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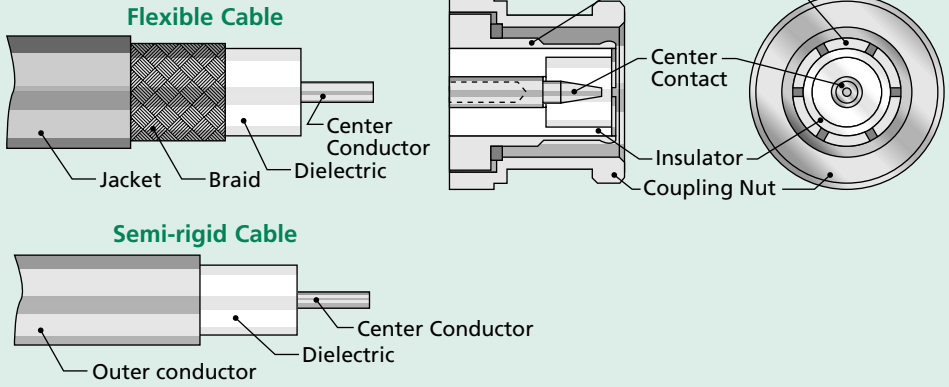
Shielding Types

Coaxial Cable and Connector

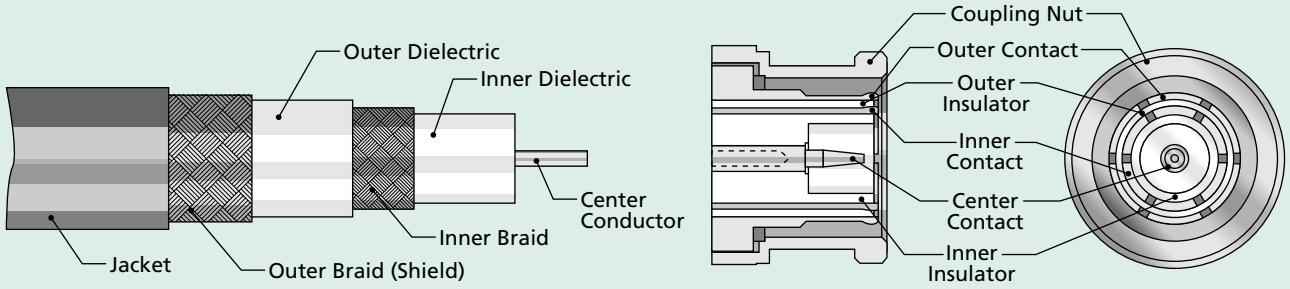


Flexible cable: Center conductor (solid wire, or stranded wire for increased flexibility) is contained within a tubular dielectric, which is covered by braided shield wires and a protective jacket. Many flexible cables have a second layer of braid for increased shielding. Armored cables have a layer of braided flat steel wires over the jacket for abrasion resistance.

The connector terminates the braid to the connector body, and to a solid or slotted outer conductor which ensures ground signal integrity with the jack connector when mated. The center contact of the connector is attached to the cable center conductor by soldering or crimping.

Semi-rigid cable: Center conductor is contained within a tubular dielectric, which is covered by a seamless extruded outer conductor of soft copper or aluminum. Copper outer conductors are generally soldered to connectors; aluminum outer conductors are usually attached by a collet in the connector.

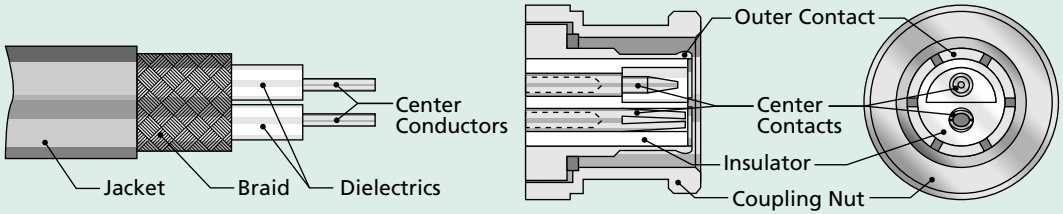
Triaxial Cable and Connector



Similar to coaxial construction, but with an additional layer of dielectric and braid shield.

The connector has an added insulator and outer contact for the intermediate cable dielectric and braid.

Twinaxial Cable and Connector

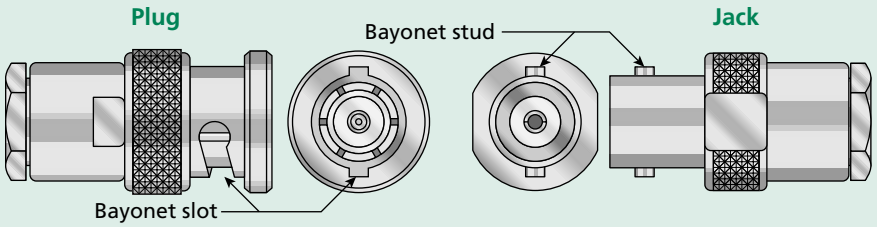


Twinaxial cable has two center conductors, each within its own dielectric, covered by a single or double braid shield and jacket.

The connectors are keyed for proper mating either by a stepped insulator (as shown) or by incorporating keyways and keys in their mating faces.

Mating Action Types

Bayonet Mating

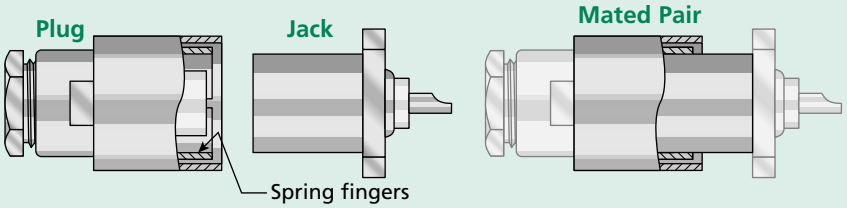


Bayonet mating is used where a quick mating and unmating action is desired, and accidental disconnection by pulling on the cable must be prevented.

The plug coupling nut is pushed forward with the slots engaging the studs on the jack, rotated, and released. When the coupling nut is released, an internal spring pulls it backward to locate the studs in the circular relief at the bottom of the slots, preventing accidental unmating.

Most bayonet-mating types have two studs. For applications that require anti-rock characteristics, many types are alternately available with three- or four-stud interfaces.

Slide-On Mating

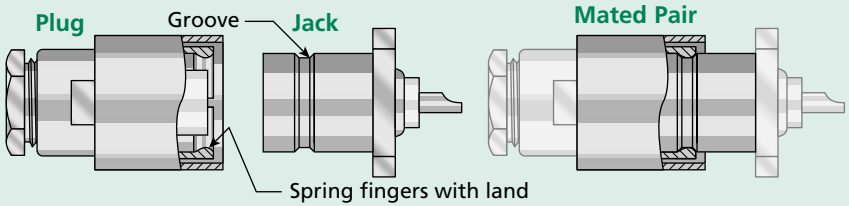


Slide-on mating is used where a quick mating and unmating action is desired, or where mating and unmating forces must be kept to a minimum.

They are mated with a straight push, and mating is maintained only by the force exerted on the jack by the spring fingers of the plug.

Connectors with slide-on mating are typically used in rack-and-panel or blind-mate applications that require multiple connectors to be mated at the same time.

