Split fingers on Clamp should extend towards end of cable.



STEP 6. Push Spanner Nut No. 1 back bulging armor, allowing approximately 2 inches for Spanner Wrench. Insert prepared end of cable into Plug Body.



STEP 7. Apply a small amount of Dielectric Compound to Spanner Nut threads and Gasket. Screw Spanner Nut No. 1 tightly into Body using wrench TL-323/U for UG-154/U and UG-532/U or TL-322/U for UG-156/U. Slide Gasket and Washer No. 2 into Body. Screw Spanner No. 2 tight against Washer No. 2. Push armor and Washer No. 3 into Body by smoothing bulge in armor. Screw up Armor Nut tightly securing armor. Tap end of dielectric with hammer to allow braid and armor to set properly. Cut dielectric of cable flush with forward edge of coupling ring. Do not nick center conductor. Remove dielectric with gas pliers. Cut center conductor 1/2 inch from dielectric for UG-154/U or 1/4 for UG-156/U. If fitting is to be used as pressure-proof submarine hull fitting, cut 3/8 inches from dielectric. Round off center conductor with file.

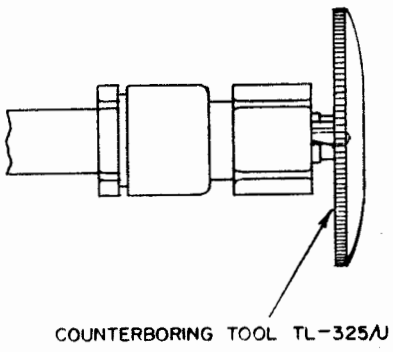
CAUTION

Make sure no filings are left on dielectric.

Before mating this type plug into an adapter, coat face of dielectric with Dielectric Compound. See Section 10-5, Paragraph 3 for Insulating and Waterproofing.

NOTE

UG-156/U must be counterbored. Use counterboring tool TL-325/U. The instructions for using this tool are given below.



INSTRUCTIONS

Slip tool over inner conductor and rotate with hand, applying pressure squarely on dielectric till tool butts against face of connector.

NOTE

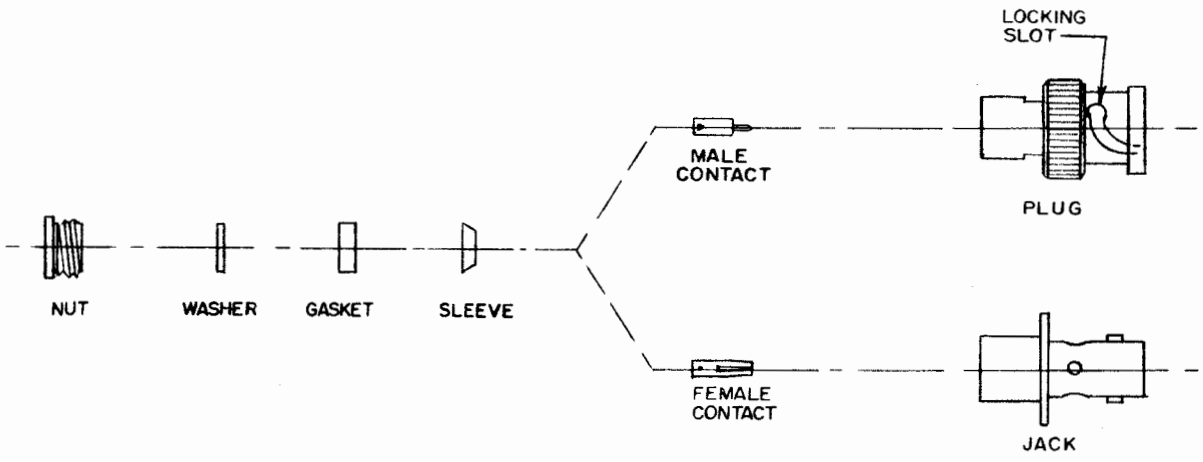
Make sure tool does not nick inner conductor and embed filings in Polyethylene.

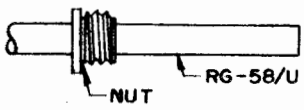
ASSEMBLY INSTRUCTIONS

RF CONNECTOR, TYPE BNC SERIES

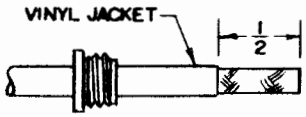
AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
UG-88/U	PLUG	RG-55/U
UG-89/U	JACK	RG-58/U
UG-291/U	JACK, PANEL	RG-58A/U
UG-253/U	JACK, BULKHEAD	
UG-260/U	PLUG	RG-59/U
UG-261/U	JACK	RG-62/U
UG-262/U	JACK, PANEL	RG-71/U
UG-624/U	JACK, BULKHEAD	

ASSEMBLY INSTRUCTIONS

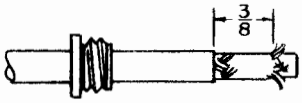




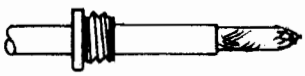
STEP 1. Cut cable off sharply and squarely.



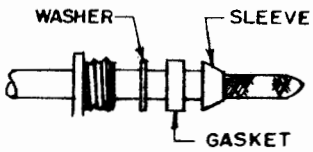
STEP 2. Cut off vinyl jacket 1/2 inch from end, being careful not to nick braid.



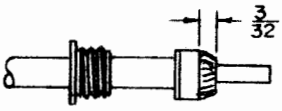
STEP 3. Cut off inner insulation and wire under braid 3/8 inch from vinyl jacket.



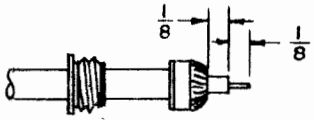
STEP 4. Taper outer braid.



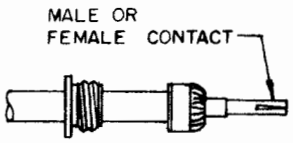
STEP 5. Slide Washer, Gasket and Sleeve over tapered braid to fit tight against vinyl jacket.



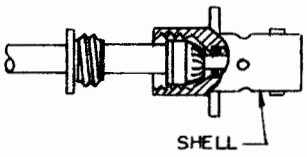
STEP 6. With Sleeve in place, comb out braid, fold back smooth as shown, and trim to 3/32 inch from end.



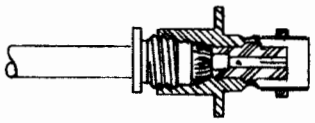
STEP 7. Cut inner dielectric 1/8 inch from braid, being careful not to nick inner conductor and cut off inner conductor 1/8 inch from end of dielectric.



STEP 8. Tin inside hole of Female Contact. Tin center conductor of cable. Slip Female Contact in place and solder. Remove excess solder.



STEP 9. Coat end of dielectric with Dielectric Compound and push into shell as far as it will go. Then slide Nut into shell and screw into place, using wrench, until tight.



STEP 10. Shows cross section of completed assembly.

ASSEMBLY INSTRUCTIONS

RF CONNECTOR, TYPE BN SERIES

AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
UG-85/U	PLUG	RG-58/U
UG-114/U	PANEL JACK	RG-59/U
UG-115/U	JACK	RG-62/U RG-71/U

NOTE

Replace with, or adapt to BNC if possible.

ASSEMBLY INSTRUCTIONS

UG-85/U

to RG-58/U

UG-85/U

to RG-59, 62, 71/U

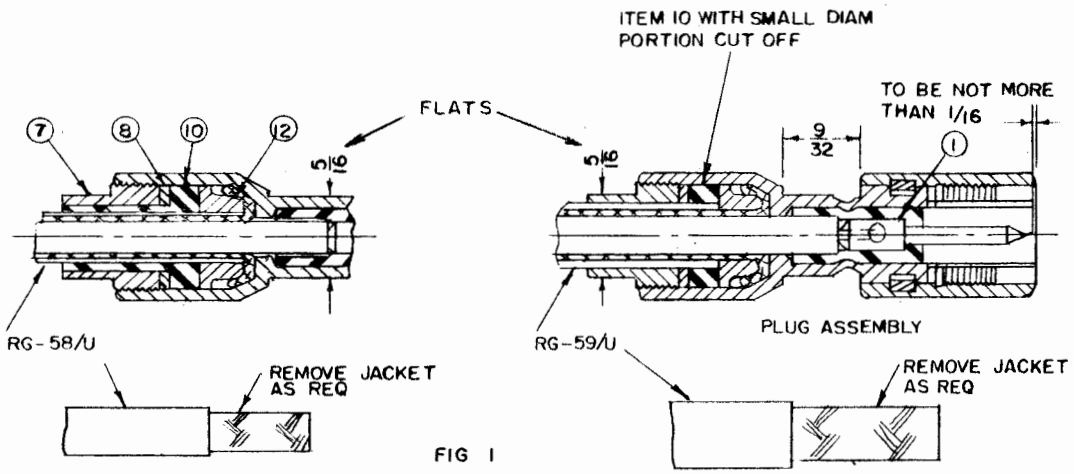


FIG 1

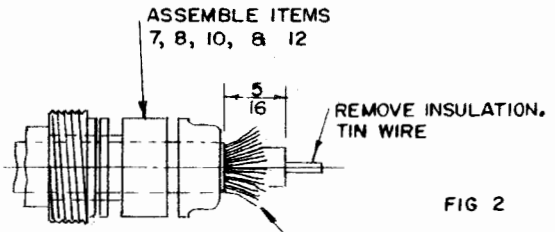
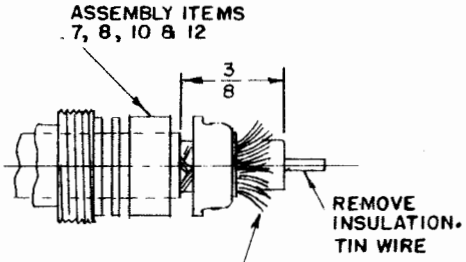


FIG 2



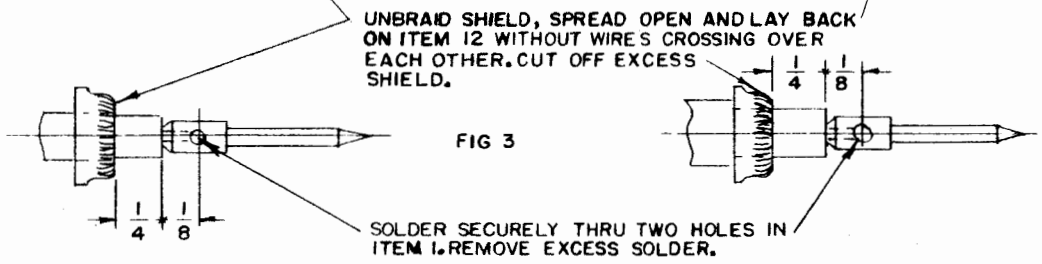


FIG 3

ASSEMBLY INSTRUCTIONS

UG 114/U and UG-115/U to RG-59/U

UG-114/U and UG-115/U to RG-59, 62, 71/U

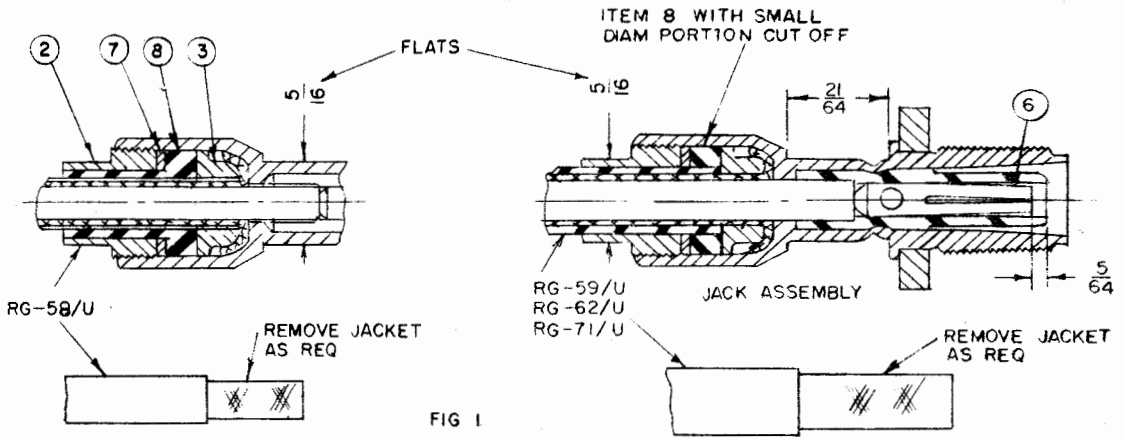


FIG 1

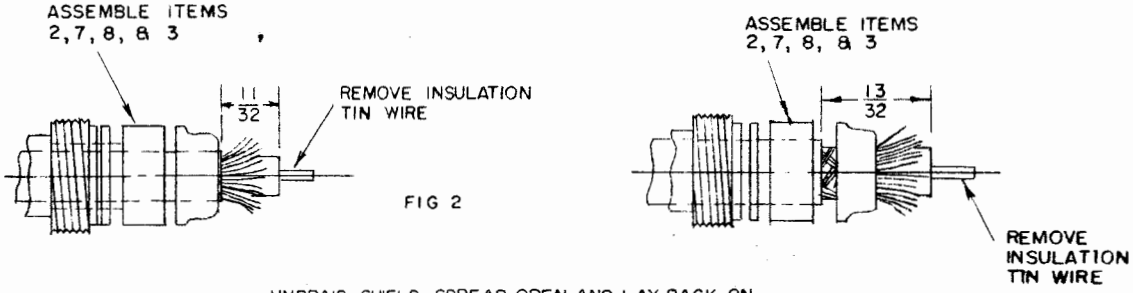


FIG 2

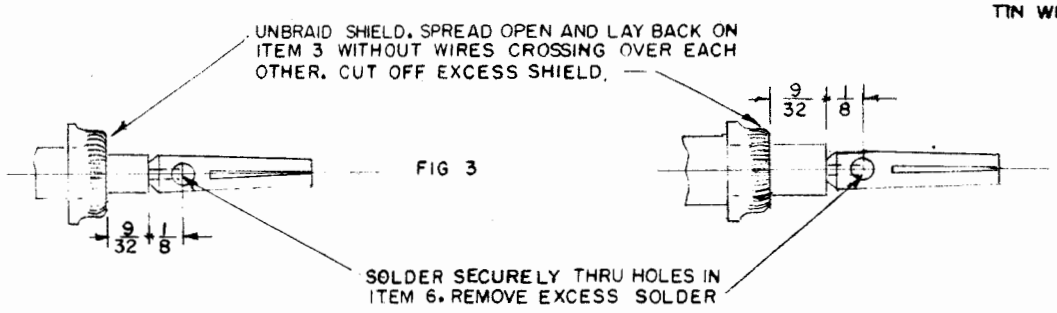


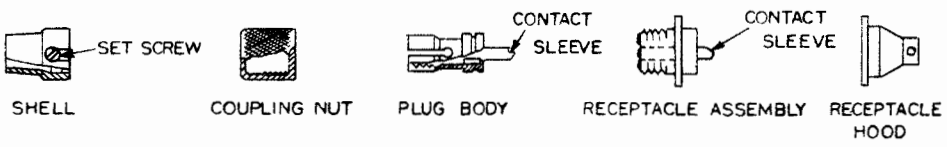
FIG 3

ASSEMBLY INSTRUCTIONS

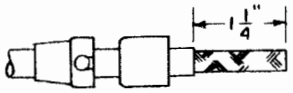
RF CONNECTOR, TYPE UHF SERIES

AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
NT 49190	PLUG	RG-8/U
NT 49193	HOOD (UG-106/U)	RG-9/U
NT 49194	RECEPTACLE	RG-10/U
NT 49195	PLUG	RG-11/U
		RG-12/U
		RG-13/U

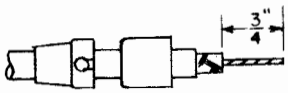
ASSEMBLY INSTRUCTIONS



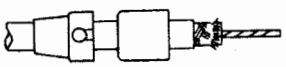
STEP 1. Cut end of cable square and clean. Slide Shell and Coupling Nut over cable.



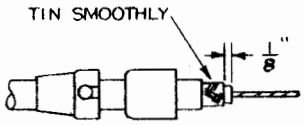
STEP 2. Cut outer vinylite jacket 1-1/4 inch from end of cable exposing copper braid sheath. Do not nick copper braid sheath.



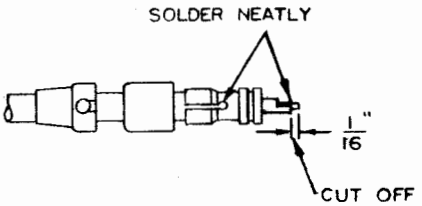
STEP 3. Bare 3/4 inch of center conductor by cutting copper braid sheath and inner insulation (dielectric) square and clean. Do not nick center conductor.



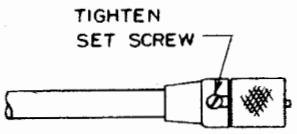
STEP 4. Fan copper braid sheath. Cut back copper braid sheath 1/8 inch.



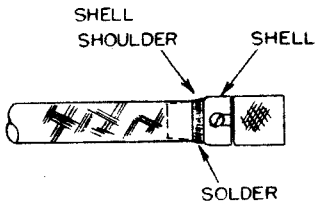
STEP 5. Smooth and tin copper braid sheath. Do not use excessive heat. Wipe solder smooth and clean.



STEP 6. Screw Plug Body over outer vinylite jacket until 1/16 inch of inner conductor is exposed. Be careful not to push back copper braid sheath. Solder Plug Body to copper braid sheath through 4 holes in Plug Body. Solder inner conductor to Contact Sleeve. Cut off the part of inner conductor that projects past Contact Sleeve. Round off end of conductor.



STEP 7. Slide Coupling Nut and Shell forward as shown. Tighten screw in Shell.

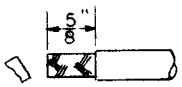


NOTE

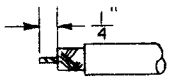
If armored cable is used it becomes necessary to ground the armor.

The armor is slid over the conical section of the Shell, as shown above, flush to the shoulder. The end of the armor should then be soldered entirely around the Shell to insure a good ground.

ASSEMBLY OF ABOVE CABLE TO UHF, RECEPTACLE AND HOOD

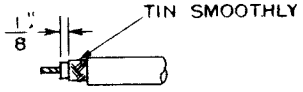


STEP 1. Cut end of cable square and clean. Cut outer vinylite jacket 5/8 inch from end of cable exposing copper braid sheath.

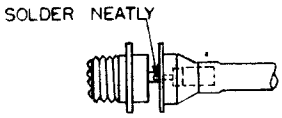


STEP 2. Bare 1/4 inch of inner conductor by cutting copper braid sheath and inner insulation (dielectric) square and clean. Do not nick center conductor.

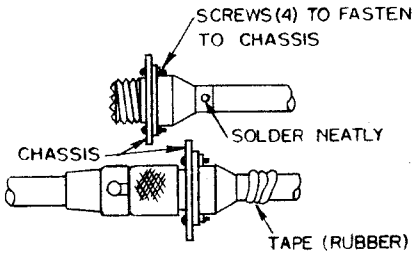
STEP 3. Fan copper braid sheath. Cut back copper braid sheath 1/8 inch.



STEP 4. Smooth and tin copper braid sheath. Do not use excessive heat. Wipe solder smooth and clean.



STEP 5. Slide Receptacle Hood over tinned copper braid sheath and force under vinylite jacket as shown. Place inner conductor in Contact Sleeve of Receptacle Assembly and solder.



STEP 6. Push Hood flush up against Receptacle Assembly and bolt Hood with Assembly to chassis. Solder Hood to copper braid sheath through 4 holes in Hood. Use Vinyl Tape at junction of Hood and vinylite jacket (if necessary).

STEP 7. Insert Plug Body Contact Sleeve into Receptacle Assembly and tighten Coupling Nut.

ASSEMBLY INSTRUCTIONS

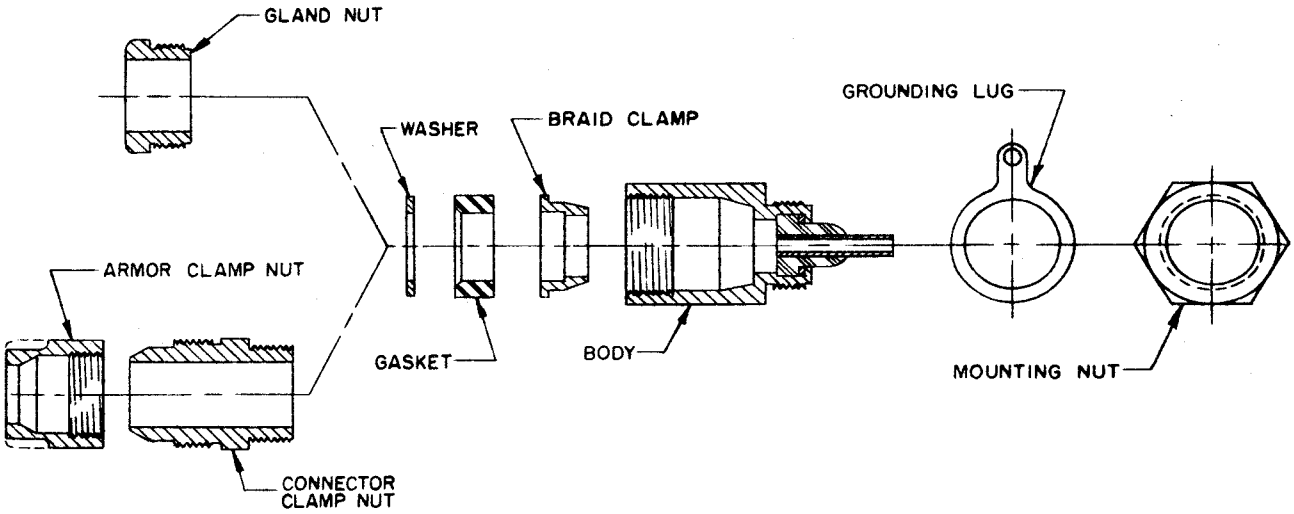
RF CONNECTOR, END SEAL

AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
MX-498/U	END SEAL LOW VOLTAGE	RG-8/U RG-9/U RG-10/U RG-11/U RG-12/U RG-13/U RG-116/U

NOTE

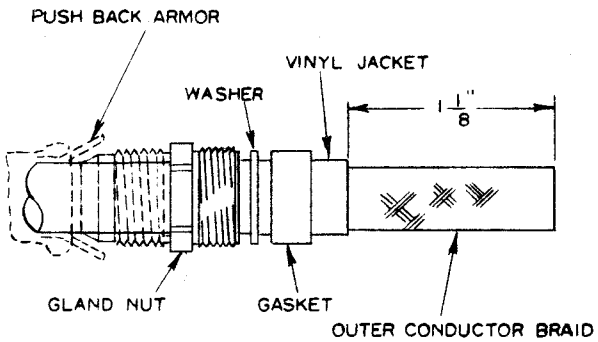
Do not use in areas exposed to weather. For exposed areas use NT-49530-B

ASSEMBLY INSTRUCTIONS

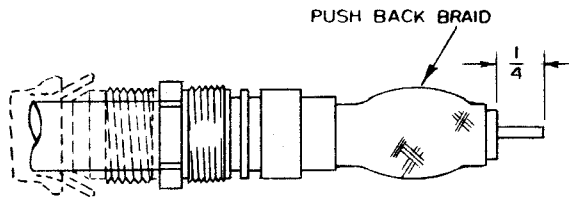


NOTE

Dotted lines indicate MX-564A/U components which are used for armored cable installation.



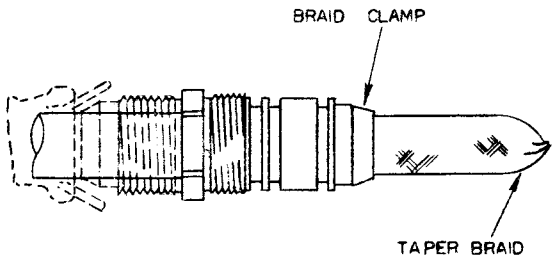
STEP 1. Cut cable to desired length approximately 1/8 inch over end insulator terminal. Push back armor and slide Gland Nut and Washer over cable jacket. Cut vinyl jacket with knife sharply and squarely 1-1/8 inches back from end. Do not damage outer conductor braid. Slide Gasket over jacket and against Washer.



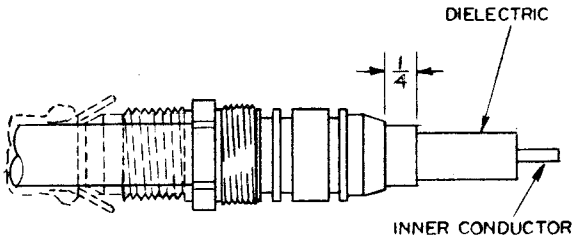
STEP 2. Push back outer conductor braid. Cut and remove approximately 1/4 inch of dielectric.

NOTE

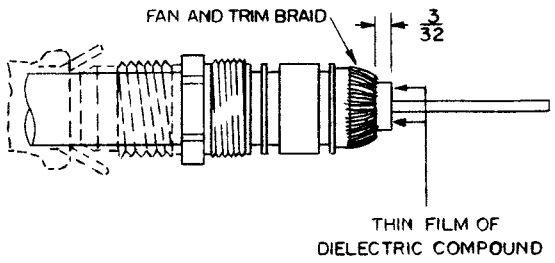
Do not nick, bend or otherwise damage inner conductor.



