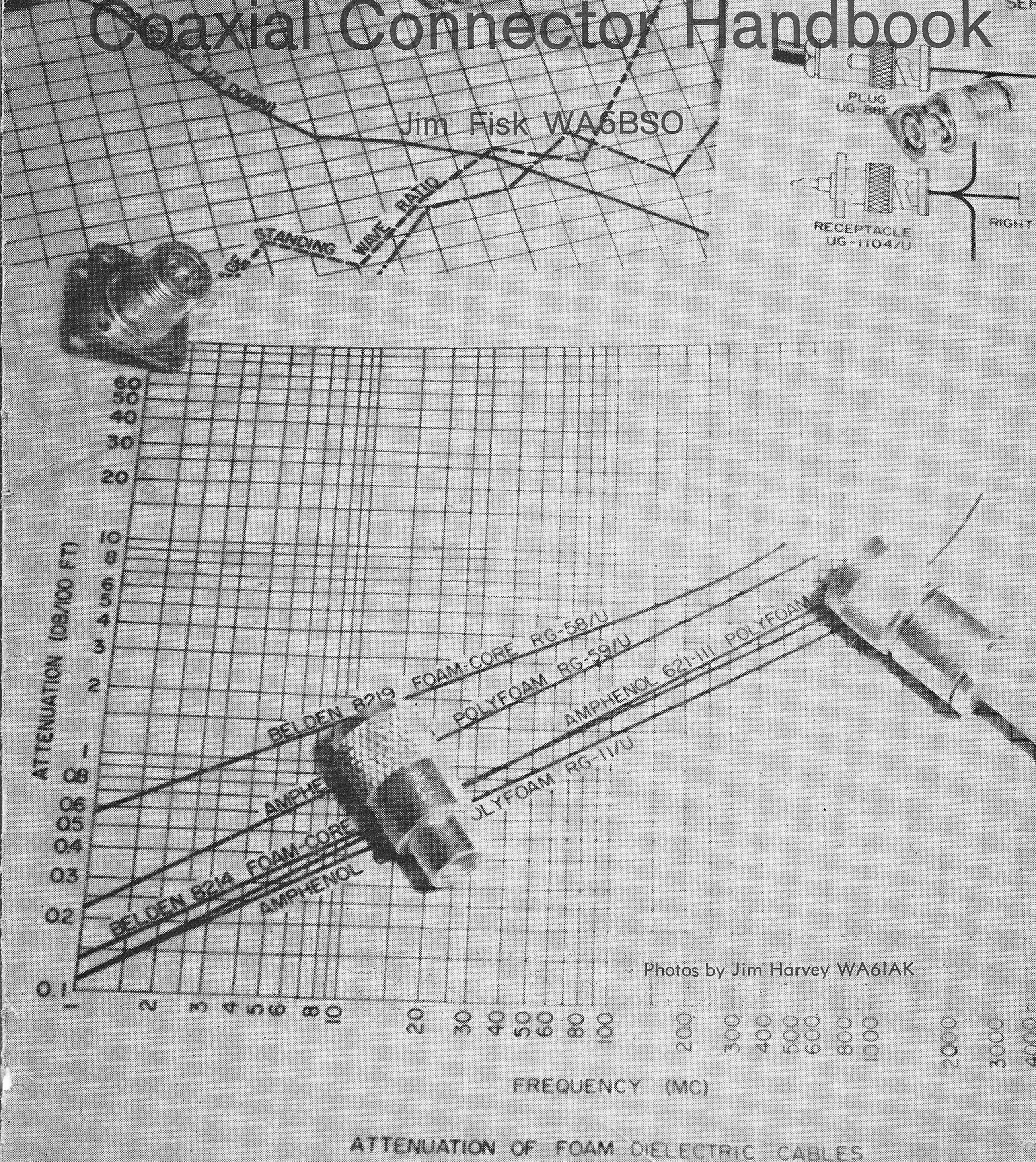
Coaxial Connector Handbook

Jim Fisk WA6BSO



ATTENUATION OF FOAM DIELECTRIC CABLES

Photos by Jim Harvey WA6IAK

Coaxial Connector Handbook

At the lowest audio frequencies and dc, coaxial cable connections consisting of simple solder joints to both conductors are sufficient in many cases. However, as the frequency of operation is increased into the low megacycle range, such connections allow leakage of rf energy and it is necessary to provide 360° contact with the outer conductor to completely contain the conducted electromagnetic field within the confines of the cable. At these frequencies the characteristic impedance of the section of line represented by the inner and outer diameters of the connector is generally not too important; the familiar series UHF connectors or "phono" connectors are illustrative of connectors suitable for these frequencies.

As the frequency of operation is increased beyond 150 mc, it becomes increasingly important that the characteristic impedance of the connector be the same as that of the cable. Also, any physical discontinuities such as the pin diameter of the connector differing from the cable inner conductor diameter must be held to a minimum. Common physical discontinuities such as steps or radial grooves in conductors act like shunt capacitors or series inductors respectively.

The adverse effect of these reactive components increases with frequency; therefore, to maintain a given standard of performance, the physical size of the discontinuities must be effectively made smaller and smaller as frequency is increased. Unfortunately it is not always possible to avoid all discontinuities and at the same time maintain a strong mechanical joint. In those cases where it is impossible to avoid discontinuities in the connector, they are compensated for by deliberately placing another compensating discontinuity in the same vicinity.

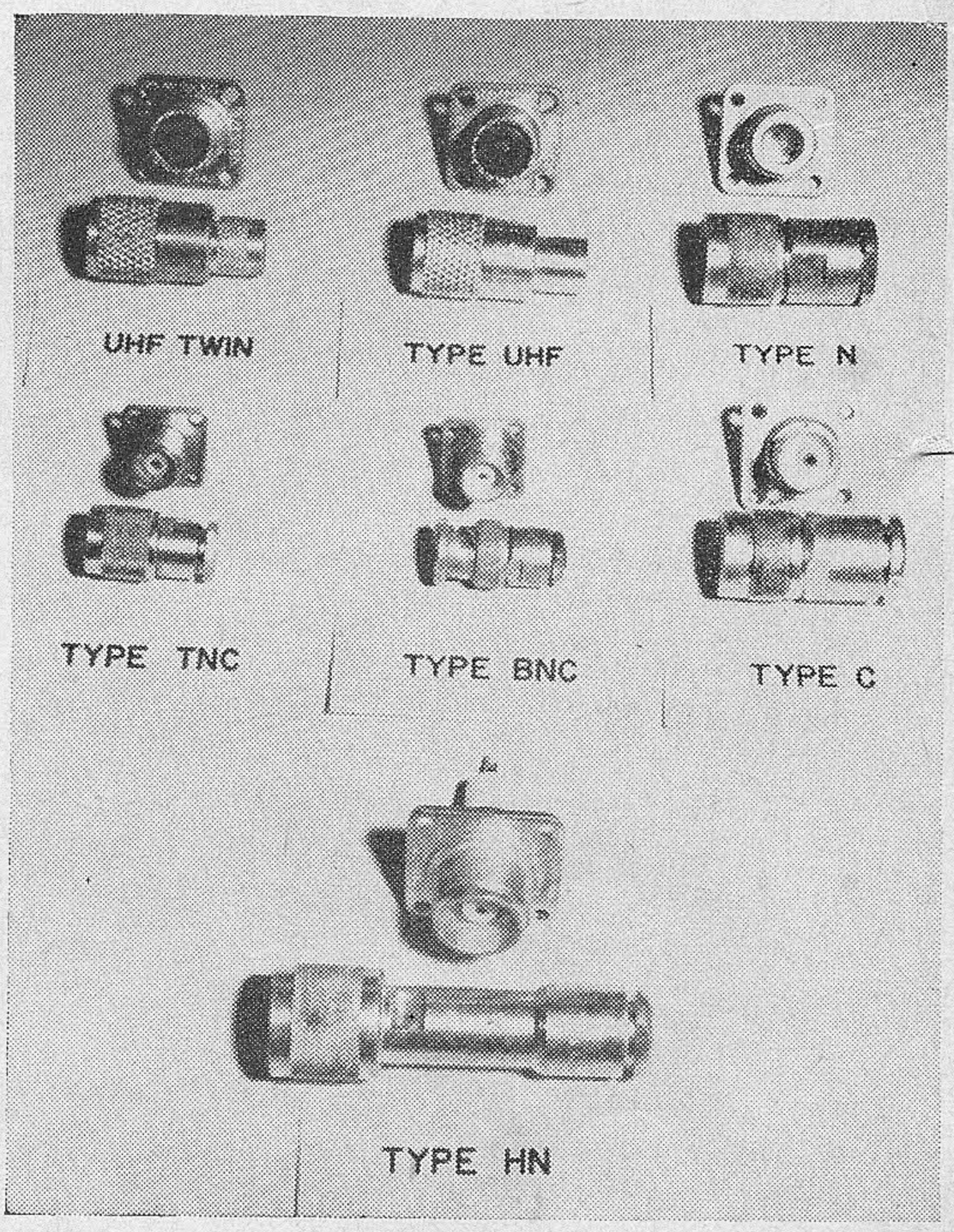
Types of coaxial connectors

Standardization of coaxial connectors has immeasurably aided in the selection and use of these devices. A direct result of this standardization is that a connector made by one manufacturer is directly interchangeable with similar connectors made by any other company.

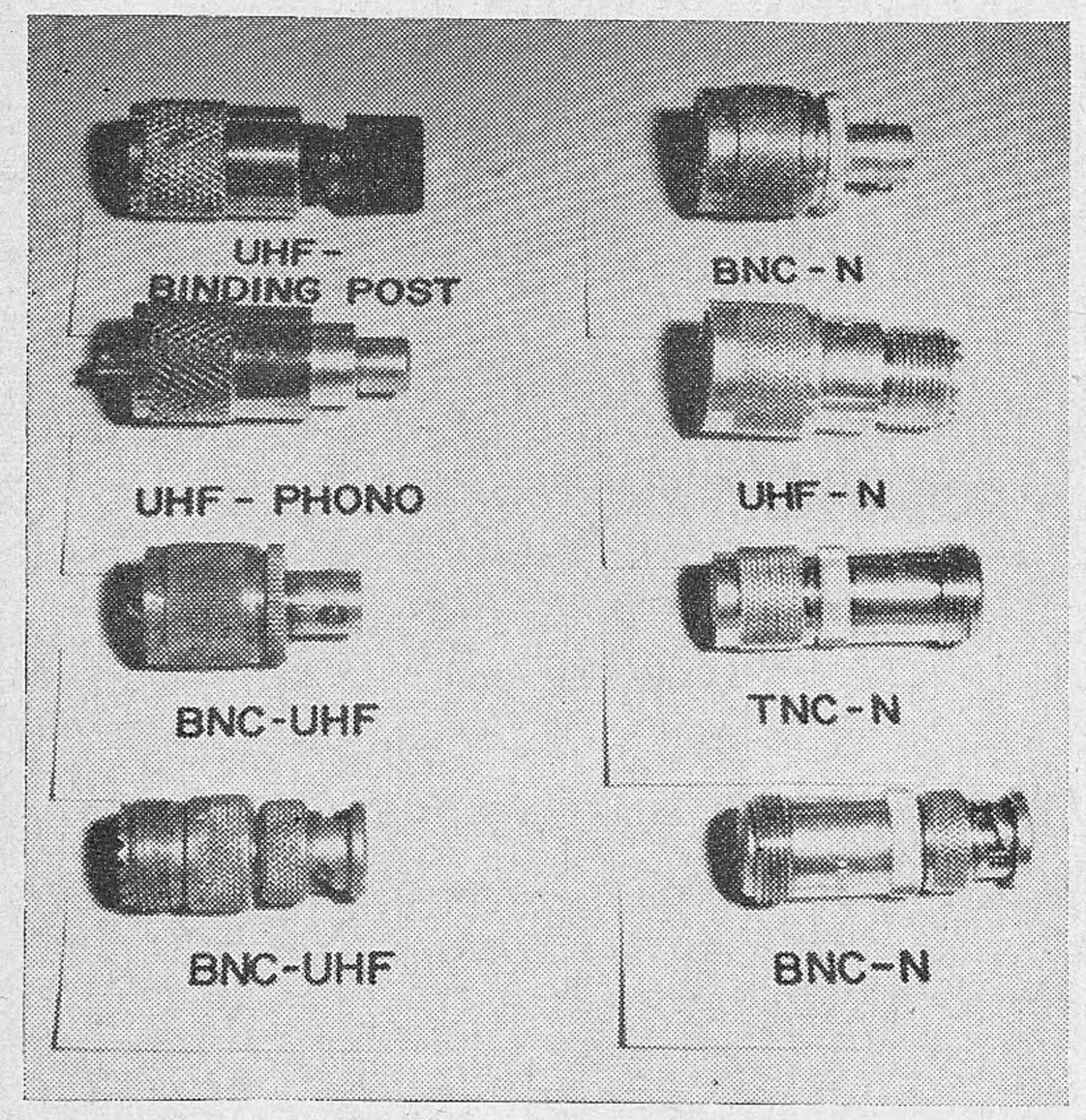
Coaxial connectors may be categorized by the method of coupling and cable size with which they may be used as shown in **Table 1.** Essentially, there are three methods of coupling; threaded, bayonet, and push-on. The five major cable sizes are subminiature, small, medium, medium-large and large. Although the various coaxial connectors were designed specifically for the cable sizes shown in **Table 1,** some types may be used with other cables. The Type N for instance, is available in configurations that are suitable for small, medium, medium-large and large coaxial lines.

Most major types of connectors are available in several different configurations within the series, based upon contact arrangement and cable clamping mechanisms. The three main divisions are "standard," "improved," and "captivated contact."

The "standard" connector employs a sleeve type or grooved silicone gasket which allows metal-to-metal braid clamping. The "improved" type used a "V" groove silicone rubber gasket which also provides metal-to-metal clamping but provides a better grip on the cable with minimum braid deformation and better SWR. In most cases the improved connectors may be used at considerably higher



Various coaxial connectors.



Straight between-series adapters.

frequencies than the standard versions. For example, standard Type N connectors have an upper frequency limit of 3500 mc whereas the improved version may be used to 10,000 mc.

"Captivated contact" connectors were designed to keep the center contact in a fixed position within the connector. This type is recommended for cables using Teflon dielectric and Teflon or fiberglass jackets. These cables, although excellent for high temperature applications, are difficult to use because the inner conductor has a tendency to shift when subjected to rapid environmental changes or mechanical stresses. The technique for captivating the contact provides protection against undesirable equipment disconnections.

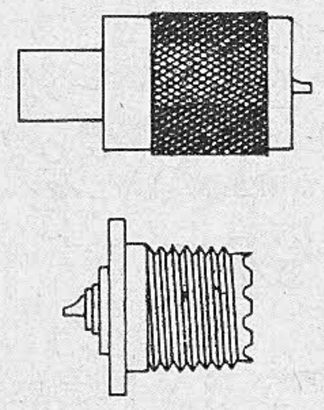
Connectors are also available with clamping devices for subminiature cables and semi-flexible cables such as Phelps Dodge Foam-flex. Coaxial connectors are attached to these cables through the use of barbed collets or clamps within the connector. The barbs may be machined into the clamp or a helically grooved sleeve is screwed over a barbed, helically coiled wire wound around the cable. The barbs are embedded in the cable's outer conductor and provide a rigid base for mounting the desired connector.

In addition to these variations, many manufacturers have "polarized" connectors available for the more popular types. These connectors are used to prevent careless or improper connections. The polarization is accomplished by reversing the normal insulation and inner contact assemblies. These connectors will not mate with normal connectors and the selected mating connector must also be polarized.

Two other types of connector construction that are worthy of mention are the crimped and wedged clamping types. The crimped connectors require no soldering and assembly time is reduced as much as 60%. These connectors are often used in large production facilities, and are the least expensive and simplest to assemble of all the connectors that require special tools. Unfortunately, the tools required are quite expensive and the crimped connectors are economical only where large quantities are involved.

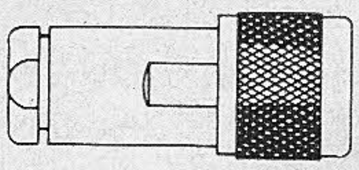
One type of wedged clamping connector available is Automatic Metal Products "Wedge-eze" illustrated in **Fig. 1.** This connector is economical, simple to assemble and does not require special tools for assembly. Another advantage over standard crimp types is that these connectors may be reused whereas the crimp styles are usable only once. In the Wedge-eze connector, the wedge-body assembly is placed over the cable dielectric, forcing the braid and outer jacket up over the conical section of the body. The nylon wedge cap then effectively clamps the braid and jacket to the connector as it is screwed on.

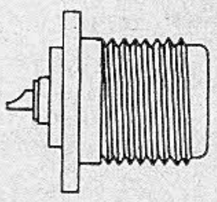
Types of connectors



UHF The UHF series was originally designed for use with medium sized cables such as RG-8/U, but reducing adapters were later introduced to permit usage with smaller cables. These non-constant impedance, non-weatherproof connectors are generally satisfactory for use up to about 200 mc and in some specific non-critical cases up to 500 mc. They may be used at peak voltages up to 500 volts. These connectors are made in two sizes, UHF small which is ⅝ inch in diameter and UHF large, one inch in diameter. Plugs, receptacles and adapters were included in the original design, but jacks were not in demand and were not developed. This series also includes twin contact connectors (both large and small) for use with twin coaxial cables such as RG-22/U.

Although this series is the most common coaxial connector found in amateur equipment, it is no longer approved for use on any new equipment built for the Armed Services. The complete family of UHF (single contact) connectors is illustrated in **Fig. 2.**



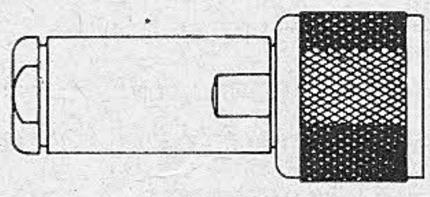


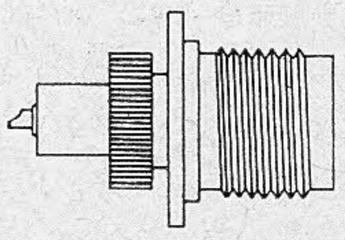
SERIES N

SERIES N Series N connectors are recommended where a medium size, weatherproof connector with a screw type coupling is desired and it is one of the most widely used series of connectors. They are general purpose connectors with constant impedance characteristics and may be used in 50 ohm circuits employing medium sized cables such as RG-8/U. However, when matching requirements are not critical, they may also be used with larger or smaller cables.