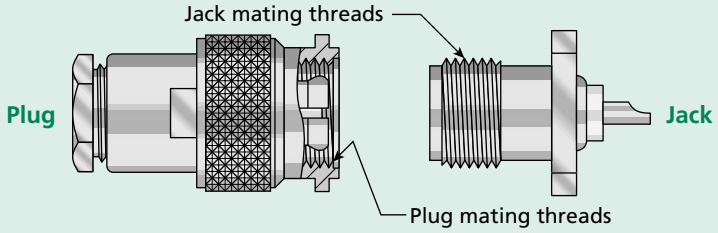
Snap-On Mating



Snap-on mating is used where a quick mating and unmating action is desired, or where the application does not have space to allow for turning a coupling nut.

They are mated with a straight push, and the spring-loaded land within the plug snaps into the groove on the jack to minimize the possibility of accidental unmating by pulling on the cable.

Threaded Mating



Threaded mating is used where secure mated condition is desired (or where connector interface characteristics require a specific amount of force), and space is available to turn the coupling nut.

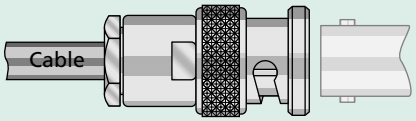
The plug coupling nut is engaged with the jack threads and rotated, either hand-tight, or (for some series) to a specified torque.

For faster mating, some threaded types have double-lead threads.

For severe-vibration applications, most threaded connectors can be supplied with lockwire holes in the coupling nut.

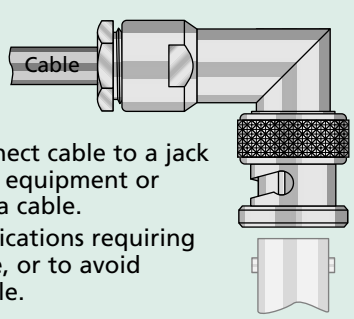
Cable Connector Configurations

Straight Cable Plug



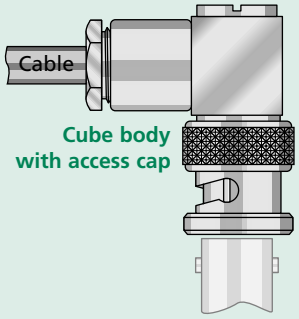
Used to connect cable to a jack mounted on equipment or attached to a cable.

Right Angle Cable Plug

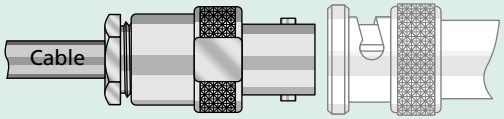


Used to connect cable to a jack mounted on equipment or attached to a cable.

Used in applications requiring a low profile, or to avoid bending cable.

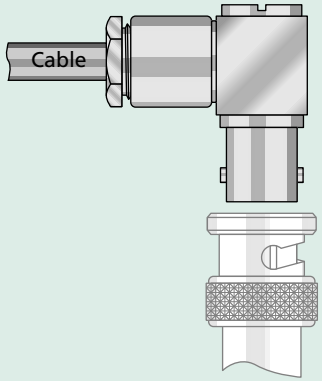


Straight Cable Jack



Used to connect cable to a plug mounted on equipment or attached to a cable.

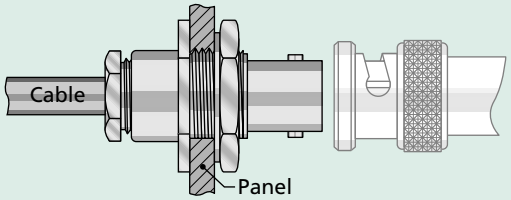
Right Angle Cable Jack



Used to connect cable to a plug mounted on equipment or attached to a cable.

Used in applications requiring a low profile, or to avoid bending cable.

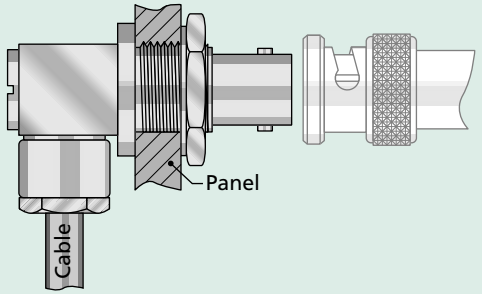
Straight Bulkhead Mounted Cable Jack



Used to transmit signal from a cable through a panel, using a single mounting hole.

Best suited for use with thick panels.

Right Angle Bulkhead Mounted Cable Jack

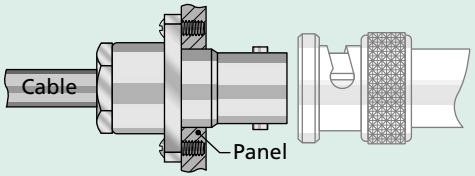


Used to transmit signal from a cable through a panel, using a single mounting hole.

Best suited for use with thick panels.

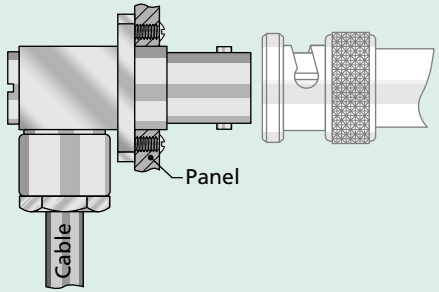
Used in applications requiring a low profile, or to avoid bending cable.

Straight Panel Mounted Cable Jack



Used to transmit signal from a cable through a panel, using a flange with two to four holes to accommodate mounting screws or bolts. Best suited for use with thin panels.

Right Angle Panel Mounted Cable Jack

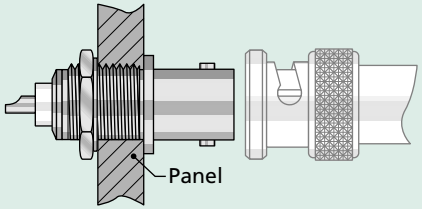


Used to transmit signal from a cable through a panel, using a flange with two to four holes to accommodate mounting screws or bolts. Best suited for use with thin panels.

Used in applications requiring a low profile, or to avoid bending cable.

Receptacle Configurations

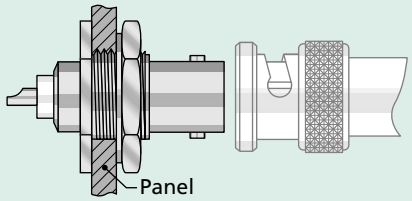
Bulkhead Jack Receptacle—Front Mount



Used to transmit a signal from internal circuitry through a panel, using a single mounting hole. Best suited for use with thick panels.

Mounting nut is behind panel.

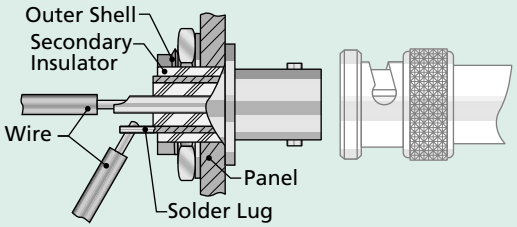
Bulkhead Jack Receptacle—Rear Mount



Used to transmit a signal from internal circuitry through a panel, using a single mounting hole. Best suited for use with thick panels.

