



How To Make Coaxial Cables

A Custom Brew of Style and Science

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Presentation Purpose → Provide a basic overview of the techniques, materials, and tools necessary to make custom coaxial cables



Due to it's popularity, this presentation will focus on UHF Connectors ...

Why Make Your Own Coaxial Cables?

Cost → Retail prices \$2 - \$6 per foot for LMR 400 with connectors

Customization → Length, waterproofing, connector types, etc

Repairability → Recycle or fix damaged cables

Quality → Get high levels of quality without the cost

Impact of Installation → Minimize the size of holes
to pass through structures

Guiding Recommendations

 *Warning! K5AYR's Opinions*

Limit capability to two coaxial cable sizes

LMR400 / RG213 for VHF/UHF or longer runs (100+ feet)

LMR240 / RG8X for HF or short runs and flexible jumpers

Use crimp style UHF connectors

Don't worry too much about brand – you will destroy connectors when first starting

Dedicate a portable toolbox for all components

Grab and go – everything organized, contained, and protected

Use heat shrink with built in glue

Colored heat shrink can help you quickly identify cable types

High quality heat shrink helps provide strain relief for the coax connection

Materials and Tools

1. Coax
 2. Connectors
 3. Crimper and Dies for RG8X and RG213 (~\$30)
 4. Razor Blade or Fine Utility Knife (~\$5)
 5. Heat Shrink (~\$10)
 6. Heat Gun (~\$20)
 7. Small Scissors (~\$10)
 8. Small Wire Cutters (~\$10)
 9. Soldering Iron (optional)
 10. Solder (optional)
- Total: ~\$85**