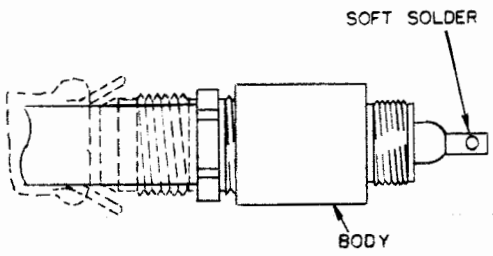
STEP 3. Pull braid forward and taper to a point. Slide Braid Clamp over braid and against vinyl jacket so that jacket fits snugly against internal shoulder of Braid Clamp.



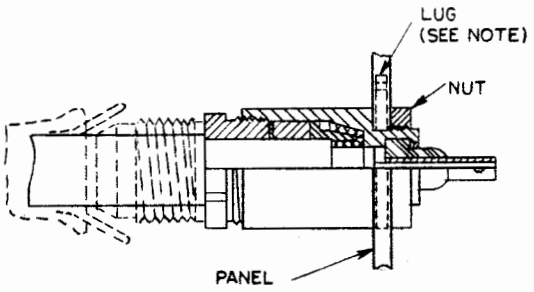
STEP 4. Cut off braid 1/4 inch from Braid Clamp. Do not damage dielectric.



STEP 5. Unbraid ends of outer conductor and fan straight back over tapered portion of Clamp. Trim braid flush with outer-most part of Clamp bevel so that no strands extend over outside diameter of flange of Braid Clamp. Braid wires should not cross each other. Cut off dielectric sharp and square, 3/32 inch from a point where the braid bends back over Clamp. This dimension is critical. Be careful not to nick, bend, or otherwise damage the inner conductor.



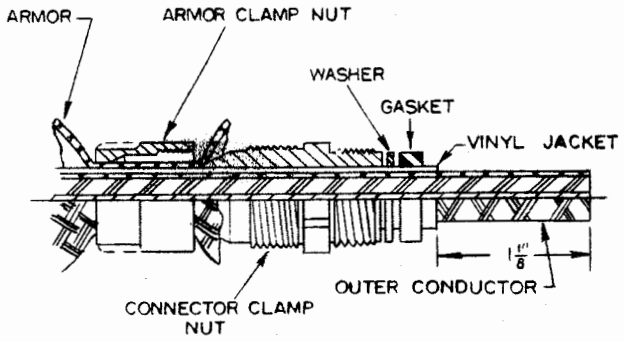
STEP 6. Apply a small amount of Dielectric Compound to end of cable and threads of Gland Nut. Insert prepared end of cable through the Body of the End Seal. Make sure that all strands pass through terminal contact and braid seats in its proper position in Body recess. Tighten Gland Nut firmly using wrench. Solder inner conductor at terminal contact. Remove any traces of flux or solder from insulator of End Seal. If armored cable is used, push armor forward, trim, and sieze with No. 20 bare tinned copper wire. Solder to end of Gland Nut.



STEP 7. The End Seal is then mounted to the panel as shown in complete assembly. Not relative positions of Lug and Mounting Nut.

NOTE

For panel mounting remove Grounding Lug.



INSTRUCTIONS

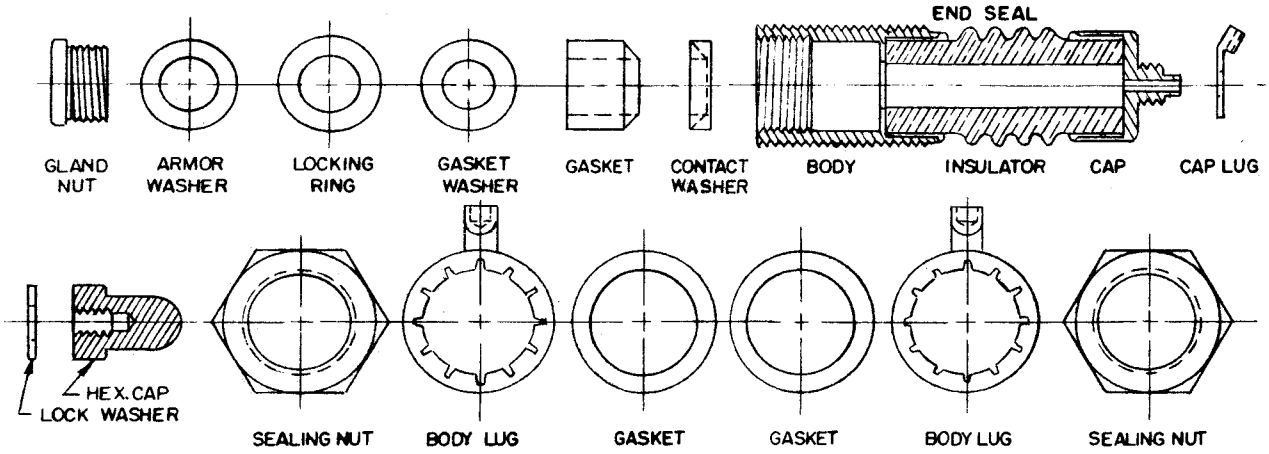
For armored cable requiring Armor Clamp MX-564A/U, slide the Armor Clamp Nut over the Armor and bubble the Armor back as shown. The armor should then be cut and flared and the MX-564A/U Connector Clamp slid over the cable jacket in place of the MX-498/U Gland Nut. The remaining assembly instructions are the same as for unarmored cable as described in STEPS 1 through 7.

ASSEMBLY INSTRUCTIONS

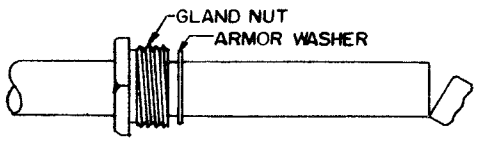
RF CONNECTOR, END SEAL

AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
MX-407/U	END SEAL, HIGH VOLTAGE	RG-17/U RG-18/U

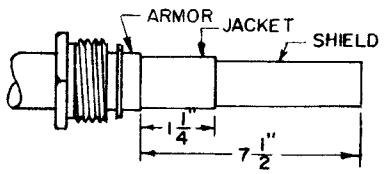
ASSEMBLY INSTRUCTIONS



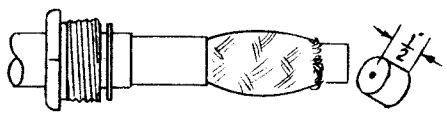
NOTE: This connector is waterproof but not pressure-proof. For pressure-proof connector as used on Submarines, use **MX-1203.** This replaces modified **MX-407/U** for Submarine use.



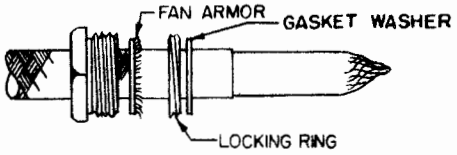
STEP 1. Cut **RG-18/U** cable to desired length approximately 1 inch above Insulator Cap when in the mounted position. Slip Gland Nut and Armor Washer over cable.



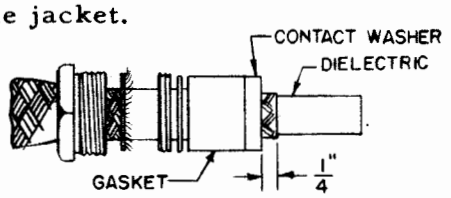
STEP 2. Cut armor 7-1/2 inches back from end of cable. Do not damage jacket. Cut jacket sharply and squarely 1-1/4 inches from armor cut. Do not damage outer conductor braid.



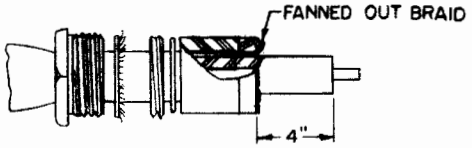
STEP 3. Push back braid and cut off and discard 1/2 inch of cable dielectric and center conductor.



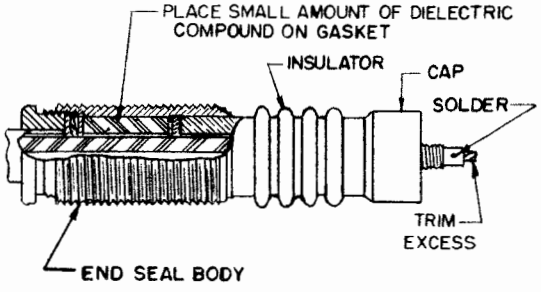
STEP 4. Pull braid forward over dielectric and taper to a point. Fan 1/4 inch of armor against Armor Washer. Slide Locking Ring and Gasket Washer over cable jacket.



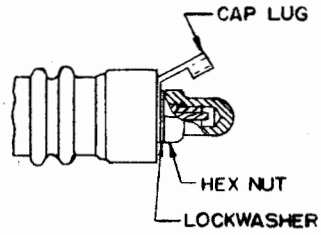
STEP 5. Push back fanned-out armor by bulging armor. Slide Gasket and Contact Washer over jacket so that forward part of Contact Washer is flush with cable jacket. Cut off braid 1/4 inch from Contact Washer and jacket.



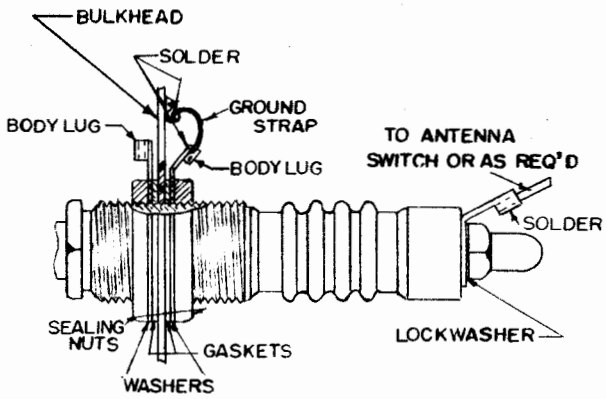
STEP 6. Fan braid against Contact Washer. Make sure that no strands extend beyond outside diameter of Contact Washer. Lubricate Gasket and threads with small amount of Dielectric Compound. Cut dielectric sharply and squarely 4 inches from fanned-out armor. Do not nick, bend, or otherwise damage the inner conductor. Remove burrs and bevel end of inner conductor with file.



STEP 7. Push prepared end of cable into End Seal Body so that inner conductor protrudes through Insulator Cap and fanned-out armor comes in contact with shoulder. Screw Locking Ring in tightly into Body with Spanner Wrench TL-323/U. Push fanned-out armor into Body by smoothing bulge in Armor and screw Gland Nut tightly into Body. Solder projecting center conductor through two holes provided in Cap. Remove all excess solder and flux and cut off excess center conductor.



STEP 8. Place Cap Lug and Lockwasher on Insulator Cap and screw on Hex Cap with Lug pointing in the desired direction.



STEP 9. Place large Gaskets, Sealing Nuts, and Washers as required on each side of bulkhead boxes, etc. Ground Body of End Seal to bulkhead or box with ground strap soldered to Body Lug. Make sure that all ground connections are good clean grounding surfaces.

ASSEMBLY INSTRUCTIONS

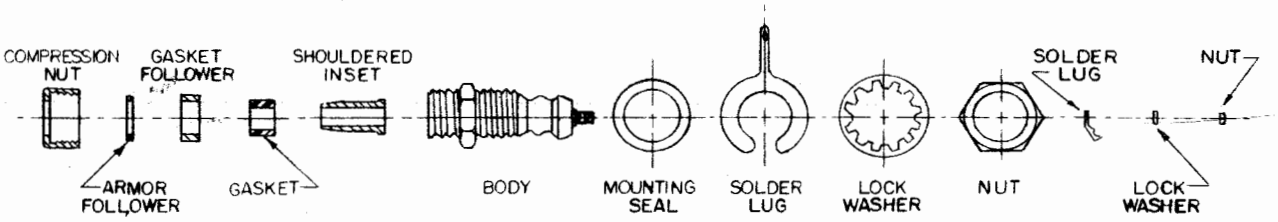
RF CONNECTOR, END SEAL

AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
NT 62111	END SEAL, LOW VOLTAGE	RG-8/U RG-9/U
NT 62119	END SEAL, MEDIUM VOLTAGE	RG-10/U RG-11/U RG-12/U RG-13/U

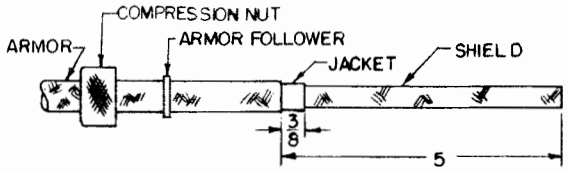
NOTE

These End Seals have been superseded by MX-498/U and NT-49530-B. (For areas exposed to weather use NT-49530-B.)

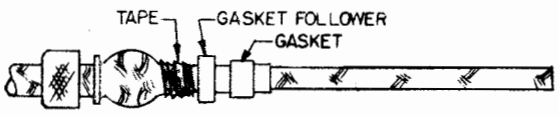
ASSEMBLY INSTRUCTIONS



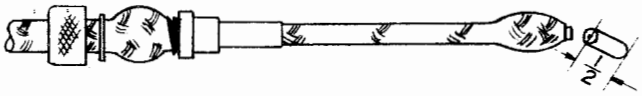
NOTE: End Seal assembly may be made with End Seal either loose or mounted, depending on which is more convenient.



STEP 1. Slip the Compression Nut and Armor Follower over cable approximately 8 inches back from desired conductor termination of the cable (tip of mounted End Seal). Cut armor at desired termination of cable allowing approximately 1/4 inch for fanning and at least 5 inches beyond this point for making up the assembly. Cut vinyl jacket with knife 3/8 of an inch from armor cut. Do not damage conductor shield braid.

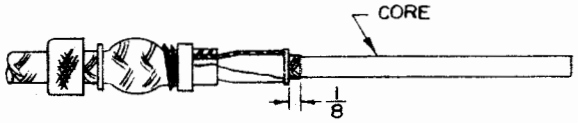


STEP 2. Bubble back armor approximately 2 inches and temporarily tape the ends to the cable jacket. Slip Gasket Follower and Gasket over vinyl jacket and against taped armor.



STEP 3. Push back outer conductor braid and cut off approximately 1/2 inch of dielectric and inner conductor.

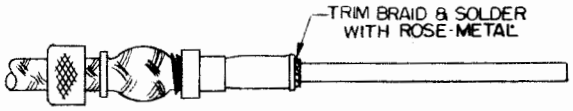
STEP 4. Pull inner conductor braid forward and taper to a point. Slip Shouldered Inset over braid and against vinyl jacket.



STEP 5. Push Shouldered Inset under vinyl jacket until the end of the jacket butts against the edge of the Shoulder. Jacket may be loosened by forcing 1/8 inch screwdriver carefully beneath jacket around the shield braid.

CAUTION

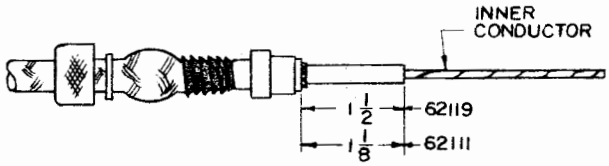
Do not damage braid strands beneath jacket. Cut shield braid approximately 1/8 of an inch from Shouldered Inset.



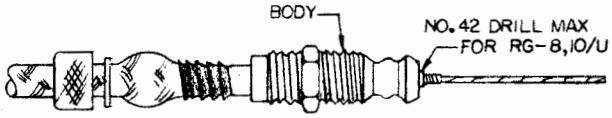
STEP 6. Fan out shield braid and trim next to countersunk portion of Inset. Solder braid ends to Inset using rose-metal wire or equivalent low melting-point solder.

NOTE

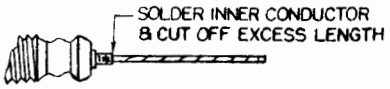
This must be done quickly as excessive heat will damage the cable dielectric and jacket. Avoid touching either with soldering iron.



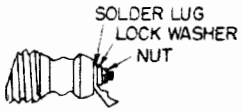
STEP 7. Smooth the ends of soldered braid flush with the face of the Shouldered Inset using a small file. Be careful not to mar face of Inset or dielectric. Cut off dielectric 1-1/2 inch from Shouldered Inset for End Seal 62119 or 1-1/8 inch for End Seal 62111. Do not damage inner conductor. Push the Gasket forward until the front edge lines up with the end of the jacket. Slide Gasket Follower against Gasket.



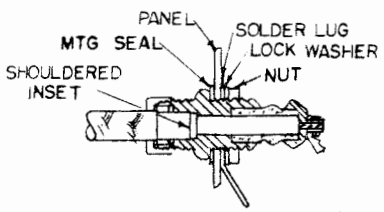
STEP 8. Insert prepared end of cable through the Body of the End Seal so that the Gasket and Shouldered Inset bottom in the respective recesses and the inner conductor protrudes through the holes in the insulator studs. If RG-8/U, RG-10/U or equivalent cable is to be used, enlarge stud hole by drilling with No. 42 drill. Do not use larger drill as it will weaken the stud. Remove tape and smooth cable armor into place behind Gasket Follower. Slide Armor Follower forward clamping the armor against the Gasket Follower. Trim armor flush with Gasket Follower and Armor Follower. Screw Compression Nut in place, hand tight, making certain that hand tightness results from Gasket compression and not because of burred or cross threads, etc. Grip the hexagonal shoulder of the Body with 1-1/8 inch open-end wrench and the Compression Nut with 6 inch gas pliers. Tighten up the Compression Nut as tightly as possible.



STEP 9. Solder the inner conductor at the tip of the insulator stud and cut off excess length. Do not let the solder flow over the threads of the insulator stud. A small soldering tong is recommended for this job.



STEP 10. Slip Solder Lug, Lockwasher and Nut onto insulator stud. Do not force nut if solder has flowed into threads. Use 8-32 die to remove solder.



STEP 11. The End Seal is then mounted to panel as shown under complete assembly. Note relative positions of Mounting Seal, Panel, Solder Lug, Lockwasher and Nut.

ASSEMBLY INSTRUCTIONS

RF CONNECTOR, PULSE

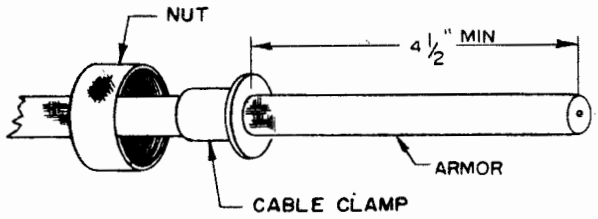
AN or NAVY TYPE	DESCRIPTION	USED WITH
UG-36/U UG-158/U	PLUG PANEL JACK	RG-27/U
UG-166/U UG-174/U	PANEL JACK PLUG	RG-28/U

ASSEMBLY INSTRUCTIONS

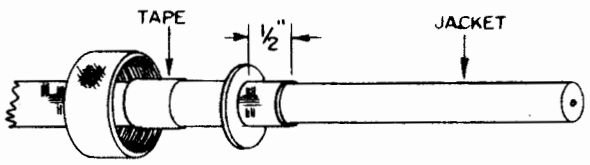
NOTE

RG-28/U cable has protective Neoprene jacket over armor.

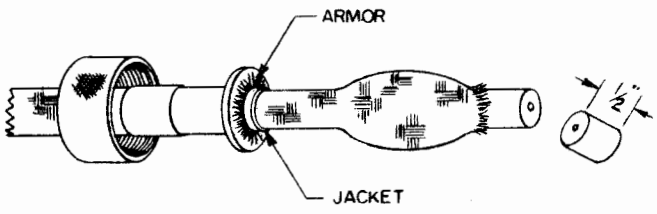
ASSEMBLY INSTRUCTIONS



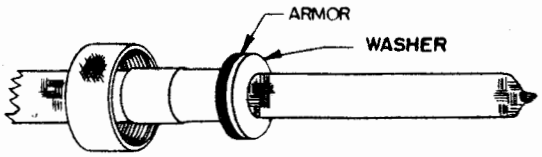
STEP 1. Slide Nut and Cable Clamp over end of cable. Allow at least 4-1/2 inches from end of cable for making assembly.



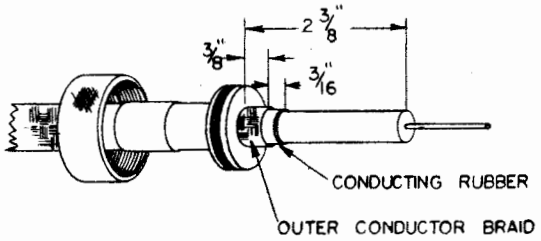
STEP 2. Wrap a piece of tape around cable behind Cable Clamp. For RG-28/U cable, cut outer Neoprene jacket flush with face of Cable Clamp. Do not damage armor. Cut armor approximately 1/2 inch from Cable Clamp.



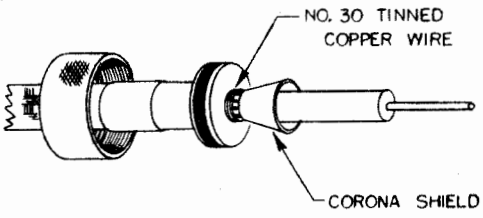
STEP 3. Separate armor strands and fan out against Cable Clamp. Cut jacket flush with fanned-out armor. Do not damage outer conductor braid. Push back braid and cut off approximately 1/2 inch of dielectric and inner conductor.



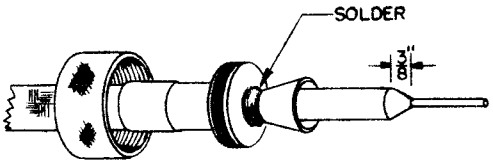
STEP 4. Pull braid forward over dielectric and taper to a point. Slide Washer over braid and against fanned-out armor.



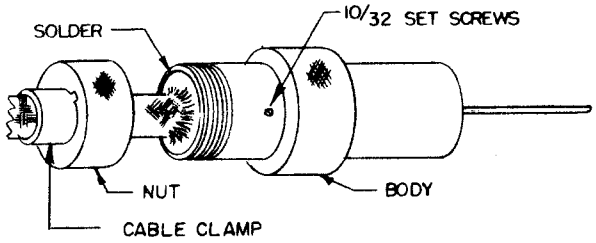
STEP 5. Cut off outer conductor braid 3/8 inch from Washer. Remove layer of conducting rubber 3/16 inch from braid. IMPORTANT: Every trace of this conducting rubber must be removed. It is best removed with a sharp knife by slitting conducting rubber and peeling back. Clean residue by scraping with knife. Cut insulating rubber 2-3/8 inches from Washer. Do not nick, bend, or otherwise damage inner conductor.



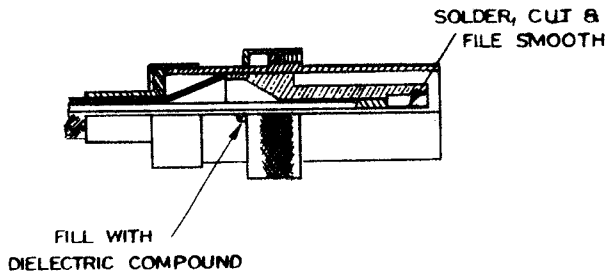
STEP 6. Slip Corona Shield over conducting rubber and under copper braid and about 1/16 inch into hole in Washer. Fan out braid against Corona Shield. Wrap copper braid with tinned copper wire (approximately No. 20 to No. 30).



STEP 7. Solder copper braid to Corona Shield and to Washer using a 200 watt soldering iron or higher. Do not burn rubber.



STEP 8. With scraper, remove the nickel plating from groove in back of the Plug Body into which the brass Washer fits. This is to permit soldering the Washer to the back of the connector with rosin core solder. Insert the cable assembly into the back end of the plug making sure that center conductor fits into the center hole of the plug. Taper the insulating rubber to approximately 3/8 inches back from the end. This allows Dielectric Compound to flow into area at end of rubber to prevent corona. Remove tape and trim armor approximately 1/16 inch below outer diameter of washer. Solder Washer to Body by flowing rosin core solder into groove. Mask threads with tape before soldering. Slide Cable Clamp against armor and remove mask. Tighten Nut onto Connector Body with Spanner wrench TL-323/U.



STEP 9. Cut inner conductor flush with end of contact and flow in rosin core solder leaving a drop at the tip. Smooth and round tip.

Remove the two No. 10-32 set screws. Using an Alemite grease gun with a No. 10-32 adapter, see Section 10-5, Paragraph 3a (1) (d), fill plug with Dielectric Compound until the compound flows out through opposite No. 10-32 hole. Replace set screw for that hole. Turn grease gun handle until a sudden resistance is felt. Back off gun handle to prevent spurting when gun is removed. Remove gun and replace set screw.

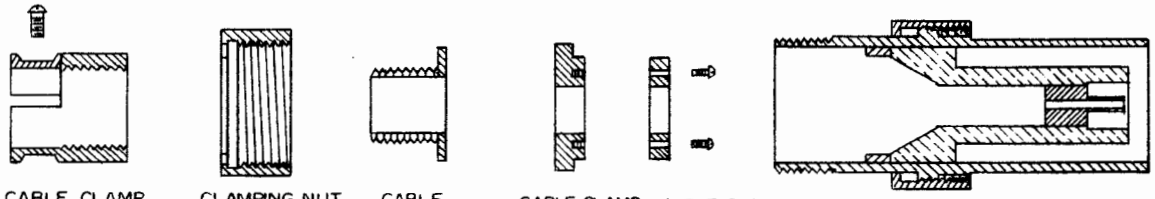
Test the assembly by applying 25 kv, 60 cycle, AC peak for ten minutes. Terminate plugs in sockets to prevent flashing over. If the other end is not terminated in a plug, peel back shielding braid and outer conducting rubber for a distance of 1 inch.