The original Series N design used a polystyrene bead as the dielectric material and the connectors were widely used because they were made in 50 ohm, 70 ohm, weatherproof and non-weatherproof varieties. The 50 ohm connectors will not mate with the 70 ohm connectors; however, 50 ohm connectors may be used with 70 ohm coaxial cables where impedance matching is not important. These connectors have a maximum voltage rating of 1500 volts and a practical upper frequency limit of 10,000 mc. They are gasketed for weatherproof operation and are available with various types of metal-to-metal clamping devices.

The complete family of type N connectors is shown in **Fig. 3.** This drawing rather graphically illustrates the versatility of this series with the many configurations available.

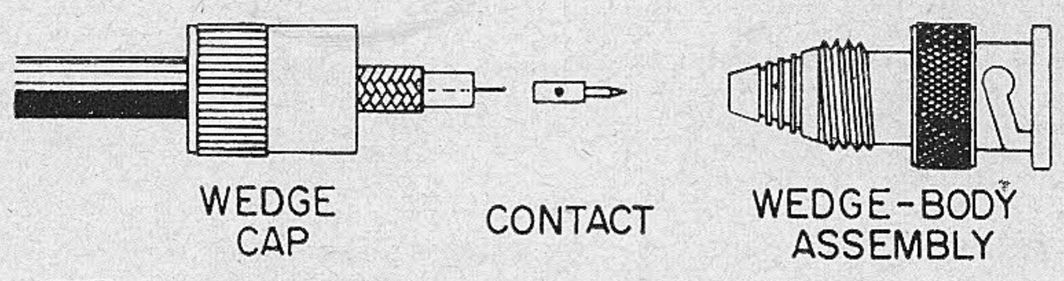




SERIES HN

SERIES HN Series HN connectors are medium-large weatherproof connectors for the same size cable as series N. The difference being that the dielectric material is tapered to permit their use at higher voltages. The latest version of these connectors employs a step design in lieu of tapering the cable dielectric. These connectors have a nominal impedance of 50 ohms, screw-type coupling and metal-to-metal braid clamping in standard, improved and captivated contact types.

Series HN connectors were originally designed for use in high voltage applications up to 5000 volts peak; however, results of tests conducted by the U. S. Navy indicate that at rf frequencies, the voltage characteristics of the HN connectors are no better than those



WEDGE CAP

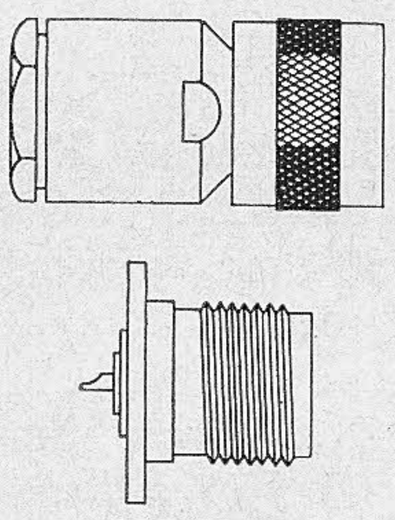
CONTACT

WEDGE-BODY ASSEMBLY

ASSEMBLED UNIT

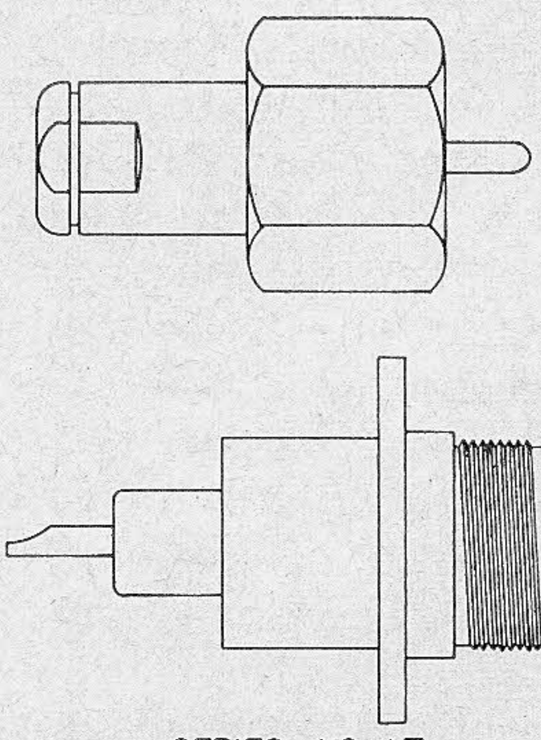
Fig. 1. Typical Wedge-eze construction.

of the C or N series. Consequently, HN connectors should be used for replacement purposes only.



SERIES LN

SERIES LN The series LN connectors are essentially nothing more than an oversized "N" connector originally used with the larger rf cables such as RG-14, -74, and -94/U. These weatherproof connectors have a nominal impedance of 50 ohms and an approximate peak voltage rating of 1000 volts. This series has been replaced by two plugs, UG-204A/U in the N series and UG-494/U in the HN series. Consequently, very few LN connectors are found in present day equipment.



SERIES LC-LT

SERIES LC-LT LC connectors are large-size weatherproof, 50 ohm connectors for RG-17, -18, -19 or -20/U coaxial cables employing screw-type coupling. They are intended for high power rf transmission up to 1000 mc. A jack was not originally designed for this series and it wasn't until the early 1950's that one was introduced.

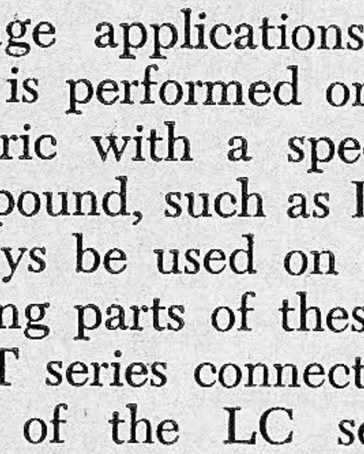
Two groups of LC connectors are available; group LC-1 which will withstand peak voltages of 500 volts and the slightly larger LC-2 which will withstand voltages in excess of 10,000 volts. Where it is desired to operate

Cable Size	THREADED COUPLING Type	Thread	Impedance (ohms)	Max Freq (mc)	BAYONET COUPLING Type	Coupling	Impedance (ohms)	Max Freq (mc)	PUSH-ON COUPLING Type	Coupling	Impedance (ohms)	Max Freq (mc)
Sub-miniature	SM	1/4 X 32	50	1000	TPS	3 prong	50	10000				
Small	BN	3/8 X 32	50	200	BNC	2 prong	50	10000	Phono	Not Detented	Not Matched	200
	TNC	7/16 X 28	50	10000								
	SKL	3/8 X 32	50	—	MHV	3 prong	50	50				
Medium	N	5/8 X 24	50	10000	C	2 prong	50	10000	QDS	Ball Detent	50	10000
	UHF (Single)	5/8 X 24	Not Matched	200								
	UHF (Twin)	5/8 X 24	Not Matched	200								
	SC	11/16 X 24	50	10000								
Medium-Large	UHF (Single)	1 X 20	Not Matched	200								
	UHF (Twin)	1 X 20	Not Matched	200								
	LN	3/4 X 27	50	1000								
	HN	3/4 X 20	50	3500								
Large	LC-1	1 1/4 X 18	50	1000					QDL	Ball Detent	50	1000
	LC-2	1 3/4 X 16	50	1000								
	LT	1 1/4 × 18	50	2500								

Table 1. Coaxial connectors charted by cable size and coupling method.

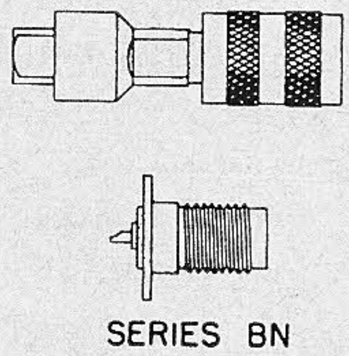
the LC series as a low voltage connector, the cable dielectric is butted flush against the dielectric in the mating connector. For high voltage applications, a counterboring operation is performed on the end of the cable dielectric with a special tool. Ignition sealing compound, such as Dow-Corning No. 4 should always be used on the faces of the dielectric mating parts of these connectors.

LT series connectors are actually an extension of the LC series designed to accept RG-117 and -118/U size cables. They have been improved greatly by specialized design, and several models are now manufactured for use at elevated frequencies. It should be noted that the LT series is similar to but not interchangeable with the LC series; an adapter is available which allows connection of this series to the LC series.



SERIES QDS

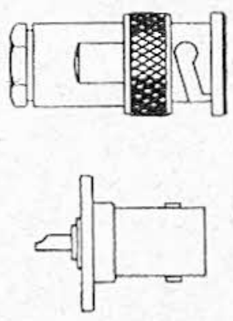
SERIES QDS The QDS series of connectors is an advanced version of the QDL series which was designed primarily for use aboard submarines to replace the LC series. This series uses a "push-pull" locking ball coupling arrangement similar to that found on air line hoses. This arrangement reduces coupling-decoupling time considerably. The QDS series are weatherproof, 50 ohm connectors for use with medium sized coaxial cables such as RG-8/U. These connectors are rapidly connected and disconnected and overcome the "rocking" tendency found in the bayonet type C and BNC series. QDS connectors employ an improved metal-to-metal cable clamping mechanism that provides a practical upper frequency limit of 10,000 mc.



SERIES BN

SERIES BN BN series connectors are small, lightweight connectors designed for use with small cables such as RG-58 and -59/U. Actually, they might be called small-size "N" connectors. They may be used for video, *if*, and other low power rf applications. These connectors are not electrically matched or weatherproof, and therefore are not recommended for applications at frequencies in excess of approximately 200 mc unless the electrical requirements of the circuit are not critical. They may be used at peak voltages up to 250 volts. Since the advent of the BNC

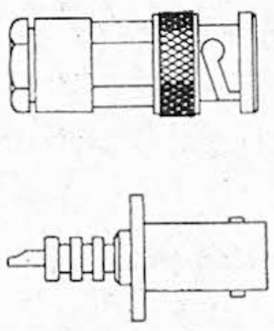
connector, their use has been virtually eliminated except for replacement purposes on very old equipment.


SERIES BNC

SERIES BNC This small connector design is probably the best known series in use at the present time. It was the first reliable quick connect and disconnect series; all the other connectors in early use used screw coupling. The bayonet coupling permitted rapid connections to be made and as such they made a tremendous hit in the test equipment field. These connectors are similar in size to the BN series but electrically they are greatly improved; original designs showed them to have an SWR of 1.15 from 1 to 3000 mc.

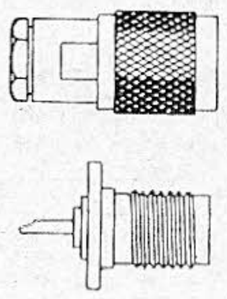
BNC connectors are of constant impedance with a nominal value of 50 ohms, and introduce little discontinuity in 50 ohm coaxial circuits employing small cables such as RG-58/U. Where some electrical mismatch is allowable, they may be used with other small and medium sized cables.

These connectors are fully weatherproofed and rated for use where the maximum voltage does not exceed 500 volts. They are available in standard, improved and captivated contact clamping arrangements. The improved connectors have been redesigned to give low standing wave ratios up to 10,000 mc in 50 ohm circuits. They are available with Teflon insulators which allow high temperature operation, and feature heat-treated beryllium copper spring fingers for both inner and outer contacts. There connectors are also available in polarized and pressurized versions.


SERIES MHV

SERIES MHV MHV series connectors are miniature high voltage connectors employing a bayonet-lock coupling similar to the BNC series. They are designed for small cables such as RG-58/U, and may be used at frequencies up to 50 mc. They may be used at peak voltages up to 5000 volts with a maximum current rating of 5 amps.

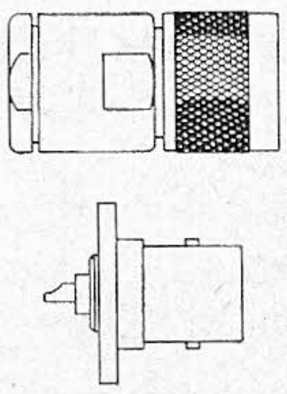
These connectors are similar to, but will not mate with, the series BNC connectors. They are weatherproofed with silicone rubber gaskets and feature the same metal-to-metal cable clamping mechanism used in the improved BNC series.


SERIES TNC

SERIES TNC Where in previous years great emphasis was put on ease of connection, the advent of high speed aircraft and missiles with their inherently stringent environmental requirements forced a return to the more positive vibration-proof threaded coupling. As a result the TNC series was created. Originally merely a threaded version of the BNC series prescribed for moderate frequency applications, increased usage at elevated frequencies through 10,000 mc has required manufacturing techniques far beyond those originally required for the BNC series.

The threaded coupling and safety wire provisions of the TNC series insure locking and secure mating under the most severe conditions of vibration and shock. Heat-treated beryllium copper spring fingers are used for both inner and outer contacts, thus providing positive contact during vibration and a substantial reduction in noise level.

These connectors are rated at 500 volts and have been designed to give low standing wave ratios at frequencies up to 10,000 mc in 50 ohm circuits. They feature clamping of the improved BNC type and are gasketed for weatherproof operation. Normally the TNC series is not used except in the stringent environmental conditions encountered in high speed aircraft or missiles.


SERIES C

SERIES C When originally designed the C series represented a big step forward in electrical performance at the higher frequencies. These connectors are for use with the same size cables as the N series but employ the mechanical advantage of bayonet coupling. This series introduced the new improved cable clamping mechanism wherein the cable gasket is actually cut when the clamp nut is tightened. This action gives good electrical contact for the cable shield and improves cable retention.

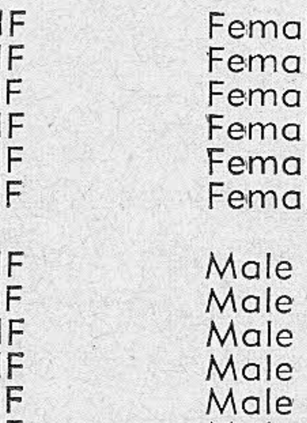
The C series is recommended where fast connection and disconnection by means of the bayonet lock coupling is required. For these purposes, this series is ideal. They are of constant impedance and may be used with minimum mismatch in 50 ohm circuits employing medium size cables such as RG-8/U. However, where matching requirements are not critical, they may also be used with either

Description					Military Number	Engineering Data
BNC	Female	to	C	Male	UG-636A/U	
BNC	Female	to	HN	Male	UG309/U	
BNC	Female	to	N	Male	UG-201A/U	
BNC	Female	to	N	Female	UG-606/U	
BNC	Female	to	QDS	Male	UG-1146/U	
BNC	Female	to	SM	Female	UG-690/U	Not Weatherproof
BNC	Female	to	SM	Male	UG-691/U	Pressurized
BNC	Female	to	UHF	Female	UG-255/U	Not Weatherproof
BNC	Female	to	UHF	Male	UG-273/U	Not Weatherproof
BNC	Female	to	Banana Jacks		UG-1035/U	
BNC	Male	to	C	Female	UG-635/U	
BNC	Male	to	HN	Female	UG-559B/U	Right Angle
BNC	Male	to	N	Female	UG-335/U	Flange Mounting
BNC	Male	to	N	Female	UG-349B/U	
BNC	Male	to	N	Male	UG-1034/U	Not Weatherproof
BNC	Male	to	QDS	Female	UG-1136/U	
BNC	Male	to	Banana Jacks		UG-978/U	
BNC	Male	to	Banana Plugs		UG-987/U	
BNC	Male	to	Binding Post		UG-282/U	
N	Female	to	BN	Male	UG-605/U	
N	Female	to	BNC	Female	UG-606/U	
N	Female	to	BNC	Male	UG-335/U	Flange Mounting
N	Female	to	BNC	Male	UG-349B/U	
N	Female	to	C	Male	UG-565/U	
N	Female	to	HN	Female	UG-1107/U	
N	Female	to	HN	Male	UG-1108/U	
N	Female	to	LC	Male	UG-999A/U	
N	Female	to	LN	Female	UG-108A/U	
N	Female	to	QDS	Male	UG-1144/U	
N	Female	to	UHF	Male	UG-83B/U	Not Weatherproof
N	Male	to	BNC	Female	UG-201A/U	
N	Male	to	BNC	Male	UG-1034/U	Not Weatherproof
N	Male	to	C	Female	UG-564/U	
N	Male	to	LN	Male	UG-213A/U	
N	Male	to	QDS	Female	UG-966/U	
N	Male	to	UHF	Female	UG-318/U	Not Weatherproof
N	Male	to	UHF	Male	UG-146A/U	Not Weatherproof
UHF	Female	to	BN	Male	UG-241/U	Not Weatherproof
UHF	Female	to	BNC	Female	UG-255/U	Not Weatherproof
UHF	Female	to	N	Male	UG-146A/U	Not Weatherproof
UHF	Female	to	Twin	Male	UG-970/U	Right Angle
UHF	Female	to	Banana Jack		UG-1017/U	
UHF	Female	to	Brittish 10H588		UG-197/U	
UHF	Male	to	BNC	Female	UG-273/U	Not Weatherproof
UHF	Male	to	C	Female	UG-637/U	Not Weatherproof
UHF	Male	to	N	Female	UG-83B/U	Not Weatherproof
UHF	Male	to	N	Male	UG-318/U	Not Weatherproof
UHF	Male	to	Binding Post		UG-332/U	
UHF	Male	to	British 10H365		UG-171/U	

Table 2. Coaxial connector guide adapters between different series.

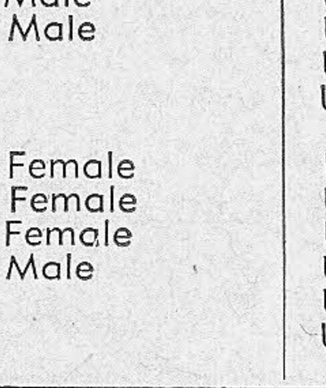
larger or smaller cables.

These weatherproof connectors have a maximum peak voltage rating of 1500 volts and a practical frequency limit of 10,000 mc. There is a high voltage version made for use up to 4000 volts peak, but this connector should not be used in applications above 2000 mc.


SERIES SC

SERIES SC SC Connectors are a threaded coupling version of the C series and represent an upgrading of the C connectors similar to the BNC-TNC improvement. The threaded coupling and safety wire provisions insure locking and secure mating under the most extreme conditions of vibration and shock.