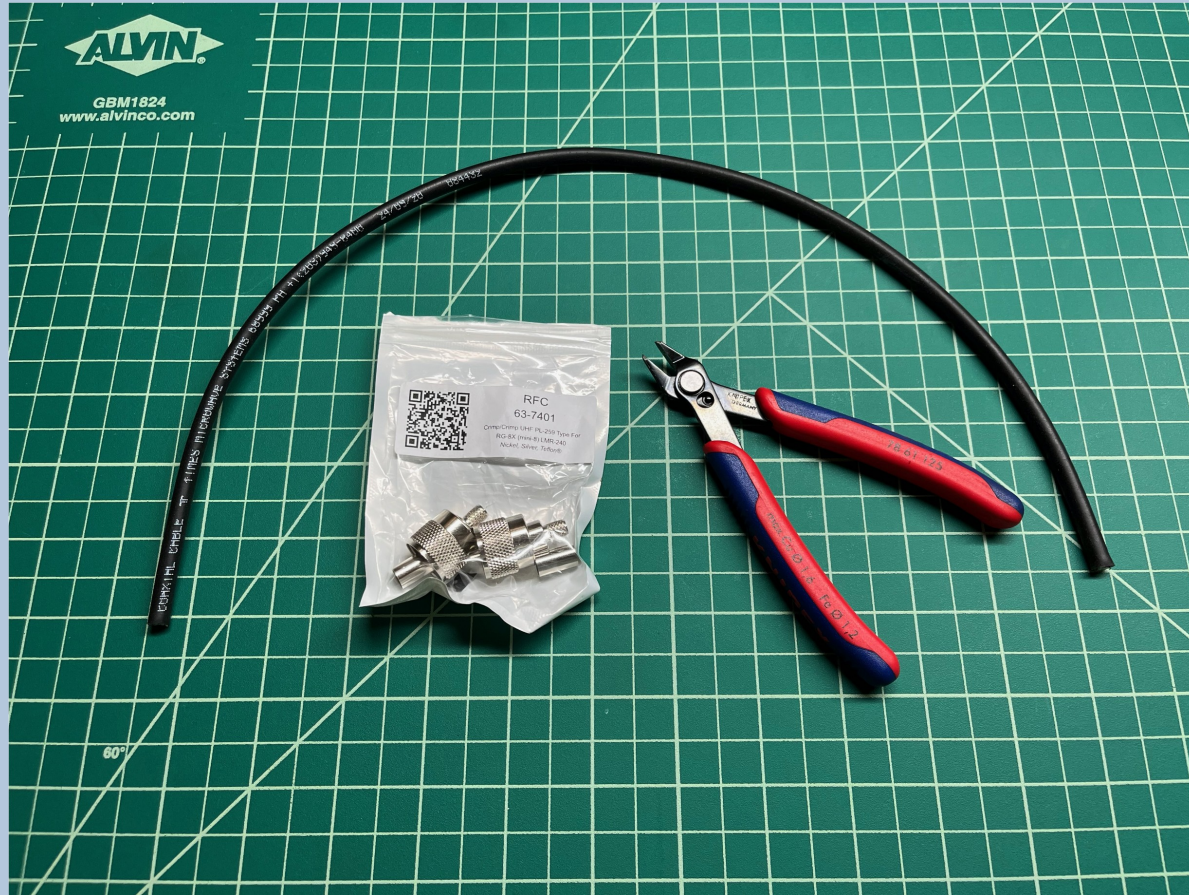
Materials and Tools



Steps to Attach UHF Crimp Connectors

- 1. Cut coax to desired length**
- 2. Add crimp ring, outer connector, and heat shrink**
- 3. Remove outer jacket**
- 4. Trim outer shielding**
- 5. Trim insulator**
- 6. Remove inner shielding (if present)**
- 7. Install inner connector**
- 8. Trim and install center conductor**
- 9. Set heat shrink**
- 10. Test with multimeter or VNA (optional)**

Step 1: Cut coax to desired length



Step 2: Add crimp ring, outer connector, and heat shrink



Step 3: Remove outer jacket



▲ *Hint: Use the inner connector to estimate the length*

Step 4: Trim outer shielding



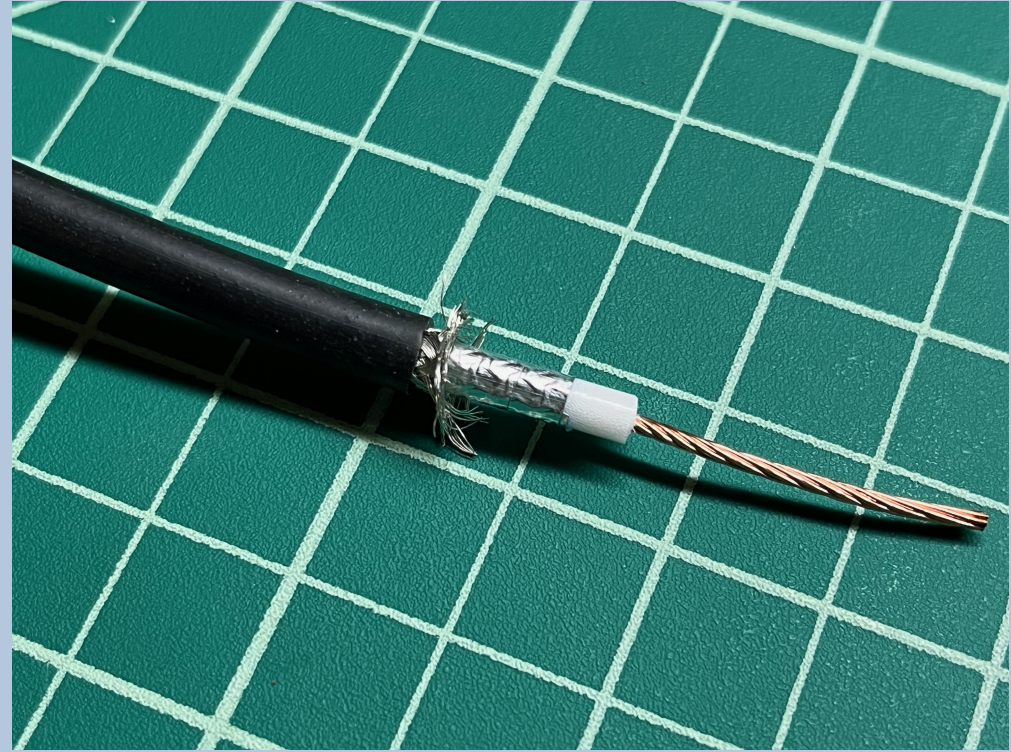
▲ *Hint: Cut the outer shielding a bit longer than expected*