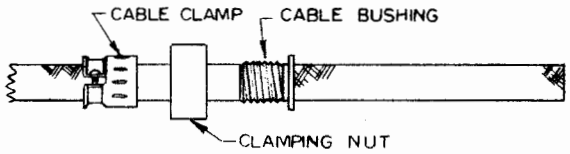
ASSEMBLY INSTRUCTIONS

RF CONNECTOR, PULSE, CERAMIC

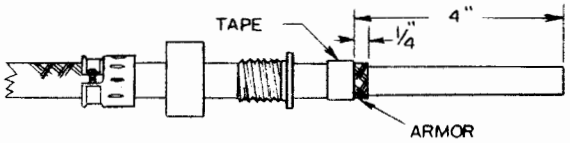
AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
NT 49854	PULSE CONNECTOR, CERAMIC INSERT (MODIFIED UG-36/U)	RG-74/U

ASSEMBLY INSTRUCTIONS

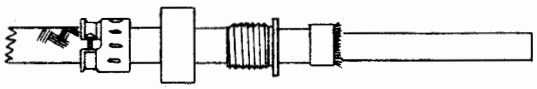




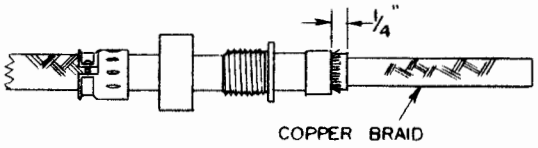
STEP 1. Slip Cable Clamp, Clamping Nut and Cable Bushing over cable.



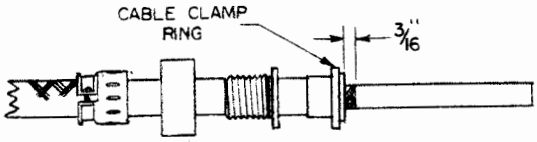
STEP 2. Wrap a piece of tape around cable 4 inches from end. Cut armor 1/4 inch from tape.



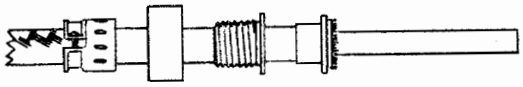
STEP 3. Unweave armor to end of tape and bend out at right angles to cable.



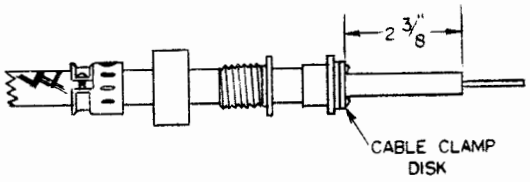
STEP 4. Cut vinyl jacket 1/4 inch from armor.



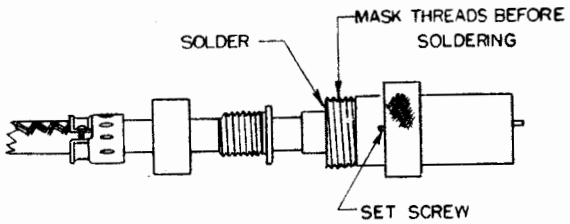
STEP 5. Slide Cable Clamp Ring over copper braid and vinyl jacket to end of armor. Trim off strands of armor to 1/16 inch below outer diameter of Cable Clamp Ring. Cut off copper braid 3/16 inch from Cable Clamp Ring.



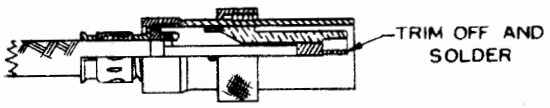
STEP 6. Unweave copper braid to edge of Cable Clamp Ring and fan out at right angles to cable.



STEP 7. Slide Cable Clamp Disk against copper braid and assemble to Cable Clamp Ring with the screws and lockwashers provided. Cut off dielectric 2-3/8 inches from Cable Clamp Disk. Do not nick, bend or otherwise damage inner conductor.



STEP 8. Scrape plating from washer groove at back of Plug. Insert cable assembly into Plug Body guiding center conductor into center contact hole until Cable Clamp Ring is seated in groove. Mask threads. Solder Cable Clamp Ring to Plug by flowing rosin core solder into groove.



STEP 9. Remove piece of tape from cable. Slide Bushing up against armor and screw on the Clamping Nut. Tighten Nut securely with a Spanner Wrench TL-323/U while supporting the Plug housing with a strap wrench. Attach Cable Clamp.

Cut inner conductor flush with end of Center Contact and flow in rosin core solder leaving a drop at the tip. Smooth and round tip.

Remove the two No. 10-32 set screws. Using an Alemite grease gun with a No. 10-32 adapter, see section 10-5, Paragraph 3a (1) (d), fill plug with Dielectric Compound until the compound flows out through the opposite No. 10-32 hole. Replace set screw for that hole. Turn grease gun handle until a sudden resistance is felt. Back off gun handle to prevent spurting when gun is removed. Remove gun and replace set screw.

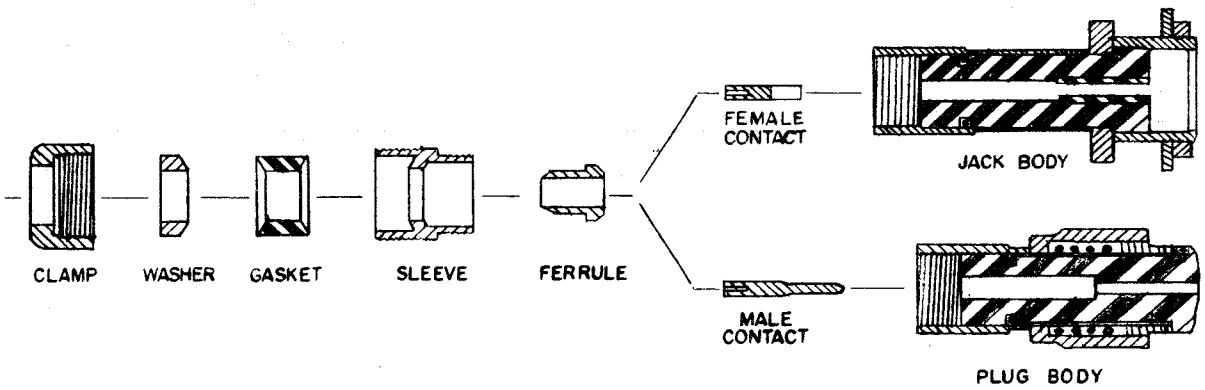
Test the assembly by applying 25kv, 60 cycles, peak AC for 10 minutes. Terminate plugs in sockets to prevent flashing over. If one end is not terminated in a plug, peel back shielding braid.

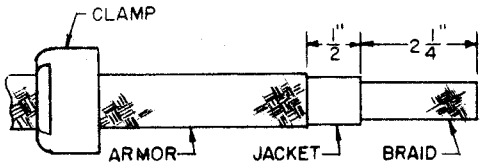
ASSEMBLY INSTRUCTIONS

RF CONNECTOR, PULSE, RUBBER

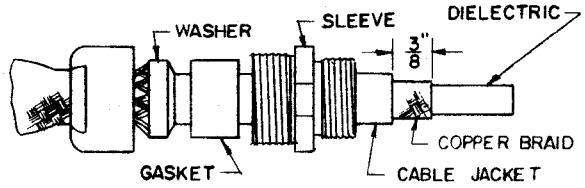
AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
UG-180A/U	PLUG, PULSE CONNECTOR, RUBBER INSERT	RG-64/U RG-64A/U
UG-181A/U	JACK, PULSE CONNECTOR, RUBBER INSERT	RG-77/U RG-78/U
UG-182A/U	JACK	RG-88/U (See Special Assembly)
UG-228/U	JACK	RG-25A/U RG-26A/U
UG-229/U	PLUG	
UG-230/U	PANEL JACK	

ASSEMBLY INSTRUCTIONS

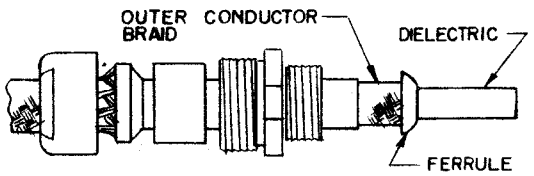




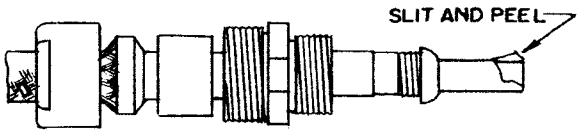
STEP 1. Slide Clamp over armor. Cut armor sharp and square allowing at least 2-3/4 inches for making assembly. Cut jacket sharp and square 1/2 inch from armor cut. Do not damage conductor braid.



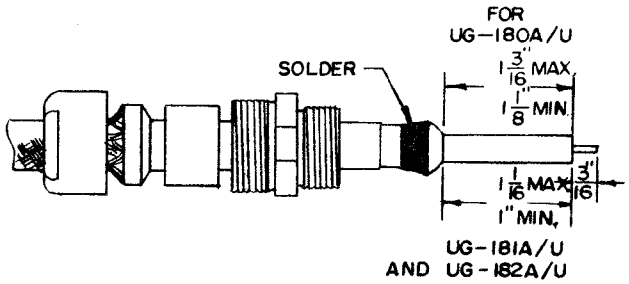
STEP 2. Spread end of armor away from cable. Slide Washer, Gasket and Sleeve over cable and against armor, pushing back armor. Cut off copper braid 3/8 inch from cable jacket.



STEP 3. Slide Ferrule over dielectric and under braids so that Ferrule butts against jacket.

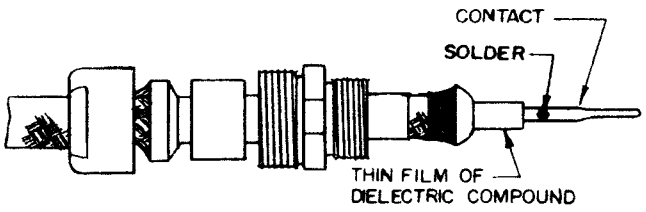


STEP 4. If cable has conducting rubber, split and peel black conducting rubber back and cut off flush with Ferrule. This is not necessary for cables which have a red Neoprene insulating rubber, see section 10-5, Paragraph 3a (1)(c). Seize copper braid with approximately 8 turns of No. 30 tinned copper wire.

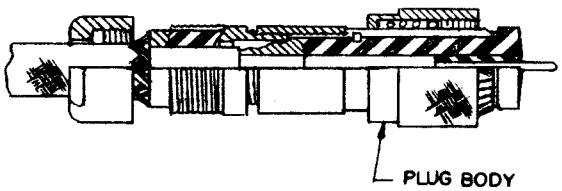


STEP 5. Solder braid wire carefully to Ferrule all around circumference. Be sure solder flows through to all braids. To remove slack in braid for ease of soldering, pull Ferrule forward slightly. Cut cable dielectric to dimension shown in Step 5 for assembly of UG-180A/U or

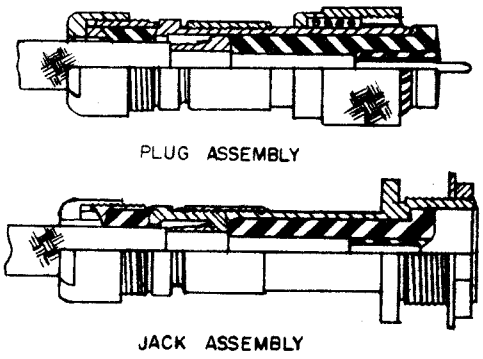
UG-181A/U and UG-182A/U. Do not nick, bend, or otherwise damage inner conductor. Cut inner conductor 3/16 inch from the dielectric.



STEP 6. Check Contact to make sure that it fits over inner conductor and butts against cable dielectric. Tin inner conductor and solder Contact to inner conductor. Remove all excess solder and flux. Make sure Contact is straight and at right angles with face of dielectric.

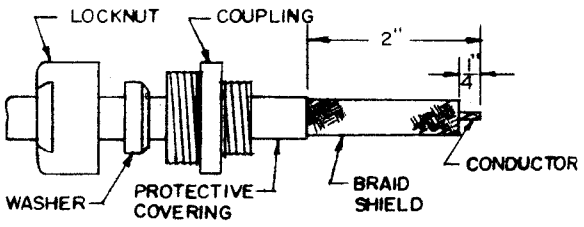


STEP 7. Apply a thin layer of Dielectric Compound to the cable dielectric. Push cable dielectric into Body assembly as far as it will go. If trouble is encountered in making the contact enter the hole in the rubber, insert a guide which may be made from a 3 inch length of No. 14 solid wire with a female contact soldered to one end. For inserting a female contact, a guide with a male contact pin soldered to one end may be used. Wipe off excess Dielectric Compound which may be squeezed out on the front or back end. Hold Body securely with a wrench and insert sleeve and tighten against Ferrule. This should be tightened as much as it will go. Insert Gasket into Sleeve and follow up with Washer. Push armor against Washer and trim flush with outside diameter of Washer. Make sure that Gasket is well seated before trimming armor.



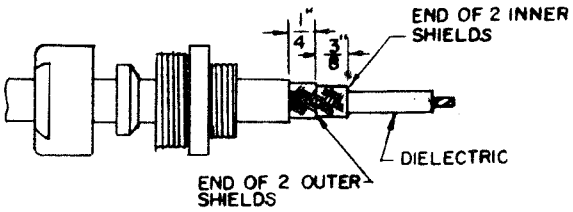
STEP 8-9. Tighten Clamp to Sleeve sufficiently to seal the Gasket around the cable and hold the armor securely. Check complete assembly for correct positioning of Contacts. See Figure 10-8.

SPECIAL ASSEMBLY TO RG-88/U CABLE

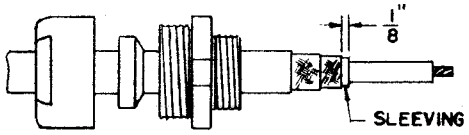


STEP 1. Assemble Locknut, Washer and Coupling over cable.

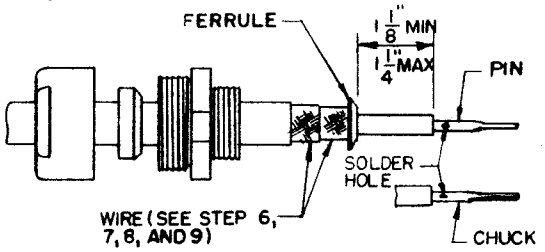
STEP 2. Prepare end of cable to dimensions as shown.



STEP 3. The two outer shields shall be cut 1/4 inch from end of outer covering. The two inner shields 5/8 inch from end of outer covering.



STEP 4. Insert a piece of No. 4 saturated Sleeving 1/2 inch long between shielding and dielectric to dimension shown.



STEP 5. Insert Ferrule over Sleeving and under shielding.

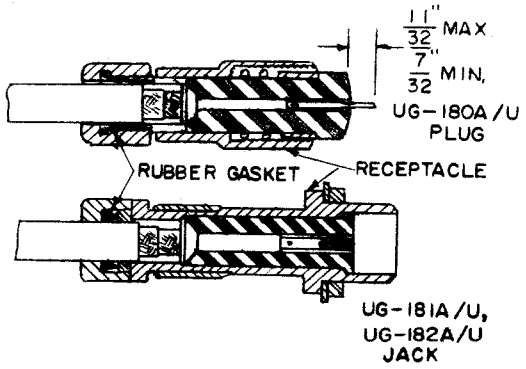
STEP 6. Wrap inner shielding with approximately 8 turns of No. 30 tinned copper wire close to the washer part of Ferrule.

STEP 7. Wrap outer shielding at the point where it was cut with approximately 8 turns of No. 30 tinned copper wire.

STEP 8. Solder entire circumference of the shield braid to Ferrule. Sufficient heat and solder should be applied to secure shield to Ferrule all around.

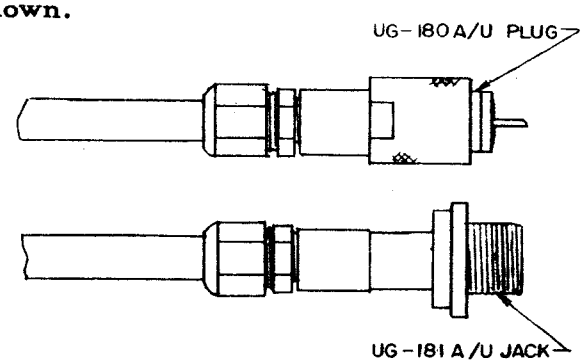
STEP 9. Solder wrapping of the two outer shields as per above mentioned method. Remove excess solder.

STEP 10. Check Contact to make sure that it fits over inner conductor and butts against cable dielectric. Trim inner conductor and solder Contact to inner conductor. Remove all excess solder and flux. Make sure Contact is straight and at right angles with face of dielectric.



STEP 11. Apply liberal quantities of Dielectric Compound to dielectric before inserting.

STEP 12. Insert cable in Receptacle as shown.



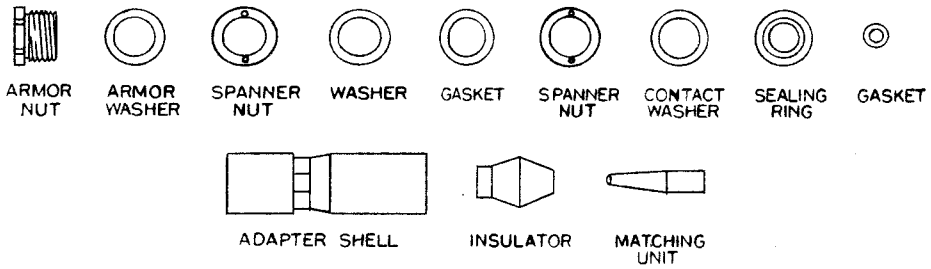
STEP 13. Tighten Coupling to Receptacle. Insert Washer into Coupling and tighten Locknut.

ASSEMBLY INSTRUCTIONS

RF CONNECTOR, CABLE TO RIGID LINE

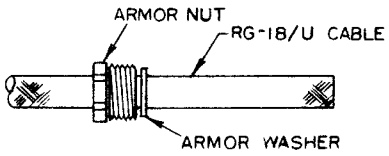
AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
UG-192/U	ADAPTER, HIGH VOLTAGE, PRESSURIZED, CABLE TO 1-5/8" RIGID LINE.	RG-17/U RG-18/U

ASSEMBLY INSTRUCTIONS

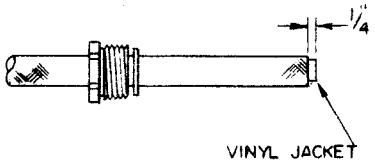


NOTE

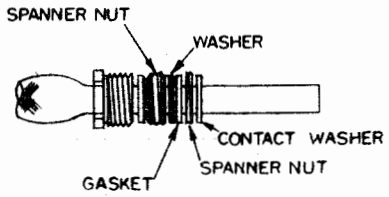
For RG-17/U disregard instructions on armor.



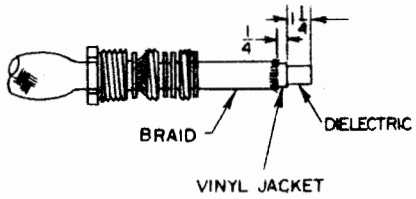
STEP 1. Cut RG-18/U cable to desired length. Place Armor Nut and Armor Washer on cable.



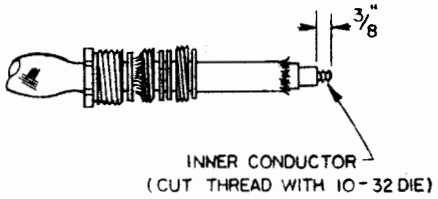
STEP 2. Cut off armor approximately 1/4 inch from end of cable.



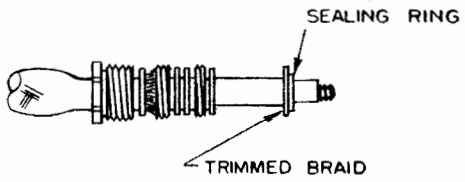
STEP 3. Push armor back out of the way. Slide Spanner Nut, Washer, Gasket, Spanner Nut and Contact Washer over vinyl jacket.



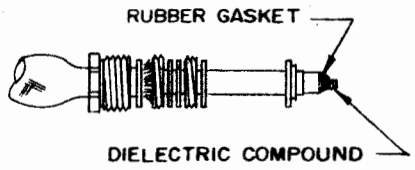
STEP 4. Cut vinyl jacket back 1-1/4 inches from end. Cut braid approximately 1/4 inch from jacket. Fan braid back about 1/4 inch.



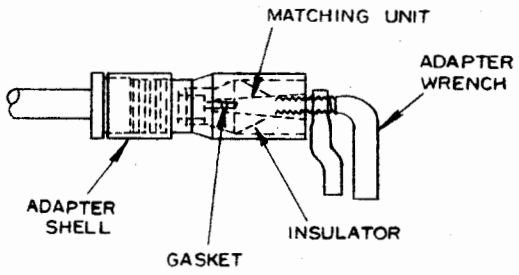
STEP 5. Cut dielectric square and evenly 3/8 inch from end. Do not damage inner conductor. Trim inner conductor over cable using 10-32 die within 1/16 inch from dielectric. Run 10-32 nut over threads cleaning out all copper chips. Smooth and bevel end of threads with small file for easy fit into Matching Unit. Remove 10-32 nut and clean end thoroughly with carbon tetrachloride making sure no copper particles remain on dielectric surface or threaded copper conductor.



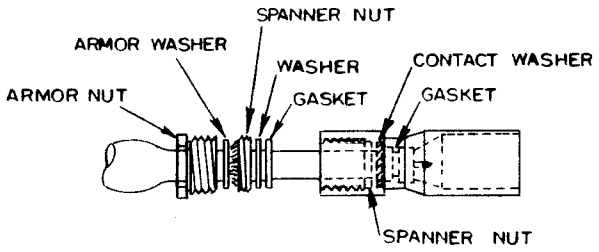
STEP 6. Put on Sealing Ring with flange toward conductor end of cable. Trim braid flush with diameter of Sealing Ring.



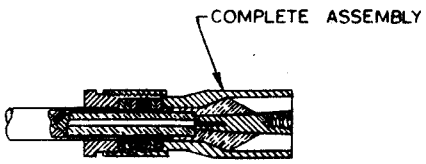
STEP 7. Stretch small rubber Gasket over dielectric of cable end. Push against Sealing Ring. Apply small amount of Dielectric Compound to end of cable on dielectric.



STEP 8. Insert prepared end of cable into Adapter Shell and set Gasket in proper position as shown. Push Contact Washer into Shell. Screw into Shell first Spanner Nut until in contact with but not tight against Contact Washer and braid. Use Spanner Wrench (Type TL-323/U). If adapter is to be coupled to 1-5/8 inch air line by means of solderless coupling, it will be necessary to solder proper end of inner conductor connector of solderless coupling into Matching Unit.



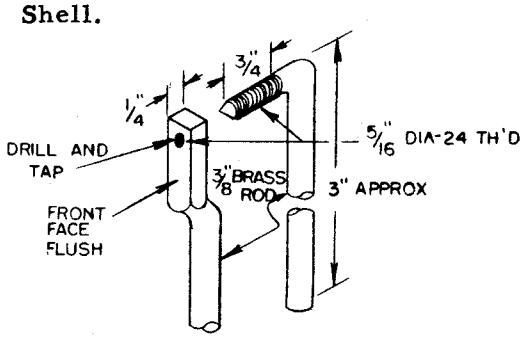
STEP 9. Apply small amount of Dielectric Compound into cable end of Insulator and Matching Unit. Insert Matching Unit and Insulator into Adapter Shell. Thread Matching Unit and Insulator assembly tightly into Shell onto the threaded inner conductor, using an adapter wrench constructed as shown under Adapter Wrench Details. Do not use pliers. Retighten first Spanner Nut, push in Gasket and Washer and screw in second Spanner Nut tight. Form armor and armor Washer into end of Shell after properly trimming or cutting armor and secure by tightening Armor Nut.



STEP 10. Shows completed assembly.

NOTE

Matching Unit should be flush with outside edges of Adapter Shell.