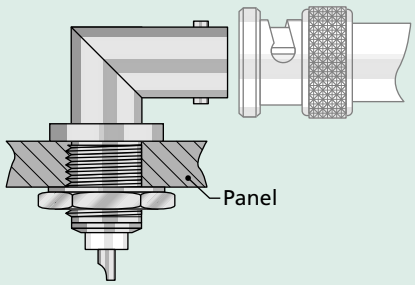
Mounting nut is in front of panel.

Bulkhead Jack Receptacle—Isolated Ground



A secondary coaxial dielectric insulates the connector body from the panel. A solder lug is provided to transmit the ground signal from the connector body.

Right Angle Bulkhead Jack Receptacle

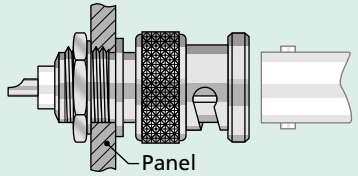


Used to transmit a signal from internal circuitry through a panel, using a single mounting hole. Best suited for use with thick panels.

Mounting nut is behind panel.

Used in applications requiring a low profile, or to avoid bending cable.

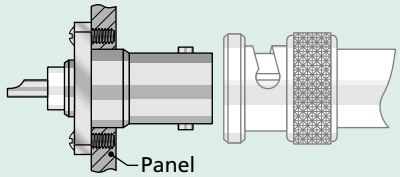
Bulkhead Plug Receptacle—Front Mount



Used to transmit a signal from internal circuitry through a panel, using a single mounting hole. Best suited for use with thick panels.

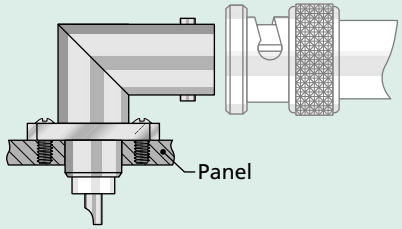
Mounting nut is behind panel.

Panel Jack Receptacle



Used to transmit signal from internal circuitry through a panel, using a flange with two to four holes to accommodate mounting screws or bolts. Best suited for use with thin panels.

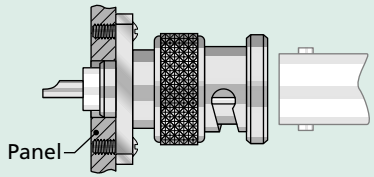
Right Angle Panel Jack Receptacle



Used to transmit signal from internal circuitry through a panel, using a flange with two to four holes to accommodate mounting screws or bolts. Best suited for use with thin panels.

Used in applications requiring a low profile, or to avoid bending cable.

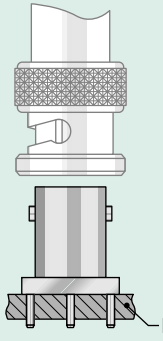
Panel Plug Receptacle



Used to transmit signal from internal circuitry through a panel, using a flange with two to four holes to accommodate mounting screws or bolts. Best suited for use with thin panels.

Receptacle Configurations and Contact Types

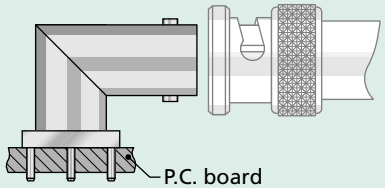
Straight Printed-Circuit Board Jack Receptacle



Contact and legs are soldered to plated-through holes in printed-circuit board.

Also available with plug interface.

Right Angle Printed-Circuit Board Jack Receptacle

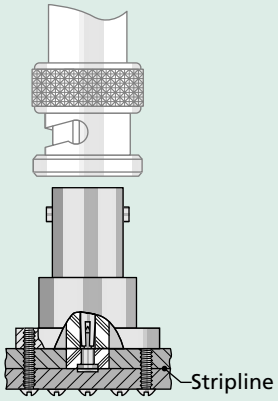


Contact and legs are soldered to plated-through holes in printed-circuit board.

Used in applications requiring a low profile, or to avoid bending cable.

Also available with plug interface.

Straight Stripline Jack Receptacle (Top Mount)



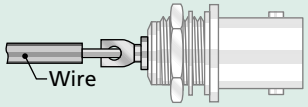
Used to transmit signal from a strip transmission line.

Uses a square flange, or a round flange with accommodation for 6 to 8 mounting holes.

A male pin with a turret head is connected to the signal strip, and the connector with socket contact is mounted over it.

Also available as in right angle configuration, with plug interface, or as cable terminations to feed signal directly into a coaxial cable.

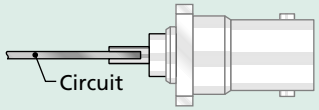
Flattened & Pierced Contact



Used on receptacles with soldered-in glass hermetic seals.

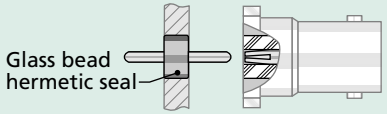
The seal pin is flattened and cross-drilled to provide a hole for soldering wire.

Slotted Contact



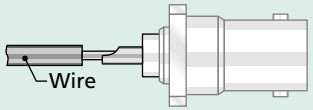
Circuit fits into slot in contact.

Socket Contact



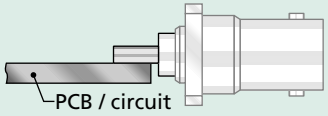
Female contact in rear of receptacle slides over male pin connected to circuitry, or pin of separate hermetic seal.

Solder Pot Contact



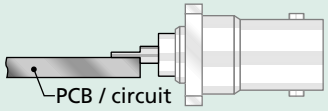
Wire conductor is placed into hole drilled in rear of contact and soldered.

Straight Contact



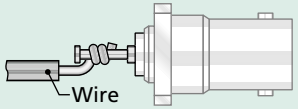
Rear of contact is soldered or otherwise bonded to circuitry.

Tab Contact



Rear of contact is milled to a flat tab for better electrical transition to circuitry.

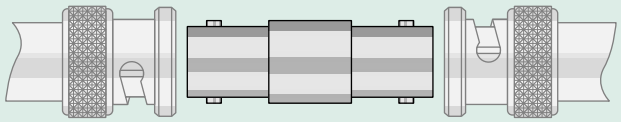
Turret Contact



Wire conductor is wrapped around contact and soldered.

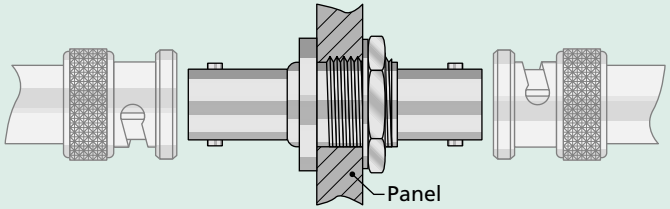
Adapter Types

Straight Jack to Jack Adapter



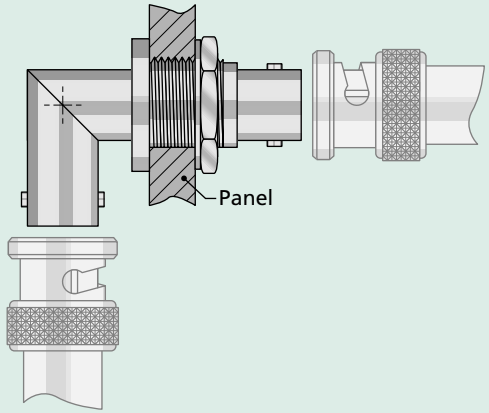
Used to connect two plugs.