This series has a maximum peak voltage rating of 1500 volts and provides low standing wave ratios at frequencies up to 10,000 mc in 50 ohm circuits. Like the TNC series, these connectors are not ordinarily used except under the stringent environmental conditions found in high speed aircraft and missiles.


SERIES SM

SERIES SM This series was designed for use inside equipment which does not require the weatherproof features found in present connectors. They employ the screw type design similar to the old BN series and in some ways could be called improved BN connectors. They were developed to fulfill the

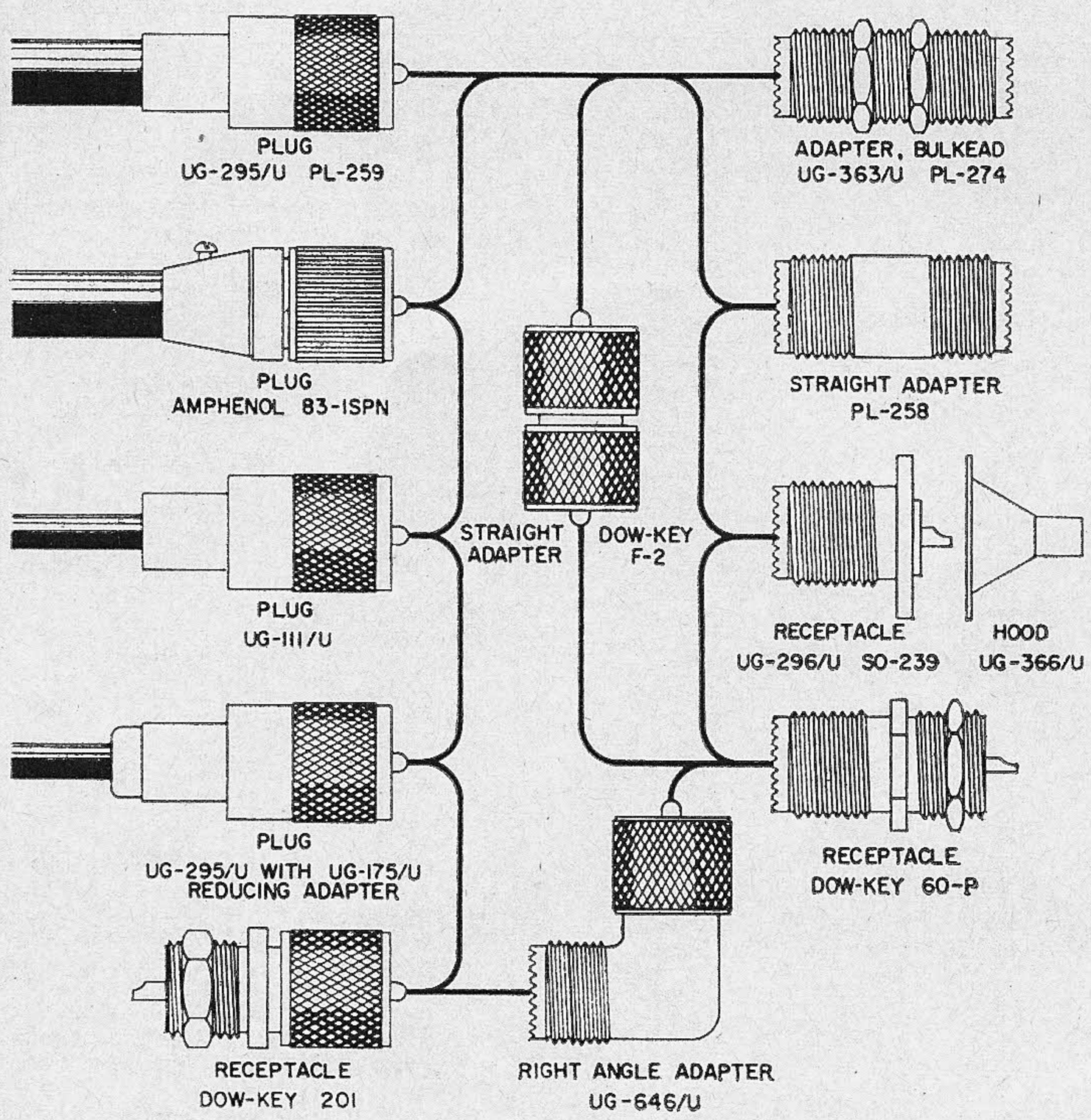
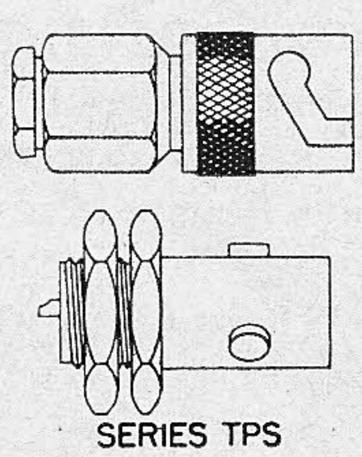


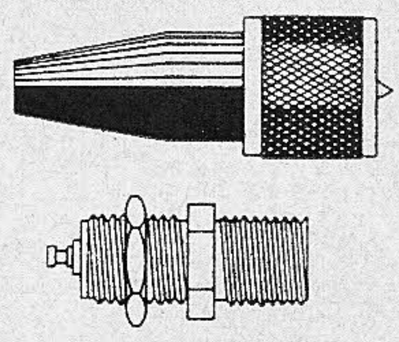
Fig. 2. UHF connector family.

need for a small rf fitting for use with coaxial cables of ¼ inch overall diameter and smaller. They should not be used where electrical matching is required.

SM connectors are considerably smaller and contain fewer parts than the BNC series; for simplicity of design, they employ a female contact on the plug and a male contact on the jack and receptacle. The SM series has the advantage of positive braid clamping and does not use the inner conductor of the cable as the center contact. These connectors are not intended to replace the BNC series except for internal equipment connections where weatherproofness is not required. Its useful range is presently limited to frequencies below 1000 mc and peak voltages below 100 volts.


SERIES TPS

SERIES TPS A recent development of the Signal Corps, this three-pronged bayonet coupled series is slightly smaller than the BNC series and larger than the SM series. These connectors are weatherproof and produce minimum electrical discontinuities in small size solid dielectric 50 ohm coaxial cables up to 10,000 mc. They are rated at 1500 volts RMS at sea level. The method of cable clamping is a wedge type device that when used with RG-59/U type cables, provides a minimum cable retention of 45 pounds.


SUBMINIATURE

SUBMINIATURE Because of the tremendous number of subminiature connectors manufactured by the various connector companies, it is impossible to cover all of them here. The inset drawing is just representative of the many varieties available. The majority of these connectors are recommended for use in test equipment, video leads, communications receivers. *if* and rf circuits or wherever miniaturization is a factor. In fact, several manufacturers have printed circuit models of receptacles and terminations.

Subminiature connectors are available in threaded, bayonet, push-on and snap on versions with nominal impedances of 50, 75 and 93 ohms. Some units are weatherproof and various sizes are made to accommodate cables to ¼ inch in diameter. Because of their small

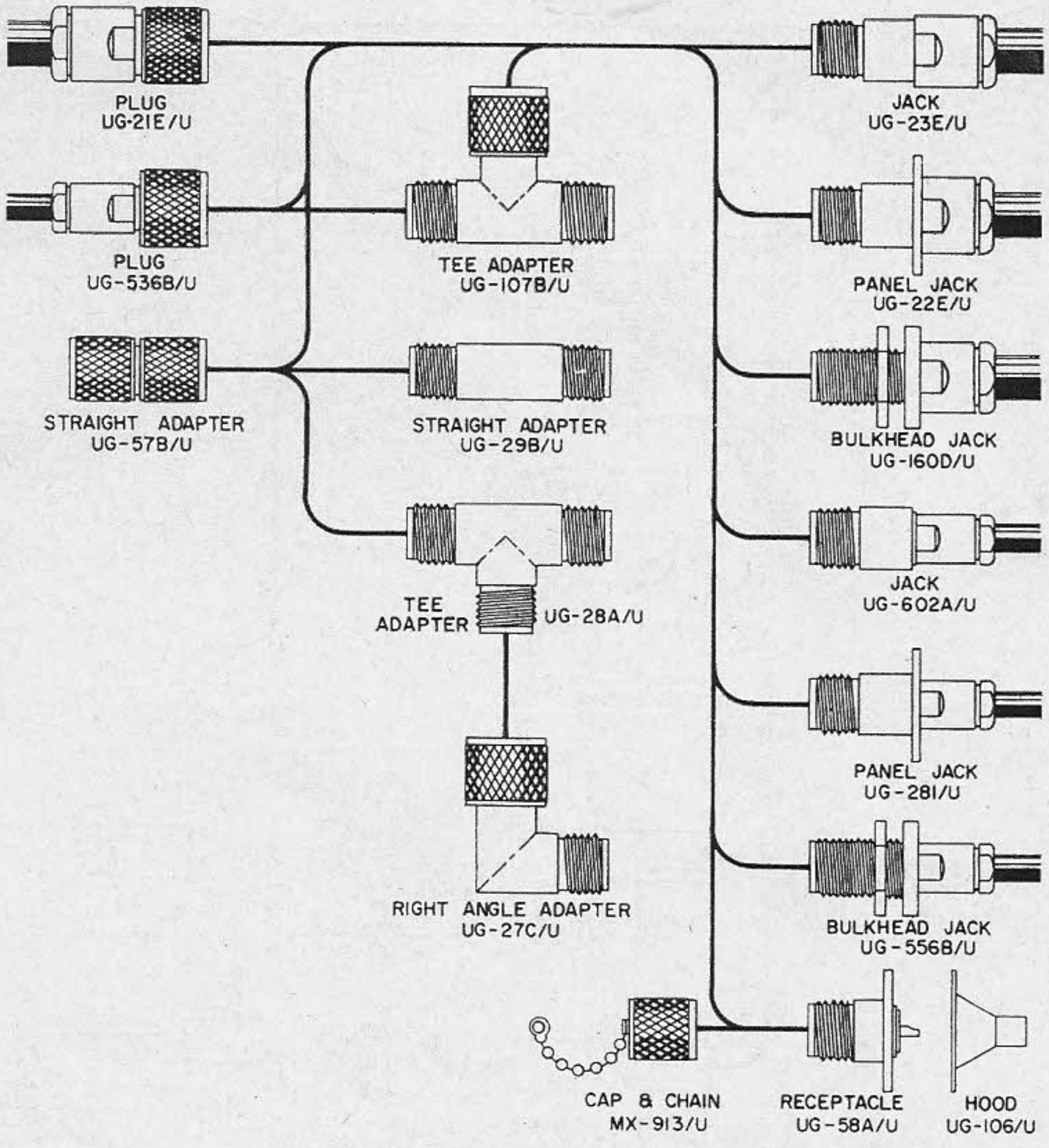
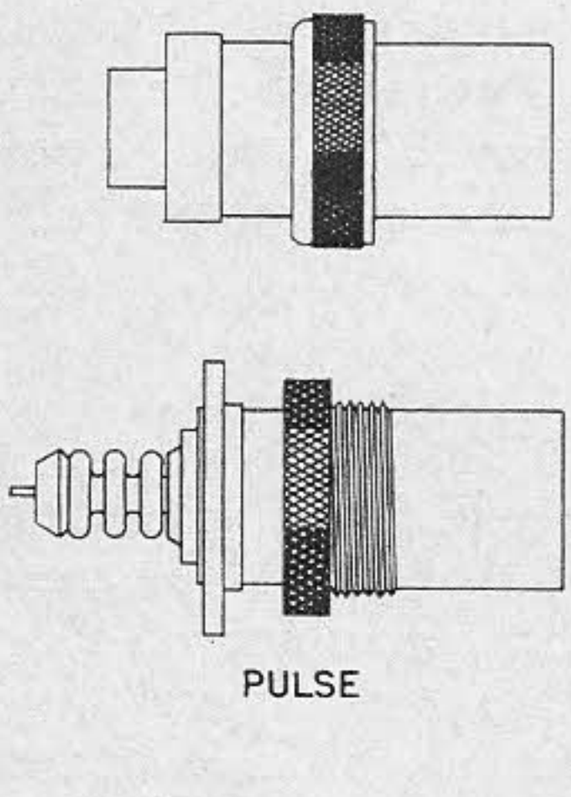
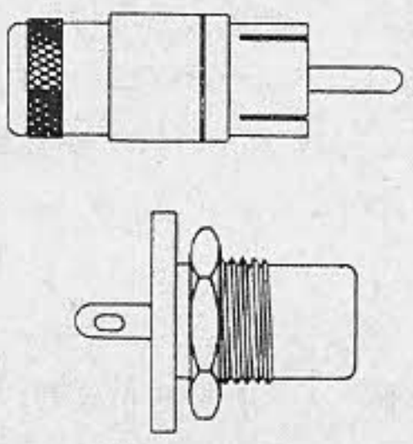


Fig. 3. Series N connector family.

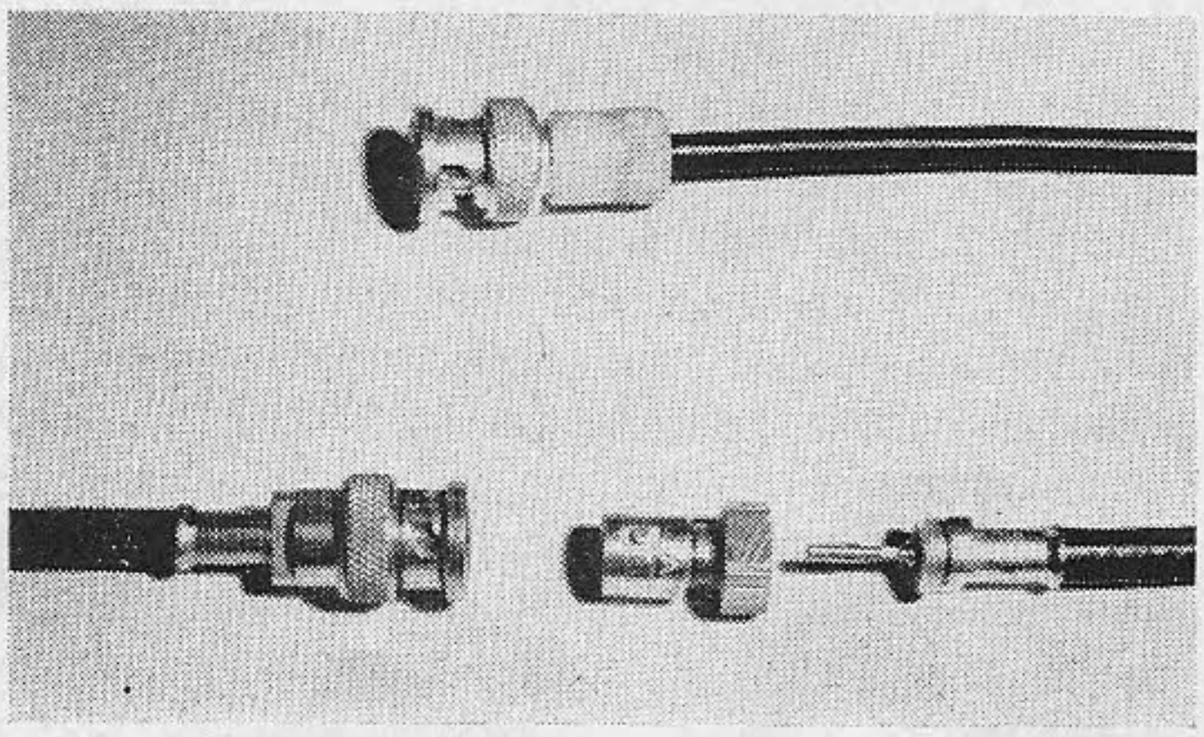
size, many of these connectors are usable up to 3000 mc. Typical of these connectors are the Sub Minax series by Amphenol, the BSM and MTM series by Automatic Metal Products and the OSM connector made by Omni Spectra, Inc.



PULSE Several varieties of connectors have been developed for high voltage pulse applications, particularly for radar. The pulse connectors with ceramic inserts are divided into two groups known as types A and B. The Pulse A connectors are widely used on U. S. Navy aircraft and at high altitudes they occasionally arc across the ceramic dielectric. However, as soon as the voltage stress is removed, they are again usable. The chief difficulty of the Pulse A connector is that inadequate bonding between mating connectors creates excessive noise when used near communications equipment. Pulse B connectors are considered standard for shipboard and ground equipment and may be used up to 15,000 volts peak. The Pulse B connectors also suffer from the tendency to leak noise.



PHONO Phono connectors were originally designed for interconnection of shielded audio cables, but modern versions with nylon and ceramic insulation are suitable for low-power rf applications. These connectors are somewhat limited in use,



Labor saving coax connectors. In the front is a crimped type. An automatic Metal Products "Wedge-eze" is in the rear.

Fig. 4. Series BNC connector family.

but are economical, easy to assemble and provide a simple method for interconnection of receivers, VFO's, *if* strips, and other low-power equipment. These connectors do not provide 360° contact with the cable braid so there is some radiation loss at frequencies above one megacycle. They are not moisture-proofed and are intended only for indoor applications. Photo connectors have been used to a limited extent up to 150 mc, but the BNC, N or even UHF series do a better job and should be used instead of the photo connector in all but the least critical areas.

SERIES QL and QM (Not illustrated) These connectors are a recent development of the Signal Corps which feature a quick lead thread and are intended for high power, high voltage, low SWR connections with large size coaxial cables such as RG-217, -218, -219, -220, and -221/U where LC, LT, C and N connectors have been used in the past. These connectors provide a maximum SWR of 1.27:1 in mated pairs of cable assemblies up to 5000 mc.

SERIES SKL (Not illustrated) This type connector was originally designed to provide connections to klystron tubes, and various modifications were subsequently added to provide general-purpose cable to cable connections. Unfortunately, some of these connectors are still in use today even though the BNC would do a much better job. Furthermore, existing standard types such as the BNC and N perform the same function and are more generally available than the SKL series.