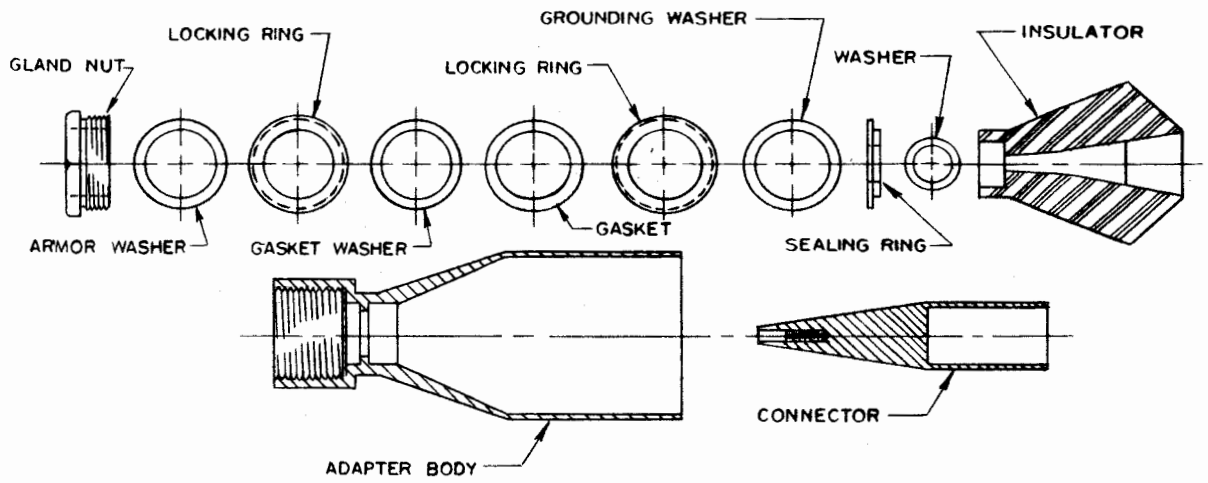
ADAPTER WRENCH DETAILS

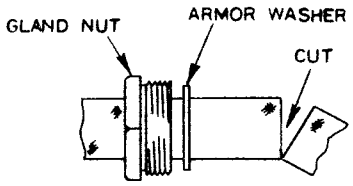
ASSEMBLY INSTRUCTIONS

RF CONNECTOR, CABLE TO RIGID LINE

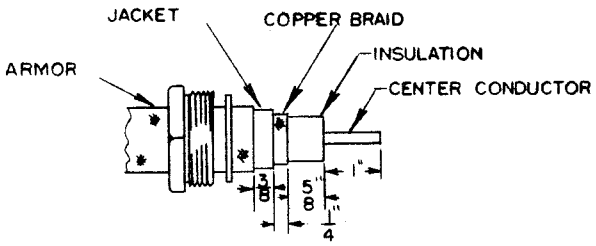
AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
UG-161/U	ADAPTER, CABLE TO 3-1/8" RIGID LINE (PRESSURIZED)	RG-19/U RG-20/U

ASSEMBLY INSTRUCTIONS

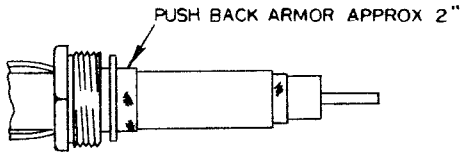




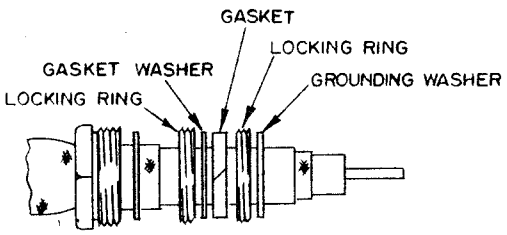
STEP 1. Cut end of cable to desired length. Slide Gland Nut and Armor Washer over armor.



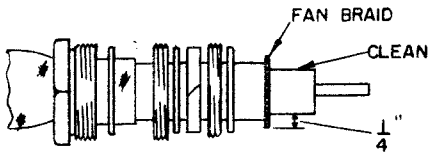
STEP 2. Cut armor sharp and square at desired point. Point of armor cut may be determined by using Adapter Body as guide. Allow 1/4 inch for fanning out the armor. Cut jacket, copper braid, insulation and center conductor as shown. Do not nick, or cut jacket, copper braid, or center conductor.



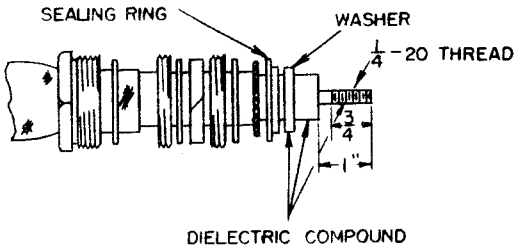
STEP 3. Push armor back on cable about 2 inches by bulging armor.



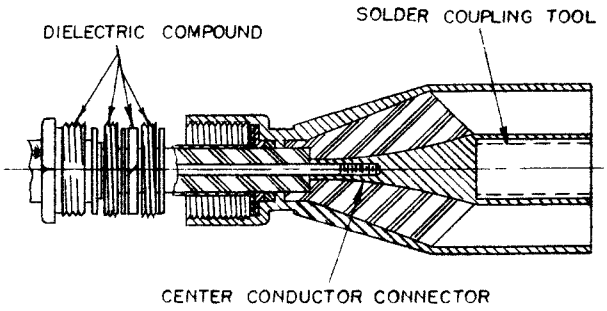
STEP 4. Slide Locking Ring, Gasket Washer, Gasket, Locking Ring, and Grounding Washer over cable jacket.



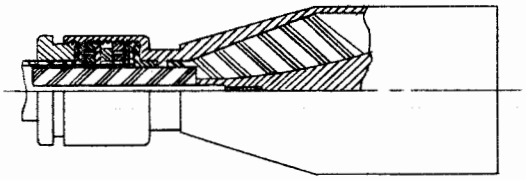
STEP 5. Fan out copper braid at jacket. Trim loose and ragged ends with cutters or scissors, so that no strands extend beyond outside diameter of Grounding Washer. Clean loose metal particles from insulation.



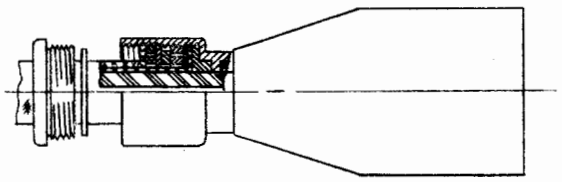
STEP 6. Slide Sealing Ring and Washer over cable dielectric. Thread center conductor with 1/4 x 20 die, 3/4 inch from end. Clean all metal particles from threads and dielectric by washing with carbon tetrachloride. Check connector to make sure threads start easily.



STEP 7. Apply a small amount of Dielectric Compound to end of cable dielectric, Washer, Gasket and threads. Insert cable assembly into Adapter Body with Insulator in Body making sure that cable, Washer, and Sealing Ring seat in their proper recesses. Screw Connector onto threaded center conductor by first soldering a coupling tool made to take a wrench or by cutting small hole or slot in end of Connector wall and using an offset tool.



COMPLETE ASSEMBLY



STEP 8. Push Grounding Washer into place and follow up with Locking Ring. Screw Locking Ring tightly into place by using spanner wrench TL-322/U. Push Gasket, Gasket Washer and second Locking Ring into place and tighten securely.

STEP 9. Fan out 1/4 inch of armor and push armor into Body by smoothing bulge in armor. Screw Gland Nut against Armor Washer, tightly, securing armor in place. Check center Connector and retighten on threaded center conductor if necessary.

NOTE

In removing soldered connector tool, do not apply excess heat as Insulator may be damaged. This also applies to securing Adapter to Air Line.

ASSEMBLY INSTRUCTIONS

RF CONNECTOR, ADAPTER, CABLE TO RIGID LINE

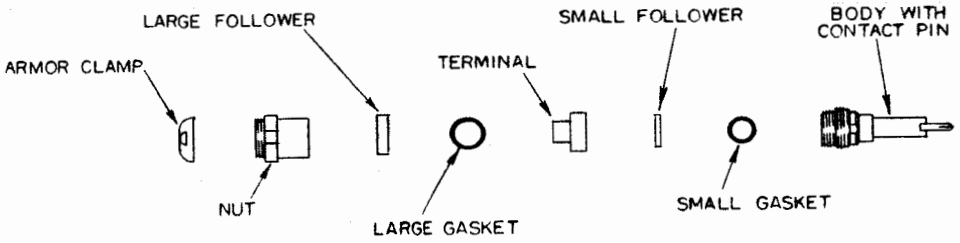
AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
NT 49531	ADAPTER, CABLE TO RIGID 7/8", 50 OHM LINE	RG-17/U RG-18/U
NT 49553	ADAPTER, CABLE TO RIGID 7/8", 70 OHM LINE	

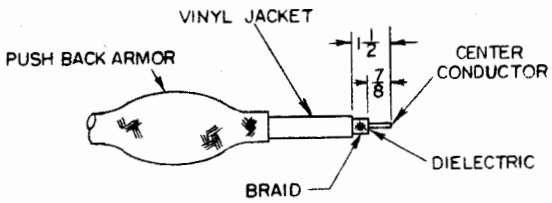
NOTE

NT 49531 IS SUPERSEDED BY UG-234/U

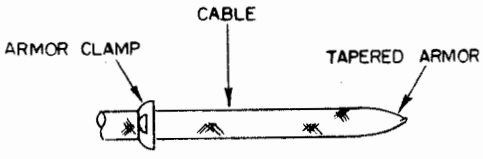
NT 49553 IS SUPERSEDED BY UG-233/U

ASSEMBLY INSTRUCTIONS

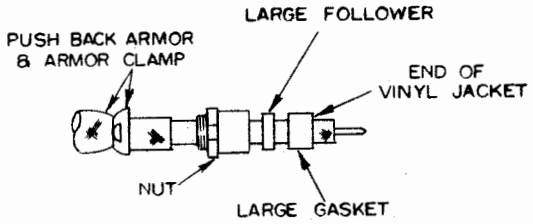




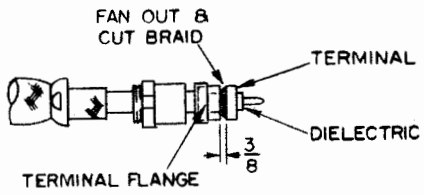
STEP 1. Push armor back. Cut off vinyl jacket approximately 1-1/2 inch from end. Cut off braid and dielectric approximately 7/8 inch from end. Do not nick center conductor. Scrape and thoroughly clean center conductor. Use carbon tetrachloride, making sure no copper particles remain on dielectric. Round off end of center conductor with file. Dimensions should be as shown.



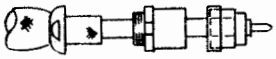
STEP 2. Pull armor forward over end and taper as shown. Slide Armor Clamp over armor.



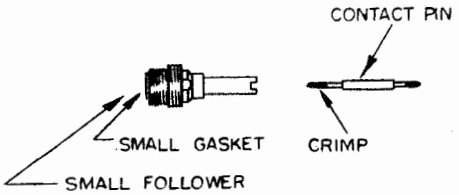
STEP 3. Push armor and Armor Clamp back. Slide Nut on over vinyl jacket. Slide Large Follower on over vinyl jacket. Work Large Gasket over vinyl jacket until edge of Gasket is flush with end of vinyl jacket as shown. Coat Large Gasket with Dielectric Compound.



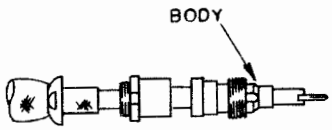
STEP 4. Slide Large Follower against Large Gasket. Fan out braid as shown. Slide Terminal on over dielectric and under braid until shoulder of Terminal is 3/8 inch form end of vinyl jacket. With Terminal flange protecting the dielectric, cut off the braid even with end of vinyl jacket and edge of Large Gasket.



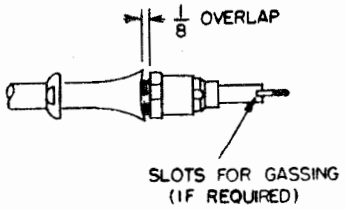
STEP 5. Force Terminal toward Large Gasket until shoulder of Terminal is flush with end of braid, vinyl jacket and edge of shoulder of Large Gasket.



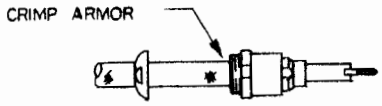
STEP 6. Remove Contact Pin from Body as shown. It may be necessary to cool Body to permit the Contact Pin to slide out with ease. Crimp the Contact Pin slightly with crimping pliers so that center conductor of cable when inserted makes good contact with pin. Coat end of dielectric in Body and Small Gaskets with thin film of Dielectric Compound. Do not use excessive amount of compound. Replace Contact Pin in Body. Place Small Gasket in recess in end of Body. Place Small Follower over Small Gasket so that the rim of Small Follower fits within recess of Body.



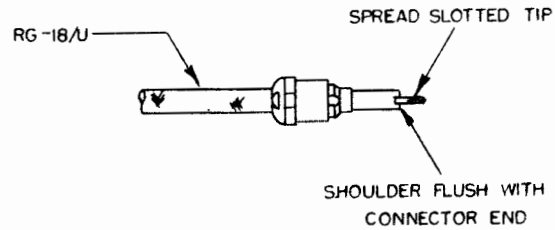
STEP 7. Slide Body into place (as shown) carefully, so that center conductor enters Contact Pin properly. Cable dielectric should butt against dielectric in body. Keeping Body in place, (with the dielectric butted together) screw Terminal very tight. Make sure Small Follower does not bind between Body and Terminal.



STEP 8. Slide Nut over Terminal and screw Nut tightly on Body. (Hold cable and Body firmly while tightening Nut.) Pull armor over Nut as far as possible and cut off armor leaving 1/8 inch overlap (as shown).



STEP 9. Crimp (turn up) edge of armor approximately 1/8 inch from end and smooth against rear end of Nut as shown. Cut any long strands which might otherwise jam threads of Nut and Armor Clamp.



STEP 10. Slide Armor Clamp forward and tighten. Be sure to securely catch the 1/8 crimp of armor between Armor Clamp and Nut. Shoulder on Contact Pin should be flush with end of connector.

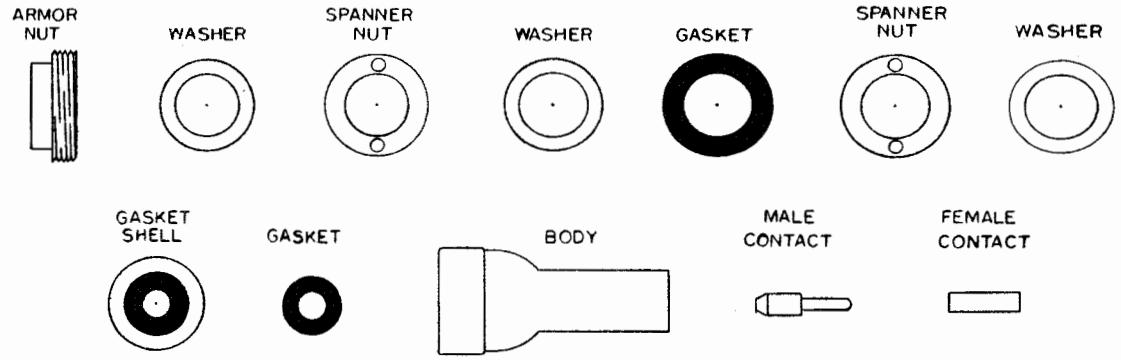
NOTE: Suitable solderless coupling may be used to couple connector to 7/8 inch rigid line. If solderless coupling has provision for gassing, gas inlet should be positioned in line with slots in Body. Be sure to spread slotted tip of Contact Pin to fit properly into center conductor of 7/8 inch line. Scrape and thoroughly clean inside of center conductor of 7/8 inch line.

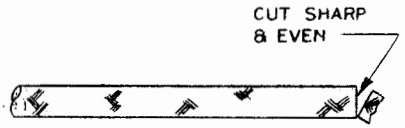
ASSEMBLY INSTRUCTIONS

RF CONNECTOR, CABLE TO RIGID LINE

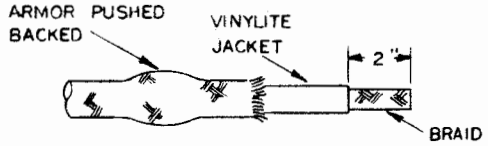
AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
NT 49577	ADAPTER, LOW VOLTAGE, PRESSURIZED, CABLE TO 7/8" RIGID LINE	RG-35/U

ASSEMBLY INSTRUCTIONS

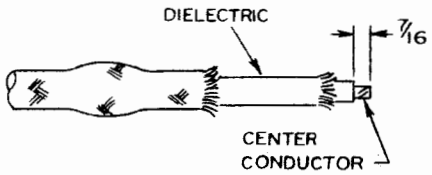




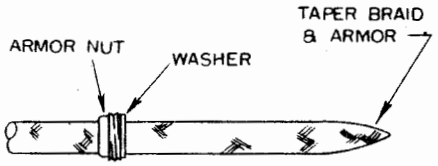
STEP 1. Cut end of cable sharp and even.



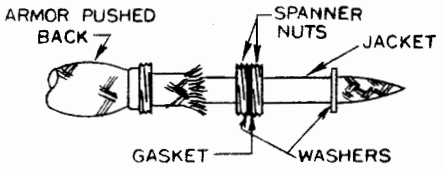
STEP 2. Push armor back approximately 5 inches. Cut off vinylite jacket 2 inches from end of cable. Do not nick braid.



STEP 3. Fan 1/2 inch of copper braid out as shown. Cut off cable dielectric 7/16 inch from end sharp and even. Do not nick center conductor.

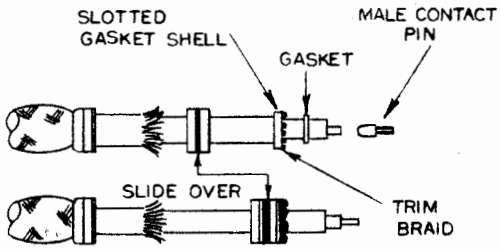


STEP 4. Push armor toward end and taper end of braid and armor. Slide Armor Nut and Washer on over the armor.



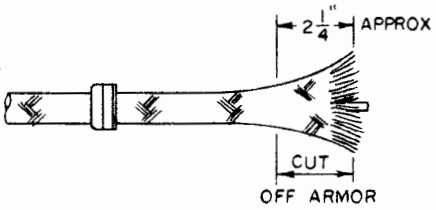
STEP 5. Push armor and Armor Nut and Washer back. Slide Spanner Nut, Washer, Gasket and Spanner Nut over vinylite jacket. Slide Washer over braid and up to vinylite jacket.

STEP 6. Fan out copper braid around Washer as shown.

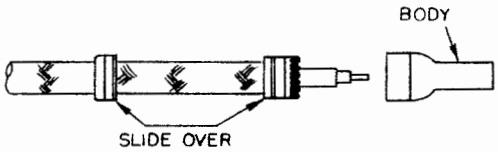


STEP 7. Trim braid even with outside diameter of Washer. Place Gasket Shell over cable dielectric and push back against braid. Place Gasket on cable dielectric. Tin inner conductor using minimum amount of heat.

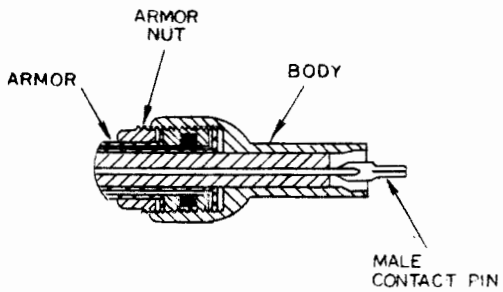
STEP 8. Slide Gasket into slotted Gasket Shell and bend slotted corners of Gasket Shell inward to contain Gasket. Holding Contact Pin with pliers, soft solder Contact Pin to center conductor. Do not use excess solder, wipe clean. See that end of cable insulation is clean and free of solder, resin, and foreign material. Slide Spanner Nut, Gasket, and second Spanner Nut up to Washer and Gasket Shell.



STEP 9. Pull armor up as far as possible. Cut off 2-1/4 inches from end of armor.



STEP 10. Push armor back and place end of armor (fanned out and then trimmed) flush with circumference of Spanner Nut. Slide Armor Nut and Washer up to Spanner Nut tight. Slide Body into place and properly tighten Body and Nut with Spanner Wrench TL-323/U.



STEP 11. Completed assembly shown in enlarged section.

ASSEMBLY INSTRUCTIONS

RF CONNECTOR, JONES PLUG TO CABLE

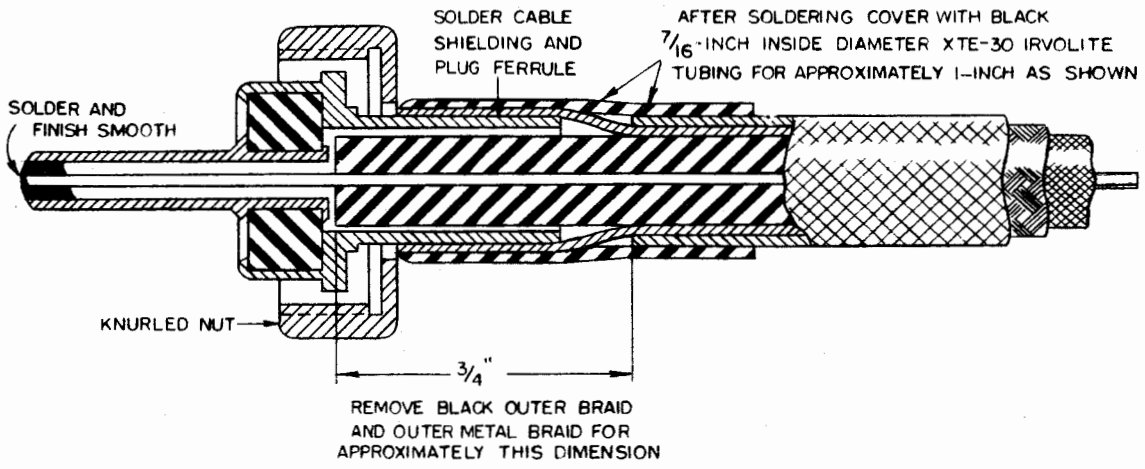
AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
NT 49458 *	JONES PLUG	RG-11/U RG-12/U RG-13/U

* These connectors are obsolete. Use standard connectors whenever possible.

NOTE

FOR STRAIN RELIEF CLAMP, SEE SECTION 10-5, PARAGRAPH 2k.

ASSEMBLY INSTRUCTIONS



ASSEMBLY INSTRUCTIONS

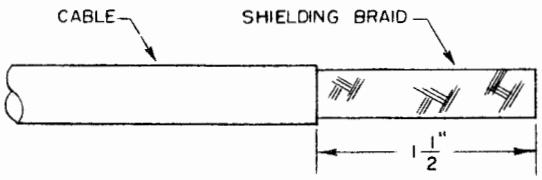
RF CONNECTOR, AMPHENOL 93 SERIES

TYPE	DESCRIPTION	CONNECTS TO
AMPHENOL 93	PLUG	RG-8/U RG-10/U RG-11/U RG-12/U

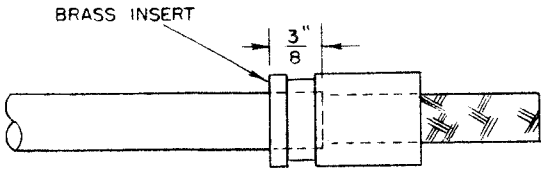
NOTE

These connectors are obsolete. Use standard connections whenever possible.

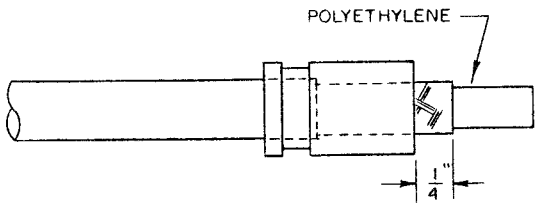
NOTE: These plugs must be fitted with brass sleeve inserts to insure a good RF connection between the outer shell of the cable and the plug. In making up this cable, care must be exercised to prevent filings from falling between the center conductor and the brass insert. As many as five out of six connections checked on one job were found to have this trouble.



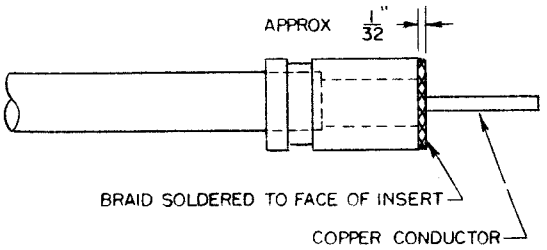
STEP 1. Take the Connector apart and slip the Rear Shell over the cable. Remove 1-1/2 inches of the jacket from cable. If armored, push back as necessary.



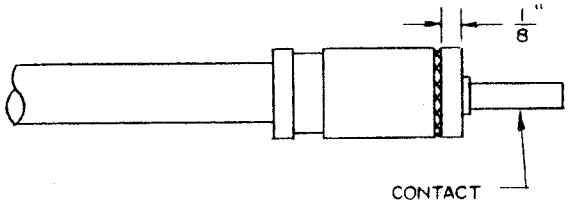
STEP 2. Slip Brass Insert fitting over cable, so that the jacket enters 3/8 inch into the fitting.



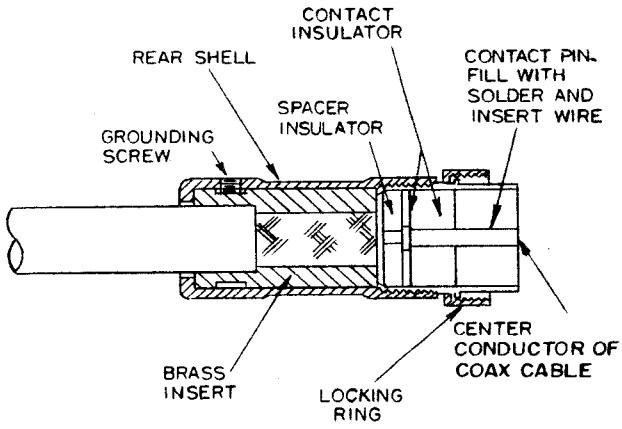
STEP 3. 1/4 inch from front of Insert cut through the shielding braid. Flare out the end of the remaining end (1/4 inch) of the braid so that it lies flat against the front vertical edge of the Insert.