Straight Bulkhead Mounted Jack to Jack Adapter



Used to transmit signal through a panel, using a single mounting hole, and connect two plugs.

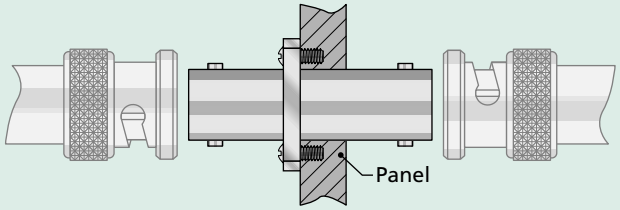
Right Angle Bulkhead Mounted Jack to Jack Adapter



Used to transmit signal through a panel, using a single mounting hole, and connect two plugs.

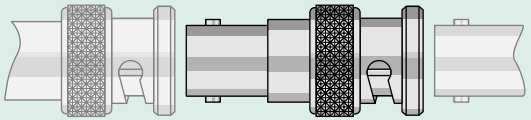
Used in applications requiring a low profile, or to avoid bending cable.

Straight Panel Mounted Jack to Jack Adapter



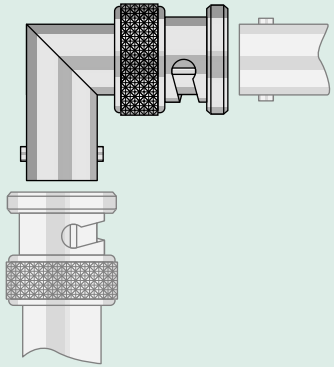
Used to transmit a signal through a panel, using a flange with two to four holes for screws or bolts, and connect two plugs.

Straight Jack to Plug Adapter



Used to connect a plug and a jack. Frequently used to minimize wear on receptacles mounted to test equipment.

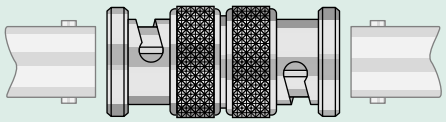
Right Angle Jack to Plug Adapter



Used to connect a plug and a jack. Used in applications requiring a low profile, or to avoid bending cable.

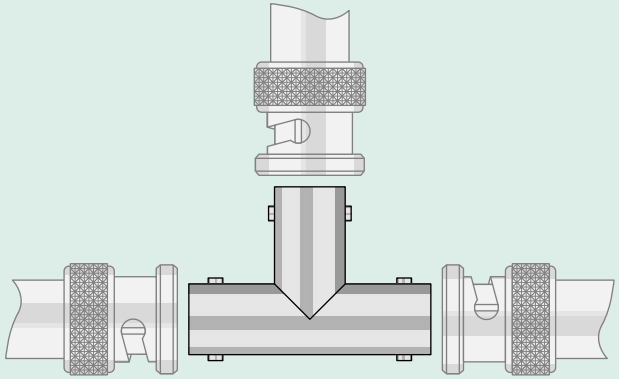
Adapter Types

Straight Plug to Plug Adapter



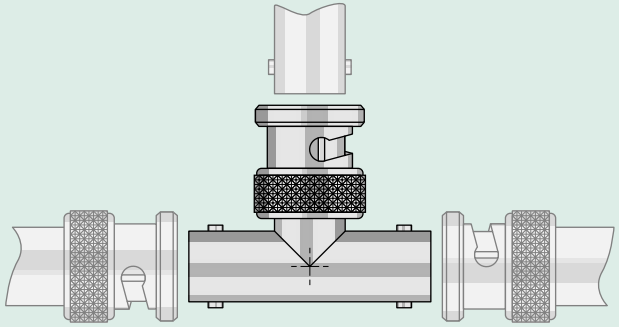
Used to connect two jacks.

Tee Adapter—Jack-Jack-Jack



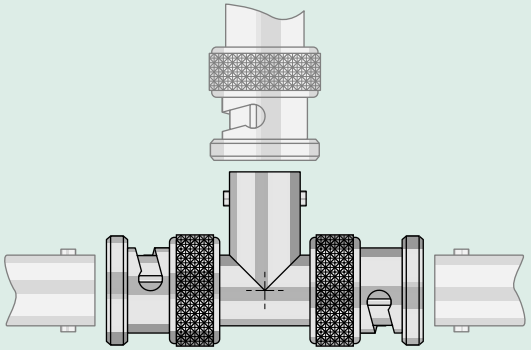
Used to connect three plugs.

Tee Adapter—Jack-Plug-Jack



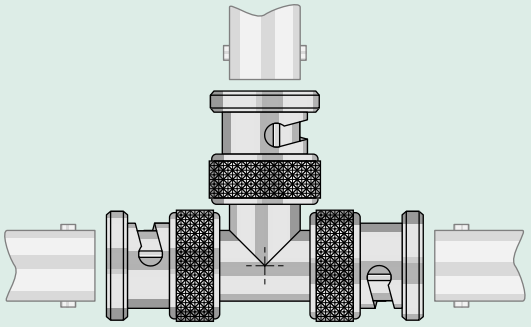
Used to connect two plugs and one jack.

Tee Adapter—Plug-Jack-Plug



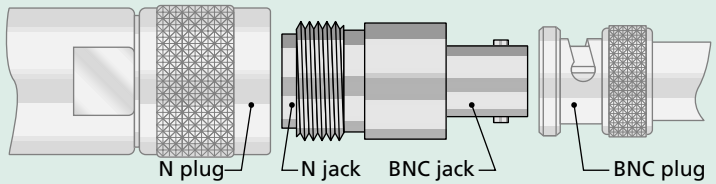
Used to connect two jacks and one plug.

Tee Adapter—Plug-Plug-Plug



Used to connect three jacks.

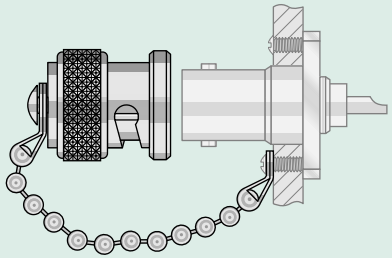
Adapter Between Series



Used to connect a cable or device equipped with one series of connector to a cable or device equipped with a different series of connector. Also available with bulkhead or panel mount.

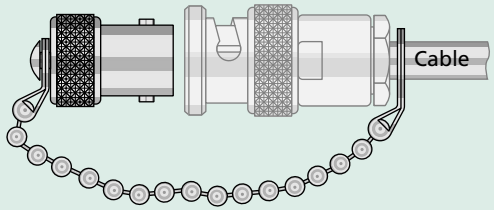
Accessories; Cable Terminations

Plug Cap and Chain



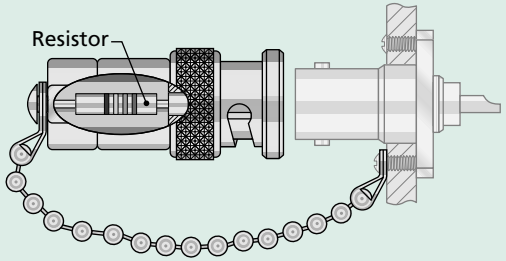
Used for protection and weatherproofing of unmated jacks.
Also available without chain, and/or as shorting type.

