Dual Band Dipole Antenna — 2M / 70cm Build Guide

Overview

This guide covers building a dual-band dipole antenna for 2 meters (144 MHz) and 70cm (440 MHz) using thick copper wire, mounted on a PVC mast and fed with KMR-240 50-ohm coax.

Materials

- Thick copper wire (enough for two legs plus extra for U folds)
- KMR-240 (or LMR-240) 50-ohm coax — length to reach from antenna to radio
- Soldering iron and solder
- Dielectric grease
- PVC pipe for mast
- Screws and washers for mounting legs to PVC
- Zip ties
- Appropriate coax connectors and adapters for your radio

How It Works

Each leg of the antenna is one continuous wire with two straight radiating sections:

- The **lower straight section** (19.5 inches) is the 2M radiating element
- The **upper straight section** (6.5 inches) is the 70cm radiating element
- Any remaining wire past the 6.5 inch section is folded into a **U bend** — this is just wire storage, it does not radiate

The feedpoint sits at the junction between the two straight sections — where the 19.5 inch and 6.5 inch sections meet on each leg.

Wire Measurements

Section	Length per leg
2M radiating section	19.5 inches
70cm radiating section	6.5 inches
U fold (remainder)	Whatever is left — shape does not matter

Cut each leg with a few extra inches to allow for the U fold and for trimming at the feedpoint end.

Step 1 — Shape Each Leg

Working from the feedpoint end outward on each leg:

1. Measure and mark 19.5 inches — this is your 2M section
2. Continue another 6.5 inches past that mark — this is your 70cm section
3. Fold any remaining wire back into a U shape — keep it tidy and not touching the other leg or the straight sections

Both legs should mirror each other. One points up from the feedpoint, one points down.

Step 2 — Mount Legs to PVC

Attach each leg to the PVC mast using screws and washers. The legs run parallel to the mast with the feedpoint junction at the center. The screw/washer hardware holds the wire mechanically — the electrical connection will be handled by solder in the next step.

Step 3 — Prepare the Coax

At the antenna end of the KMR-240, strip back enough jacket to cleanly separate:

- **Center conductor** — connects to one leg
- **Shield braid** — connects to the other leg

Tin both the coax conductors and the antenna wire ends with solder before joining them. Solder flows onto pre-tinned surfaces much more cleanly.

Step 4 — Solder the Feedpoint

The two solder joints sit at the junction between the 19.5 inch and 6.5 inch sections on each leg — right where the two straight sections meet.

- Center conductor solders to one leg at this point
- Shield braid solders to the other leg at the same point
- Keep the two joints as close together as possible without touching — a half inch gap is fine
- Make sure no braid strands are shorting to the center conductor
- Let joints cool completely before handling

Step 5 — Make a Choke Balun

Right at the feedpoint, coil 8 turns of the KMR-240 into a roughly 6-inch diameter loop. Zip-tie the coil to hold its shape and secure it to the mast.

This stops RF current from running back down the outside of the coax shield, which would otherwise cause the feedline to act as part of the antenna and degrade performance.

Step 6 — Weatherproof the Feedpoint

Since the antenna is taken down periodically for inspection, tape is not used here — dielectric grease alone is sufficient for the Buena Park climate and makes the connection easy to service.

1. Inspect the solder joints visually — no cracks, no shorts
2. Apply a generous coat of dielectric grease over every solder joint and exposed bare metal at the feedpoint
3. Ensure all bare surfaces are fully coated — the grease displaces moisture and slows oxidation
4. Reapply fresh grease each time the antenna is reinstalled

Check and reapply at least once a year, or after any extended period of wet weather.

Step 7 — Run the Feedline

Run the KMR-240 from the feedpoint to the radio. Notes for the cable run:

- KMR-240 handles bends well but do not force sharp kinks — keep bends gradual around corners and door casings
- Seal the point where the coax enters the house with silicone caulk or a weatherproof grommet
- Use appropriate adapters at the radio end to match your connector (UV-5R uses SMA-Female; most SDR dongles use SMA-Female or MCX)

Connector Reference

Device	Connector
Baofeng UV-5R	SMA-Female (on radio)
KMR-240 cable ends	N-Male
Most RTL-SDR dongles	SMA-Female
Some cheap SDR dongles	MCX
Old TV coax	F-connector
Typical mobile radio	PL-259 (UHF)

Use quality silver-plated adapters — avoid no-name adapters especially for 70cm where connector losses add up.

Notes

- The U fold wire length and shape do not affect antenna performance — only the two straight sections matter
- The feedpoint is the only electrical connection point — one solder joint per leg, nothing at the U fold ends
- Height helps but a mismatched or poorly connected antenna will underperform a lower well-built one

- For transmit use, always confirm your radio sees a reasonable SWR before running high power

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