Step 5: Trim insulator



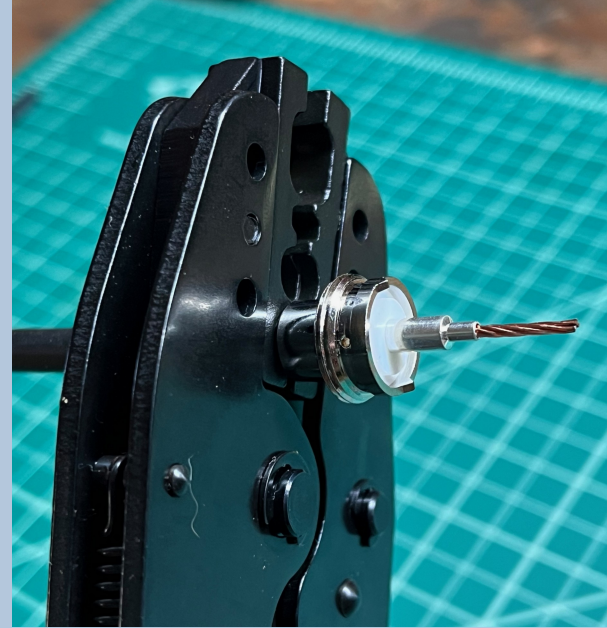
▲ *Hint: Use the inner connector to estimate the length of the barrel*