Jack Cap and Chain



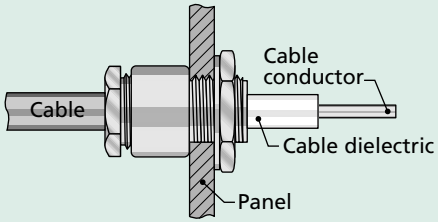
Used for protection and weatherproofing of unmated plugs.
Also available without chain, and/or as shorting type.

Resistive Termination (Dummy Load)



Used to simulate a load in an incomplete circuit.

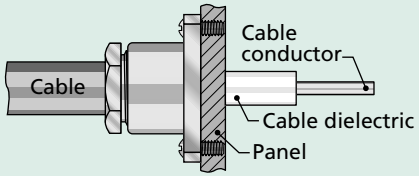
Bulkhead Mounted Cable Termination



Terminates the cable braid; feeds the cable dielectric and center conductor through a panel, using a single mounting hole.

Best suited for use with thick panels.

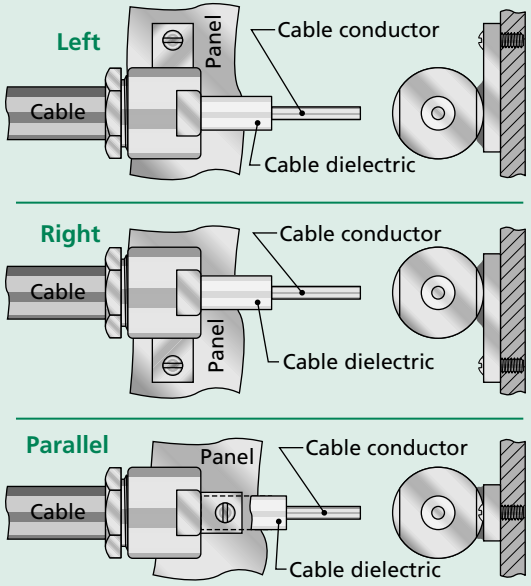
Panel Mounted Cable Termination



Terminates the cable braid; feeds the cable dielectric and center conductor through a panel, using a flange with four holes to accommodate mounting screws or bolts.

Best suited for use with thin panels.

Strap Mounted Cable Termination

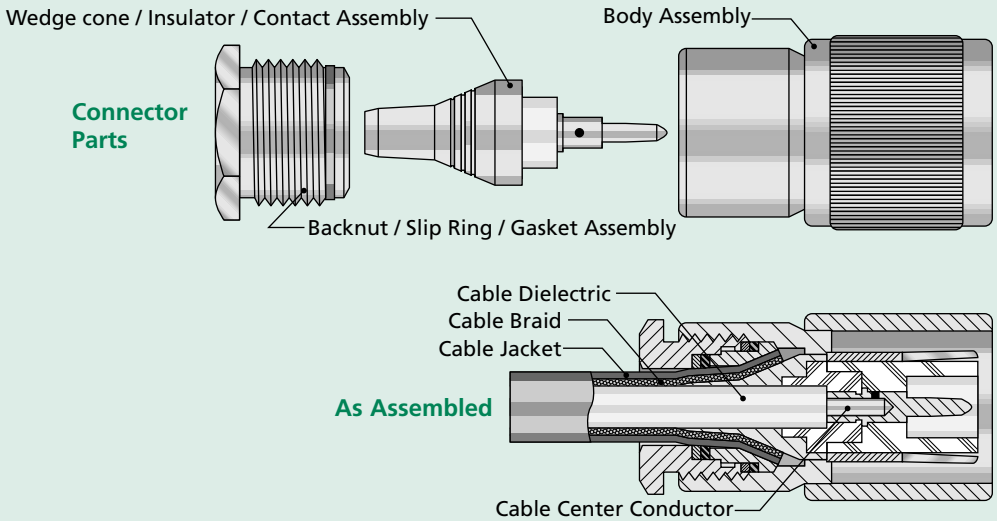


Terminates the cable braid; feeds the cable dielectric and center conductor through the body, and attaches to a panel with a screw or bolt.

Available with left, right, or parallel strap.

Cable Attachment Types—Flexible Cable

Standard Wedge-Lock



This patented attachment system features a captive contact, quick assembly, and secure cable retention.

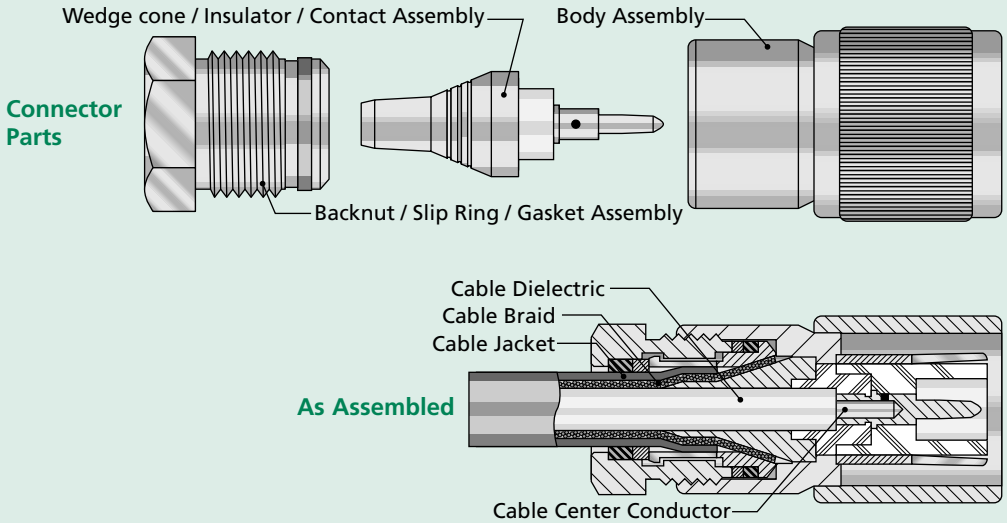
The cable braid and jacket are flared over the cone-shaped wedge, and the backnut captures the braid and jacket when screwed into the body assembly.

Unlike some similar constructions, the backnut incorporates a slip ring to prevent twisting of the cable during assembly.

Gaskets in the backnut provide weatherproofing of the cable attachment. The cable center conductor is soldered to the contact.

Many connectors with Wedge-Lock cable attachment are qualified to MIL-PRF-39012, Category A (field replaceable, no special tools required for assembly).

Improved Wedge-Lock



This patented attachment system features a captive contact, quick assembly, and secure cable retention.

The cable braid and jacket are flared over the cone-shaped wedge, and the backnut captures the braid and jacket when screwed into the body assembly.

This construction differs from standard Wedge-Lock in that the braid is clamped directly by the nut and wedge, providing metal-to metal contact. The cable jacket is secured in an adjacent area of the backnut assembly for weatherproofing.