STEP 4. Solder braid to the front face of the Insert, pressing the braid flat until the braid and solder are approximately 1/32 inch thick as indicated. Clean the surface thoroughly and trim away the braid extending beyond the face of the fitting. Cut the insulation at the front edge of the Insert and slip off, exposing the copper conductor.



STEP 5. Solder Contact in place after slipping it over conductor, leaving 1/8 inch for Spacer Insulator.



STEP 6. Assemble and thoroughly tighten Plug.

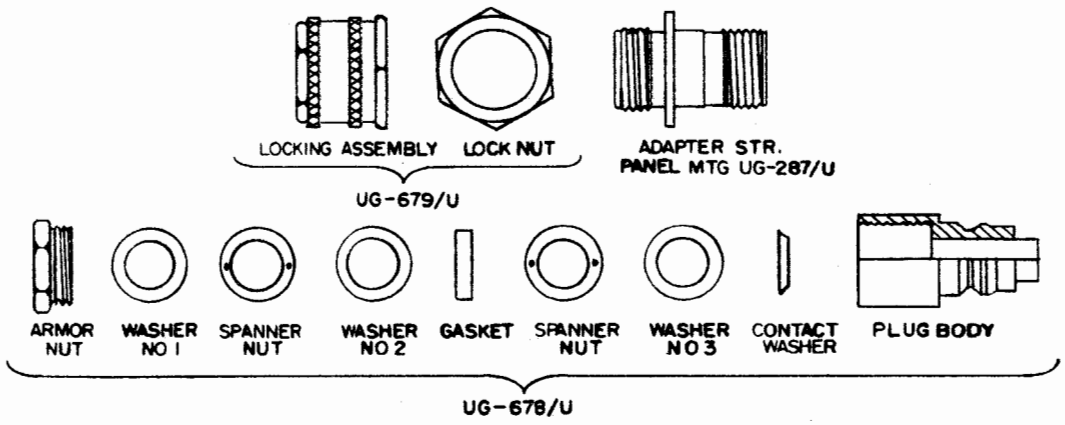
ASSEMBLY INSTRUCTIONS

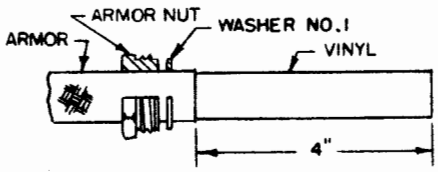
RF CONNECTOR, QUICK DISCONNECT

AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
UG-678/U	QUICK DISCONNECT CONNECTOR	RG-17/U RG-18/U
UG-679/U	ADAPTER LOCKING ASSEMBLY USED WITH UG-287/U. TO MATE WITH UG-678/U.	

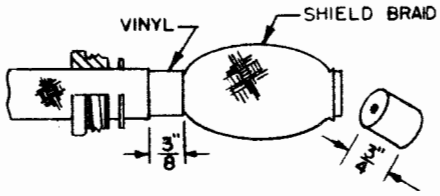
NOTE: Before assembly is made, connector should be properly positioned on Adapter. To position, screw lock nut and locking assembly (UG-679/U) on adapter UG-287/U and mate with assembled UG-678/U as shown in Step 8 without RG-17/U or RG-18/U cable connected. With Locking Nut bottomed, screw Locking Assembly (UG-679/U) and Connector Body (UG-678/U) onto Adapter (UG-287/U) until split fingers come up against shoulder in Adapter. This should only be brought up finger tight. Test slip ring to make sure it slips back easily. If it does not, loosen Locking Assembly. When slip ring slips back freely, bring back up Lock Nut, locking Assembly in place. Remove Connector Body (UG-678/U) and assemble to RG-18/U cable as follows.

ASSEMBLY INSTRUCTIONS

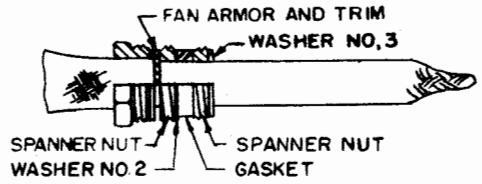




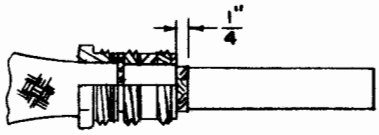
STEP 1. Slip Armor Nut and Washer No. 1 over cable armor. Cut armor sharp and square at desired point allowing approximately 1/4 inch for fanning the armor. Allow approximately 4 inches for making connector assembly.



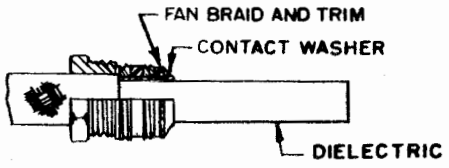
STEP 2. Cut cable jacket sharp and square with knife 3/8 inch from cut of armor. Do not damage conductor braid. Push back shield conductor braid and cut off approximately 3/4 inch of dielectric and inner conductor.



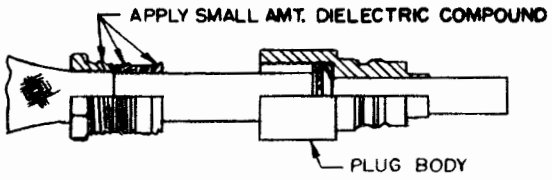
STEP 3. Pull braid forward and taper to a point. Fan 1/4 inch of armor against Washer No. 1 and trim flush with Washer. Slide Spanner Nut, Washer No. 2, Gasket and Spanner Nut against fanned out armor pushing back armor to allow parts to slide over jacket. Slide Washer No. 3 over braid and against jacket.



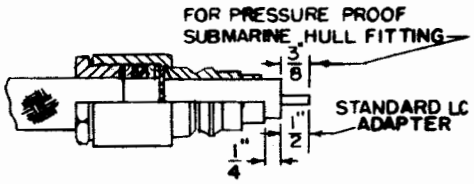
STEP 4. Cut off braid 1/4 inch from Washer and fan against Washer. Trim flush with outside diameter of Washer.



STEP 5. Slide Contact Washer against fanned out braid. Split fingers on Contact Washer should extend toward end of cable.



STEP 6. Push Spanner Nut, Washers and Gasket back bulging armor and allowing approximately 2 inches for Spanner wrench. Insert prepared end of cable into Plug Body.



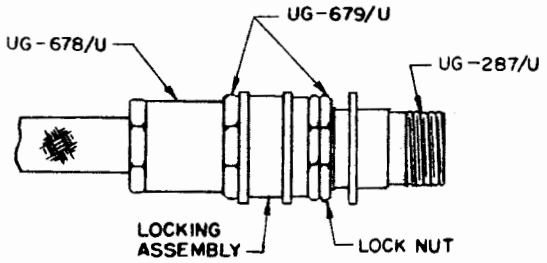
STEP 7. Apply a small amount of Dielectric Compound to Spanner Nut threads and Gasket. Screw Spanner Nut No. 1 tightly into Body using wrench TL-323/U. Slide Gasket and Washer No. 2 into Body. Screw Spanner No. 2 tight against Washer No. 2. Push armor and Washer No. 1 into Body smoothing bulge in armor. Screw up Armor Nut tightly securing armor. Cut dielectric 1/4 inch from split fingers. Do not nick inner conductor. Remove dielectric with gas pliers. Cut center conductor 1/2 inch from dielectric for standard "LC" Adapter UG-287/U.

If fitting is to be used with pressurized submarine hull fitting, cut center conductor 3/8 inch from dielectric. Round off center conductor with file.

CAUTION

Make sure no filings are left on dielectric.

Before mating this assembly, coat face of dielectric on cable and in Adapter with Dielectric Compound.



NOTE

Be sure cable dielectric butts against dielectric face in UG-287/U adapter to eliminate air space and subsequent voltage breakdown.

CAUTION

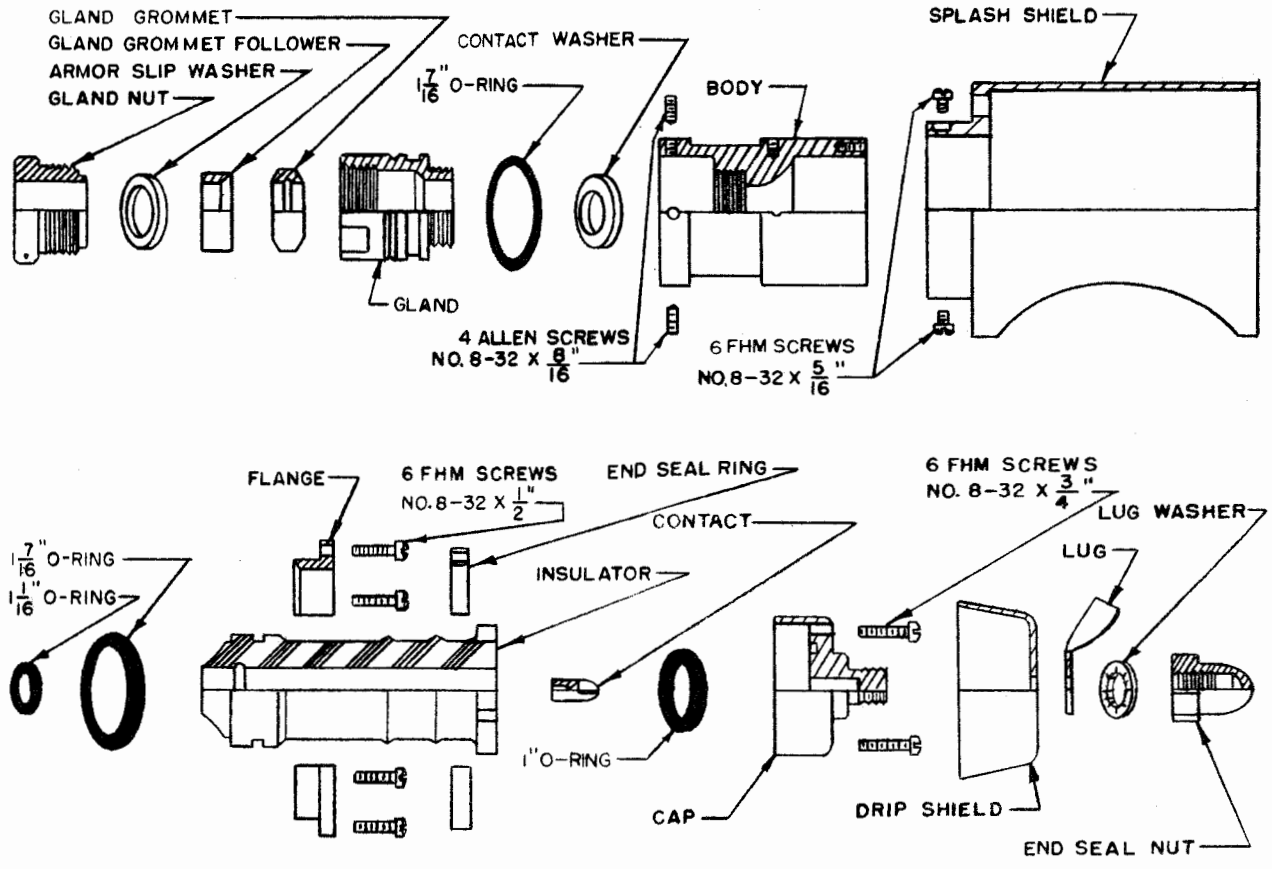
Do not apply paints or varnishes to Locking Assembly.

ASSEMBLY INSTRUCTIONS

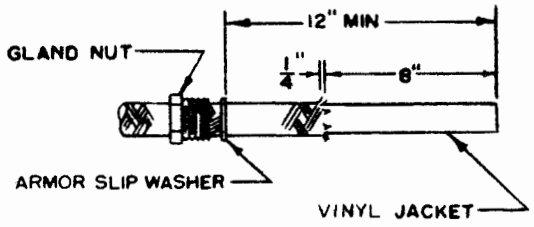
END SEAL, PRESSURE-PROOF

AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
MX-1203/1"	END SEAL	RG-17/U RG-18/U

ASSEMBLY INSTRUCTIONS



NOTE: The following instructions are based on the use of RG-18/U cable. If RG-17/U cable is used, omit the instructions concerning the armor braid but retain the Armor Slip Washer.

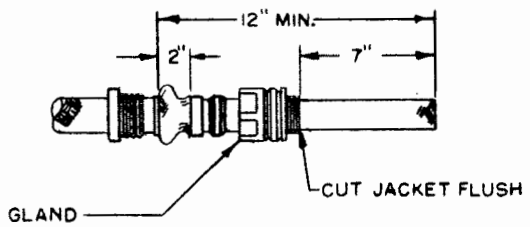


STEP 1. Disassemble the following parts after loosening the four Allen set screws, the Gland Nut, Armor Slip Washer, Gland Grommet Follower, Gland Grommet, Gland, and Contact Washer. From the other end remove the End Seal Nut, Lug Washer, Lug, Drip Shield, six fillister head machine screws (No. 8-32 x 3/4"), the Cap with O-ring, and the two halves of the End Seal Ring.

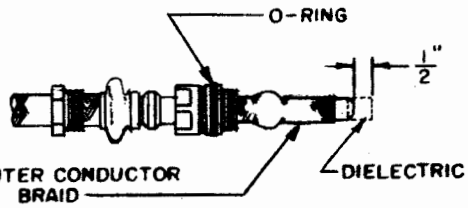
CAUTION

Do not lose any of the parts.

Cut RG-18/U cable to desired length. Slide Gland Nut and Armor Slip Washer over the armor and at least 12 inches back from the end. Cut off and discard 8 inches of armor. Do not damage jacket. Fan out 1/4 inch of remaining armor. Taper end of jacket to facilitate Step 2.



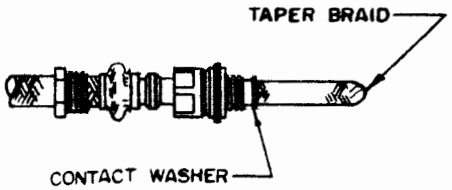
STEP 2. Slide Gland Grommet Follower against the fanned out armor and push armor back about 2 inches forming a bulge. Slide Gland Grommet and Gland against Follower. Place 1-7/16 inch O-ring in U-shaped groove in Gland. Cut cable jacket back 7 inches from end. End of Gland should be used as a guide to insure a square cut. Do not damage outer conductor braid.



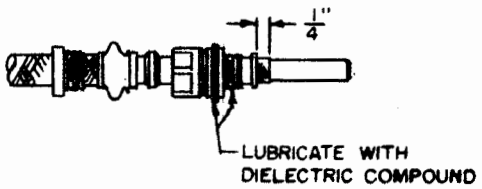
STEP 3. Push outer conductor braid back and cut off dielectric and inner conductor 1/2 inch back from end. Taper end of dielectric about 1/8 inch back with pocket knife.

NOTE

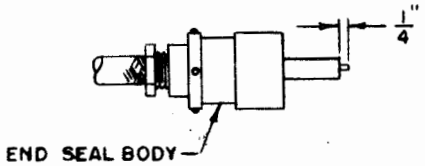
This step is important to facilitate succeeding steps.

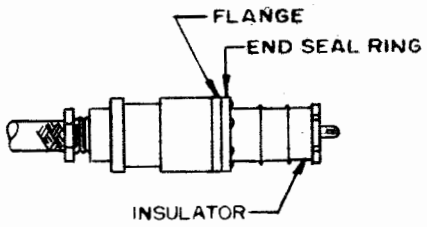


STEP 4. Pull braid over end of dielectric and taper to a point. Slide Contact Washer over braid and against cable jacket.



STEP 5. Fan out braid against Washer and trim flush with outside diameter of Contact Washer. Lubricate O-ring on Gland and Gland threads with small amount of Dielectric Compound.



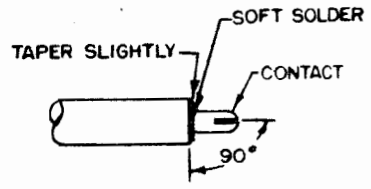


STEP 6. Make sure that set screws in Body are fully retracted or removed to avoid damage to O-ring. Push cable into Body until braid makes contact with shoulder. Slide Gland into Body and screw firmly into place using a wrench.

NOTE

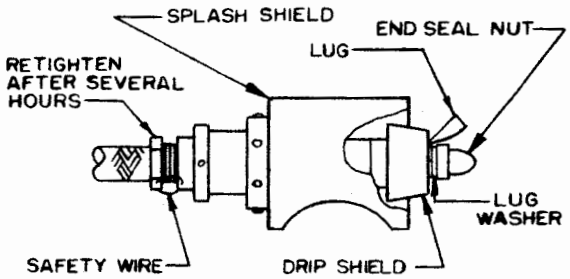
Hold Body and turn Gland.

Tighten set screws into V-shaped groove in Gland. Push Gland Grommet into recessing Gland using a Packing Stick to prevent damage to Grommet or jacket. Push Gland Grommet Follower against Grommet. Extend armor until it is against Follower and push Armor Washer against it with Gland Nut. Screw Gland Nut into cable Gland as tightly as possible using a wrench. Slide End Seal Insulator over dielectric and into Body as far as possible. Mark dielectric of cable flush with end of Insulator and remove Insulator. Do not mar surface of Insulator. This is an O-ring sealing surface. Cut dielectric back 1/4 inch from end. Clean and tin inner conductor.



STEP 7. Push Contact against dielectric and soft solder to inner conductor. Slight taper on end of dielectric.

STEP 8. Place 11/16 inch O-ring and 1-7/16 inch O-ring in inner and outer grooves of Insulator and lubricate with Dielectric Compound. Push Insulator over dielectric and into Body. Place two parts of Flange around Insulator and push into Body. Line holes in Flange with threaded holes in Body. Insert screws and tighten. Thread soft brass safety wire through holes in slip, wiring them together in pairs in such a manner that tightening the wire tends to tighten the screws. See Safety Wiring Detail.



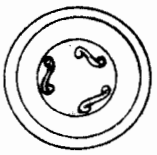
STEP 9. Place remaining 1 inch O-ring into groove in Cap and lubricate with Dielectric Compound. Push Cap over Insulator and onto Contact until Cap butts against end of Insulator.

Place two parts of End Seal Ring around Insulator and push back two parts of End Seal Ring around Insulator and push into Cap. Make sure curved position of End Seal Ring is against Insulator. Line up holes in Insulator with threaded holes in Ring. Insert screws and tighten. Thread soft brass safety wire through holes as shown in Safety Wiring Detail.

If the End Seal is mounted where wave splash or heavy spray is likely to occur, place splash shield over body. Line up holes in splash shield with threaded holes in Body and secure Seal with screws and lockwashers. The hand hole is to permit cleaning the Insulator and, if the end seal is mounted horizontally, it also serves as a drain hole.

Solder End Seal Lug to antenna lead if End Seal is to be mounted vertically. Place End Seal Drip Shield over thread end of Cap. The Drip Shield need not be used if the End Seal is mounted in a horizontal position. Place Lug and Lug Washer over threads on Cap and screw End Seal Nut onto Cap and tighten using wrench.

Gland Nut should be retightened several hours after initial tightening since the jacket and dielectric have some cold flow. Insert the soft brass Safety Wire in the Gland and Gland Nut and twist the ends together in such a manner that the Nut cannot loosen.



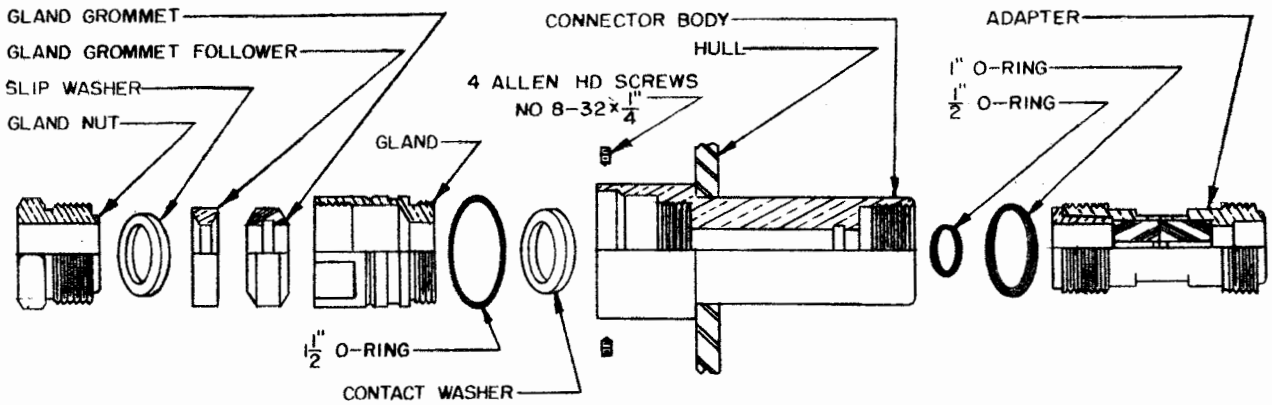
SAFETY WIRING DETAIL

ASSEMBLY INSTRUCTIONS

RF CONNECTOR, PRESSURE-PROOF

AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
UG-640/U	RECEPTACLE CONNECTOR, PRESSURE-PROOF, HULL, CABLE TO TYPE LC	RG-17/U RG-18/U

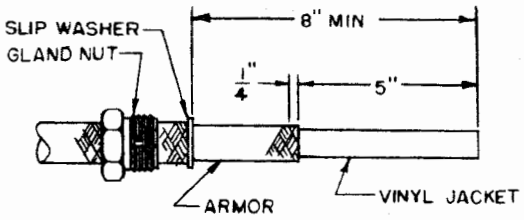
ASSEMBLY INSTRUCTIONS



NOTE: The following instructions are based on the use of RG-18/U Cable. If RG-17/U Cable is used, omit the instructions concerning the armor braid but retain the cable Armor Slip Washer.

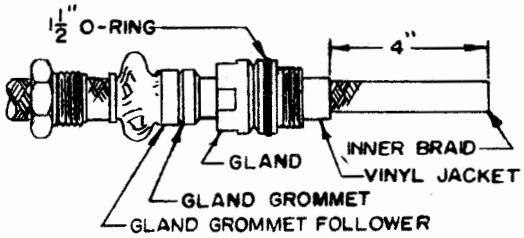
INBOARD END

After Connector Body has been welded into the hull (inboard), insert 1/2 inch O-ring into internal groove in inboard end. Lubricate O-ring with small amount of Dielectric Compound.

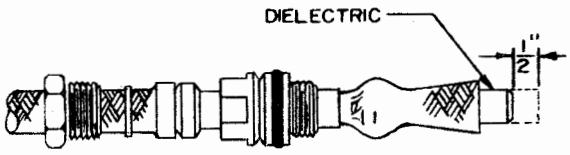


OUTBOARD END

STEP 1. Allow about one foot of cable for making fitting. Cut RG-18/U cable to the desired length and slide Gland Nut and Armor Slip Washer over the armor end and at least 8 inches back from the end. Cut off and discard 5 inches of armor. Fan out 1/4 inch of the remaining armor. Do not damage the jacket.



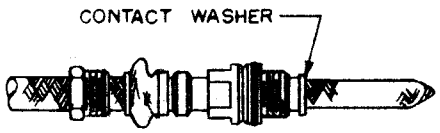
STEP 2. Slide Gland Grommet Follower against the fanned out armor and push armor back about 2 inches. Slide Gland Grommet and Gland against Follower. Place 1-1/2 inch O-ring in U-shaped groove in the Gland. Cut cable jacket back 4 inches from the end. End of Gland may be used as a guide to insure a square cut. Do not damage outer conductor braid.



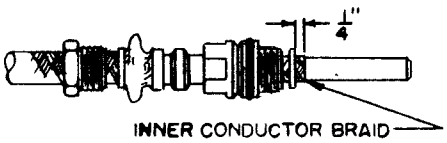
STEP 3. Push outer conductor braid back and cut off dielectric and inner conductor 1/2 inch back from end. Taper the end of the dielectric about 1/8 inch back with pocket knife.

NOTE

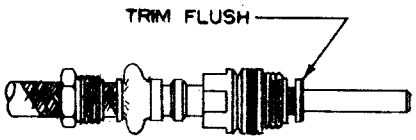
This step is important to facilitate insertion of dielectric through O-ring in fitting.



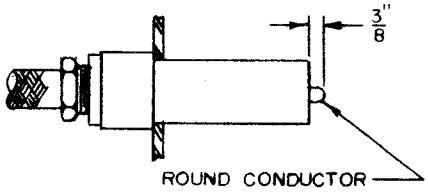
STEP 4. Pull braid over end of dielectric and taper to a point. Slide Contact Washer over braid and against the cable jacket.



STEP 5. Cut off braid 1/4 inch from Washer.



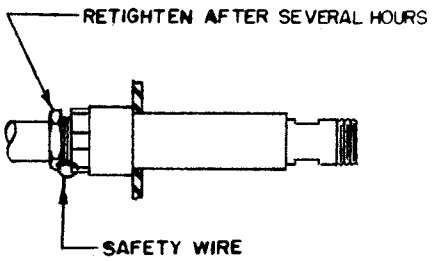
STEP 6. Fan out braid against Washer and trim flush with outside diameter of Washer.



