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Easy to Build 2 Meter (146 MHz) Vertical Antenna

 [Hayden VK7HH \(https://hamriodx.net/author/vk7hh/\)](https://hamriodx.net/author/vk7hh/) -

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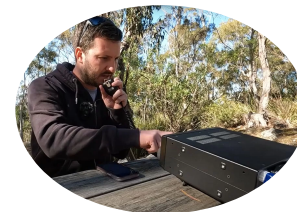
If you're looking for a simple and effective way to improve your handheld VHF performance on the 2-meter band, the **Flowerpot** antenna (also known as a **T2LT**) is one of the easiest antennas you can build at home. It requires minimal tools, common materials, and delivers a **big upgrade in range** compared to the rubber-duck antenna that comes with most handheld radios.

In this guide, I'll walk you through how the antenna works, the measurements you'll need, how to wind the choke coil, and how to tune it for best performance.

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About Me



AMATEUR RADIO BLOG

Hi, I'm Hayden (VK7HH) — an amateur radio operator based in Hobart, Tasmania, Australia. I also hold a US Technician license (KD9SSB). I post regular YouTube videos on all things ham radio, so hit subscribe!



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What is a Flowerpot / T2LT Antenna?

The Flowerpot antenna is a **full-length vertical antenna** made from a single **piece of coaxial cable**. The *top* section has the braid and shield removed, leaving only the center conductor. The *bottom* section remains **fully intact coax** (braid + dielectric + center conductor) — this forms the counterpoise. A simple coil (choke) placed between them prevents RF traveling back down the coax to your radio. This is a **common-mode choke**, not a loading coil — it does not change the electrical length of the antenna. It simply keeps RF energy where it belongs (in the antenna), improving efficiency and reducing interference.

The result is:

- ✓ Excellent performance
- ✓ Lightweight and portable

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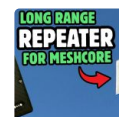
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✓ Perfect for handhelds, mobile rigs, home stations, SOTA/POTA activations, and emergency communication.

What You'll Need

- RG58 coaxial cable (a few meters depending on feed length)
- PVC conduit (25mm / 1" recommended, but others work)
- Coax connector for your radio (PL-259, BNC, SMA etc.)
- Tape or heat-shrink to secure the coax
- Sharp blade or coax stripper

That's it. No baluns, no radials, no tuning network.

How the Antenna Is Constructed

The antenna is made by **removing the braid and shield** from the top portion of the coax to form the radiating element, and leaving the bottom portion intact.



You can mount the antenna either **inside** or **outside** the PVC. Mounting it **outside** makes it easier to adjust and reduces measurement sensitivity — so that's the method used here.

If mounting the antenna *inside* the PVC, the lengths are slightly shorter because the dielectric inside the pipe changes velocity factor. See original build notes or video for the alternative measurements.

Lengths for Mounting Outside PVC:

SECTION	LENGTH (MM)
Radiating Element (top)	468 mm

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SECTION	LENGTH (MM)
Counterpoise Section (bottom)	458 mm

The Choke Coil

After the bottom section, you'll wind a choke coil to stop RF flowing back down the feedline.

PVC DIAMETER	TURNS OF RG58
25 mm (1")	9 turns
32 mm	5 turns

Secure the windings with tape so the spacing doesn't shift.

After the coil, the **rest of the coax just runs back to your radio**. Keep it as short as practical to minimize feedline loss.



Assembly Steps

1. **Strip** the top section to expose only the center conductor (remove braid/shield).
2. **Measure** both the top and bottom lengths precisely.
3. **Tape** the coax along the PVC evenly to keep it straight.
4. **Wind the choke coil** with the correct number of turns.
5. **Attach connector** to the radio end of the coax.
6. **Mount the antenna vertically** and tune.

Tuning the Antenna

Use an SWR meter or NanoVNA to check resonance near **146 MHz** (middle of 2m band).

If the antenna resonates:

- Below your target frequency → it's **too long** → shorten it.
- Above your target frequency → it's **too short** → lengthen it.

Quick Calculation Method:

$$\text{New Length} = (\text{Desired Frequency} / \text{Measured Frequency}) \times \text{Current Length}$$

For example, I measured the lowest SWR at **139.35 MHz**, so:

$$146 / 139.35 = 0.954$$

Multiply your original lengths by **0.954** to find the corrected dimensions.

After trimming both the top and bottom elements, the antenna tuned perfectly at **146 MHz**.

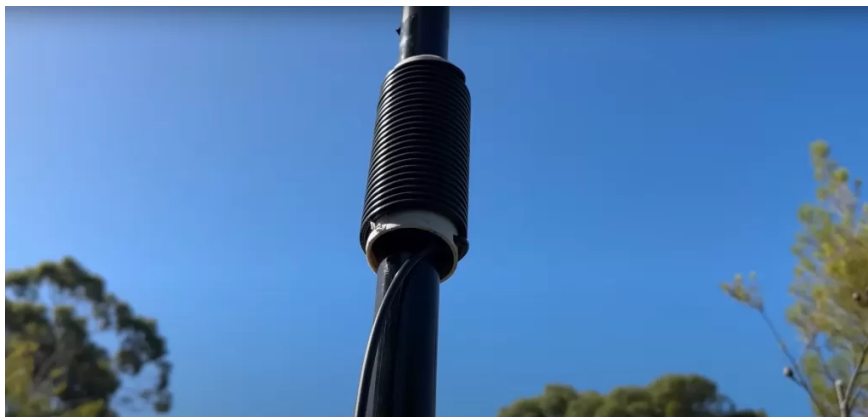


Performance and Flexibility

This antenna design works not only for **2 meters**, but can easily be scaled for:

- 6 meters
- 10 meters
- and other HF/VHF bands

I've built versions for 6m and 10m successfully — and plenty of people have reported working DX using the 10m version!



Easy to Build 10 Meter (28 MHz) Vertical Antenna for DX

If you've been active on the ham bands lately, you may have noticed something exciting — the 10-meter amateur radio band (28 MHz) has been absolutely alive with DX contacts. With the recent solar cycle conditions, this band has been wide open to the world, so I decided to join the fun by building a ... [Continue reading](#)



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Video Tutorial

If you'd like to see the full construction process step-by-step, including how to tune it using a NanoVNA, watch the full video here:

👉 <https://youtu.be/4EhUau841jk> (<https://youtu.be/4EhUau841jk>)

If you found this helpful, feel free to share it with your club, field day team, or new hams just getting on the air. This is a **perfect first antenna project** and a great way to learn practical skills in amateur radio.

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