Special connectors

There are several special types of coaxial connectors and adapters that should be mentioned. Perhaps the most important of these are the between series adapters. These adapters provide an efficient electrical and mechanical transition between two different rf series. They are of non-constant impedance, but are designed so that the inherent electrical discontinuities are minimized. Although the straight adapter is the most common, other configurations are available to satisfy nearly any requirement; from straight and bulkhead adapters to angles, crosses and tees. A complete listing of between series adapters

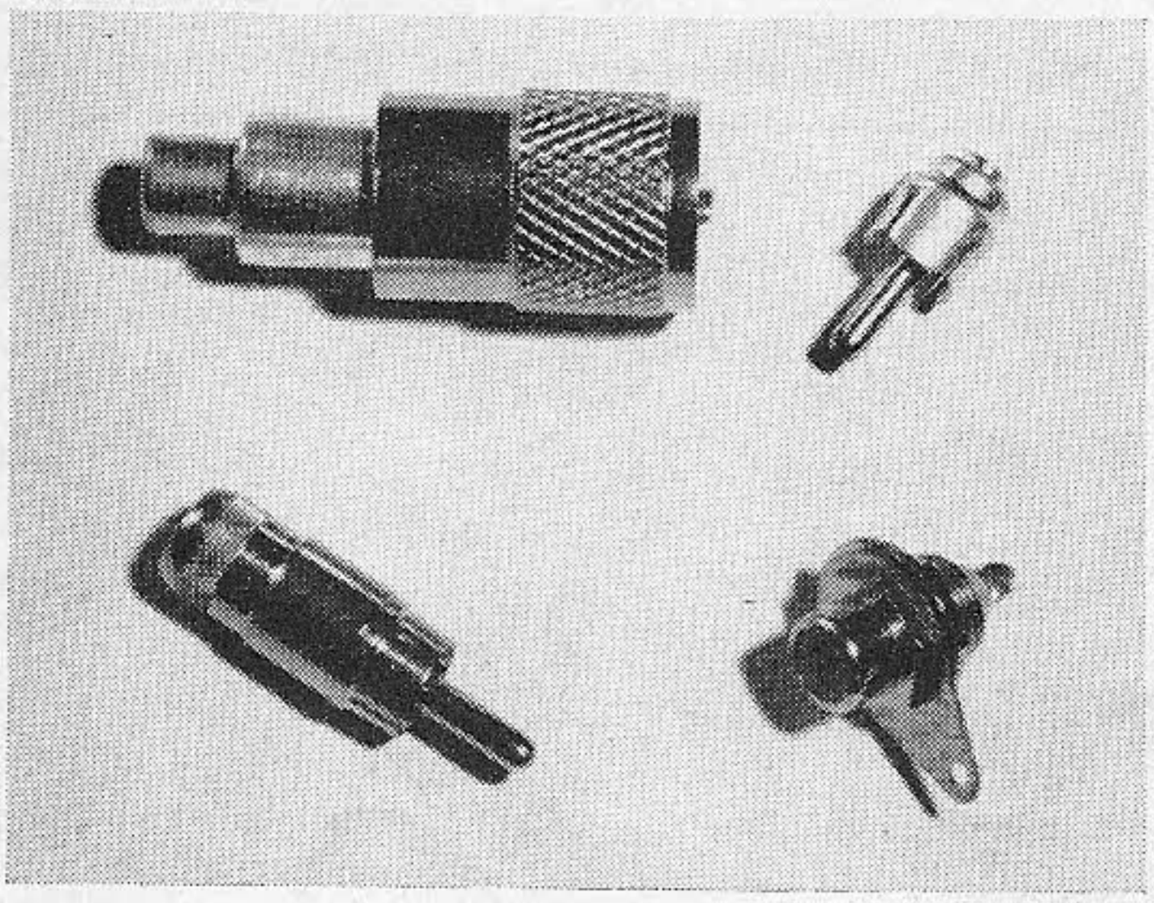
for BNC, N and UHF to other types is listed in **Table 2.**

Transitions and splices

Terminations or end seals are a very helpful class of connector not normally encountered by amateurs. These devices provide a convenient, mechanical method for securing the end of a coaxial cable. A neat, connector-type braid clamp grounds the braid to the chassis terminal and allows the cable dielectric and inner conductor to extend for any convenient length for direct connection to a component. A variety of mounting arrangements are available as shown in **Fig. 5.** BNC or N connector techniques are employed in the assembly of these units.

Cable end seals are usually used in one of two ways; either as a termination or for strain relief. The termination is designed so that the jacket and braid of the cable are clamped within the body of the connector, while the dielectric and inner conductor are allowed to continue through. The strain relief variety is used for support only and the entire cable is allowed to continue through the body of the connector.

Cable splices are another class of connector which is not too familiar. These special connectors provide a convenient and neat workmanship method of joining two, three or four coaxial cables with a minimum of impedance mismatch. Splices are available in three basic configurations: tee, cross and transition as shown in **Fig. 6.** The tee and cross versions provide an efficient junction point for three or four cables and are especially useful in antenna phasing assemblies or similar applications. They may be used for continuation of the cable shielding or for inserting instruments in the circuit. They are also used for locating resistors and other components within the splice, or simply to save time and work in the repair of defective coaxial cable. The transitions may be used for splicing two similar or dissimilar cables. Normally the tees and crosses are gasketed for weatherproof operation while the transitions are non-weatherproof.



Phono connectors. Clockwise from upper left: phono to series UHF adapter, cable plug, chassis receptacle and improved cable plug.

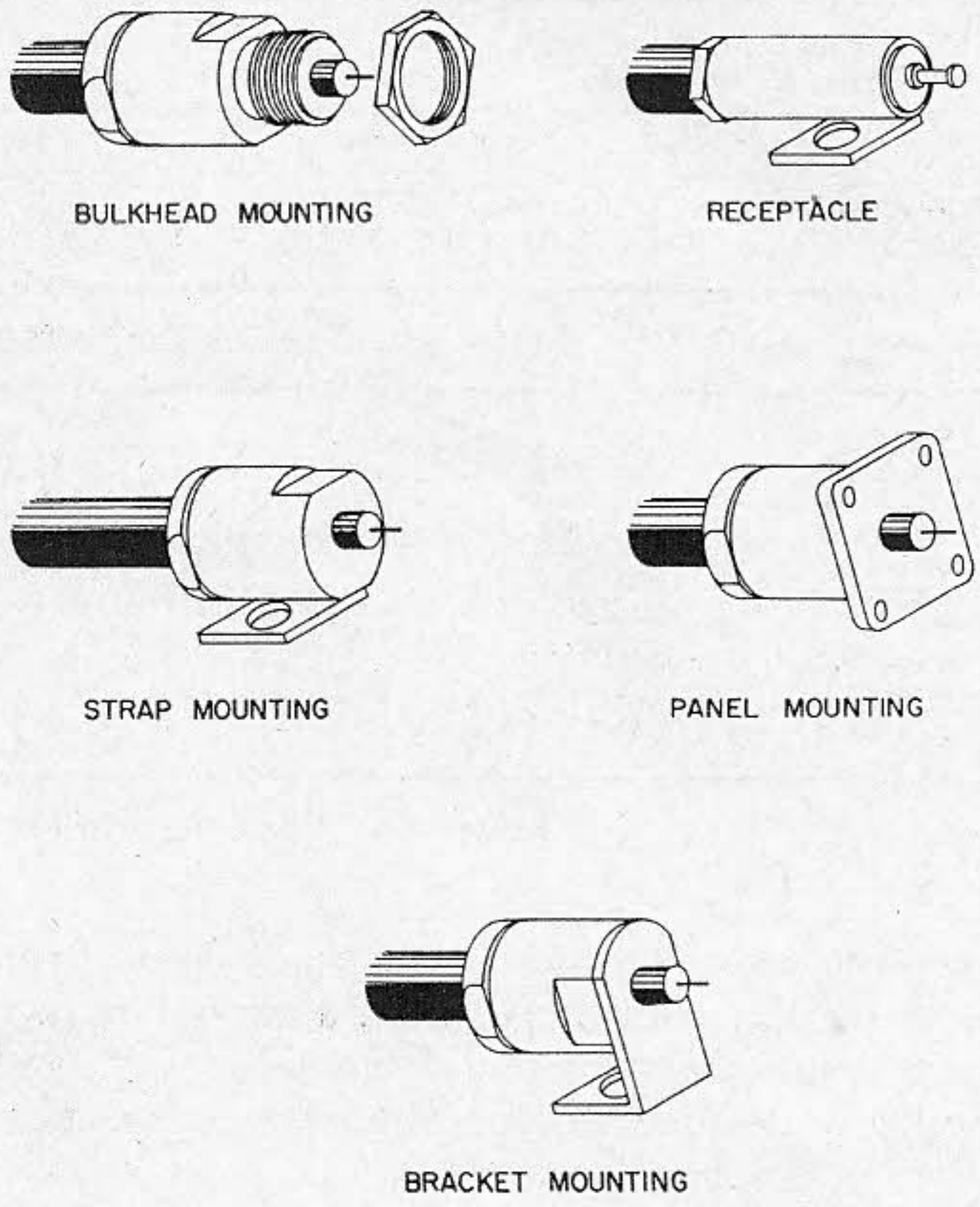


Fig. 5. Terminations.

Coaxial connector selection

Because of their importance in high frequency connector work, a considerable amount of experimental data on coaxial cable discontinuities has been accumulated and rather

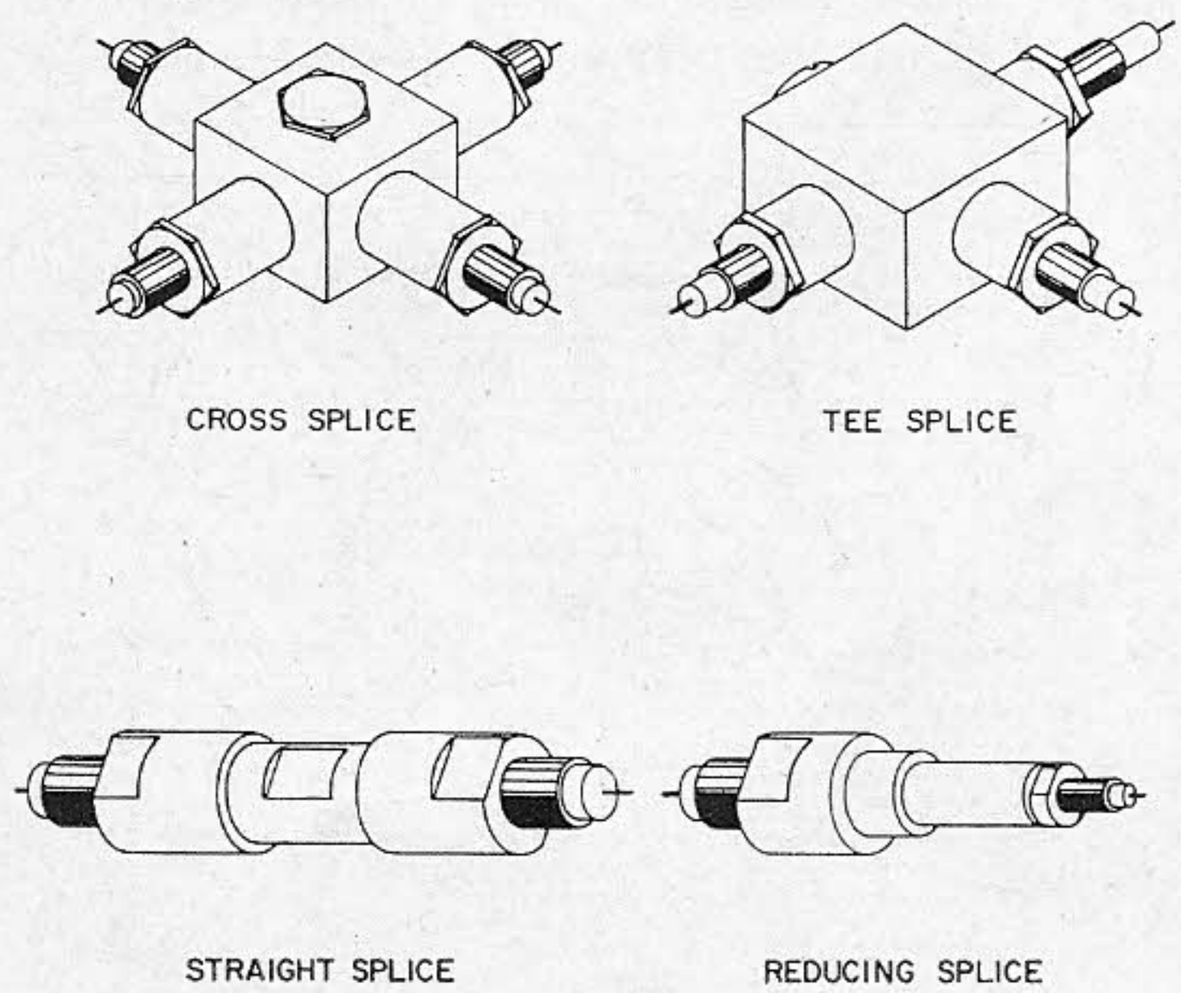


Fig. 6. Coaxial cable splicing hardware.

For RG/U Cables	Plug	Jack	Panel Jack	Bulkhead Jack	Hood	Engineering Data
RG-8/U	UG-959/U	—	—	—	—	Non-constant impedance
RG-58/U	UG-88E/U	UG-89C/U	UG-291/U	UG-909B/U	MX-195A/U	
RG-59/U	UG-260D/U	UG-261C/U	UG-262/U	UG-910B/U	MX-195A/U	
RG-122/U	UG-1082/U	UG-1056/U	UG-1055/U	—	MX-195A/U	

Table 3A. Coaxial connector selection guide for BNC series.

For RG/U Cables	Plug	Jack	Panel Jack	Bulkhead Jack	Hood	Engineering Data
RG-5/U	UG-626B/U	UG-633A/U	UG-629A/U	UG-630A/U	UG-570A/U	Impedance Mismatched
RG-8/U	UG-573B/U	UG-572A/U	UG-571A/U	UG-937A/U	UG-570A/U	
RG-11/U	UG-573B/U	UG-572A/U	UG-571A/U	UG-937A/U	MX-1144/U	
RG-17&U	UG-708B/U	—	—	—	—	
RG-58/U	UG-709B/U	—	—	—	MX-1870/U	
RG-59/U	UG-627B&U	—	—	—	MX-1870/U	

Table 4A. Coaxial connector selection guide for series C.

sophisticated matching techniques have been used by the connector manufacturers to produce connectors having high electrical and mechanical qualities for almost every coaxial cable in common use.

The large variety of connectors and cables, each designed to fit a specific need, and the almost infinite number of combinations available from them, indicates that the problem of selecting the proper connector is unique to the type of service required. Essentially, the selection of a cable connector boils down to the same requirements as the selection of the transmission line; i.e. SWR, attenuation, mechanical strength, and power and voltage limits. Since the desired operating requirements usually contain some conflicting requirements, such as long cable length and low attenuation, the most successful approach is very often to find the best compromise in available cables and connectors to fit the specific application.

One of the best criteria on which to base connector selection is that of the standing wave ratio at the frequency of operation. Fig. 7 charts the nominal standing wave ratio

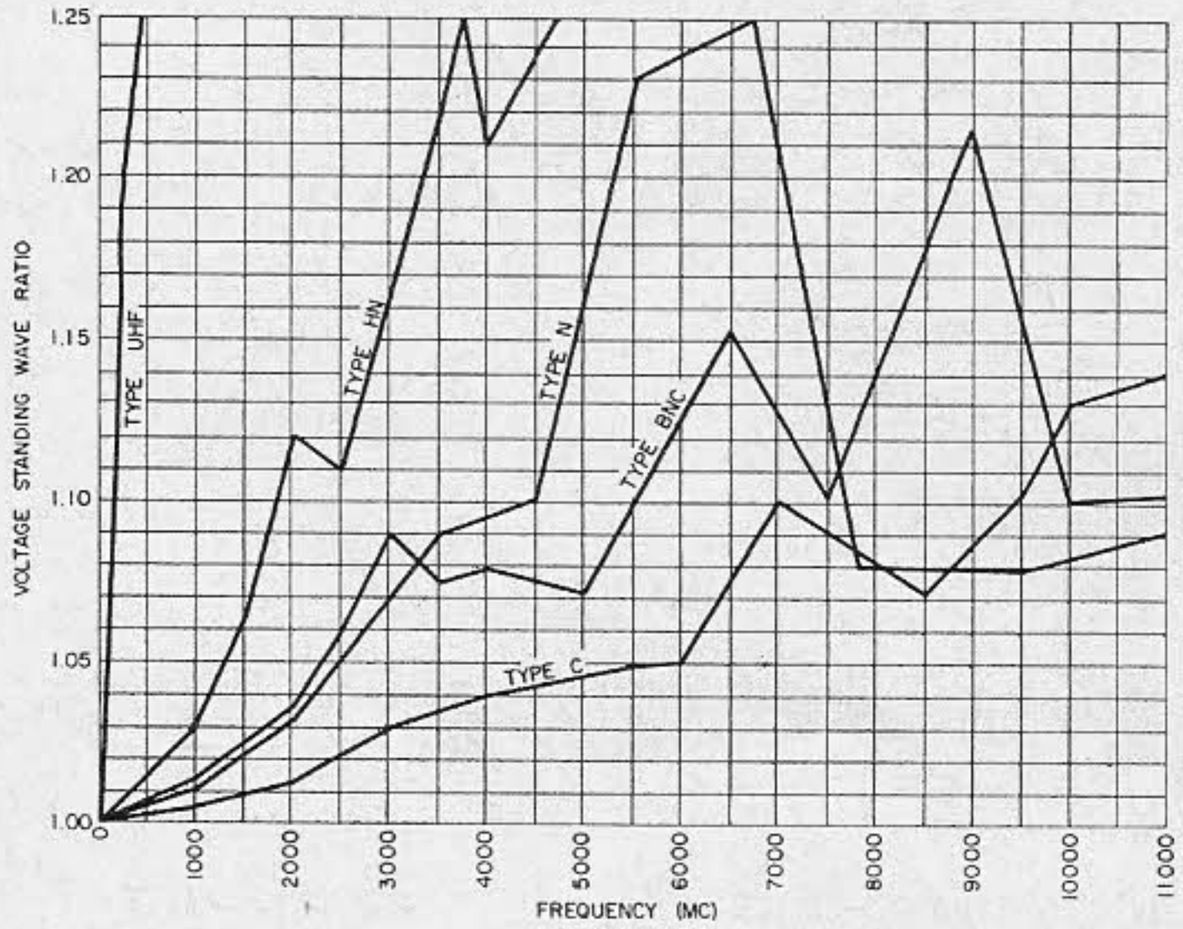


Fig. 7. Typical coaxial connector VSWR.