STEP 7. Lubricate O-ring on Gland with small amount of Dielectric Compound. Make sure that set screws in Connector Body are fully retracted, or remove to avoid damage to the O-ring. Push cable into Connector Body until braid makes contact with the shoulder. Slide Gland into Body and screw into place firmly using wrench. Tighten set screws into V-shaped groove in Gland. Push Gland Grommet into recess in Gland using dull tool such as a Packing Stick to prevent damage to Grommet or jacket. Push Grommet Follower against Grommet. Extend armor until it is against Follower and push Armor Slip Washer against it with Gland Nut. Screw Nut into Gland as tightly as possible using wrench.

STEP 7. INBOARD END

Cut the cable dielectric off flush with the end of the Connector Body. Do not damage the inner conductor. Cut the inner conductor off 3/8 inch from the end of the dielectric and round off the inner conductor.



STEP 8. Lubricate 1 inch O-ring with Dielectric Compound. Push into unthreaded space behind threads in Connector Body. Coat face of cable dielectric with Dielectric Compound. Screw Adapter into Connector Body as far as possible using a wrench.

Gland Nut should be retightened several hours after initial tightening since the jacket and dielectric have some cold flow. After retightening, insert the soft brass safety wire into the holes in the Gland and Gland Nut and twist the ends together in such a manner that the nut cannot be loosened.

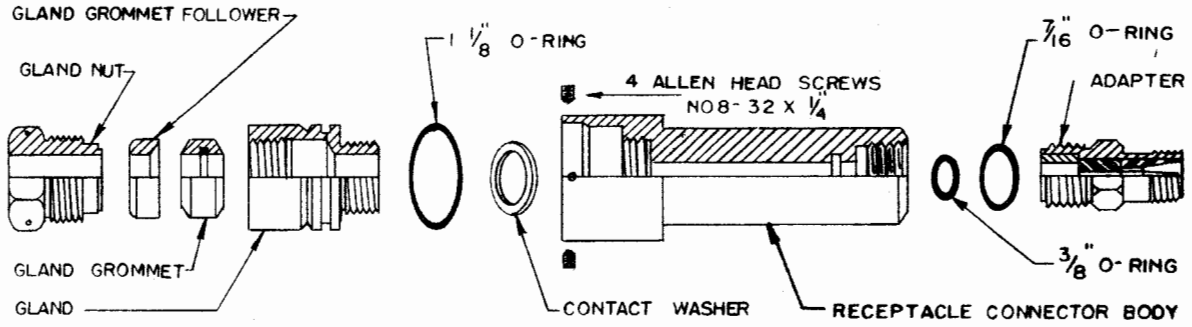
Check completed installation for insulation resistance between contact and Adapter Body with a Megger. Check continuity between contact and inner conductor of cable, and between Adapter Body and outer conductor braid of cable.

ASSEMBLY INSTRUCTIONS

RF CONNECTOR, PRESSURE-PROOF

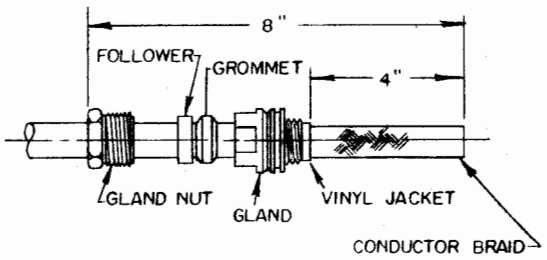
AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
UG-665/U	RECEPTACLE CONNECTOR, PRESSURE-PROOF, HULL, CABLE TO TYPE N	RG-14/U

ASSEMBLY INSTRUCTIONS



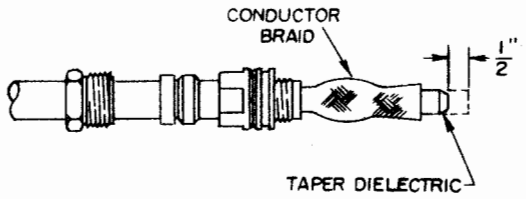
INBOARD END

After the Receptacle Connector Body has been welded into the hull (small end inboard), insert 3/8 inch O-ring into internal groove in inboard end. Lubricate O-ring with small amount of Dielectric Compound.

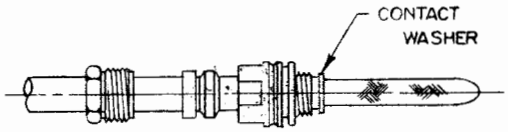


OUTBOARD END

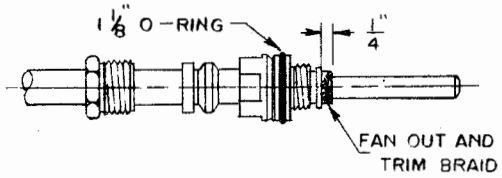
STEP 1. Cut RG-14/U cable to desired length and slide Gland Nut, Grommet Follower, Grommet, and Connector Gland onto cable and at least 8 inches back from end. Cut cable jacket back 4 inches from the end. End of Receptacle Connector Gland should be used as a guide to insure a square cut.



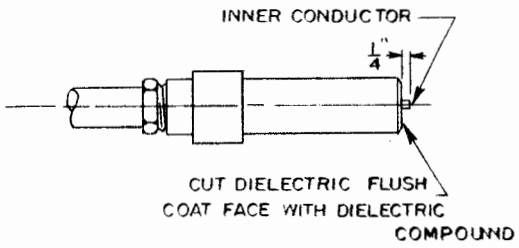
STEP 2. Push outer conductor braid back and cut off dielectric and inner conductor 1/2 inch back from end. Taper end of dielectric about 1/8 inch back with pocket knife to facilitate succeeding steps.



STEP 3. Pull braid over end of dielectric and taper to a point. Slide Contact Washer over braid and against end of cable jacket.



STEP 4. Cut off braid 1/4 inch from Washer. Fan out braid against Washer and cut off flush with outside diameter of Washer. Place 1-1/8 inch O-ring in U-shaped groove in Gland and lubricate with small amount of Dielectric Compound.

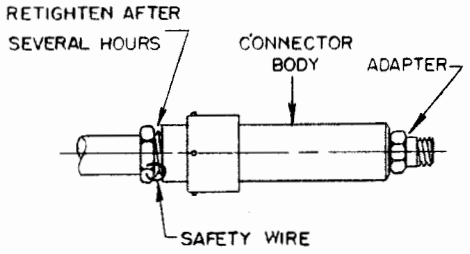


STEP 5. Make sure that set screws and Connector Body are fully retracted or removed to avoid damage to the O-ring. Push cable into Connector Body until braid makes contact with shoulder. Slide Connector Gland into Connector Body and screw firmly into place using a wrench. Tighten set screws firmly into V-shaped groove in Gland.

Push Gland Grommet into recessing Gland using a Packing Stick or dull tool to prevent damage to Grommet or jacket. Push Gland Grommet Follower against Grommet. Screw Gland Nut into Gland as tightly as possible using a wrench.

STEP 5. INBOARD END

Cut the cable dielectric off flush with the end of Connector Body. Do not damage the inner conductor. Cut the inner conductor off 3/16 to 1/4 inch from the end of the dielectric. Remove burrs from inner conductor.



STEP 6. Lubricate 7/16 inch O-ring with Dielectric Compound and place O-ring against shoulder in inboard end of Connector Body. Coat face of cable dielectric with Dielectric Compound. Screw Adapter into Connector Body as far as possible using wrench.

Gland Nut should be retightened several hours after initial tightening since the jacket and dielectric have some cold flow. Insert the soft brass safety wire into the holes in the Gland Nut and twist the ends together in such a manner that the nut cannot loosen.

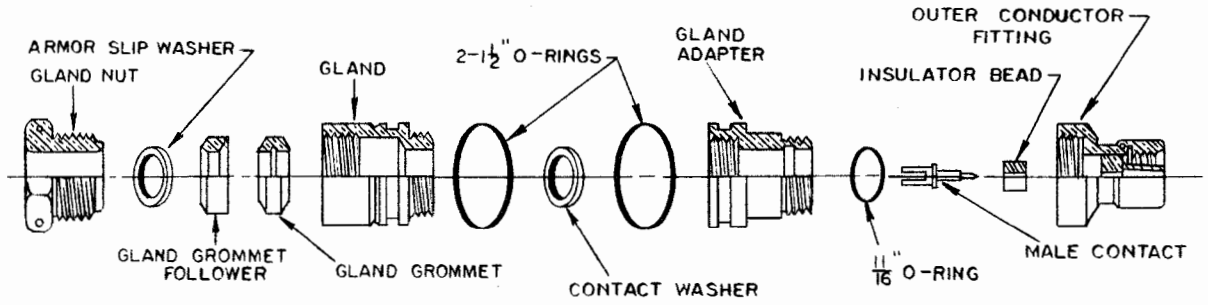
After assembly is completed, check installation for insulation resistance between Adapter Contact and Adapter ody with a Megger. Also check for continuity between Adapter Contact and inner conductor of cable, and Adapter Body and outer conductor braid of cable.

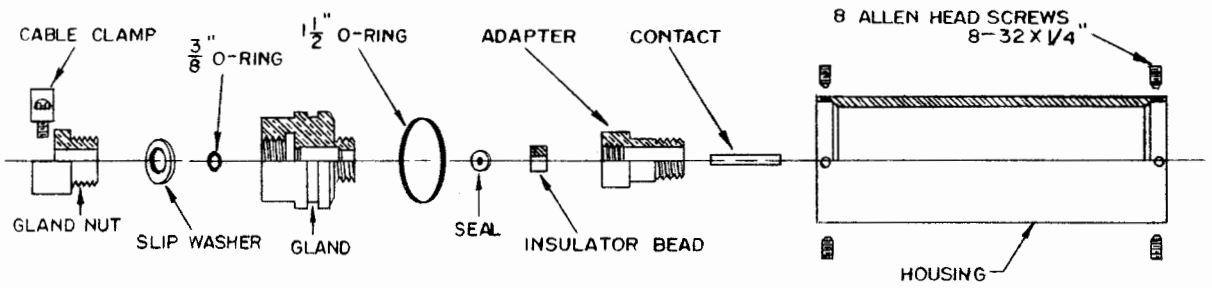
ASSEMBLY INSTRUCTIONS

RF CONNECTOR, PRESSURE-PROOF

AN or NAVY TYPE	DESCRIPTION	CONNECTS
UG-670/U	ADAPTER, CONNECTOR, PRESSURE-PROOF	RG-17/U or RG-18/U to RG-81/U

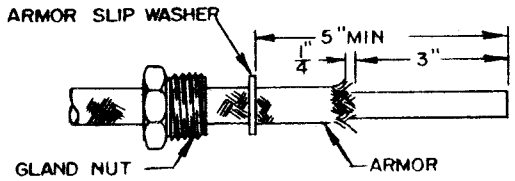
ASSEMBLY INSTRUCTIONS



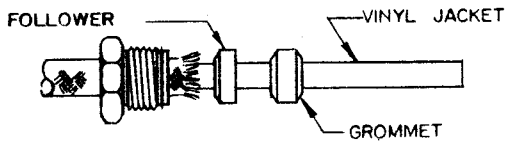


PREPARATION OF RG-18/U CABLE

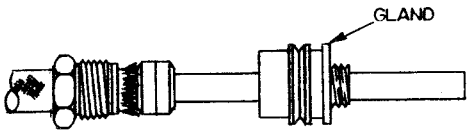
NOTE: The following instructions are based on the use of RG-18/U cable. If RG-17/U cable is used, omit the instructions concerning the armor braid but retain the cable Armor Slip Washer.



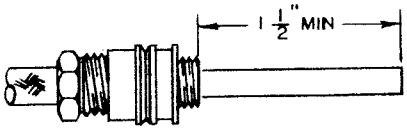
STEP 1. Cut RG-18/U cable to desired length and slide Gland Nut and Armor Slip Washer over the armor and at least 5 inches back from the end. Cut off and discard 3 inches of the armor. Fan out 1/4 inch of the remaining armor. Do not damage jacket.



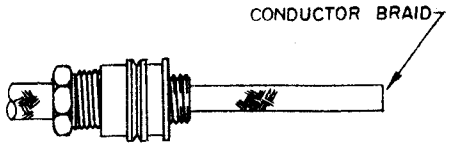
STEP 2. Slide Gland Grommet Follower against the fanned out armor. Slide Gland Grommet against the Follower.



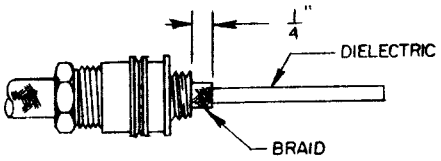
STEP 3. Push Gland onto cable and over Grommet.



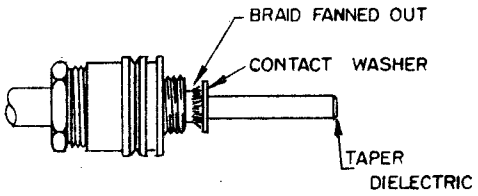
STEP 4. Screw Gland Nut into Gland as tightly as possible using wrench. Cable should extend at least 1-1/2 inch beyond the Gland.



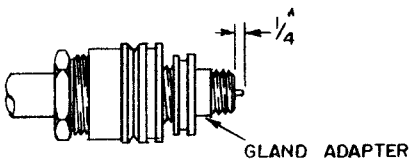
STEP 5. Cut jacket off flush with end of Gland. Do not damage the outer conductor braid.



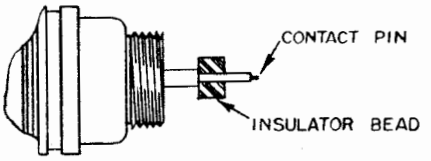
STEP 6. Cut conductor braid off 1/4 inch from end of Gland. Do not damage dielectric.



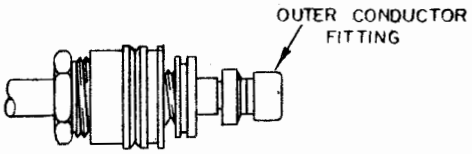
STEP 7. Fan out braid against end of Gland and trim flush with Gland. Taper end of dielectric about 1/8 inch back with knife and slide Contact Washer over dielectric and against braid.



STEP 8. Place 11/16 inch O-ring in Gland Adapter and lubricate with Dielectric Compound. Slide Gland Adapter over dielectric and screw into Gland using a wrench. Cut cable dielectric off flush with end of Gland Adapter. Do not damage inner conductor. Cut inner conductor off 1/4 inch beyond dielectric. Remove burrs from inner conductor.



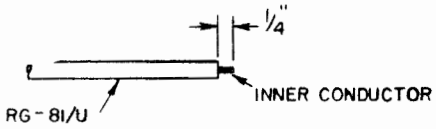
STEP 9. Push Male Contact on inner conductor and against face of dielectric. Slide Insulator Bead over Contact and against shoulder of Contact.



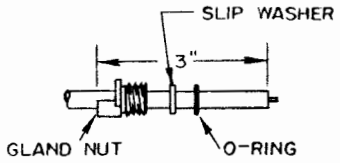
STEP 10. Screw Outer Conductor Fitting onto cable Gland Adapter and tighten with wrench.

PREPARATION OF RG-81/U CABLE

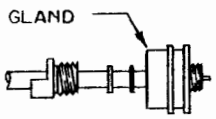
NOTE: RG-81/U cable will be treated as given under "Rigid Transmission Line", Chapter 11, Section 11-6.



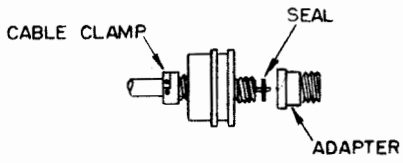
STEP 11. Cut RG-81/U to desired length and cut cable jacket 1/4 inch from end using a tubing cutter to score the cable jacket, and a pair of diagonals to twist the jacket off. Check the insulation resistance of the cable with a Megger and if not infinite, heat cable with a torch to drive moisture out of dielectric. When cable has cooled, recheck resistance. Repeat this step if necessary until resistance becomes infinite. Square end of cable jacket and dielectric using a safety edge file. Do not damage inner conductor. Clean exposed inner conductor and at least 2 inches of the cable jacket with fine emery paper.



STEP 12. Slide Gland Nut and Slip Washer and 3/8 inch O-ring on cable at least 3 inches back from end.

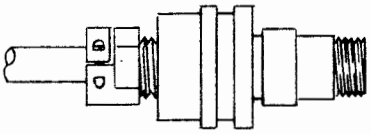


STEP 13. Slide Gland on cable so that cable jacket comes in contact with shoulder and threaded end of Gland. Push Slip Washer against O-ring and screw Gland Nut in place and tighten with a wrench.

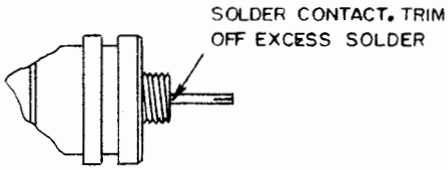


STEP 14. Place Cable Clamp in place on Gland Nut and tighten screws. Place Cable Seal over inner conductor and back against Gland. This part will push hard since the hole in the seal is smaller than the inner conductor. Push Insulator Bead into recess in Adapter for RG-81/U cable.

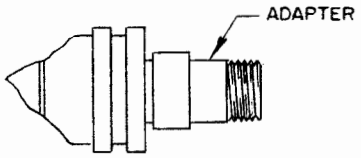
CONNECTING CABLES



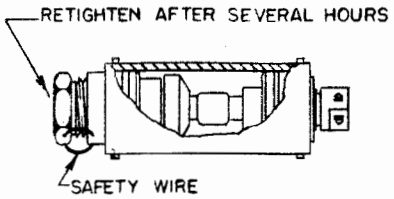
STEP 15. Screw Adapter onto Gland forcing Seal into recess in Gland and against cable dielectric.



STEP 16. Remove Adapter and check Seal to make sure it is pressed in flush with end of Gland. Trim off any excess dielectric material that may be on the face of the Gland. Tin the inner conductor and push Contact on inner conductor and against cable Seal and soft solder in place. Make sure that there is no excess solder on the dielectric surface after Contact is soldered in place.



STEP 17. Screw Adapter with Insulator Bead in place back on Gland and tighten with a wrench.



STEP 18. Put 1-1/2 inch O-ring in U-shaped grooves on RG-81/U Cable Gland and RG-18/U Cable Gland and Gland Adapter. Lubricate O-ring with Dielectric Compound. Push Housing back over the most convenient cable. Make sure that set screws in Housing are fully removed to prevent damage to O-rings. Mate two halves of Connector and screw Coupling Nut on outer conductor setting finger tight only. Slide Housing into place and tighten set screws into V-groove on cable Gland so that O-rings will be properly located with respect to the polished sealing surface in the Housing. Then lighten set screws in opposite end against Gland.

NOTE

Groove may be spotted through set screw holes on RG-18/U side.

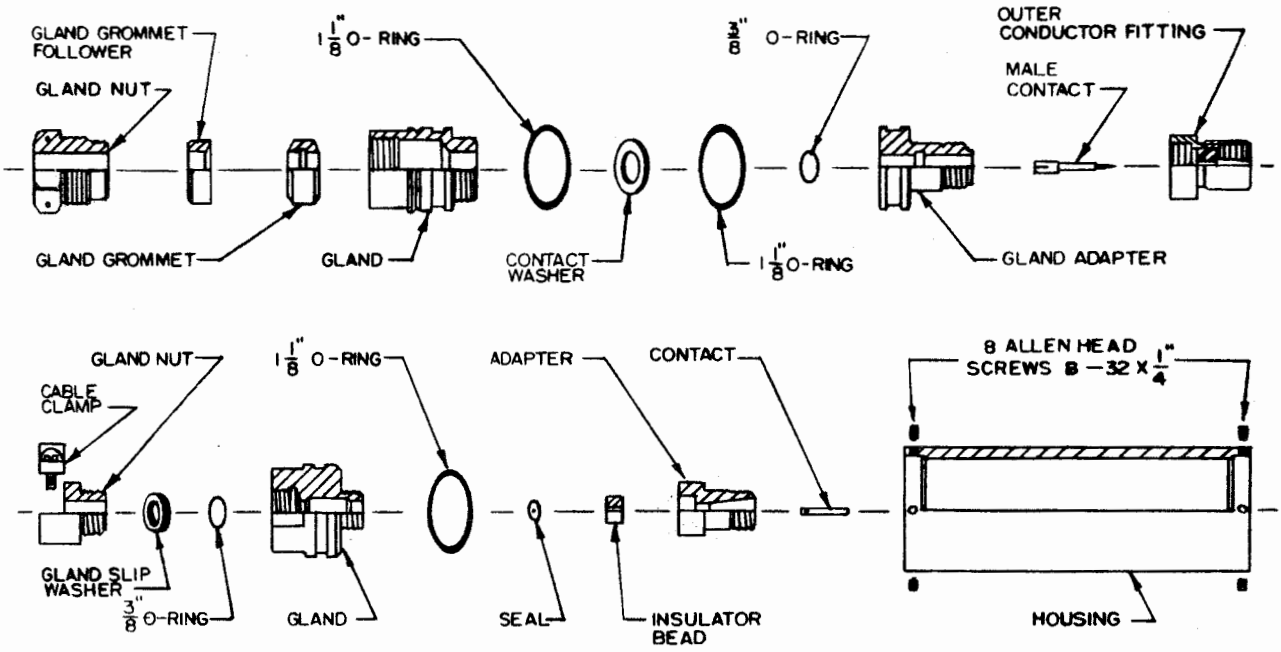
Make sure set screws on RG-81/U side are on the round of the Gland. Gland Nut should be retightened on RG-18/U several hours after initial tightening since jacket and dielectric have some cold flow. After tightening, insert soft safety wire in holes of Gland and Gland Nut and twist ends together in such a manner that the Nut cannot loosen.

ASSEMBLY INSTRUCTIONS

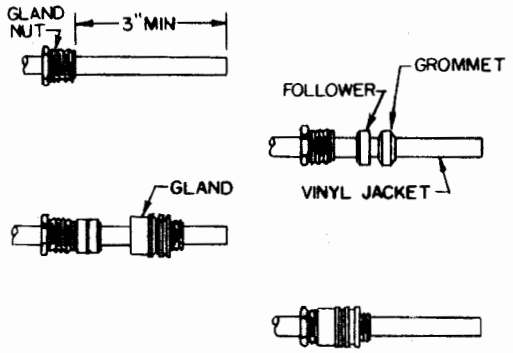
RF CONNECTOR, PRESSURE-PROOF

AN or NAVY TYPE	DESCRIPTION	CONNECTS
UG-671/U	ADAPTER CONNECTOR, PRESSURE-PROOF	RG-14/U to RG-81/U

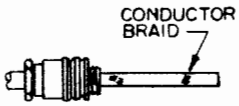
ASSEMBLY INSTRUCTIONS



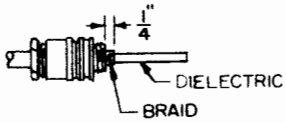
PREPARATION OF RG-14/U CABLE



STEP 1 thru 4. Cut RG-14/U cable to desired length and slide cable Gland Nut. Gland Grommet Follower, and Gland Grommet on cable and at least 3 inches back from end. Push Gland onto cable and over Grommet. Push Follower against Grommet and screw Gland Nut into Gland as tightly as possible using wrench. Cable should extend at least 1-1/2 inches beyond cable Gland.

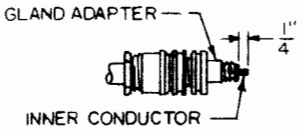


STEP 5. Cut jacket off flush with end of Gland. Do not damage the outer conductor braid.

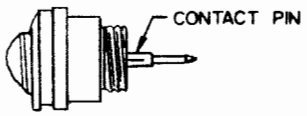


STEP 6. Cut outer conductor braid off 1/4 inch from end of cable. Do not damage dielectric.

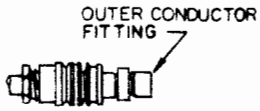
STEP 7. Fan out braid against end of Gland and cut off flush with outside diameter. Taper end of dielectric about 1/8 inch back with pocket knife and slide outer conductor Contact Washer over dielectric and against braid.



STEP 8. Place 3/8 inch O-ring in groove in cable Gland Adapter and lubricate with Dielectric Compound. Slide Gland Adapter over dielectric and screw onto Gland using wrench. Cut cable dielectric off flush with end of Gland Adapter. Do not damage inner conductor. Cut inner conductor off 1/4 inch from dielectric.



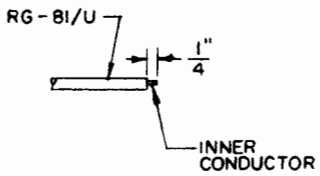
STEP 9. Tin the inner conductor and push Male Contact on inner conductor and against face of dielectric. Soft solder Male Contact in place. Remove all excess solder and flux. Make sure that face of dielectric is clean.



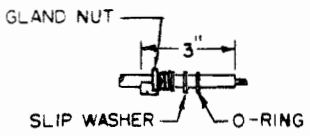
STEP 10. Slide Insulator Bead of Outer Conductor Fitting over Contact and against Gland Adapter. Screw Outer Conductor Fitting onto Gland Adapter and tighten with wrench.