Step 6: Remove inner shielding



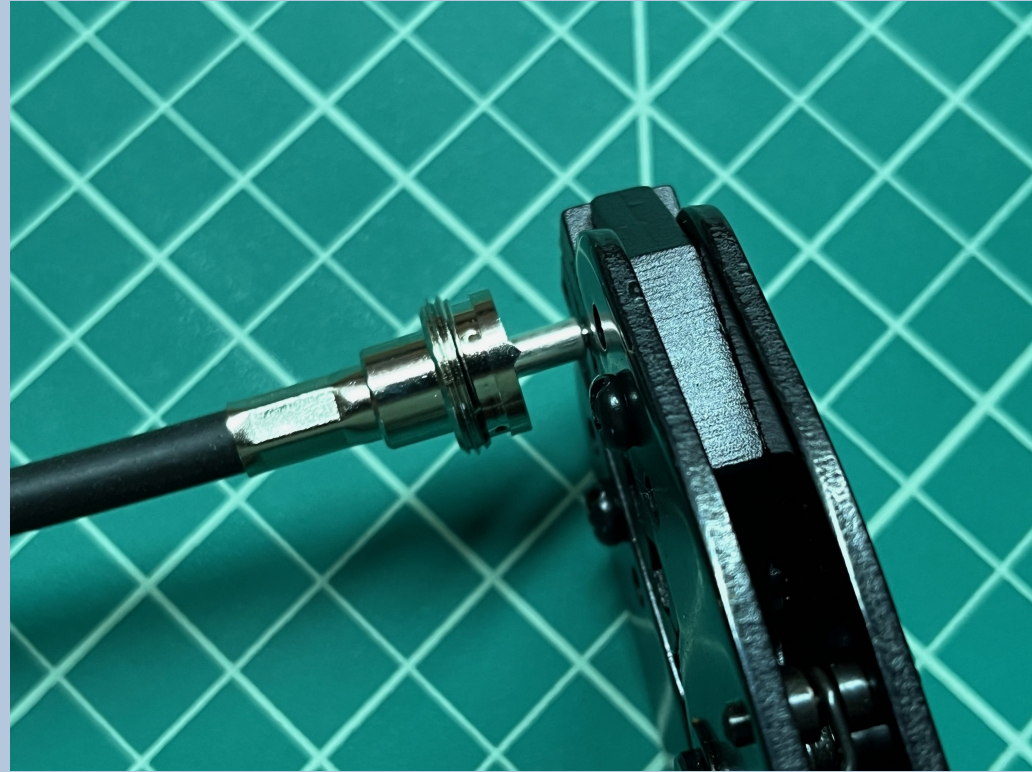
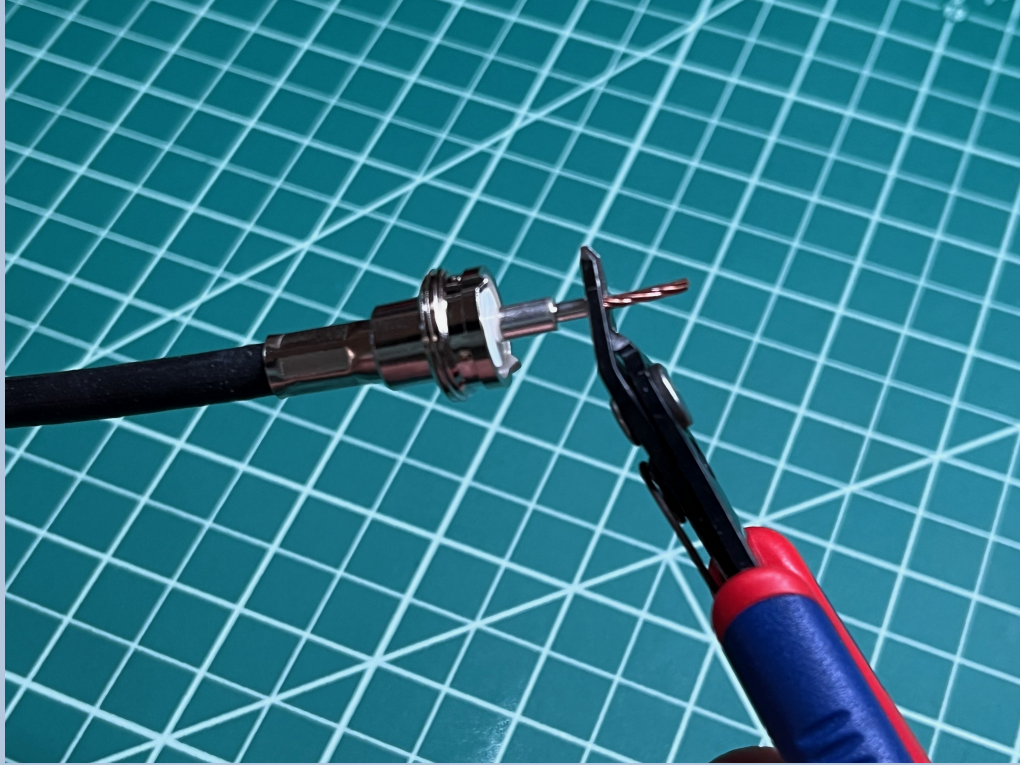
▲ *Hint: Look for the seam and carefully pick at it with the edge of a razor*