Description	Military Number	Engineering Data
Adapter, Binding Post	UG-282/U	
Adapter, Bulkhead (F-F)	UG-492D/U	Pressurized
Adapter, Feedthrough (F-F)	UG-914/U	
Adapter, Feedthrough (F-F)	UG-414A/U	Flange Mounting
Adapter, Right Angle (M-F)	UG-306B/U	
Adapter, Straight (M-M)	UG-491B/U	
Adapter, Tee (M-M-F)	UG-274B/U	
Cap and Chain (F)	CW-282/U	
Cap and Chain (M)	CW-123A/U	
Receptacle	UG-185/U	Flange Mounted
Receptacle	UG-290A/U	Teflon Insulation
Receptacle	UG-928/U	Rexolite Insulation
Receptacle, Bulkhead	UG-1094A/U	3/8" Thread Mounting
Receptacle, Male	UG-1104/U	3/8" Thread Mounting
Receptacle, Pressurized	UG-912A/U	7/16" Thread Mounting
Receptacle, Pressurized	UG-625B/U	1/2" Thread Mounting
Receptacle, Pressurized	UG-911A/U	Flange Mounted
Rectptacle, Right Angle	UG-535/U	3/8" Thread Mounting
Rectptacle, Right Angle	UG-1098A/U	

Table 3B. Miscellaneous series BNC connectors.

Description	Military Number	Engineering Data
Adapter, Bulkhead (F-F)	UG-701/U	Pressurized
Adapter, Bulkhead (F-F)	UG-1138/U	
Adapter, Right Angle (M-F)	UG-567A/U	
Adapter, Straight (F-F)	UG-643/U	
Adapter, Straight (M-M)	UG-642A/U	
Adapter, Tee (F-M-F)	UG-566A/U	
Cap and Chain (M)	UG-1142/U	
Cap and Chain (F)	UG-1143/U	
Receptacle, Bulkhead	UG-569/U	3/4" Thread Mounting
Receptacle, Bulkhead	UG-705/U	Presusrized
Receptacle, Panel	UG-568/U	

Table 4B. Miscellaneous series C connectors.

For RG/U Cables	Plug	Jack	Panel Jack	Bulkhead Jack	Hood	Engineering Data
RG-5/U	UG-18D/U	UG-20D/U	UG-19D/U	UG-159C/U	UG-106/U	70 Ohm Connectors Improved Type Captivated Contacts 70 Ohm Connectors
RG-6/U	UG-91A/U	UG-92A/U	UG-93A/U	—	UG-106/U	
RG-8/U	UG-21E/U	UG-23E/U	UG-22E/U	UG-160D/U	UG-106/U	
RG-8/U	UG-1185A/U	UG-1186A/U	UG-1187/U	—	—	
RG-11/U	UG-94A/U	UG-95A/U	UG-96A/U	—	UG-106/U	
RG-17/U	UG-167E&U	—	—	—	—	
RG-58/U	UG-536B&U	—	UG-1095B/U	UG-556B/U	UG-177/U	
RG-59/U	UG-603A/U	UG-602A/U	UG-593A/U	—	UG-366/U	

Table 5A. Coaxial connector selection guide for series N.

For RG/U Cables	Plugs	Reducing Adapters	Hoods
RG-8/U RG-58/U RG-59/U	PL-259, PL-259A, UG-295/U UG-175/U adater to PL-259 UG-73/U, UG-111/U, UG-203/U	— UG-175, UG-410/U UG-176/U	MX-543/U, MX-372/U UG-177/U, MX-539/U UG-239/U, UG-366/U

Table 6A. Coaxial connector selection guide for series UHF.

Description	Military Number	Engineering Data
Adapter, Bulkhead (F-F)	UG-30D/U	Pressurized
Adapter, Right Angle (M-F)	UG-27C/U	
Adapter, Right Angle (F-F)	UG-202A/U	Panel Mounting
Adapter, Straight (F-F)	UG-29B/U	
Adapter, Straight (F-F)	UG-1018/U	Not Weatherproof
Adapter, Staright (M-M)	UG-57B/U	
Adapter, Tee (F-F-F)	UG-28A/U	
Adapter, Tee (F-F-M)	UG-464/U	
Adapter, Tee (F-M-F)	UG-107B/U	
Cap and Chain	MX-913/U	
Receptacle	UG-58A/U	70 Ohm Impedence With Hood
Receptacle	UG-231/U	
Receptacle	UG-367/U	
Receptacle	UG-680A/U	Pressurized
Receptacle, Right Angle	UG-997A/U	

Table 5B. Miscellaneous series N connectors.

Description	Military Number	Engineering Data
Adapter, Bulkhead (F-F)	UG-224/U	Rexolite Insulation
Adapter, Bulkhead (F-F)	UG-300/U	
Adapter, Bulkhead (F-F)	UG-363/U	Polystyrene Insulation
Adapter, Bulkhead (F-F)	PL-274	
Adapter, Right Angle (M-F)	UG-297A/U	
Adapter, Right Angle (M-F)	UG-646/U	Polystyrene Insulation
Adapter, Straight (F-F)	UG-299/U	
Adapter, Straight (F-F)	UG-360/U	Polystyrene Insulation
Adapter, Straight (F-F)	PL-258	
Adapter, Straight (F-F)	UG-307/U	Panel Mounting
Adapter, Tee (F-M-F)	UG-298/U	
Receptacle	UG-296/U	
Receptacle	SO-239	
Receptacle, Bulkhead	UG-223/U	
Receptacle, Pressurized	UG-266/U	Rexolite Insulation

Table 6B. Miscellaneous series UHF connectors.

of the more popular coaxial connectors at frequencies up to 11,000 mc. These curves are based on actual laboratory measurements of improved versions of connectors properly assembled to RG-8A/U cable except for the BNC connector which was assembled to RG-58/U cable. The non-constant impedance UHF series is shown for information purposes only, but it becomes quite obvious why this connector is not recommended for use at frequencies above 200 mc.

When selecting coaxial connectors, many factors must be considered; first of all, the coupling mechanism of the connector should be selected in accordance with the intended service. Where long, massive cables are to be joined, the coupling nut and associated retaining rings must be correspondingly strong such as those in **Fig. 8A.** When the completed assembly is to be used under conditions where frequent movement or vibration is anticipated, the connection must be strong, positive and vibration proof (**Fig. 8B** and **C**). For light duty where frequent connections and disconnections are required such as for test equipment, the connection should be quick and positive such as illustrated in **Fig. 8D.** Where severe space limitations prevent the use of threaded or bayonet mechanisms, push-on connectors with detent arrangements are useful (see **Fig. 8E**). In some applications "phono" connectors provide a simple and economical push-on connector (**Fig. 8F**).

Since final connector selection is essentially an electrical problem, transmission line practice is normally employed to determine the basic line parameters of impedance and SWR once the characteristic impedance of the system is known. When the ideal solution of these parameters has been found, average power, peak voltage and permissible power loss must be considered. In this phase, con-

Table 7A. Coaxial connector selection guide for UHF twin series.

nector-cable combinations must be chosen that satisfy the operating requirements; at this point it is often necessary to make compromises in the final choice.

Connector-cable combinations that appear satisfactory from the standpoint of the electrical requirements should then be analyzed for operating temperature, mounting methods and coupling requirements. Many connectors that are employed internally do not require weatherproofing and a less expensive connector can frequently be used. In general, connectors which are used outside must be weatherproofed.

To reduce the SWR and impedance discontinuities to a minimum, coaxial connectors must be designed to have the same characteristic impedance as their mating cable. Actually, the objective is to make the connector a homogenous electrical extension of the cable itself. In this way the practical upper frequency limit of the complete assembly often exceeds 10,000 mc. Expansion, due to temperature, may cause a discontinuity by separating the cable from the clamp within the connector. For this reason, great emphasis is put on the metal-to-metal braid clamping mechanism using large contact areas. In some cases it is advantageous to insure that the center conductor is mechanically held in a fixed position by a captivated contact arrangement.

Additionally, coaxial connectors must be designed so that they operate safely at the maximum rating of the cables with which they are used. The most difficult of these requirements is the peak voltage rating. This is accomplished in several ways. First, physical changes where high voltage gradients might occur must be kept to a minimum; and second, a good high-quality dielectric must be used throughout the connector. Also, provisions should be made to avoid the development of air pockets at the mating boundaries of connector pairs.

Actually, connector selection is not nearly as complex as it might sound at first. For amateur application, there are only three types of connectors that are generally used; series UHF, BNC and N. These series will satisfy nearly any amateur requirement, but series C or phono connectors may be useful in some special applications.

The "Connector Selection Guides" in **Tables 3** through **7** were prepared as an aid in the selection of connectors for use with specific cables. The cables listed are those that are most apt to be used in amateur work. When selecting a connector for use with coaxial cables not listed in the "guide," reference to the "Coaxial Cable Assembly Groups" chart in **Table 8** may be helpful. In essence, there are fourteen main groups of RG-/U cables within the large number available. For example, RG-8A/U belongs to cable group "F" as do RG-9, -31, -87, -165, -213, -214 and -229/U. Therefore, connectors listed in the guide for RG-8/U may also be used with any of the other coaxial cables in the same assembly group.

Coaxial connector installation

It must be remembered that the primary function of the coaxial cable connector is electrical and every available provision should be made to support it mechanically. Occasionally, the mounting environment will prevent supporting the cable at intervals as often as desired and a larger, stronger connector must be used. In addition, the cable may be required to follow the contour of a building or corner or roof peak; in such a case, larger connectors should be used to preclude premature failures.

Many connectors are attached to panels or bulkhead partitions. There are three standard methods for attachment of these fittings. The most common is the "single hole mount"; the connector has an external thread and is locked to the panel with a hex nut and lock-washer. In some cases a method of keying the connector to the panel is employed. The three main types are single flat on the connector body requiring a "D" hole in the chassis, a

Description	Military Number	Enginering Dat
Adapter, Right Angle (M-F)	UG-104/U	Not weatherproof
Adapter, Right Angle (M-F)	UG-931/U	Weatherproof
Adapter, Straight (F-F)	UG-105/U	Not weatherproof
Adapter, Straight (F-F)	UG-493A/U	Weatherproof
Adapter, Tee (F-M-F)	UG-196/U	Not weatherproof

Table 7B. Miscellaneous series UHF twin connectors.

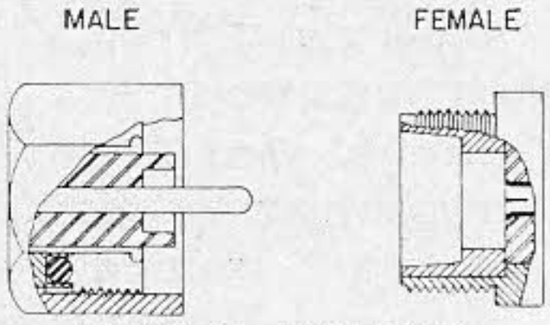


Fig. 8. Cutaway drawings of series LT, N, UHF, BNC, QDS and push-on connectors.

double flat requiring a special hole in the panel or a bent tab on the connector requiring a notched hole in the chassis. When large thick chassis are used, the connector may be screwed into, press fit or soldered to the chassis as desired.

Outdoor use of connectors

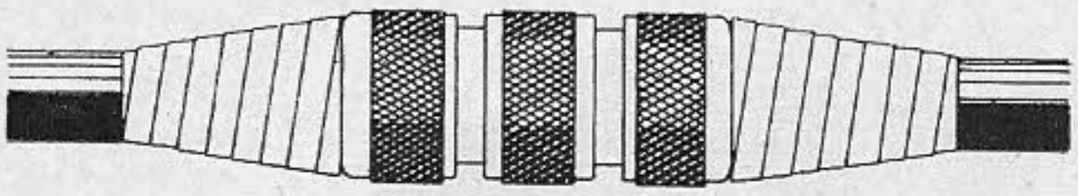
While steps have been taken in all of the more modern coaxial connectors to achieve moisture-proofing, none of the connectors may be classified as entirely waterproof and suitable for outdoor use unless protected by additional coverings. The most common practice used to protect the mating surface between plug and receptacle is to pack one side with silicone grease. The connectors are then mated and any excess grease is forced to the outside of the connector where it may be wiped off. The grease tends to dry and form voids after a period of time however, and should be replaced periodically. If not replaced, the voids within the grease may become water traps during periods of temperature change with high humidity. In some cases packing will adversely effect the operation of the cable at UHF frequencies. This is because matched connectors for use above 1000 mc utilize high impedance compensating air sections at the mating surfaces. Silicone grease has a greater dielectric constant than air and packing the mating surface results in a low impedance section with resultant mismatch.

An alternate and preferred method of weatherproofing is to utilize connectors with threaded mating surfaces such as type N or UHF. The mating threads on the receptacle side can be coated with a waterproof varnish such as Glyptal just prior to making the connection. Then, after assembly, the outer surface of the mated pair may be covered with the same varnish. UHF series connectors may be coated with varnish on the outside but not on the threaded surface, because in these connectors the rf current path takes place along the threaded surface. Unfortunately, the use of Glyptal varnish may only be used once since it renders connectors useless for future mating.

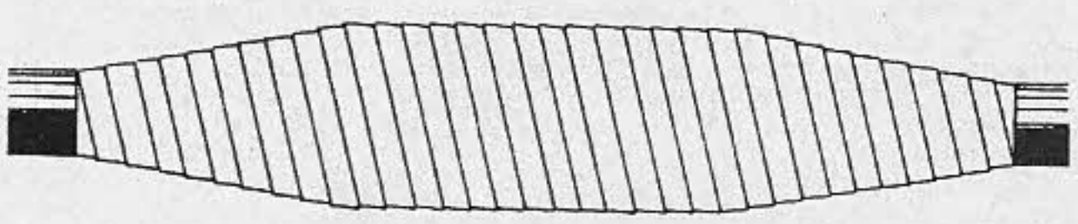
A third method of waterproofing coaxial connector assemblies is to wrap a good quality pressure-sensitive vinyl tape over the junction as shown in **Fig. 9.** As in the case of silicone grease protection, the tape should be periodically replaced.

For best results, the tape wrap should be installed in the following manner:

1. After the two lengths of cables are connected together, tightly wind tape behind each connector to obtain a smooth contour between connector and cable.
2. Tightly wrap several layers of tape over the entire assembly. Use a 50% overlap and wind each of the layers in opposite directions; a minimum of four layers should be used for maximum protection.
3. The completed tape covering should extend beyond each connector a minimum of eight times the diameter of the cable.



WIND PLASTIC ELECTRICAL TAPE AROUND CABLE IMMEDIATELY BEHIND CONNECTORS TO PROVIDE A SMOOTH CONTOUR BETWEEN CABLE AND CONNECTORS.



WRAP SEVERAL LAYERS OF TAPE WITH A 50% OVERLAP OVER THE CONNECTORS AND BUILT-UP JUNCTIONS. EACH OF THE LAYERS SHOULD BE WRAPPED IN REVERSE DIRECTIONS.

Fig. 9. Taping coaxial cable junctions.

The best method to remove the tape is to unwrap it. A knife may be used for this purpose, but care must be taken not to cut into the plastic jacket of the cable. The recommendation here is to cut the tape in the immediate vicinity of the metal connector and peel it off.

Coaxial connector assembly

The coaxial connector is a highly engineered device and even the smallest mechanical dimension or material characteristic may be of great electrical or mechanical significance. Accordingly, the cable assembly operation must carry out the objective of the original design if the connector is expected to operate to its fully intended capabilities.

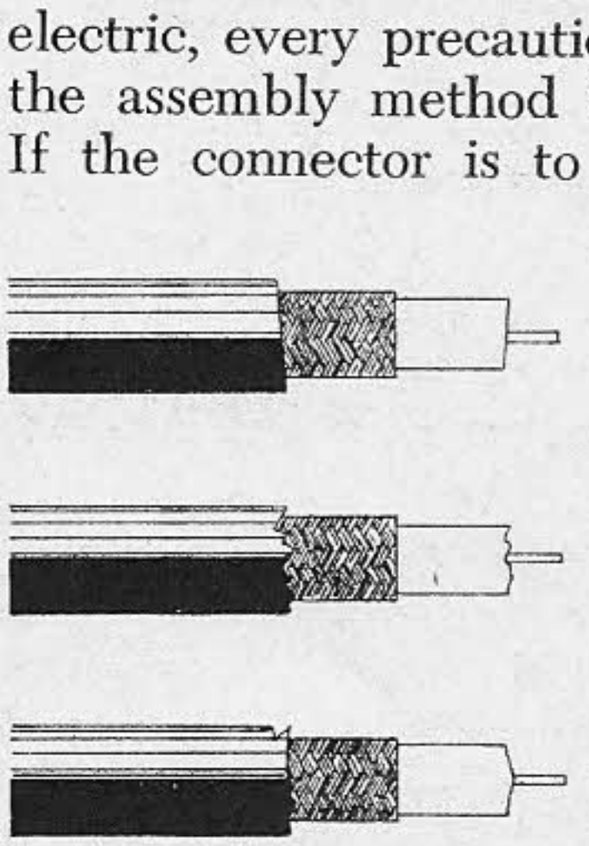
Where the assembly instructions show the cable's dielectric butting the connector's dielectric, every precaution should be taken that the assembly method insures a positive butt. If the connector is to be used at ultra high frequencies with a low SWR, the development of air pockets because of loose butt joints or rounded dielectric corners will give rise to impedance mismatches proportional to the frequency of operation. In high voltage cables air pockets or loose joints materially reduce the peak voltage capability of the entire assembly.

Loose butt joints usually develop unless the dielectric trimming process is made one of the last assembly operations. Rounded corners develop because of excess heating during soldering or through a mistaken notion that all "sharp edges should be avoided." It is extremely important that the dielectric be cut at perfect right-angles to the center conductor; no notches should be permitted. Correct methods of stripping the cable dielectric and jacket are shown in **Fig. 10.**

Air pockets between the inner conductor and the dielectric of the cable usually develop due to excessive heat when soldering the center contact of the connector onto the inner conductor of the cable. Some of the dielectric is softened, and through movement of the inner conductor, a larger hole is formed.