PREPARATION OF RG-81/U CABLE

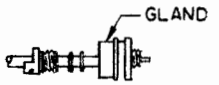
NOTE: RG-81/U cable will be treated as given under "Rigid Transmission Lines", Chapter 11, Section 6.



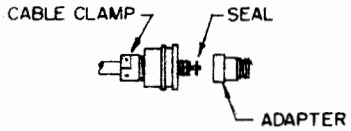
STEP 11. Cut RG-81/U cable to desired length and cut cable jacket 1/4 inch from end using a tubing cutter to score the cable jacket and a pair of diagonals to twist the jacket off. Check the insulation resistance of the cable with a Megger and if not infinite, heat cable with a torch to drive moisture out of dielectric. When cable has cooled, recheck resistance. Repeat this step if necessary until resistance becomes infinite. Square end of cable jacket and dielectric using a safety edge file. Do not damage inner conductor. Clean exposed inner conductor and at least 2 inches of the cable jacket with fine emery paper.



STEP 12. Slide Gland Nut and Slip Washer and 3/8 inch O-ring on cable at least 3 inches back from end.

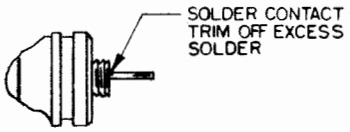


STEP 13. Slide Gland on cable so that cable jacket comes in contact with shoulder and threaded end of Gland. Push Slip Washer against O-ring and screw Gland Nut in place and tighten with a wrench.

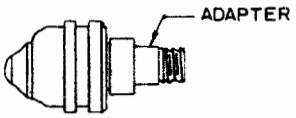


STEP 14. Place Cable Clamp in place on Gland Nut and tighten screws. Place Cable Seal over inner Conductor and back against Gland. This part will push hard since the hole in the Seal is smaller than the inner conductor. Push Insulator Bead into recess in Adapter for RG-81/U cable.

STEP 15. Screw Adapter onto Gland forcing Seal into recess in Gland and against cable dielectric.

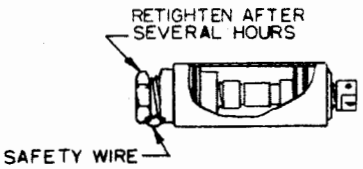


STEP 16. Remove Adapter and check Seal to make sure it is pressed in flush with end of Gland. Trim off any excess dielectric material that may be on the face of the Gland. Tin the inner conductor and push Contact on inner conductor and against cable Seal and soft solder in place. Make sure that there is no excess solder on the dielectric surface after Contact is soldered in place.



STEP 17. Screw Adapter with Insulator Bead in place back on Gland and tighten with a wrench.

CONNECTING CABLES



STEP 18. Put 1-1/8 inch O-rings in U-shaped grooves on RG-81/U Cable Gland and RG-14/U Cable Gland and Gland Adapter. Lubricate O-ring with Dielectric Compound.

Push Housing back over the most convenient cable. Make sure that set screws in Housing are fully removed to prevent damage to O-rings. Mate two halves of Connector and screw Coupling Nut on outer conductor setting finger tight only. Slide Housing into place and tighten Set screws into V-groove on cable Gland so that O-rings will be properly located with respect to the polished sealing surface in the Housing. Then tighten set screws in opposite end against Gland.

NOTE: Groove may be spotted through set screw holes on RG-14/U side.

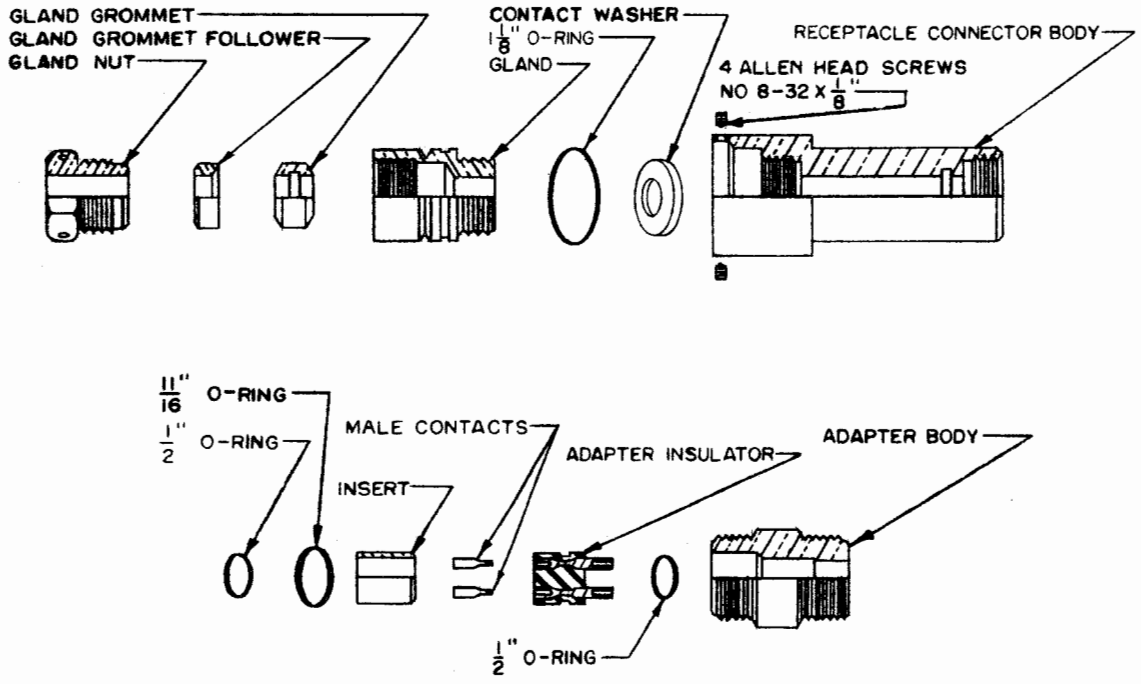
Make sure set screws on RG-14/U side are on the round of the Gland. Gland Nut should be retightened on RG-14/U several hours after initial tightening since jacket and dielectric have some cold flow. After tightening, insert soft safety wire in holes of Gland and Gland Nut and twist ends together in such a manner that the Nut can not loosen.

ASSEMBLY INSTRUCTIONS

RF CONNECTOR, PRESSURE-PROOF

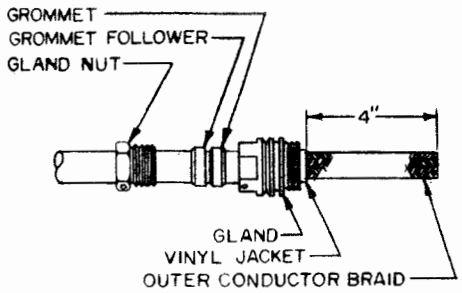
AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
UG-672/U	RECEPTACLE CONNECTOR, PRESSURE-PROOF, HULL, CABLE TO TWIN COAX	RG-57/U RG-130/U RG-131/U

ASSEMBLY INSTRUCTIONS



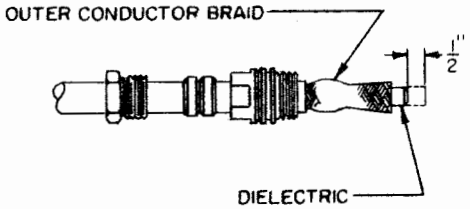
INBOARD END

After Receptacle Connector Body has been welded into the hull inboard, insert 1/2 inch O-ring into internal groove in inboard end. Lubricate O-ring with small amount of Dielectric Compound.

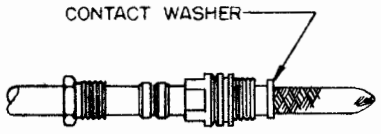


OUTBOARD END

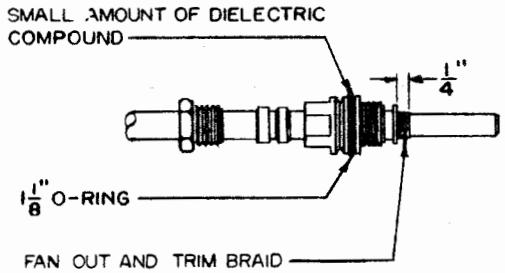
STEP 1. Cut RG-57/U cable to desired length and slide Gland Nut, Grommet Follower, Grommet and Gland on the Cable and at least 8 inches back from the end. Cut Cable Jacket 4 inches from the end. End of Gland should be used as a guide to insure a square cut. Do not damage the Outer Conductor Braid.



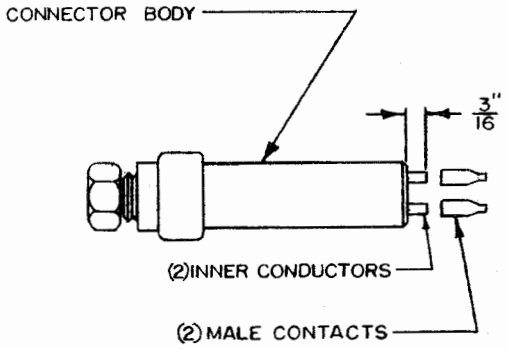
STEP 2. Push Outer Conductor Braid back and cut off Dielectric and Inner Conductor 1/2 inch back from the end. Taper end of Dielectric about 1/8 inch back with pocket knife to facilitate succeeding steps.



STEP 3. Pull Braid over end of Dielectric and taper to a point. Slide Contact Washer over Braid and against end of Cable Jacket.



STEP 4. Cut off Braid 1/4 inch from Washer. Fan out braid against Washer and cut off flush with outside diameter of Washer. Place 1-1/8 inch O-ring in U-shaped groove in Gland and lubricate with small amount of Dielectric Compound.

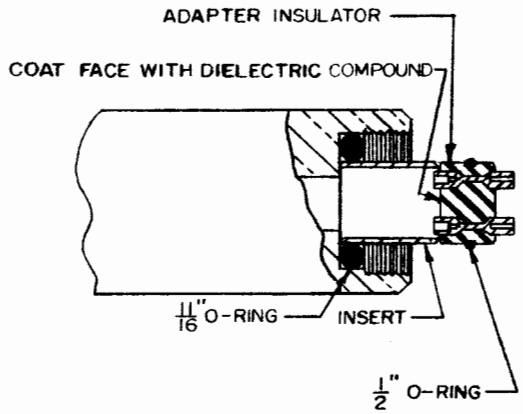


STEP 5. Make sure that set screws in Connector Body are fully retracted or removed to avoid damage to O-ring. Push cable into Connector Body until braid makes contact with shoulder. Slide Gland into Connector Body and screw firmly into place using a wrench. Tighten set screws into V-shaped groove in Gland.

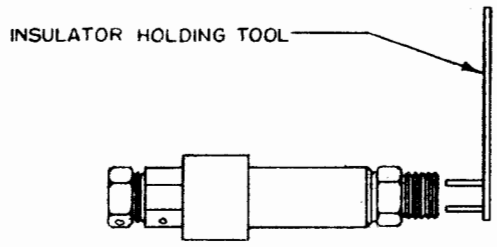
Push Gland Grommet into recess in Gland using a Packing Stick or dull tool to prevent damage to Grommet or jacket. Push Gland Grommet Follower against Grommet. Screw Gland Nut into Gland as tightly as possible using wrench.

STEP 5. INBOARD END

Cut the cable dielectric off flush with the end of the Connector Body. Do not damage the inner conductor. Cut the inner conductor off 3/16 inch from the end of the dielectric. Screw Male Contacts onto inner conductors.



STEP 6. Lubricate 11/16 inch O-ring with Dielectric Compound and place O-ring against shoulder in inboard end of Connector Body. Coat face of cable dielectric with Dielectric Compound. Place insert in 11/16 inch O-ring and against shoulder in inboard end of Connector Body. Place 1/2 inch O-ring in U-shaped groove on Adapter Insulator and lubricate with Dielectric Compound. Plug Adapter Insulator onto Male Contacts.

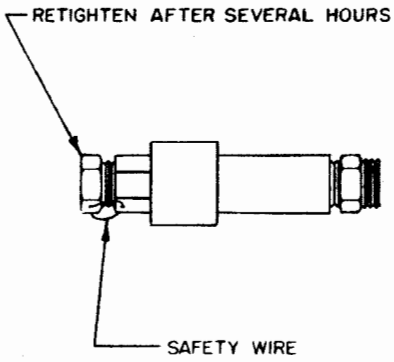


STEP 7. Press Adapter Body over Insulator and Insert. Hold Insert from twisting while screwing Adapter Body tightly into Connector Body.

A holding tool may be made by silver soldering two hardened pins on a flat handle approximately 6 inches long. The pins should be approximately 1 inch long and of such a diameter that they fit snugly into insulator inserts. Another method is using the insert of a Navy Type 49188 Plug as a holding tool. After the assembly is completed, check installation for insulation resistance between each conductor and ground with a Megger.

NOTE

When the Receptacle Connector is connected to an Amphenol VLF loop antenna through 50 to 75 feet of RG-57/U cable, a reading of .5 to 1 ohm should be obtained between the two inner conductors Contacts.



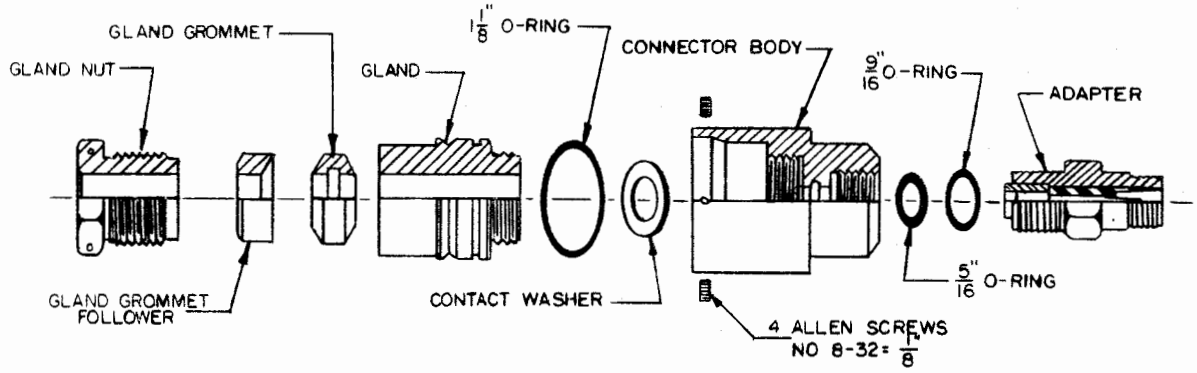
STEP 8. Gland Nut should be retightened several hours after initial tightening since the jacket and dielectric have some cold flow. Insert the soft brass safety wire into the holes in the Gland and Gland Nut and twist the ends together in such a manner that the Nut cannot loosen.

ASSEMBLY INSTRUCTIONS

RF CONNECTOR, PRESSURE-PROOF

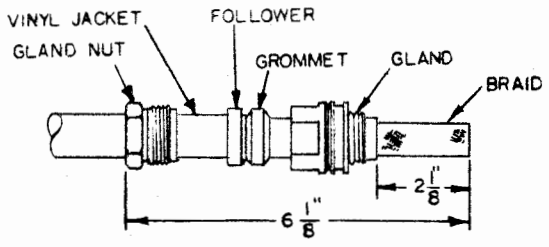
AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
	RECEPTACLE CONNECTOR, PRESSURE-PROOF, BULKHEAD, CABLE TO TYPE N.	RG-14/U

ASSEMBLY INSTRUCTIONS



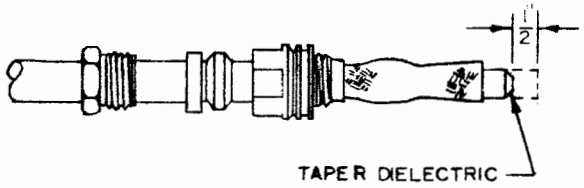
INBOARD END

After Receptacle Connector Body has been welded into place (small end inboard), insert 5/16 inch O-ring into internal groove in inboard end. Lubricate O-ring with small amount of Dielectric Compound.

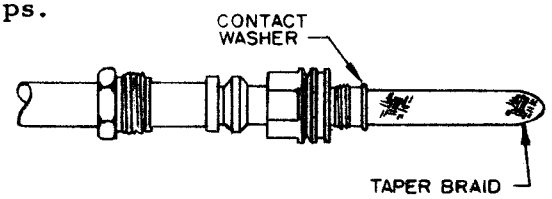


OUTBOARD END

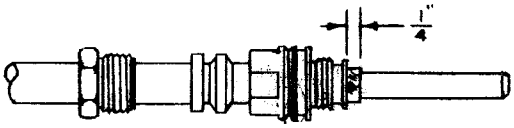
STEP 1. Cut RG-14/U cable to desired length and slide Cable Gland Nut, Grommet Follower, Grommet and Receptacle Connector Gland on to cable and at least 6-1/8 inches back from the end. Cut cable jacket back 2-1/8 inches back from the end. End of Receptacle Connector Gland should be used as a guide to insure a square cut. Do not damage outer conductor braid.



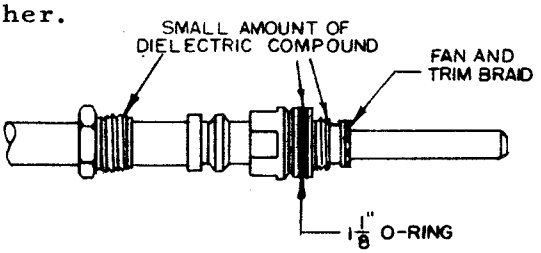
STEP 2. Push outer conductor braid back and cut off dielectric and inner conductor 1/2 inch back from end. Taper end of dielectric about 1/8 inch back with pocket knife to facilitate succeeding steps.



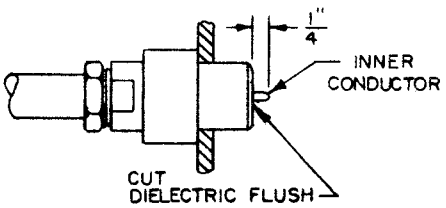
STEP 3. Pull braid over end of dielectric and taper to a point. Slide outer conductor Contact Washer over braid and against end of cable jacket.



STEP 4. Cut off braid 1/4 inch from Washer.



STEP 5. Fan out braid against Washer and trim flush with outside diameter of Washer. Place 1-1/8 inch O-ring in U-shaped groove in Receptacle Connector Gland and lubricate with small amount of Dielectric Compound.

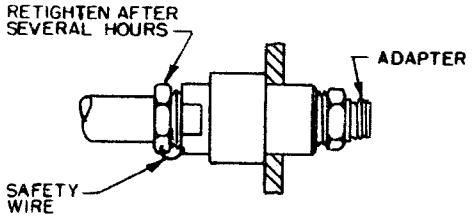


STEP 6. Make sure that set screws in Receptacle Connector Body are fully retracted or removed to avoid damage to the O-ring. Push cable into Receptacle Connector Body until braid makes contact with shoulder. Slide Receptacle Connector Gland into Connector Body and screw into place firmly using a wrench. Tighten set screws into V-shaped groove in Gland.

Push Cable Gland Grommet into recess in Gland using a Packing Stick or dull tool to prevent damage to Grommet or jacket. Push Grommet Follower against Grommet. Screw Cable Gland Nut into Gland as tightly as possible using a wrench.

STEP 6. INBOARD END

Cut the cable dielectric off flush with the end of the Receptacle Connector Body. Do not damage the inner conductor. Cut the inner conductor off 3/16 inch to 1/4 inch from the end of the dielectric. Round off end of conductor.



STEP 7. Lubricate 9/16 inch O-ring with Dielectric Compound and place O-ring against shoulder in inboard end of Receptacle Connector Body. Coat face of cable dielectric with Dielectric Compound. Screw Adapter into Receptacle Connector Body as far as possible using a wrench.

Gland Nut should be retightened several hours after initial tightening since the jacket and dielectric have some cold flow. Secure Nut with safety wire.

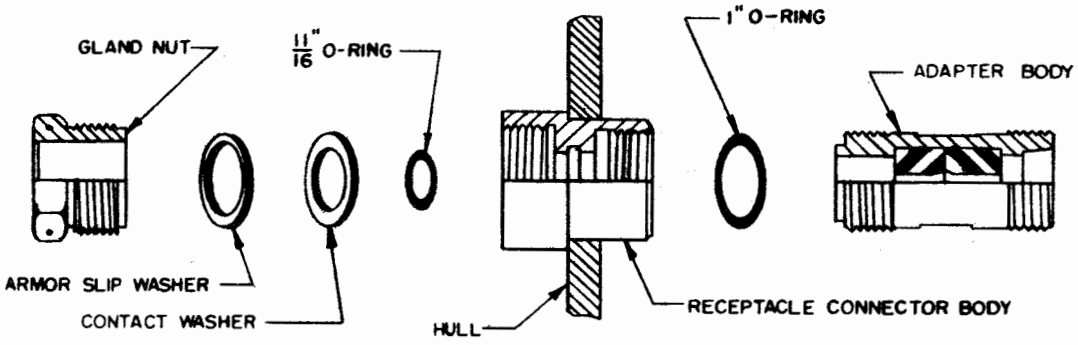
After assembly is complete, check installation for insulation resistance between Adapter Contact and Adapter Body with a Megger. Also, check continuity between both Adapter Contact and inner conductor of cable, and Adapter Body and outer conductor braid of cable.

ASSEMBLY INSTRUCTIONS

RF CONNECTORS, PRESSURE-PROOF

AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
	RECEPTACLE CONNECTOR, PRESSURE-PROOF, BULKHEAD, CABLE TO TYPE LC (LV)	RG-17/U RG-18/U

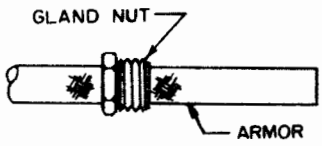
ASSEMBLY INSTRUCTIONS



NOTE: The following instructions are based on the use of RG-18/U cable. If RG-17/U cable is used, omit the instructions concerning the armor braid but retain the cable Armor Slip Washer.

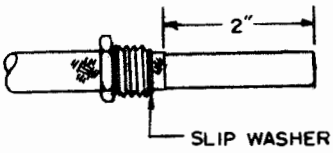
INBOARD END

After Receptacle Connector Body has been welded into the bulkhead, insert 11/16 inch O-ring into internal groove in inboard end. Lubricate O-ring with small amount of Dielectric Compound.

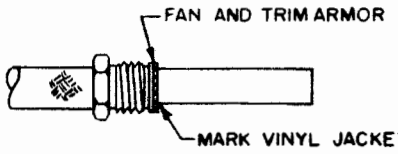


OUTBOARD END

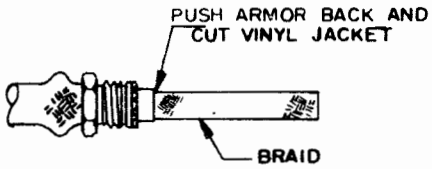
STEP 1. Cut RG-18/U cable to desired length and slide cable Gland Nut and cable Armor Slip Washer over the armor and at least 3 inches back from the end.



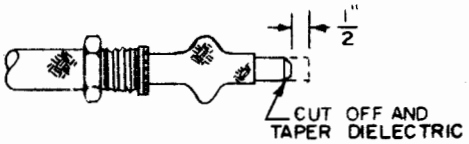
STEP 2. Cut off and discard 2 inches of armor.



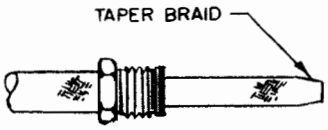
STEP 3. Fan out radially 1/4 inch of remaining armor. Mark vinyl jacket next to fanned out armor.



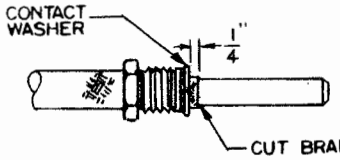
STEP 4. Push back armor and cut vinyl jacket at mark.



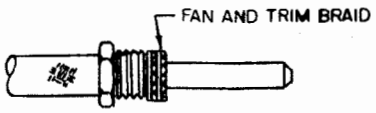
STEP 5. Push outer conductor braid back and cut off dielectric and inner conductor 1/2 inch back from end. Taper end of dielectric about 1/8 inch back with pocket knife to facilitate succeeding steps.



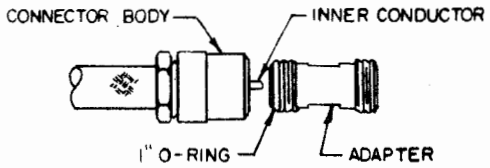
STEP 6. Pull braid over end of dielectric and taper to a point. Slide outer conductor Contact Washer over braid and against end of vinyl jacket.



STEP 7. Cut off braid 1/4 inch from Washer.



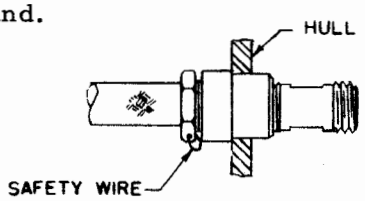
STEP 8. Fan braid out against Washer and trim flush with outer diameter of Washer.



STEP 9. Push cable into Receptacle Contact Body and screw Cable Gland Nut into place as tightly as possible using wrench. Insert the soft brass safety wire into the holes in the Receptacle Connector Body and Gland Nut and twist the ends together in such a manner that the nut cannot loosen.