Step 7: Install inner connector

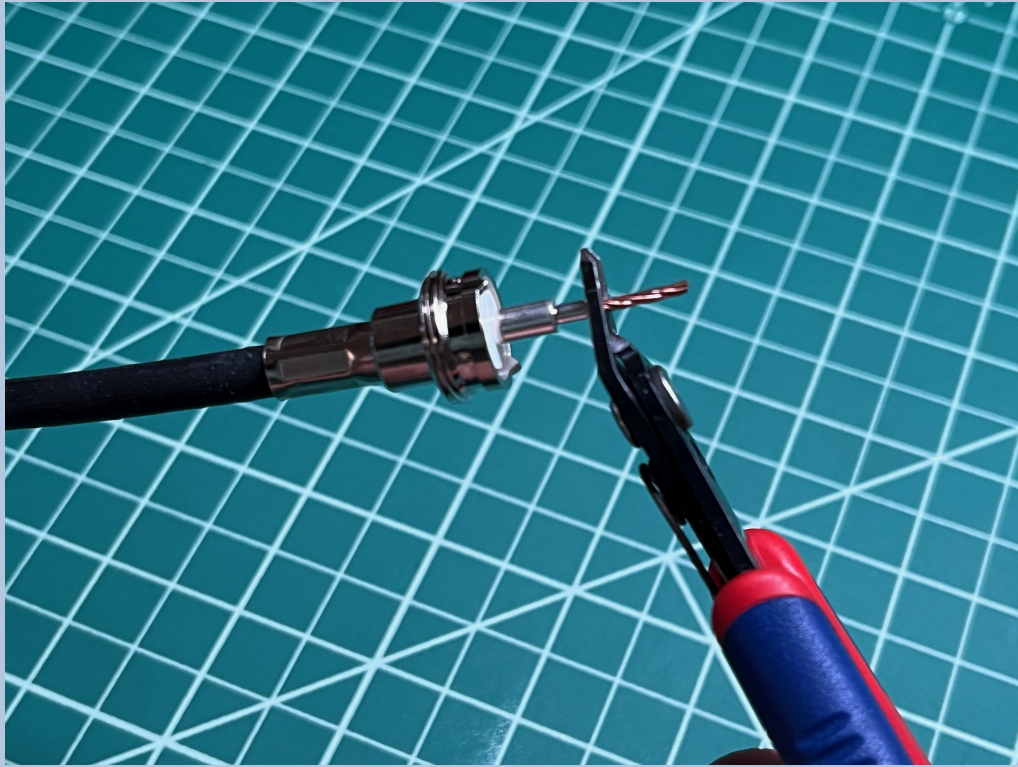


▲ *Hint: Most crimps have a correct direction so a flare is created towards the coax – I messed up when creating this one :)*

Step 8: Trim and install center conductor (crimp)

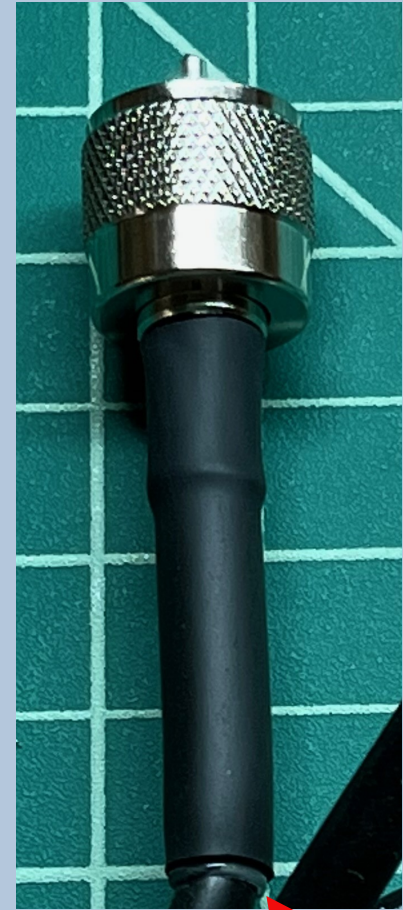


Step 8: Trim and install center conductor (solder)



▲ *Hint: Solder when using ultra-flex coax with multiple strands*

Step 9: Set heat shrink



See the glue?

Questions?



I created this spider-looking amalgamation to roughly show each stage of the connection process