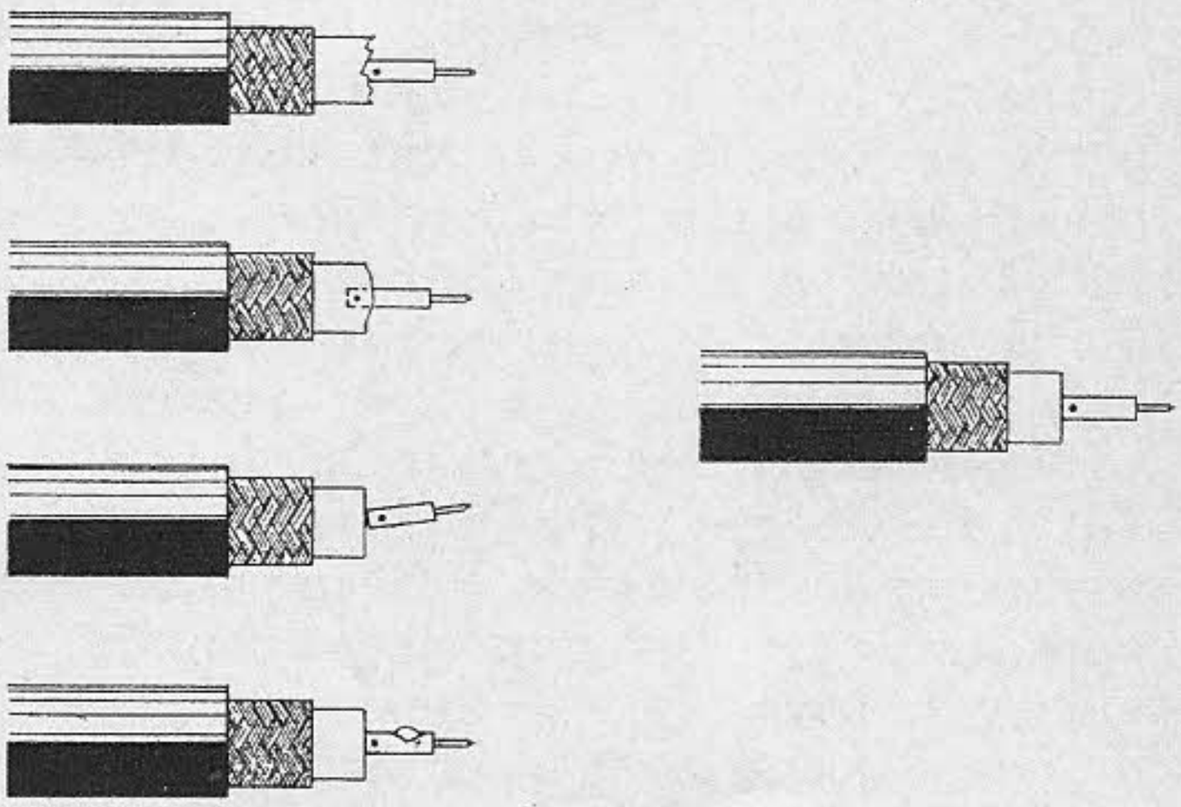
Finally, precautions should be taken during the assembly process to insure that the center contact of the connector rests at its proper lateral position as shown in **Fig. 11.** In many connectors, the exact axial distance between a point on the connector shell and the tip of the pin is an electrical matching circuit. In type N connectors this is the case where the male pin steps down before entering the female pin of the mating connector, leaving a deliberate radial notch—compensated by the overhung iris in the inside dimension of the outer conductor.

Many times, misalignment results from assembling connectors to both ends of a relatively long cable while it is still coiled. When



INCORRECT CORRECT

Fig. 10. Stripping coax cable jacket and dielectric.



INCORRECT CORRECT

Fig. 11. Installing center contact.

RG-/U	Cable Group	RG-/U	Cable Group	RG-/U	Cable Group
5	D	62	B	148	H
6	E	63	J	149	H
8	F	71	B	159	A
9	F	79	J	164	N
10	G	81	K	165	F
11	H	82	M	166	G
13	H	87	F	210	B
17	N	89	J	212	D
18	P	100	C	213	F
21	D	114	J	214	F
29	A	116	G	215	G
31	F	118	L	216	H
32	G	124	B	218	N
35	P	133	J	219	P
38	D	140	B	222	D
39	E	141	A	223	A
55	A	142	A	225	F
58	A	143	D	227	G
59	B	144	H	228	L

Table 8A. Coaxial cable assembly groups.

it is uncoiled, the ends of the center conductor may assume a different position with respect to the ends of the outer braid. For similar reasons, a connector should not be assembled to cable under temperature extremes.

Except for the UHF series of connectors, the only soldering operations encountered during connector to cable assembly is in joining the center contact of the connector to the inner conductor of the cable. However, there are two major precautions which must be observed during this operation. It is imperative that a good solder bond be made between the pin and the inner conductor of the cable over the entire depth of the pin. Otherwise, a significant inductive reactance may be created because the hole in the pin and the inner conductor form the conductors of a miniature short-circuited coaxial line having significant electrical length at UHF frequencies.

Also, any excess solder must be removed so that the step contour between the pin and the cable conductor corresponds essentially to the original dimensions. A change in dimensions because of excessive solder acts like a shunt capacitor and is in effect a circuit change within the connector.

Complete assembly instructions for type BNC, N and UHF connectors are provided in **Fig. 12** through **22.** Note that standard series N connectors come in two different versions, one with a v-groove gasket, the other with a cylindrical gasket, but that the assembly sequence is basically the same.

During connector assembly, there are five basic rules which must be followed to obtain proper operation.

1. Closely follow the recommended assembly instructions to insure proper SWR and voltage ratings.
2. Do not apply more heat than necessary during soldering operations. Use crimped or clamped connections on cable braid to prevent heat distortion of the dielectric.
3. Do not exert excessive force in tightening fittings containing rubber or plastic gaskets as permanent deformation will result; occasional light retightening is preferred.
4. Carefully remove all filings, loose solder and other foreign objects from the connectors prior to assembly; observe cleanliness during all operations. Extraneous matter in connectors reduces power and voltage ratings and increases the SWR of the assembly.
5. Use extreme care in the assembly and grounding of connectors operating at high voltages to reduce corona and radiated noise.

Cable Group	Center Conductor	Maximum Dimensions: Dielectric	Braid	Jacket	Armor	RG-/U Cables	Impedance (ohms)
A	0.040	0.121	0.177	0.216	—	29, 55, 58, 141,142, 159, 223	50
B	0,030	0.151	0.206	0.251	—	59, 124, 140	75
						62, 71, 210	93
C	0.096	0.151	0.206	0.251	—	100	35
D	0.061	0.194	0.263	0.342	—	5, 21, 38, 143, 212, 222	50
E	0.030	0.194	0.263	0.342	—	6, 39	75
F	0.096	0.295	0.357	0.435	—	8, 9, 31, 87, 165, 213, 214, 225	50
G	0.096	0.295	0.357	0.435	0.511	10, 32, 116, 166, 215, 227, 229	50
H	0.061	0.295	0.357	0.435	—	11, 13, 144, 148, 149, 216	75
J	0.030	0.295	0.357	0.435	—	133	95
						63, 79, 89, 144	125
K	0.081	0.334	0.379	—	—	81	50
L	0.198	0.640	0.670	0.745	0.813	118, 228	50
M	0.127	0.650	0.755	—	—	82	50
N	0.198	0.695	0.761	0.888	—	17, 218	50
						164	75
P	0.198	0.695	0.761	0.888	0.963	18, 219	50
						35	75

Table 8B. Coaxial cable assembly groups.

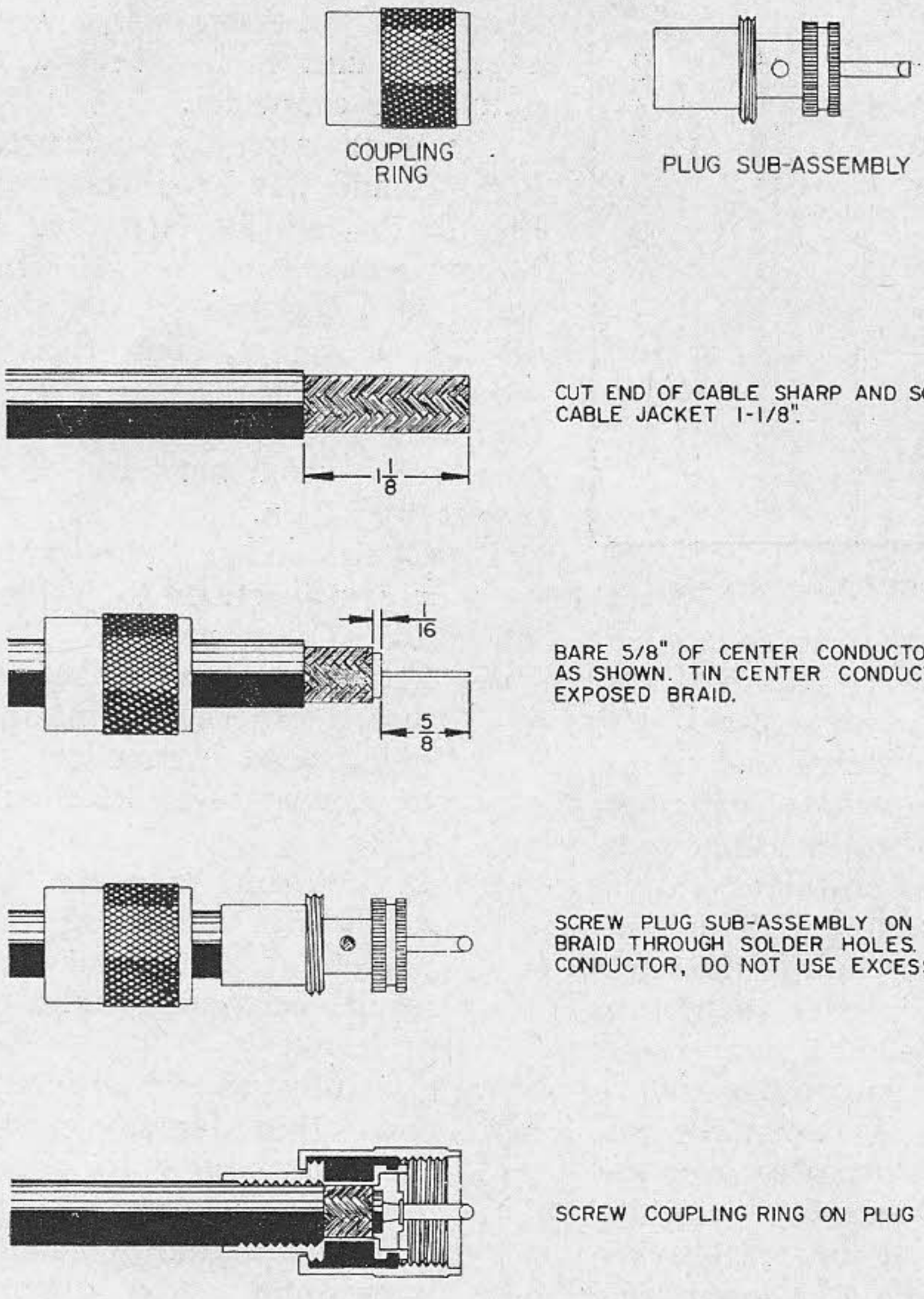


Fig. 12. Series UHF assembly instructions for Amphenol 83-1SP.

Coaxial connector assembly group charts

The "Coaxial Cable Assembly Group Charts" in **Table 8** are useful in selecting coaxial connectors for various size coaxial cables. The first part of the charts list 57 of the most popular coaxial cables and the lettered assembly group to which they belong. RG-8/U for example, is in assembly group "F."

The second part of the chart lists the dimensions of each of the cables within a group and their characteristic impedance. Cables within group "F" for example, include RG-8, -9, -31, -87, -165, -213, and -214/U.

The primary use of these charts is in the selection of coaxial connectors. In the "Coaxial Connector Index" in **Table 9,** only one type of RG-/U cable is listed for each connector. However, the same connector may be used with any other coaxial cable in the same assembly group. For example, the UG-21E/U type N improved plug is listed for cable type RG-8/U. This indicates that the UG-21E/U plug is suitable for any of the other cables in the "F" assembly group.

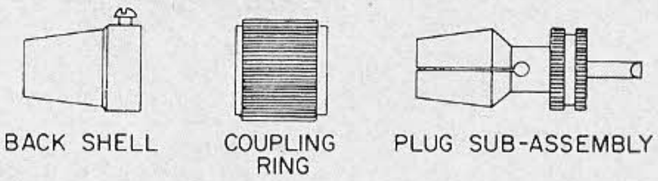
These charts are also useful when selecting connectors for cables which are not listed. In this event, the various dimensions of the cable are compared to the group chart to determine which group is most applicable; suitable connectors are then selected accordingly.

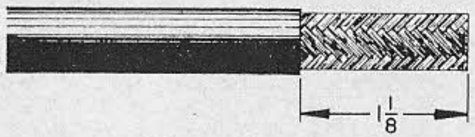
As an aid in connector selection, identification and assembly, the "Connector Index" in **Table 9** lists all of the type BNC, N and UHF coaxial connectors currently available along with description, type, equivalent Amphenol part number and applicable RG-/U cables. Many of these connectors have very subtle differences which may be recognized only from the information in the "engineering data" column of the table.

Type designation refers to standard (S), improved (I) and captivated contact (CC) assembly techniques. This index is indispensable in determining what method to use when assembling a particular connector.

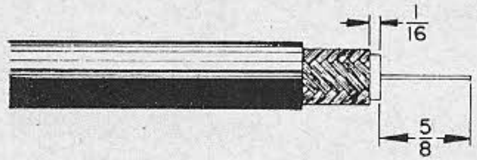
SERIES UHF

UG-203/U OR AMPHENOL 83-776

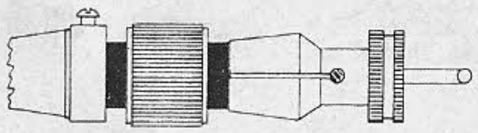




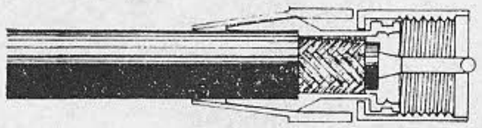
CUT END OF CABLE SHARP AND SQUARE. STRIP CABLE JACKET 1-1/8"



BARE 5/8" OF CENTER CONDUCTOR. TRIM BRAID AS SHOWN. TIN CENTER CONDUCTOR.



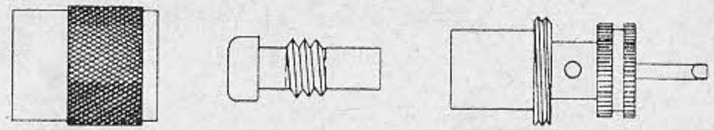
SCREW PLUG SUB-ASSEMBLY ON CABLE. SOLDER BRAID THROUGH SOLDER HOLES. SOLDER CENTER CONDUCTOR, DO NOT USE EXCESSIVE HEAT.

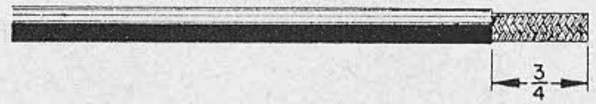


SLIP COUPLING RING OVER PLUG SUB-ASSEMBLY. ALLOW SUFFICIENT CLEARANCE TO PERMIT FREE ROTATION OF COUPLING NUT AND TIGHTEN SET SCREW.

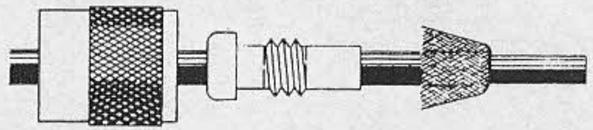
Fig. 13. Assembly instructions for UHF series UG-203/U.

SERIES UHF REDUCING ADAPTERS

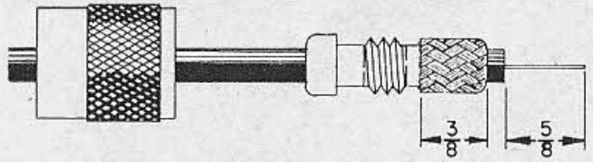




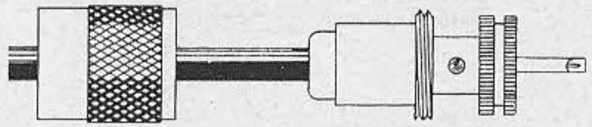
CUT END OF CABLE SHARP AND SQUARE. STRIP CABLE JACKET 3/4".



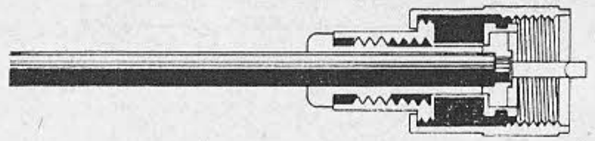
SLIDE COUPLING AND ADAPTER ON CABLE. FAN BRAID SLIGHTLY AND FOLD BACK AS SHOWN.



POSITION ADAPTER AS SHOWN. PUSH BRAID DOWN OVER BODY OF ADAPTER AND TRIM TO 3/8". BARE 5/8" OF CENTER CONDUCTOR. TIN EXPOSED CENTER CONDUCTOR. AVOID EXCESSIVE HEAT.



SCREW PLUG SUB-ASSEMBLY ON ADAPTER. SOLDER BRAID THROUGH SOLDER HOLES TO SHELL. USE JUST ENOUGH HEAT TO BOND BRAID TO SHELL. SOLDER CENTER CONDUCTOR TO CONTACT.



SCREW COUPLING RING ON PLUG SUB-ASSEMBLY.

Fig. 14. Assembly instructions for UHF series reducing adapters.

