

PL-259

Connector Series

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PL-259 Development History

- ▶ Lloyd Espenscheid and Herman Affel, developed and analyzed the first coaxial cables in 1929 while working for the legendary Bell Labs.
- ▶ Their goal was to find a transmission medium for propagating a 4 megacycle (MHz) signal (a very wide bandwidth in those early days of long-distance telephony).
- ▶ In the late 1930s the U.S. Army Signal Corps set requirements for a shielded connector series for coax cables that would be effective above 30 megacycles. (Considered to be UHF in the 1930s).
- ▶ Hence in USASC nomenclature: PLug-259, SOcket-239, adapters PLug-258 (barrel connector), etc.

Not all PL-259s are created equal

- ▶ The following is for reputable manufacturers, (Amphenol, Kings, DXE, etc.), not knockoff junk.
- ▶ PL-259s come in many flavors.
- ▶ All start as brass molded shells with copper hollow center pins.
- ▶ Center dielectric insulator may be Teflon, polyethylene or phenolic (Bakelite).
- ▶ Shells may be nickel or silver plated (silver is best for soldering to shield braid).
- ▶ Shield can be crimped or soldered to the shell.
- ▶ Center pin is plain copper or silver plated and is always soldered to center conductor.

PL-259 Series pros vs cons

Pros

- ▶ Readably available at reasonable cost.
- ▶ Plentiful in the Hamfest flea markets.
- ▶ Easier to assemble than other RF connectors. (BNC, N, TNC)
- ▶ Made for the HF freq. range.
- ▶ Will handle full legal limit power (in HF Band).
- ▶ Sturdy and strong connection.

Cons

- ▶ Not weatherproof.
- ▶ Performance declines above 60 MHz.
- ▶ A challenge to solder.
- ▶ Must be properly tensioned. (Use N3XF “two grunt” method)
- ▶ Not all pre terminated coax is equal. (Caveat Emptor)
- ▶ The market is flooded with knock-off junk! (Caveat Emptor)
- ▶ PL-259s are NOT reusable!

Some examples

Nickel Plate



Silver Plate



Solder vs Crimp

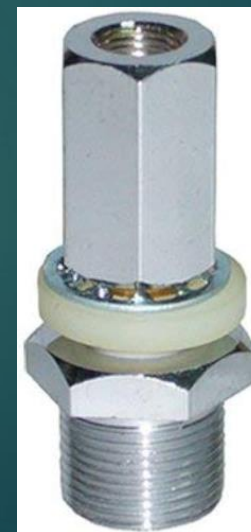
Solder Type



Crimp Type



Variants



UHF Connector Nomenclature

UHF Connectors

- ▶ For RG-8A/U and RG-58/U Cable
- ▶ Plugs: PL-259, PL-259A, UG-295/U
- ▶ Adapters for RG-58/U: UG-175/U, UG-410/U
- ▶ Right-angle adapter: UG-297/U, UG-646/U, M-359
- ▶ Adapter, straight (female-female): PL-258, UG-360/U, UG-299/U
- ▶ Receptacle: S0-239, UG-296/U
- ▶ Adapter, straight (male-male): Dow-Key F-2

Hybrid adapters:

- ▶ UHF (female) to BNC (male): UG-255/U
- ▶ UHF (male) to BNC (female): UG-273/U
- ▶ UHF (female) to N (male): UG-146A/U
- ▶ UHF (male) to N (female): UG-83B/U
- ▶ UHF (female) to male phono connector: Dow-Key A-210
- ▶ UHF (male) to male phono connector: Dow-Key A-211
- ▶ UHF plug (solderless): Amphenol 83-851 (for RG-8A/U)

Sealing UHF connections



Temflex self-amalgamating tape and UV resistant outer electrical tape

Station Maintenance and UHF Connectors

- ▶ Proper prep, assembly and soldering is key to a good connector.
- ▶ If you buy pre-made cables, be sure they are of good quality.
- ▶ Tarnish and corrosion can cause a myriad of RF problems, ie: high SWR, poor reception, “diode effect” harmonics and more.
- ▶ Outdoor UHF connector should be checked for corrosion, looseness and damage on an annual basis.
- ▶ Use water pump/slip joint pliers to tighten connectors to radios, barrel connectors, pass throughs, antennas and bulkheads (the N3XF “two grunt” method).
- ▶ By using 3M Temflex and Super 33, seals can be removed without residue and easily resealed.

Summary

- ▶ PL-259/UHF connectors go back to the 1930s.
- ▶ They are ubiquitous on Ham and older LMR equipment (SO-239 chassis mount).
- ▶ Knowledge of the connector and an ability to assemble your own will give you great flexibility in setting up your stations.
- ▶ With good soldering skills they can be assembled by every Ham.
- ▶ UHF connectors are not weatherproof. Care must be taken in sealing connections used outdoors.
- ▶ Caveat Emptor! Learn about the connectors before you forage through a hamfest or shop online.
- ▶ Thoroughly understanding these connectors is a key to Ham success!

ANY
QUESTIONS?



Practical Demonstration

KR3L AND W3DEC