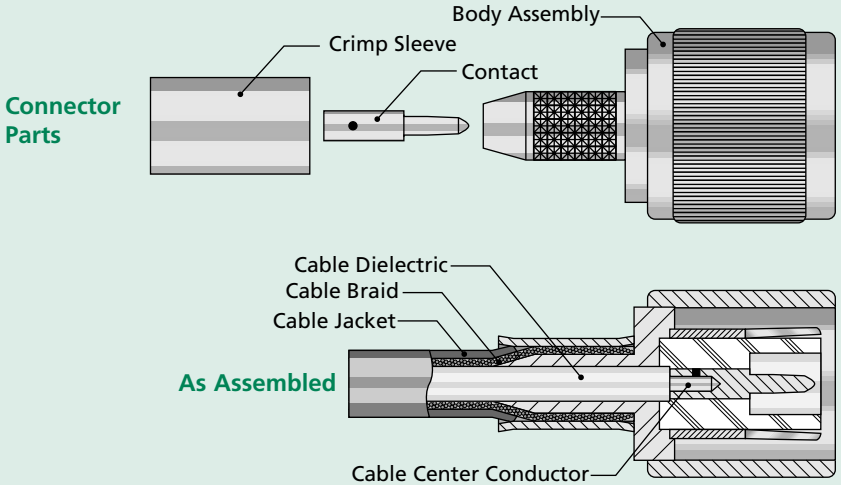
Unlike some similar constructions, the backnut incorporates a slip ring to prevent twisting of the cable during assembly.

The cable conductor is soldered to the contact.

Many connectors with Improved Wedge-Lock cable attachment are qualified to MIL-PRF-39012, Category A (field replaceable, no special tools required for assembly).

Cable Attachment Types—Flexible Cable

Econo-Crimp—Non-Captive Contact



This inexpensive cable attachment method features quick assembly and small connector size and weight.

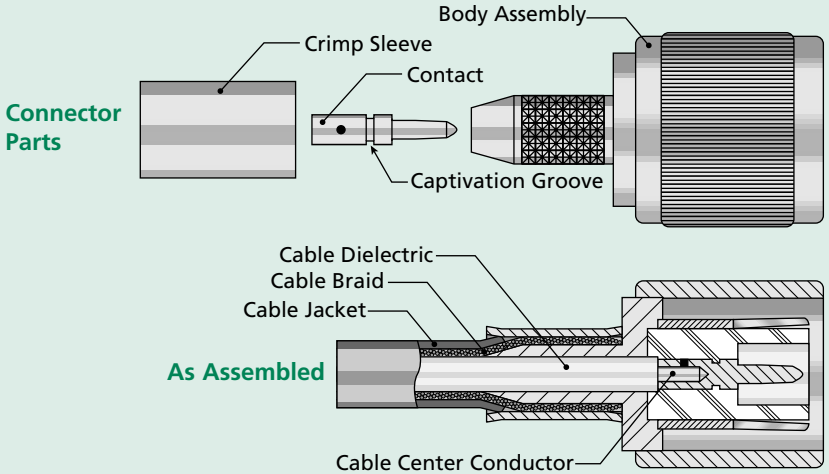
The cable is stripped and the connector contact soldered to the cable center conductor. The tail of the body is inserted under the cable braid, and the crimp sleeve moved into position and crimped.

For additional savings in assembly time, some Econo-Crimp connectors have contacts that can be crimped to the conductor instead of being soldered.

All Econo-Crimp connectors use readily-available commercial crimp tools and dies for assembly.

Econo-Crimp connectors can be ordered with heat-shrinkable tubing for weatherproofing.

Econo-Crimp—Captive Contact



These connectors offer quick assembly time and small size, and feature a captive contact which snaps into place in the insulator when assembled. This provides consistent axial contact location within the interface, and prevents movement of the contact from cable flexure or temperature changes after assembly.

The cable is stripped and the connector contact soldered to the cable center conductor. The tail of the body is inserted under the cable braid, and the crimp sleeve moved into position and crimped.

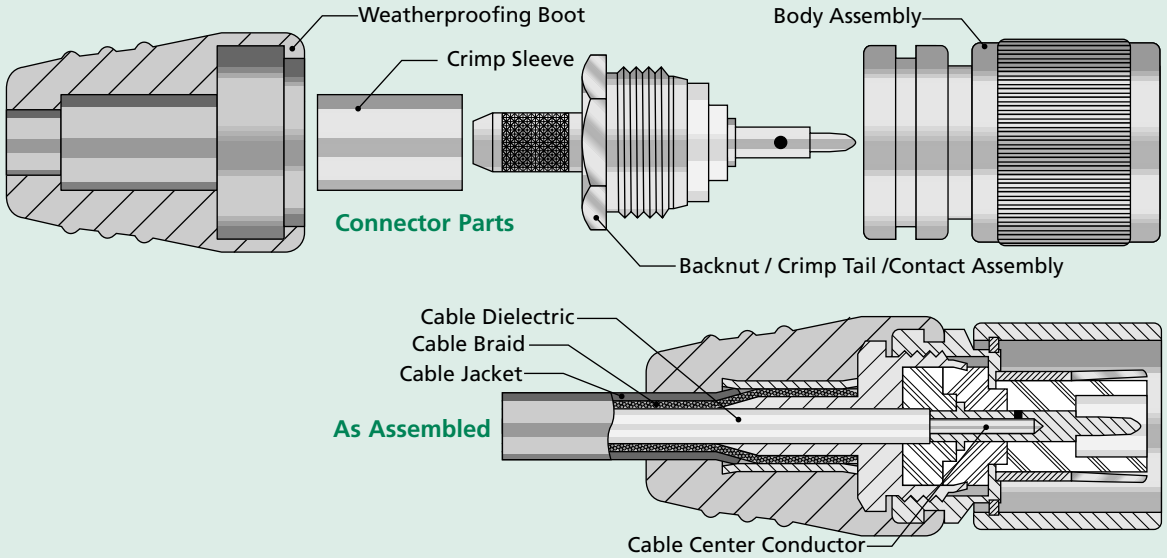
For additional savings in assembly time, some Econo-Crimp connectors have contacts that can be crimped to the conductor instead of being soldered. All Econo-Crimp connectors use readily-available commercial crimp tools and dies for assembly.

Econo-Crimp connectors can be ordered with heat-shrinkable tubing for weatherproofing.

Many connectors with Captive Contact Econo-Crimp cable attachment are qualified to MIL-PRF-39012, Category B (non-field replaceable), Category C (MIL-defined crimp tools and cable strip dimensions), and Category D (MIl-defined contact and crimp-sleeve dimensions).

Cable Attachment Types—Flexible Cable

X-Crimp



X-Crimp cable attachment combines ease of assembly with a captivated contact and a silicone-rubber boot* for weatherproofing.

The captive contact is held rigidly in place to prevent movement from cable flexure or temperature changes after assembly.

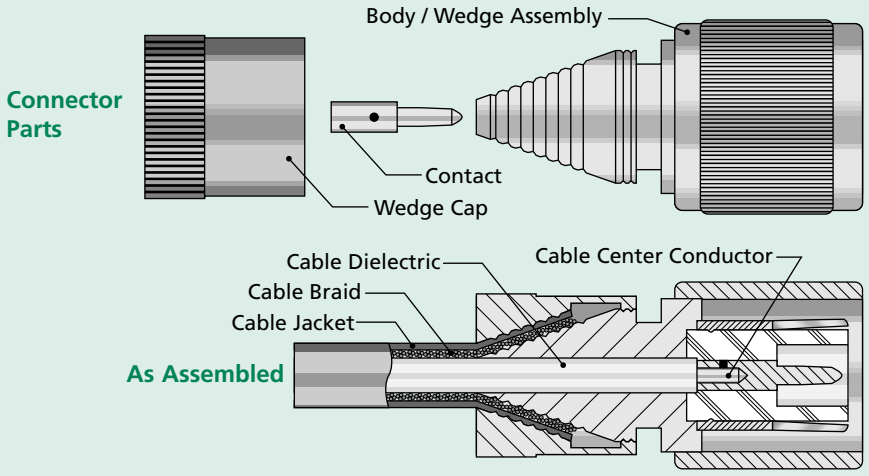
The cable is trimmed, and the tail of the back-nut assembly is pushed under the braid. The contact is soldered to the cable conductor, the braid crimped within the crimp sleeve, and the backnut assembly screwed into the body. The boot slides forward and snaps into place.