SERIES UHF HOODS

UG-177/U

UG-106/U

UG-372/U

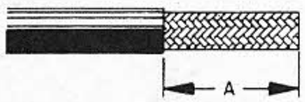
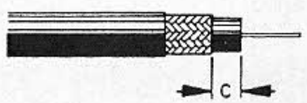
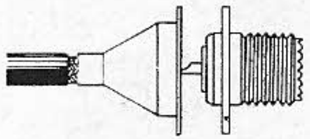
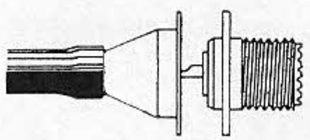
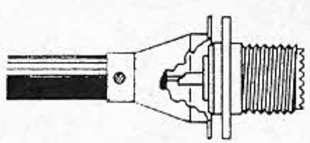
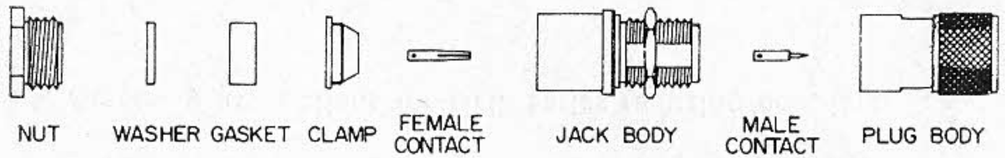
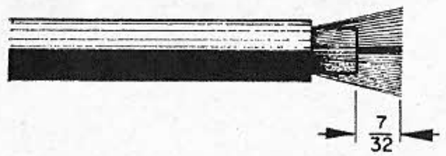
	UG-177/U	UG-106/U	UG-372/U
 CUT END OF CABLE SHARP AND SQUARE. STRIP JACKET TO APPROPRIATE LENGTH	$\frac{3}{4}$	$\frac{5}{8}$	$\frac{3}{4}$
 REMOVE BRAID AND DIELECTRIC TO DIMENSION SHOWN. TIN CENTER CONDUCTOR.	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$
 STRIP BRAID FROM DIELECTRIC TO DIMENSION SHOWN. TIN BRAID.	$\frac{3}{8}$	$\frac{3}{16}$	$\frac{3}{8}$
 SLIDE HOOD OVER BRAID. SOLDER CONDUCTOR TO CONTACT. SLIDE HOOD FLUSH AGAINST RECEPTACLE AND TACK-SOLDER HOOD FLANGE TO RECEPTACLE FLANGE. SOLDER HOOD TO BRAID.	X		
 SLIDE HOOD OVER BRAID AND FORCE UNDER JACKET. SOLDER CONDUCTOR TO CONTACT. PUSH HOOD FLUSHAGAINST RECEPTACLE. TACK-SOLDER HOOD TO BRAID THROUGH SOLDER HOLES. WITH DOUBLE BRAIDED CABLE HOOD GOES OVER INNER BRAID ONLY. OUTER BRAID IS SOLDERED TO OUTSIDE OF HOOD.		X	
 SLIDE HOOD OVER BRAID. PUSH RECEPTACLE FLUSH AGAINST HOOD. SOLDER CONDUCTOR TO CONTACT AND HOOD TO BRAID.			X

Fig. 15. Assembly of UHF series hoods.

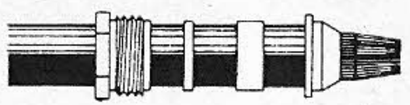
SERIES N



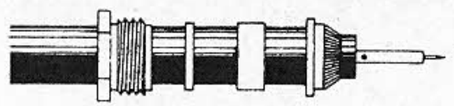
CUT END OF CABLE SHARP AND SQUARE. STRIP JACKET 9/16". STRIP 5/8" WHEN USING DOUBLE SHIELDED CABLE.



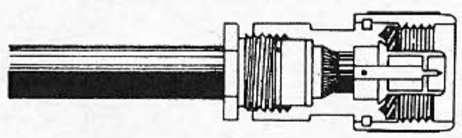
COMB OUT BRAID AS SHOWN. STRIP DIELECTRIC 7/32" FROM END. TIN CENTER CONDUCTOR.



TAPER SHIELD AND SLIDE NUT, WASHER AND GASKET OVER JACKET. INSTALL CLAMP SO THAT ITS INNER SHOULDER FITS SQUARELY AGAINST END OF CABLE JACKET.



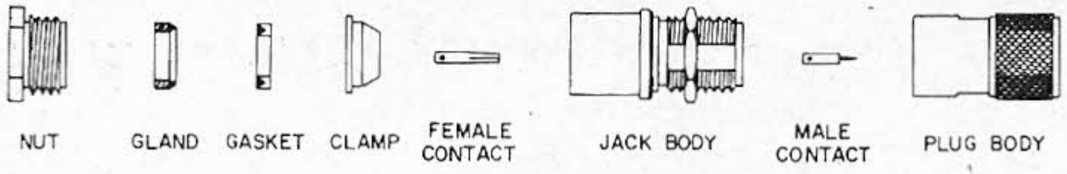
FOLD BRAID BACK AS SHOWN AND TRIM PROPERLY. SOLDER CONTACT TO CENTER CONDUCTOR. AVOID EXCESSIVE HEAT.



SLIDE ASSEMBLY INTO CONNECTOR BODY. FACE OF DIELECTRIC MUST BE FLUSH AGAINST INSULATOR. INSERT NUT, SCREW IN PLACE AND TIGHTEN WITH WRENCH.

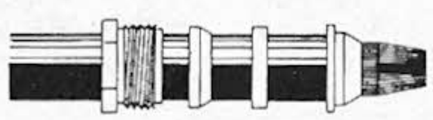
Fig. 16. Assembly of series N connectors.

SERIES N

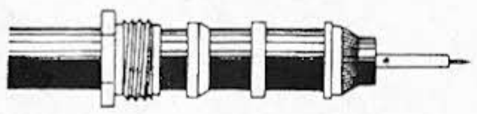


CUT END OF CABLE SHARP AND SQUARE. STRIP JACKET 9/16". STRIP 5/8" WHEN USING DOUBLE SHIELDED CABLE.

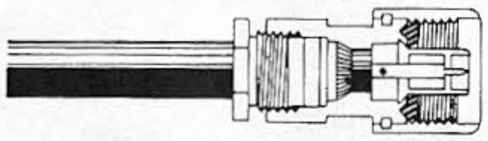
COMB OUT BRAID AS SHOWN. STRIP DIELECTRIC 7/32" FROM END. TIN CENTER CONDUCTOR.



TAPER SHIELD AND SLIDE NUT, GLAND AND GASKET OVER JACKET. INSTALL CLAMP SO THAT ITS INNER SHOULDER FITS SQUARELY AGAINST END OF CABLE JACKET. MAKE SURE KNIFE-EDGE OF GLAND IS TOWARD END OF CABLE AND MATES WITH GASKET.



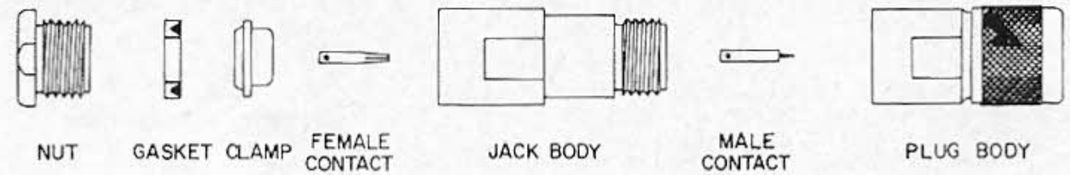
FOLD BRAID BACK AS SHOWN AND TRIM PROPERLY. SOLDER CONTACT TO CENTER CONDUCTOR. AVOID EXCESSIVE HEAT.

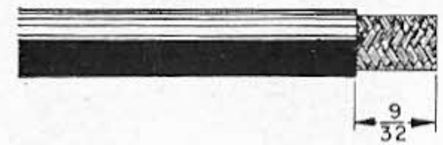


SLIDE ASSEMBLY INTO CONNECTOR BODY. FACE OF DIELECTRIC MUST BE FLUSH AGAINST INSULATOR. INSERT NUT, SCREW IN PLACE AND TIGHTEN WITH WRENCH. KNIFE-EDGE OF GLAND SHOULD CUT GASKET IN HALF WHEN SUFFICIENTLY TIGHTENED.

Fig. 17. Assembly of series N connectors.

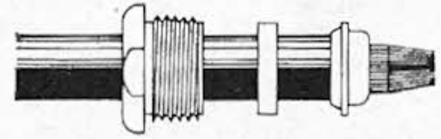
SERIES N IMPROVED



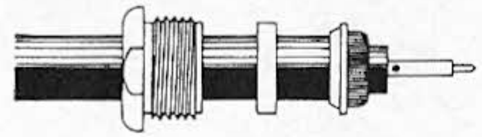


CUT END OF CABLE SHARP AND SQUARE. STRIP CABLE JACKET 9/32".

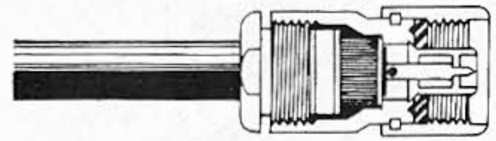
COMB OUT BRAID AS SHOWN. CUT OFF CABLE FLUSH 1/8" FROM END OF JACKET. TIN CENTER CONDUCTOR.



TAPER SHIELD AND SLIDE NUT, CLAMP AND GASKET OVER JACKET. INSTALL CLAMP SO THAT ITS INNER SHOULDER FITS SQUARELY AGAINST END OF CABLE JACKET.



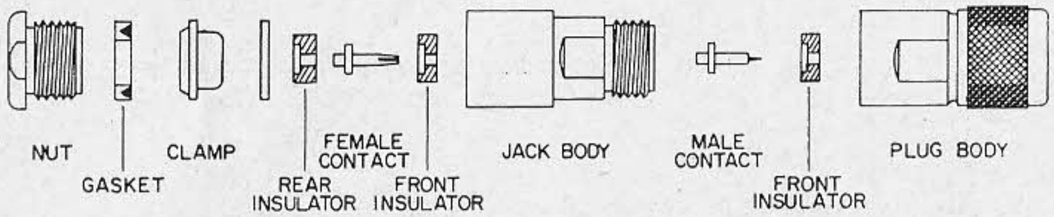
FOLD BRAID BACK AS SHOWN AND TRIM PROPERLY. SOLDER CONTACT TO CENTER CONDUCTOR. AVOID EXCESSIVE HEAT.

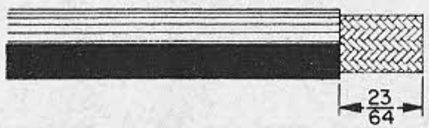


SLIDE ASSEMBLY INTO CONNECTOR BODY. FACE OF DIELECTRIC MUST BE FLUSH AGAINST INSULATOR. MAKE SURE SHARP EDGE OF CLAMP SEATS PROPERLY IN GASKET. INSERT NUT, SCREW IN PLACE AND TIGHTEN WITH WRENCH.

Fig. 18. Assembly of series N improved connectors.

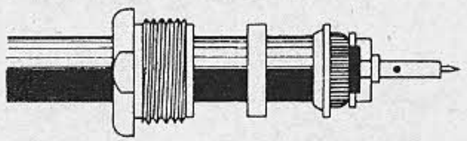
SERIES N WITH CAPTIVATED CONTACTS



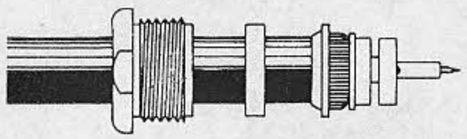


CUT END OF CABLE SHARP AND SQUARE. STRIP CABLE JACKET 23/64".

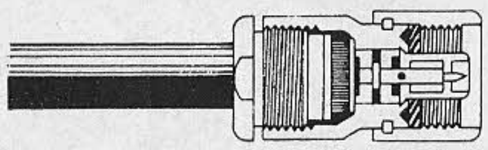
COMB OUT BRAID AS SHOWN. CUT OFF CABLE FLUSH 1/8" FROM END OF JACKET. TIN CENTER CONDUCTOR.



SLIDE NUT, GASKET AND CLAMP OVER JACKET. INSTALL CLAMP SO THAT ITS INNER SHOULDER FITS SQUARELY AGAINST END OF CABLE JACKET. FOLD BRAID BACK AS SHOWN AND TRIM PROPERLY. SLIDE ON WASHER, REAR INSULATOR AND CONTACT. CABLE CORE, INSULATOR AND CONTACT SHOULDER MUST BUTT AS SHOWN. SOLDER CONTACT TO CENTER CONDUCTOR. AVOID EXCESSIVE HEAT.



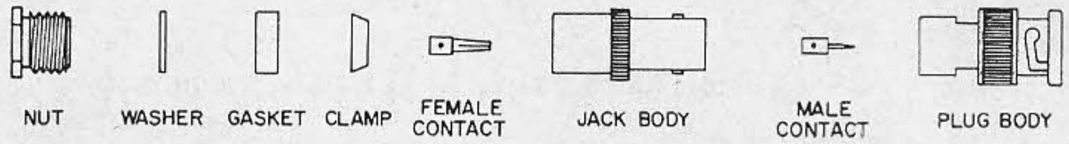
SLIDE FRONT INSULATOR OVER CONTACT. BE SURE TO PLACE COUNTER BORED END OF INSULATOR TOWARD MATING END OF CONTACT.



SLIDE ASSEMBLY INTO CONNECTOR BODY. MAKE SURE SHARP EDGE OF CLAMP SEATS PROPERLY IN GASKET. INSERT NUT, SCREW IN PLACE AND TIGHTEN WITH WRENCH.

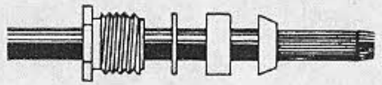
Fig. 19. Assembly of series N with captivated contacts.

SERIES BNC

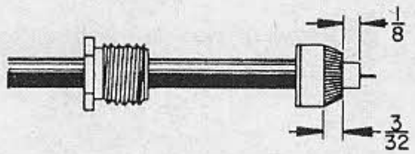


CUT END OF CABLE SHARP AND SQUARE. STRIP CABLE JACKET 19/64" FOR RG-58/U OR 5/16" FOR RG-59/U.

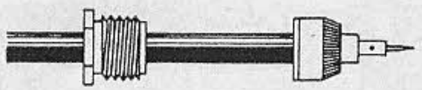
COMB OUT BRAID AND FLARE AS SHOWN. STRIP CENTER DIELECTRIC 1/8".



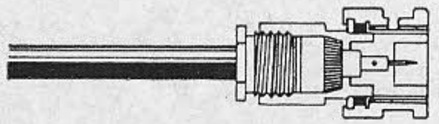
TAPER SHIELD AND SLIDE NUT, WASHER, GASKET AND CLAMP OVER BRAID. CLAMP IS INSTALLED SO THAT ITS INNER SHOULDER FITS SQUARELY AGAINST END OF CABLE JACKET.



WITH CLAMP IN PLACE, FOLD BRAID BACK AS SHOWN AND TRIM 3/32" FROM END.



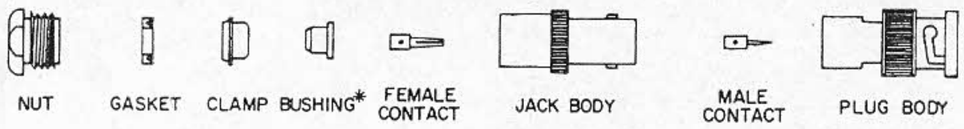
SLIP CONTACT IN PLACE, BUTT AGAINST DIELECTRIC AND SOLDER. REMOVE EXCESS SOLDER FROM OUTSIDE CONTACT SURFACE. APPLY MINIMUM HEAT SO DIELECTRIC IS NOT HEATED EXCESSIVELY AND SWOLLEN, PREVENTING ENTRANCE TO CONNECTOR BODY.



PUSH ASSEMBLY INTO CONNECTOR BODY AS FAR AS IT WILL GO. INSERT NUT, SCREW INTO PLACE AND TIGHTEN WITH WRENCH. HOLD CABLE AND BODY RIGID AND ROTATE NUT DURING THIS OPERATION.

Fig. 20. Assembly of series BNC connectors.

SERIES BNC IMPROVED

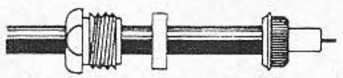


*FOR RG-62/U CABLES

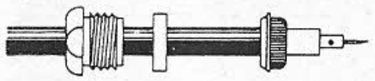
CUT END OF CABLE SHARP AND SQUARE. STRIP CABLE JACKET 5/16"

COMB OUT BRAID AND FLARE AS SHOWN. CUT CENTER DIELECTRIC 3/16" FROM EDGE OF JACKET. TIN CENTER CONDUCTOR.

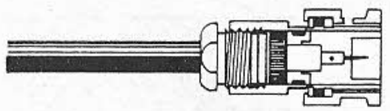
TAPER SHIELD AND SLIDE NUT, GASKET AND CLAMP OVER BRAID. PUSH CLAMP BACK AGAINST JACKET.



WITH CLAMP IN PLACE FOLD BRAID BACK AS SHOWN AND TRIM TO PROPER LENGTH. ADD BUSHING FOR RG-62/U TYPE CABLE.



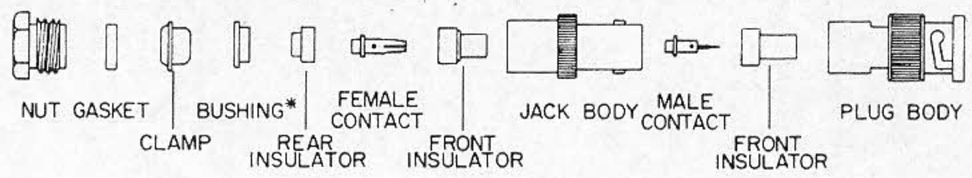
SOLDER CENTER CONDUCTOR TO CONTACT, AVOIDING EXCESSIVE HEAT WHICH MIGHT SWELL CABLE DIELECTRIC.



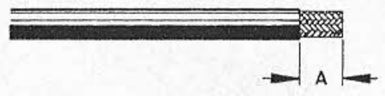
PUSH ASSEMBLY INTO CONNECTOR BODY AS FAR AS IT WILL GO. MAKE SURE SHARP EDGE OF CLAMP SEATS PROPERLY IN GASKET. TIGHTEN NUT.

Fig. 21. Assembly of series BNC improved connectors.

SERIES BNC WITH CAPTIVATED CONTACTS

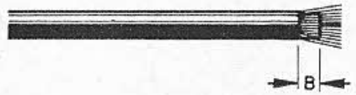


*FOR RG-62/U CABLES



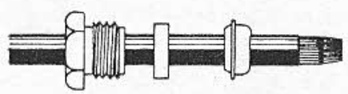
STRIP CABLE JACKET TO "A" SHOWN IN CHART BELOW. CUT END OF CABLE SHARP AND SQUARE.

	31-301, 31-304	ALL OTHERS
"A"	27/64"	3/8"

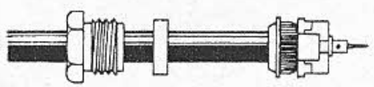


COMB OUT BRAID AND FLARE AS SHOWN. CUT CENTER DIELECTRIC TO DIMENSION "B" SHOWN IN CHART BELOW.

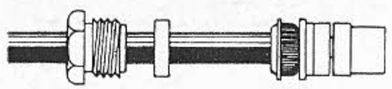
	RG-58/U, 59/U	RG-62/U
"B"	3/16"	5/32"



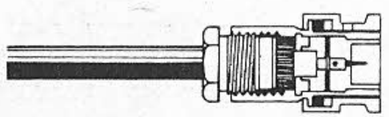
TAPER SHIELD AND SLIDE NUT, GASKET AND CLAMP OVER BRAID PUSH CLAMP AGAINST JACKET. TIN CENTER CONDUCTOR.