STEP 9. INBOARD END

Cut the cable dielectric off flush with the end of Receptacle Connector Body. Do not damage the inner conductor. Cut the inner conductor off 1/4 inch from the end of the dielectric. Round off end of the conductor. Lubricate 1 inch O-ring with Dielectric Compound. Push into unthreaded space behind threads in Receptacle Connector Body. Coat face of cable dielectric with Dielectric Compound.



STEP 10. Screw Adapter into Receptacle Connector Body as far as possible using a wrench.

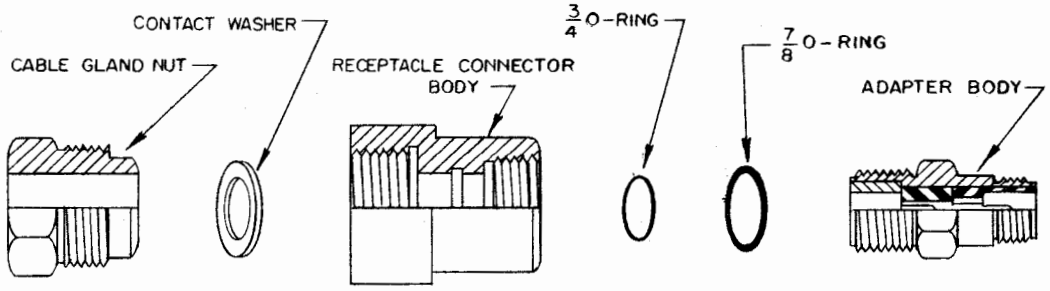
After installation is complete, check the insulation resistance between Contact and Adapter Body with a Megger. Also, check continuity between both Contact and inner conductor of cable, and Adapter Body and outer conductor braid of cable.

ASSEMBLY INSTRUCTIONS

RF CONNECTOR, PRESSURE-PROOF

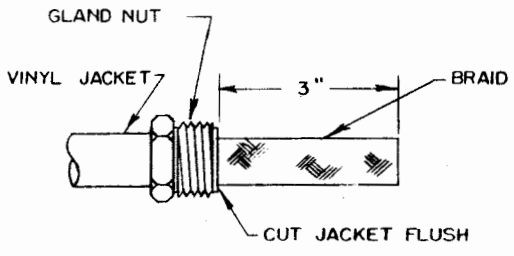
AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
	ADAPTER CONNECTOR, PRESSURE-PROOF, HULL, CABLE TO TYPE N. SIMILAR TO UG-665/U WITH REDUCED INBOARD LENGTH	RG-14/U

ASSEMBLY INSTRUCTIONS



INBOARD END

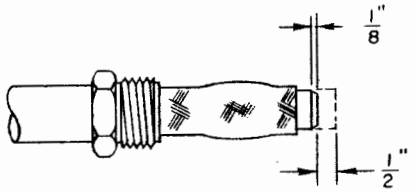
After Receptacle Connector Body has been welded into place (small end inboard) insert 3/4 inch O-ring into internal groove in inboard end. Lubricate O-ring with small amount of Dielectric Compound.



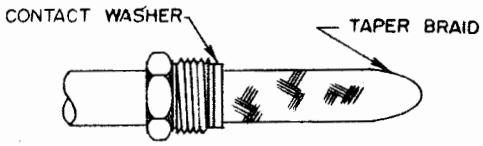
OUTBOARD END

STEP 1. Cut RG-14/U cable to desired length and slide Cable Gland Nut at least 3 inches back from the end.

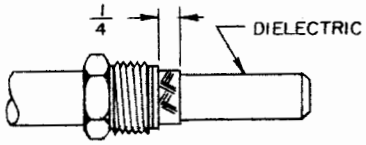
Cut off and discard 3 inches of vinyl jacket. Do not damage inner conductor braid. End of Cable Gland Nut should be used as a guide to insure a square cut.



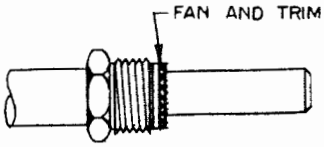
STEP 2. Push outer conductor braid back and cut off dielectric and inner conductor 1/2 inch back from end. Taper end of dielectric about 1/8 inch back with pocket knife to facilitate succeeding steps.



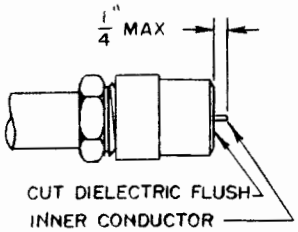
STEP 3. Pull braid over end of dielectric and taper to a point. Slide outer conductor Contact Washer over braid and against end of cable jacket.



STEP 4. Cut off braid 1/4 inch from Washer.



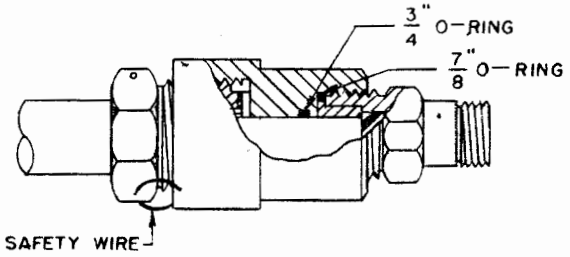
STEP 5. Fan braid out against Washer and trim flush with outer diameter of Contact Washer.



STEP 6. Push cable into Receptacle Connector Body and screw Cable Gland Nut into place as tightly as possible using wrench. Insert the soft brass safety wire into the holes in the Nut and twist the ends together in such a manner that the nut cannot loosen.

STEP 6. INBOARD END

Cut the cable dielectric off flush with the end of the Receptacle Connector Body. Do not damage the inner conductor. Cut the inner conductor off 1/4 inch from the end of the dielectric. Round off end of the conductor.



STEP 7. Lubricate 7/8 inch O-ring with Dielectric Compound. Push into unthreaded space behind threads in Receptacle Connector Body. Coat face of cable dielectric with Dielectric Compound. Screw Adapter into Receptacle Connector Body as far as possible using a wrench.

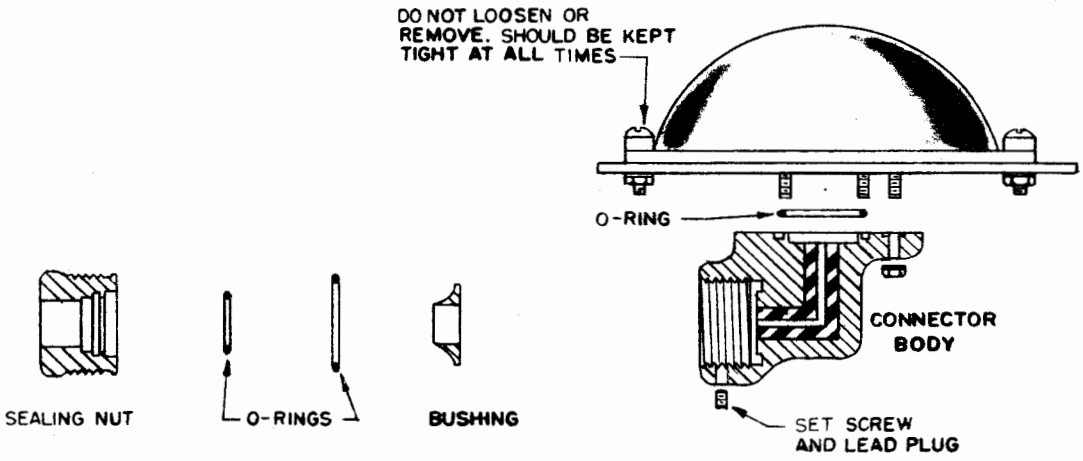
After installation is complete, check insulation resistance between Adapter Contact and Adapter Body with a Megger. Check continuity between both contact and inner conductor of cable and Adapter Body and outer conductor braid of cable.

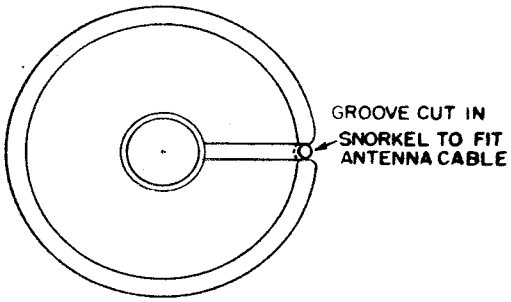
ASSEMBLY INSTRUCTIONS

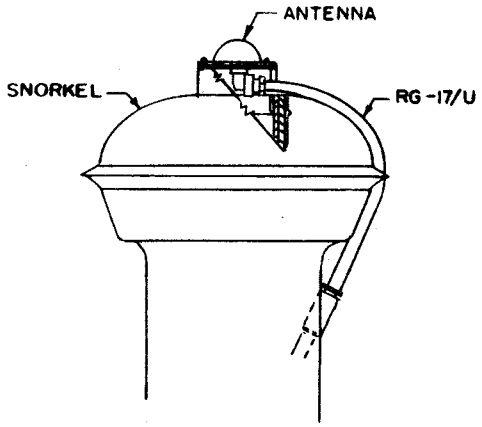
RF CONNECTOR, PRESSURE-PROOF

AN or NAVY TYPE	DESCRIPTION	CONNECTS TO
UG-685/U	SNORKEL ANTENNA CABLE ADAPTER	RG-17/U

ASSEMBLY INSTRUCTIONS

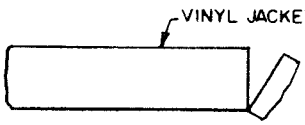




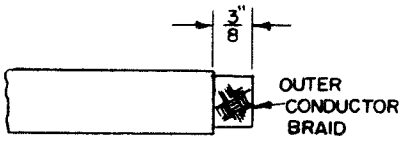


NOTE

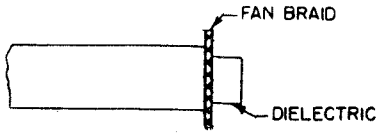
Before installing cable prepare Snorkel as shown above.



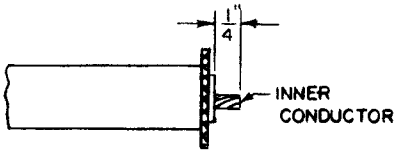
STEP 1. Cut cable sharp and even.



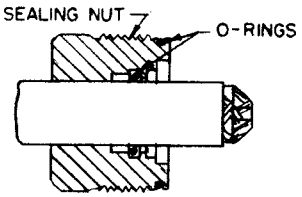
STEP 2. Remove 3/8 inch vinyl jacket. Be careful not to nick braid.



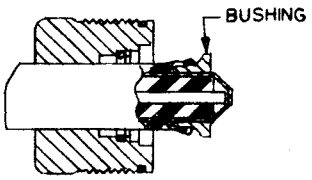
STEP 3. Fold back braid as shown in order to perform the next operation.



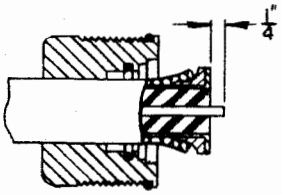
STEP 4. Cut dielectric neatly back 1/4 inch from end. Do not nick center conductor.



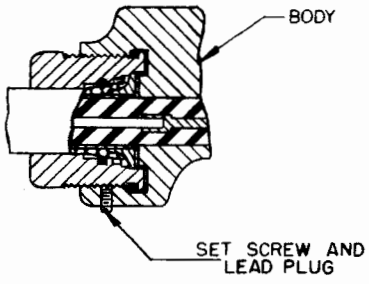
STEP 5. Insert O-rings in Sealing Nut. Apply film of Silicone grease all around both O-rings. Taper braid and slip on Sealing Nut as shown.



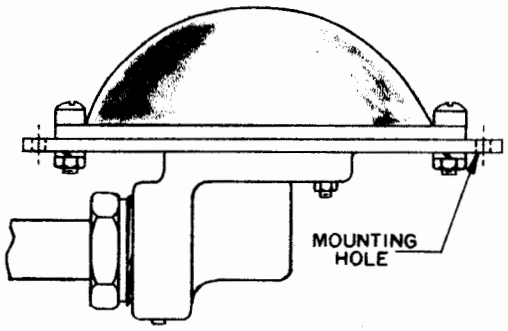
STEP 6. Slide Bushing over braid and under vinyl as shown. Be certain that no strands of the braid get folded and stuck beneath the Bushing.



STEP 7. Fold braid back against Bushing and very neatly trim the braid as shown. Do not fan or bunch braid. It is important not to allow any clipped braid strands or other foreign particles to get into the Sealing Nut. Clean off all metal particles from the cable dielectric face. Make sure only 1/4 inch of conductor is bared, and free of sharp corners or burrs.



STEP 8. Place cable assembly into Body carefully so that center conductor enters hole in center Adapter. Tighten nut with wrench and hold the RG-17/U cable firmly so it does not rotate. Place Lead Plugs and set screws in Body and tighten to lock the Nut.



STEP 9. Insert O-ring into top of cable Adapter assembly and apply film of Silicone grease to O-ring. Mount cable Adapter to bottom plate of antenna proper, evenly tightening the five nuts. Tighten nuts again several hours after initial assembly. Complete assembly operations by placing locking wire through hole in nuts.

MATERIAL REQUIREMENTS FOR INSTALLATION OF FITTINGS

Material	Obtain From	Standard Navy Stock Number	Size
Insulating Varnish JAN-V-1137 Type N Grade CA	GSSO	G52-V-1240 G52-V-1245 G52-V-1255 G52-V-1260	1 pint can 1 quart can 1 gallon can 5 gallon can
Dielectric Compound AN-C-128 (Dow Corning No. 4)	ESO ASO	N52-C-3096-790 N51-C-5194-1500 N51-C-5194-1550 R52-C-3109-110 R52-C-3109-125	8 oz tube 10 lb can 50 lb can 8 oz cartridge 10 lb can
Synthetic Resin Tape MIL-T-15126 Type VF (Vinyl)	GSSO	G17-T-1745-60 G17-T-1745-200 G17-T-1745-250 G17-T-1745-300	3/4 inch width 1 inch width 1-1/4 inch width 1-1/2 inch width
Insulating Compound No. 741 (National Products, Inc.)			
Solder 50/50 Rosin Core	GSSO	G46-S-899-150 G46-S-905 G46-S-905-150	1/16 inch diam-5 lb 3/4 inch diam -5 lb 1/8 inch diam -5 lb
Solder 60/40 Rosin Flux	GSSO	G46-S-937	1/8 inch diam -5 lb
Solder (Rose Metal)	GSSO	G46-S-539-100	Solid stick - 1/3 lb
Carbon Tetrachloride	GSSO	G51-C-775 G51-C-785	1 gallon can 55 gallon drum
No. 4 Saturated Turbo Sleeving			
No. 14 Wire			
No. 30 Wire			
Plastic Tubing (XTE-30 Irvolite or equivalent			7/16 inch inside diameter

TOOL REQUIREMENTS FOR INSTALLATION OF FITTINGS

Description	Standard Navy Stock Numbers
CUTTER, tubing, 1/8" – 3/4"	G41-C-3105
DIE, No. 10-32 threads per inch	G41-D-858
DIE, stock	G41-S-5150
DRILL, twist, straight, size No. 42	G40-D-1250
FILE, flat, 8", double cut, smooth	G41-F-884
FILE, mill, 8", square edges – one safe second cut	G41-F-1168
GREASE GUN, (Alemite) 12 oz, 10-32 adapter	G41-G-1325
HACKSAW BLADE, Tungsten, all hard, 10", 24 teeth per inch	G41-B-1153
HACKSAW FRAME, adjustable	G41-F-3394
IRON, soldering, heavy duty, 3-1/2 lb, 350 watts	G41-I-685
IRON, soldering, light duty, 125 watts	G41-I-688
IRON, soldering, medium duty, 225 watts	G41-I-691
KNIFE, boy scout, folding blade	G41-K-535
PAPER, flint, medium No. 1	G42-P-1175-60
PLIERS, diagonal cutting, 6"	G41-P-1714
PLIERS, long nose, side cutting, 6-1/2", 1" jaw capacity	G41-P-1899-800
PLIERS, slip joint, combination jaw, 6-1/2"	G41-P-1631
RULE, steel, 6"	G41-R-2990
SCREWDRIVER, common, 4", 1/4" blade	G41-S-1102
SCREWDRIVER, narrow blade, 4" x 1/8"	G41-S-1227

TOOL REQUIREMENTS FOR INSTALLATION OF FITTINGS (Cont'd)

Description	Standard Navy Stock Numbers
SCREWDRIVER, spiral rachet, 10-1/2" closed	G41-S-1614
STICK, packing (small size)	G41-S-5011
TOOL, counterboring, TL-325/U, for RG-156/U	G41-T-3178-100
TOOL, tapering, MX-103/U	G17-T-753101-101
TOOL, TL-611/U for UG-946/U	
TORCH, acetylene or gas	G41-T-3607
WRENCH, adapter	
WRENCH, adjustable, open end, 8"	G41-W-486
WRENCH, adjustable, open end, 10", 1.135" jaw capacity	G41-W-487
WRENCH, allen, hexagonal, 5/64", 1-31/32 long arm series	G41-W-2446
WRENCH, allen, hexagonal, 3/32"	G41-W-2449
WRENCH, double end, 15°, 1-1/8" x 1-1/4"	G41-W-1176-70
WRENCH, double end, 15°, 1-3/8" x 1-1/2"	G41-W-1176-82
WRENCH, monkey, 15", 2-9/16" jaw capacity	G41-W-2355
WRENCH, open end, 3/8" - max thickness 1/8"	
WRENCH, open end, 1-3/4" - max thickness 3/8"	
WRENCH, spanner, TL-322/U	G41-W-3255-633
WRENCH, spanner, TL-323/U	G41-W-3255-632
WRENCH, strap, 1/8" - 2"	G41-W-1850
WRENCH, strap, 1" - 5"	G41-W-1853

TABLE 10-14. CONNECTORS BETWEEN SAME SERIES ADAPTERS

ADAPTER TYPE	N	BNC	C	LC *			UHF			LT	PULSE		HN
				RG-17, 18/U		RG-19, 20/U							
				LC (LV)	LC (HV)	LC (HVL)	Large Twin	Small Twin	Coax		Ceramic Insert	Rubber Insert	
	29B			215	155	157	NT 49189	493	363, 224 NT 49191	533			
Panel		414		287							222		
Bkhd (PP)	30B	492											
	57B												
Bkhd (PP)		491											
	27B	306	567	216		219	NT 49198	104	NT 49192				212A
Panel	202												
	107B	274	566					196	NT 49199				
	28A												475
	58A	290 185, 447 931 (1)	568	352A (PP)			NT 49196	422	NT 49194		37A (Air) 38A (Oil)	264 (PP)	496
Bkhd		254A (PP) 625	569										
Panel		535											
Cap & Chain		CW-123/U	MX-1142/U						MX-913/U				
Cap	MX-913/U	CW-155/U											
Cap (female)			MX-1143/U										
Shorting Plug		CW-159/U											
Termination Plug (.⌒.)		MX-554/U 100 (ohms)											DA-12/U 51 (ohms)
Nut Strap		MT-412/U											

* LV – Low voltage; HV – High voltage; HVL – High voltage large

NOTE 1: 5 amp–5000V non-constant impedance w/ w UG-932/U cable plug

TABLE 10-15. CONNECTORS BETWEEN DIFFERENT SERIES ADAPTERS

	N	HN	UHF	LT	BINDING POST	SPECIAL
UHF	N 83 UHF N 146 UHF N 318 UHF				UHF 332	UHF 294 NT 49120
BNC	N 349 BNC N 335 BNC N 201 BNC N 606 BNC PRESS	BNC 559 HN BNC 309 HN	BNC 273 UHF BNC 255 UHF		BNC 641	
C	N 565 C N 564 C					

TABLE 10-15. CONNECTORS BETWEEN DIFFERENT SERIES ADAPTERS (Cont'd)

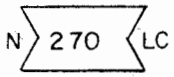
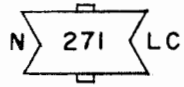
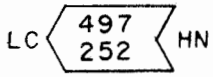
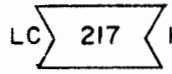
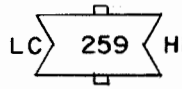
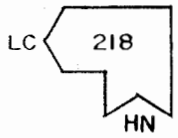
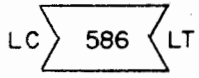
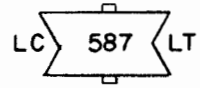
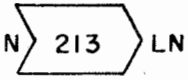
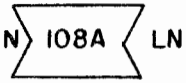
	N	HN	UHF	L T	BINDING POST	SPECIAL
LC	 	    		 		
BN						
LN	 					

TABLE 10-16. CONNECTORS BETWEEN RIGID COAX AND FLEXIBLE CABLE *

	To Jacks (Type)			To Cables (Type)			
	N	LC	HN	RG-19, 20/U	RG-17, 18/U	RG-14/U	RG-35/U
7/8" coax, 50 ohm	32	234	250				
7/8" coax, 70 ohm	33	233	251		NT 49531	257	
7/8" stub, 48 ohm	272 402	237	249		NT 49553 NT 49532	256	NT 49577
3/8" coax	371 370					207	
5/8" stub	401 519						
3-1/8" coax				161	337	258	
1-5/8" coax					192 168		

* *For preferred installations see Table 10-17*

TABLE 10-17. CABLE TO CONNECTORS

CABLE RG-( )/U	END SEAL	TYPE CONNECTOR	CABLE PLUG UG-( )/U	CABLE JACK UG-( )/U	PANEL JACK UG-( )/U	BKHD JACK UG-( )/U	HULL JACK * UG-( )/U	ARMOR CLAMP	HOOD (u/w Recp in Table 10-13)	TOOLS	REMARKS
5, 21		N	18B	20B	19B	159A					
5, 6		C	626	633	629	630					
8, 9, 11, 13 also 10, 12, 116 with armor clamp	MX-498/U 62111 62119	N	21B	23B	22B	160A		MX-564A/U	106		
		C	573	572	571	570					
		C (5000V)	628			632					
		HN	59C	60C	61C ① 427A ③			MX-564A/U		TL-612/U ② MX-103/U ④	
		UHF	NT 49195						106		
		JONES	NT 49458								
		AMPHENOL	No. 93								
10, 12, 116		N	941	940	935	936					
		C	943	944	938	937					
		C (5000V)		942		939					
		HN	925	927	929 ① 930 ③						
14, 74		N	204A				665				
		HN	494								
		LN	100	279	101						
		Pulse (Ceramic)	NT 49854							TL-323/U (Spanner)	
17, 18	MX-407/U (weatherproof)	N	167B/U								
		HN	495	333A	334						
		LC (LV)	154				640				
		LC ⑤	679								
	MX-1203/U (pressure-proof)	LN	NT 49550								
		QDL									

* Pressure-proof

NOTE 1: Drilled holes

NOTE 2: Tapering tool TL-612/U for UG-59C, 60C, 61C, 427A, 925, 927, 929, 930/U

NOTE 3: Tapped holes

NOTE 4: Tapering tool MX-103/U for UG-59, 59A, 59B, 60, 60A, 60B, 61, 61A, 61B, 427/U

NOTE 5: Quick disconnect type - u/w UG-679/U and UG-287/U superseded by QDL

TABLE 10-17. CABLE TO CONNECTORS (Cont'd)

CABLE RG-( )/U	END SEAL	TYPE CONNECTOR	CABLE PLUG UG-( )/U	CABLE JACK UG-( )/U	PANEL JACK UG-( )/U	BKHD JACK UG-( )/U	HULL JACK * UG-( )/U	ARMOR CLAMP	HOOD (u/w Recp in Table 10-13)	TOOLS	REMARKS
19, 20		LC (HVL)	156							TL-322/U (Spanner) TL-325/U (Counter-bore)	
22		UHF (small twin)	421		423				106		
27		Pulse (Ceramic)	36		158					TL-323/U (Spanner)	
28		Pulse (Ceramic)	174		166					TL-323/U (Spanner)	
55, 58, 58A		BNC	88	89	291	253 (press)			MX-195/U		See Note 6
		N	536								
		UHF	NT 49195 u/w 175 203								
		BN	85	115	114						
57		UHF (large twin)	NT 49188				672		NT 49208		
59, 62, 71		BNC	260, 932 (7)	261	262	624			MX-367/U		
		N	603	602							
		C	627		631						
		UHF	NT 49195 UG-116/U								
		BN	85	115	114						
64A, 77 78, 88		Pulse (Rubber)	180A			181A					
118		N	557								
		LT	532								
		HN	926								

NOTE 6: UG-203/U for RG-55/U; NT 49195 and UG-175/U for RG-58/U

NOTE 7: Non-constant impedance 5000V (used with UG-931/U Receptacle)

* Pressure-proof

TABLE 10-18. PREFERRED CONNECTORS – FLEXIBLE TO RIGID LINES

RIGID LINE	CONNECTOR FOR FLEXIBLE LINE	
	Transmitting	Receiving
7/8 coax, 50 ohm	UG-234/U to UG-154/U	UG-32/U to UG-21B/U..
7/8 coax, 70 ohm	Navy type 49577 to RG-35/U UG-233/U to UG-154/U	UG-33/U to UG-21B/U
7/8 stub, 48 ohm	UG-237/U to UG-154/U	UG-402/U to UG-45 male UG-519/U to UG-46 female
3/8 coax	For specific lines not listed refer to Bureau of Ships	
3-1/8 coax	UG-161/U to RG-19/U and RG-20/U	
1-5/8 coax	UG-192/U with solderless coupling	
1-5/8 NT-62200	See specific instructions NavShips 900,171 – Chapter 11	

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