The boots can be supplied in a variety of colors for identification.

Some connectors with X-Crimp cable attachment are qualified to MIL-PRF-39012, Category B (non-field replaceable), and Category C (MIL-defined crimp tools and cable stripping dimensions).

*SMA and smaller size connectors use heat-shrink tubing instead of silicone-rubber boots.

Wedge-Eze



This unique attachment system provides very fast assembly and is field replaceable.

The cable is stripped, and the connector contact soldered to the center conductor.

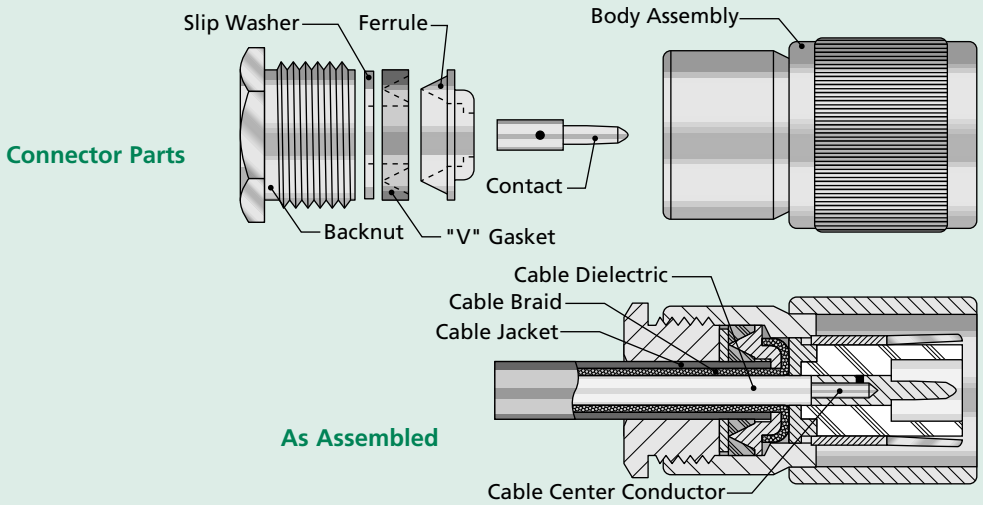
The prepared cable is pushed into the body assembly, and the wedge flares the braid. The plastic wedge cap is pushed forward over the cable braid, where it locks into place.

The cap can be assembled with an inexpensive hand tool or using automated equipment for large production runs.

The plastic caps are can be supplied in a variety of colors for identification.

Cable Attachment Types—Flexible Cable

V-Groove—Non-Captive Contact



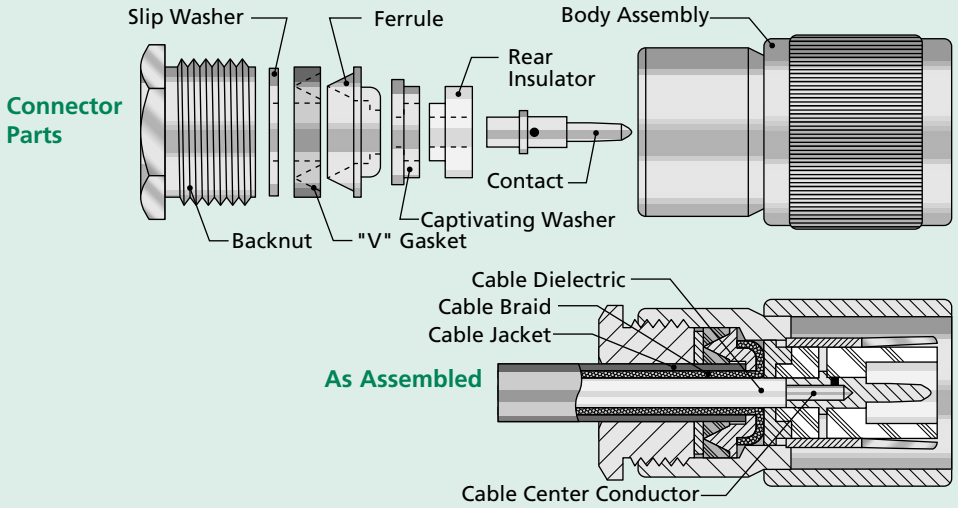
V-Groove cable attachment is the standard for military UG-type connectors, and is field-replaceable with no special tools.

The cable is stripped, and the braid is combed out and folded back over the ferrule. The connector contact is soldered to the cable conductor.

The prepared cable, the V-gasket, and the slip washer are secured in the body assembly by tightening the backnut.

The slip washer prevents twisting the cable while the nut is being tightened, and the rear surface of the ferrule cuts though the V-gasket, providing metal-to-metal braid clamping as well as weatherproofing.

V-Groove—Captive Contact



V-Groove clamping with a captive contact provides consistent axial contact location within the interface, and prevents movement of the contact from cable flexure or temperature changes after assembly.

The cable is stripped, and the braid is combed out and folded back over the ferrule. The connector contact is soldered to the cable conductor.

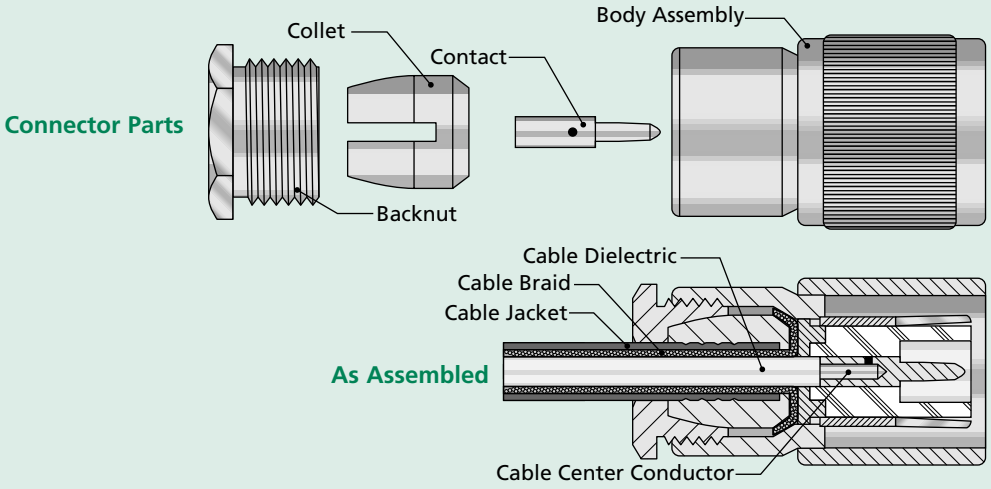
The prepared cable, the rear insulator and captivating washer, the V-gasket, and the slip washer are secured in the body assembly by tightening the backnut.