FOLD BRAID BACK AS SHOWN AND TRIM TO PROPER LENGTH. SLIDE ON BUSHING, REAR INSULATOR AND CONTACT. THESE PARTS MUST BUTT AS SHOWN. SOLDER CONTACT TO CENTER CONDUCTOR. APPLY MINIMUM HEAT SO CENTER DIELECTRIC IS NOT HEATED EXCESSIVELY AND SWOLLEN, THEREBY PREVENTING ENTRANCE TO THE CONNECTOR BODY.



SLIDE FRONT INSULATOR OVER CONTACT AND BUTT AGAINST CONTACT SHOULDER. DO NOT REVERSE DIRECTION OF INSULATOR.



PUSH ASSEMBLY INTO CONNECTOR BODY AS FAR AS IT WILL GO. MAKE SURE SHARP EDGE OF CLAMP SEATS PROPERLY IN GASKET. TIGHTEN NUT.

Fig. 22. Assembly of series BNC connectors with captivated contacts.

Table 9. Coaxial connector index. Charted by cable size and coupling method

Military Number	Series	Description	Type*	For RG/U Cables Type	Amphenol Number
UG-9/U	N	Plug	S	5	—
UG-10/U	N	Panel Jack	S	5	—
UG-11/U	N	Jack	S	5	—
UG-12/U	N	Jack	S	5	22000
UG-13/U	N	Panel Jack	S	8	—
UG-14/U	N	Jack	S	8	—
UG-15/U	N	Plug	S	5	—
UG-16/U	N	Panel Jack	S	5	—
UG-17/U	N	Jack	S	5	—
UG-18/U	N	Plug	S	5	3400
UG-18B/U	N	Plug	S	5	82-86
UG-18C/U	N	Plug	I	5	82-203
UG-18D/U	N	Plug	I	5	82-3203
UG-19/U	N	Panel Jack	S	5	3500
UG-19B/U	N	Panel Jack	S	5	82-87
UG-19C/U	N	Panel Jack	I	5	82-207
UG-19D/U	N	Panel Jack	I	5	82-3207
UG-20/U	N	Jack	S	5	42000
UG-20B/U	N	Jack	S	5	82-88
UG-20C/U	N	Jack	I	5	82-210
UG-20D/U	N	Jack	I	5	82-3210
UG-21/U	N	Plug	S	8	3900
UG-21B/U	N	Plug	S	8	82-61
UG-21C/U	N	Plug	S	8	82-96
UG-21D/U	N	Plug	I	8	82-202
UG-21E/U	N	Plug	I	8	82-3202
UG-22A/U	N	Panel Jack	S	8	7500
UG-22B/U	N	Panel Jack	S	8	82-62
UG-22C/U	N	Panel Jack	S	8	82-95
UG-22D/U	N	Panel Jack	I	8	82-208
UG-22E/U	N	Panel Jack	I	8	82-3208
UG-23/U	N	Jack	S	8	48000
UG-23A/U	N	Jack	S	8	7600
UG-23B/U	N	Jack	S	8	82-63
UG-23C/U	N	Jack	S	8	82-94
UG-23D/U	N	Jack	I	8	82-209
UG-23E/U	N	Jack	I	8	82-3209
UG-27A/U	N	Right Angle Adapter	—	—	82-64
UG-27B/U	N	Right Angle Adapter	—	—	82-98
UG-27C/U	N	Right Angle Adapter	—	—	82-213
UG-28A/U	N	Tee Adapter (F-F-F)	—	—	82-99
UG-29/U	N	Straight Adapter	—	—	15000
UG-29A/U	N	Straight Adapter	—	—	82-65
UG-29B/U	N	Straight Adapter	—	—	82-101
UG-30/U	N	Bulkhead Adapter (F-F)	—	—	82-66
UG-30C/U	N	Bulkhead Adapter (F-F)	—	—	82-201
UG-30D/U	N	Bulkhead Adapter (F-F)	—	—	91100
UG-57/U	N	Straight Adapter (M-M)	—	—	16000
UG-57A/U	N	Straight Adapter (M-M)	—	—	45250
UG-57B/U	N	Straight Adapter (M-M)	—	—	82-100
UG-58/U	N	Receptacle (70 ohm)	—	—	82-24
UG-58A/U	N	Receptacle (70 ohm)	—	—	82-97
UG-73/U	UHF	Plug	—	59	—
UG-83/U	—	Adapter, N (F) to UHF (M)	—	—	14000
UG-83A/U	—	Adapter, N (F) to UHF (M)	—	—	16150
UG-83B/U	—	Adapter, N (F) to UHF (M)	—	—	34125
UG-88/U	BNC	Plug	S	58	31-002
UG-88A/U	BNC	Plug	S	58	14525
UG-88B/U	BNC	Plug	S	58	31-018
UG-88C/U	BNC	Plug	I	58	31-202
UG-88D/U	BNC	Plug	I	58	31-2202
UG-88E/U	BNC	Plug	I	58	31-3202
UG-89/U	BNC	Jack	S	58	31-005
UG-89A/U	BNC	Jack	S	58	31-019
UG-89B/U	BNC	Jack	I	58	31-205
UG-89C/U	BNC	Jack	I	58	31-2205
UG-90/U	BNC	Panel Jack	S	59	1300
UG-91A/U	N	Plug (70 ohm)	S	6	7200
UG-92A/U	N	Jack (70 ohm)	S	6	7700
UG-93A/U	N	Panel Jack (70 ohm)	S	6	7800
UG-94A/U	N	Plug (70 ohm)	S	11	82-84
UG-95A/U	N	Jack (70 ohm)	S	11	82-89
UG-96A/U	N	Panel Jack (70 ohm)	S	11	82-90

Military Number	Series	Description	Type*	For RG/U Cables Type	Amphenol Number	Engineering Data
UG-106/U	N	Hood	—	—	83-1H	
UG-107/U	N	Tee Adapter (F-M-F)	—	—	4800	Rexolite Insul.
UG-107A/U	N	Tee Adapter (F-M-F)	—	—	82-36	Teflon Insul.
UG-107B/U	N	Tee Adapter (F-M-F)	—	—	82-102	Teflon Insul.
UG-111/U	UHF	Plug	—	59	83-750	Filled Bakelite
UG-146/U	—	Adapter, N (F) to UHF (M)	—	—	4400	Not Weatherproof
UG-159A/U	N	Bulkhead Jack	S	5	17500	
UG-159B/U	N	Bulkhead Jack	I	5	15550	
UG-160A/U	N	Bulkhead Jack	S	8	82-67	
UG-160B/U	N	Bulkhead Jack	S	8	82-93	
UG-160C/U	N	Bulkhead Jack	I	8	—	
UG-160D/U	N	Bulkhead Jack	I	8	91025	
UG-167A/U	N	Plug	S	17	82-104	
UG-171/U	—	Adapter, UHF to British	—	—	—	
UG-173/U	UHF	Reducing Adapter	—	38	—	
UG-175/U	UHF	Reducing Adapter	—	58	83-185	
UG-176/U	UHF	Reducing Adapter	—	59	83-168	
UG-177/U	UHF	Hood	—	58	83-765	
UG-185/U	BNC	Receptacle	—	—	4500	
UG-188/U	N	Plug	S	58	23250	Not Weatherproof
UG-197/U	—	Adapter, UHF to British	—	—	—	
UG-201/U	—	Adapter, N (F) to BNC (M)	—	—	31-830	
UG-201A/U	—	Adapter, N (F) to BNC (M)	—	—	31-216	
UG-202/U	N	Right Angle Adapter (F-F)	—	—	—	
UG-203/U	UHF	Plug	—	59	83-776	Filled Bakelite
UG-204A/U	N	Plug	S	14	82-105	Rexolite Insul.
UG-204C/U	N	Plug	I	14	82-214	Teflon Insul.
UG-223/U	UHF	Bulkhead Receptacle	—	—	—	
UG-224/U	UHF	Bulkhead Adapter (F-F)	—	—	29500	Rexolite Insul.
UG-231/U	N	Receptacle	—	—	2750	With Hood
UG-239/U	UHF	Hood	—	59	—	
UG-253/U	BNC	Bulkhead Jack, Pressurized	—	58	—	
UG-254A/U	BNC	Receptacle, Pressurized	—	—	31-016	Rexolite Insul.
UG-255/U	—	Adapter, BNC (F) to UHF (M)	—	—	2900	
UG-260/U	BNC	Plug	S	59	31-012	Rexolite Insul.
UG-260A/U	BNC	Plug	S	59	31-021	
UG-260B/U	BNC	Plug	I	59	31-212	Teflon Insul.
UG-260C/U	BNC	Plug	I	59	31-221	Beryllium Contacts
UG-261/U	BNC	Jack	S	59	31-015	Rexolite Insul.
UG-261A/U	BNC	Jack	S	59	31-022	Rexolite Insul.
UG-261B/U	BNC	Jack	I	59	31-215	Teflon Insul.
UG-262/U	BNC	Panel Jack	S	59	31-011	Rexolite Insul.
UG-262A/U	BNC	Panel Jack	S	59	31-023	Rexolite Insul.
UG-262B/U	BNC	Panel Jack	I	59	31-211	Teflon Insul.
UG-266/U	UHF	Receptacle, Pressurized	—	—	4575	Rexolite Insul.
UG-273/U	—	Adaptr, BNC (M) to UHF (F)	—	—	31-028	Non-constant Impedance
UG-274/U	BNC	Tee Adapter (F-M-F)	—	—	31-008	Rexolite Insul.
UG-274A/U	BNC	Tee Adapter (F-M-F)	—	—	31-208	Teflon Insul.
UG-281/U	N	Panel Jack	S	58	3525	Rexolite Insul.
UG-282/U	—	Adapter, BNC (M) to Binding Post	—	—	—	
UG-290/U	BNC	Receptacle	—	—	31-003	Rexolite Insul.
UG-290A/U	BNC	Receptacle	—	—	31-203	Teflon Insul.
UG-291/U	BNC	Panel Jack	S	58	31-001	Gold Plated Contacts
UG-291A/U	BNC	Panel Jack	S	58	31-020	Not Weatherproof
UG-291B/U	BNC	Panel Jack	I	58	31-201	
UG-295/U	UHF	Plug	—	8	—	
UG-296/U	UHF	Receptacle	—	8	—	
UG-297/U	UHF	Right Angle Adapter (M-F)	—	—	—	
UG-298/U	UHF	Tee Adapter (F-M-F)	—	—	—	
UG-299/U	UHF	Straight Adapter (F-F)	—	—	—	
UG-299/U	UHF	Straight Adapter (F-F)	—	—	—	
UG-300/U	UHF	Bulkhead Adapter (F-F)	—	—	—	
UG-306/U	BNC	Right Angle Adapter (M-F)	—	—	31-009	
UG-307/U	UHF	Straight Panl Mounting Adapter	—	—	—	
UG-314/U	—	Adapter, N (F) to UHF (M)	—	—	—	
UG-318/U	—	Adapter, N (F) to UHF (F)	—	—	26700	
UG-332/U	—	Adapter, UHF (M) to Binding Post	—	—	5800	Rexolite Insul.

Military Number	Series	Description	Type*	For RG/U Cables Type	Amphenol Number	Engineering Data
UG-335/U	—	Adapter, N (M) to BNC (F)	—	—	3025	Rexolite/Teflon Insulation
UG-349/U	—	Adapter, N (M) to BNC (F)	—	—	2975	Rexolite/Teflon Insulation
UG-349A/U	—	Adapter, N (M) to BNC (F)	—	—	31-217	Teflon Insul.
UG-357/U	UHF	Receptacle	—	34	83-21R	
UG-358/U	UHF	Plug	—	34	83-21SP	Filled Bakelite
UG-360/U	UHF	Straight Adapter (F-F)	—	—	83-21J	Polystyrene Insulation
UG-363/U	UHF	Bulkhead Adapter	—	—	83-1F	Polystyrene Insulation
UG-365/U	BNC	Receptacle	—	—	4650	Turret Terminal
UG-366/U	UHF	Hood	—	—	—	
UG-367/U	N	Receptacle	—	—	—	
UG-372/U	UHF	Hood	—	8	83-1HP	
UG-414/U	BNC	Flanged Feedthrough Adapter (F-F	—	—	47000	
UG-447/U	BNC	Receptacle	—	—	31-817	Rexolite Insul.
UG-464/U	N	Tee Adapter (F-F-M)	—	—	—	
UG-483/U	N	Jack	S	81	14175	Not Weatherproof
UG-484/U	N	Jack	I	82	—	
UG-486/U	N	Plug	I	81	—	
UG-487/U	N	Plug	I	81	—	
UG-491/U	BNC	Straight Adapter (M-M)	—	—	8425	
UG-491A/U	BNC	Straight Adapter (M-M)	—	—	31-218	
UG-492A/U	BNC	Pressurized Bulkhead Adapter (F-F)	—	—	31-220	Glass/Teflon Insulation
UG-492B/U	BNC	Pressurized Bulkhead Adapter (F-F)	—	—	31-2220	Glass/Teflon Insulation
UG-527/U	BNC	Plug	—	100	—	
UG-535/U	BNC	Right Angle Receptacle	—	—	5675	
UG-536/U	N	Plug	S	58	3400	Rexolite Insul.
UG-536B/U	N	Plug	I	58	34025	Teflon Insul.
UG-556/U	N	Bulkhead Jack	S	58	35250	
UG-556A/U	N	Bulkhead Jack	I	58	—	
UG-557/U	N	Plug	S	118	—	
UG-557A/U	N	Plug	I	118	—	
UG-589/U	BNC	Plug	—	—	—	For Single Wire
UG-593/U	N	Panel Jack	S	59	35500	
UG-593A/U	N	Panel Jack	I	59	—	
UG-594A/U	N	Right Angle Jack	I	8	15425	
UG-602/U	N	Jack	S	59	36500	Rexolite Insul.
UG-602A/U	N	Jack	I	59	36525	Teflon Insul.
UG-603/U	N	Plug	S	59	34500	Rexolite Insul.
UG-603A/U	N	Plug	I	59	34525	Teflon Insul.
UG-604/U	BNC	Receptacle	—	—	—	
UG-606/U	—	Adapter, N (M) to BNC (M)	—	—	—	
UG-624/U	BNC	Bulkhead Jack	S	59	2075	Rexolite Insul.
UG-625/U	BNC	Receptacle	—	—	5575	Rexolite Insul.
UG-625B/U	BNC	Receptacle	—	—	31-236	Teflon Insul.
UG-646/U	UHF	Right Angle Adapter (M-F)	—	—	83-1AP	Polystyrene Insulation
UG-657/U	BNC	Pressurized Receptacle	—	—	31-102	Rexolite Insul.
UG-680/U	N	Receptacle	—	—	82-811	Glass/Teflon Insulation
UG-909/U	BNC	Bulkhead Jack	S	58	31-206	½" Thread Mounting
UG-909B/U	BNC	Bulkhead Jack	I	58	—	½" Thread Mounting
UG-910/U	BNC	Bulkhead Jack	S	59	31-207	
UG-910B/U	BNC	Bulkhead Jack	I	59	—	
UG-911A/U	BNC	Pressurized Receptacle	—	—	31-237	Glass/Teflon Insulation
UG-912/U	BNC	Pressurized Receptacle	—	—	31-238	
UG-913/U	BNC	Right Angle Plug	S	58	31-204	
UG-913A/U	BNC	Right Angle Plug	I	58	—	
UG-914/U	BNC	Feedthrough Adapter (F-F)	—	—	31-219	
UG-928/U	BNC	Receptacle	—	—	1100	Rexolite Insul.
UG-935A/U	N	Panel Jack	I	10	82-211	
UG-936A/U	N	Bulkhead Jack	I	8	16250	
UG-940A/U	N	Jack	I	8	82-212	Armor Clamping
UG-941A/U	N	Plug	I	8	82-204	Armor Clamping
UG-959/U	BNC	Plug	S	8	6775	
UG-959A/U	BNC	Plug	I	8	—	
UG-978/U	—	Adapter, BNC to Banana Jack	—	—	—	
UG-982/U	N	Plug	I	17	92125	Armor Clamping
UG-987/U	—	Adapter, BNC to two Male Banana Plugs	—	—	8975	
UG-997A/U	N	Right Angle Receptacle	—	—	84975	
UG-1003/U	N	Plug	S	63	12400	Armor Clamping

Military Number	Series	Description	Type*	For RG/U Cables Type	Amphenol Number	Engineering Data
UG-1006/U	N	Plug	I	74	—	
UG-1017/U	—	Adapter, UHF to Banana Jack	—	—	—	
UG-1018/U	N	Straight Adapter	—	—	—	
UG-1033/U	BNC	Plug	I	122	84975	
UG-1034/U	—	Adapter, BNC (F) to N (F)	—	—	5225	
UG-1052/U	N	Panel Jack	I	58	36000	Rexolite Insul.
UG-1055/U	BNC	Panel Jack	I	122	84625	
UG-1056/U	BNC	Jack	I	122	84650	
UG-1082/U	BNC	Plug	I	122	—	
UG-1094/U	BNC	Receptacle	—	—	31-221	
UG-1095A/U	N	Panel Jack	I	58	36250	
UG-1098/U	BNC	Right Angle Receptacle	—	—	31222	
UG-1104/U	BNC	Male Receptacle	—	—	—	
UG-1174/U	BNC	Right Angle Receptacle	—	—	38425	
UG-1185/U	N	Plug	CC	8	82-312	
UG-1185A/U	N	Plug	CC	8	82-3312	
UG-1186/U	N	Jack	CC	8	82-313	
UG-1187/U	N	Panel Jack	CC	8	82-314	
UG-1195/U	N	Plug	CC	18	—	
MX-367	BNC	Hood	—	59	10925	
MX-539	UHF	Hood	—	58	5375	
MX-543	UHF	Hood	—	8	5475	
MX-913	N	Cap and Chain (M)	—	—	82-106	
MX-195A	BNC	Hood	—	58	87175	
PL-258	UHF	Straight Adapter (F-F)	—	—	83-1J	
PL-259	UHF	Plug	—	8	83-1SP	Filled Bakelite
PL-259	UHF	Plug	—	8	83-822	Teflon Insul.
PL-259A	UHF	Plug (Clamp set screw)	—	8	83-1SPN	Mica Filled
PL-259A	UHF	Plug (Clamp set screw)	—	8	83-756	Teflon Insul.
PL-274	UHF	Bulkhead Adapter (F-F)	—	—	83-1F	
SO-239	UHF	Receptacle	—	—	83-1R	Mica Filled
SO-239	UHF	Receptacle	—	—	83-1RTY	Polystyrene
SO-239A	UHF	Receptacle	—	—	83-798	Teflon Insul.