The slip washer prevents twisting the cable while the nut is being tightened, and the rear surface of the ferrule cuts though the V-gasket, providing metal-to-metal braid clamping as well as weatherproofing.

Many connectors with Captive Contact V-Groove cable attachment are qualified to MIL-PRF-39012, Category A (Field replaceable, no special tools required for assembly).

Cable Attachment Types—Semi-Rigid Cable

Collet Clamp—For Flexible and Semi-Rigid Cable



This attachment method is used in BSM, TSM, and SMP subminiature connectors, and is not weatherproof.

A weatherproof version is also available, incorporating gaskets within the cable attachment hardware.

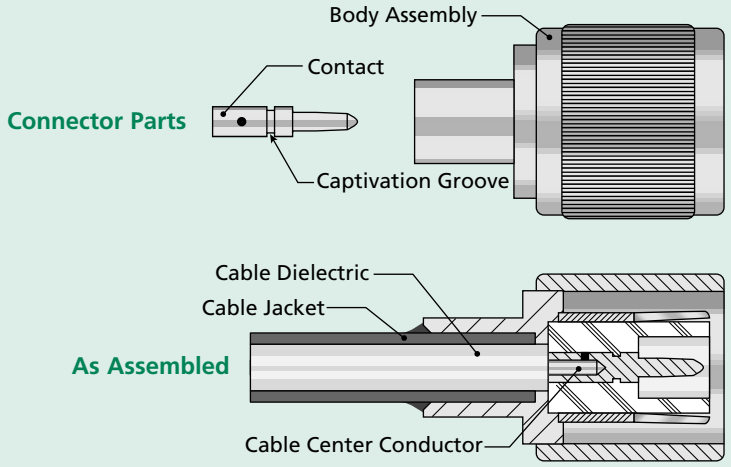
The cable is stripped, and the braid is combed out and folded back over the front of the collet. The connector contact is soldered to the cable conductor.

When the assembled cable is inserted into the body assembly and the backnut tightened, the cable is retained by the clamping action of the collet on the braid.

Additional cable retention provided by the backnut compressing the split end of the collet, clamping the cable jacket with the grooves inside the collet.

This attachment type can also be used in many connector series as a “solderless” attachment for semi-rigid cable.

Direct Solder



Direct-solder attachment is the most efficient method of attaching semi-rigid cable.

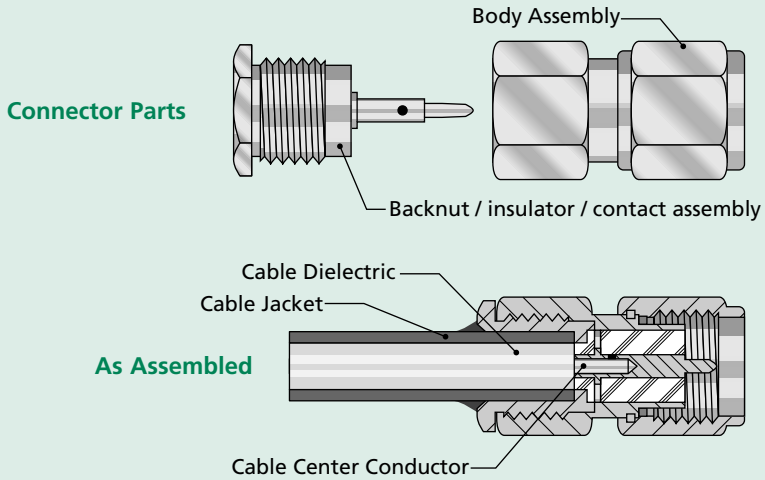
The cable is stripped and the connector contact soldered to the cable conductor. (Some SMA connectors do not have a separate contact; for these types, the conductor of .141" semi-rigid cable extends through the connector insulator and is used as the contact.)

The prepared cable is inserted into the body assembly, and the jacket (outer conductor) of the cable is soldered to tail of the connector body.

Captive contacts (as shown) are strongly recommended for connectors used with semi-rigid cable.

Cable Attachment Types—Semi-Rigid and Flexible Cable

Solder-Clamp (Used on SMA and other small connectors)



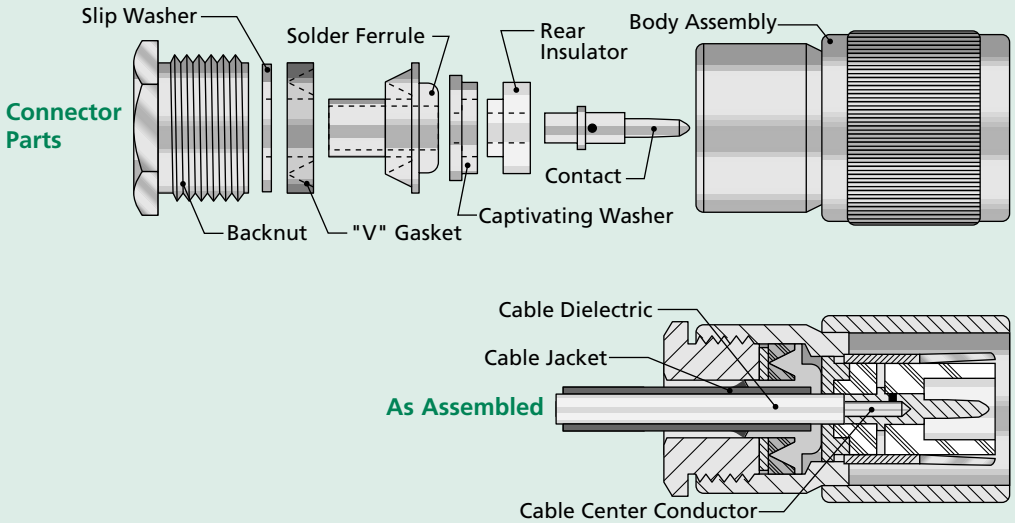
SMA and other small-size connectors feature simplified solder-clamp assembly for semi-rigid cable which incorporates a reduced parts count and captive contact. This design allows right-angle or chassis-mounted connectors to be re-oriented after cable attachment to easily conform to system layout.

The cable is stripped and inserted into the backnut / insulator / contact assembly, and the connector contact soldered to the cable conductor. The cable jacket (outer conductor) is then soldered to the backnut. The prepared cable is inserted into the body assembly and the backnut tightened.

The captive contact provides consistent axial contact location within the interface, and prevents movement of the contact from cable flexure or temperature changes after assembly.

Some SMA connectors with solder-clamp cable attachment are qualified to MIL-PRF-39012, Category B (non-field replaceable) and Category E (MIL-defined cable stripping dimensions).

Solder-Clamp (Used on BNC and larger connectors)



This attachment method is similar to the V-Groove type used for flexible cable, but is adapted to use with semi-rigid cable by replacing the braid-clamp ferrule with a ferrule designed to be soldered to the jacket (outer conductor) of semi-rigid cable.

This design allows right-angle or chassis-mounted connectors to be re-oriented after cable attachment to easily conform to system layout.

The cable is stripped, and the ferrule is soldered to the cable jacket before soldering the contact to the cable conductor. This allows for trimming the cable dielectric after soldering the jacket, eliminating any dielectric extrusion that may occur during jacket soldering.

Captive contacts (as shown) are highly recommended for connectors used with semi-rigid cable.

SMA and other small connectors use a different method of solder-clamp assembly (see next page).