

HOWTO – Building a Resonance Map

This HOWTO explains how to properly build a learned resonance map using the coverdrive Magnetic Loop Antenna Controller learned resonance system (LRS).

What is a Resonance Map?

A resonance map is a collection of saved resonance positions across an amateur radio band. Each saved position teaches the controller how the antenna behaves at that frequency.

As additional positions are added, interpolation accuracy improves between saved frequencies.

Step 1 – Start with a Clean Band (Optional)

If rebuilding the resonance map from scratch, clear existing learned positions using:

MENU-->CLEAR POS

Step 2 – Select a Frequency using the VFO

Choose a frequency somewhere within the active amateur radio band.

Well-spaced frequencies generally produce the best resonance maps.

Step 3 – Allow Tracking to Settle

Allow the controller and capacitor movement to settle naturally after changing frequency.

Step 4 – Tune for Lowest SWR

Using a steady carrier, manually or automatically refine the tuning until the lowest possible SWR is achieved.

Step 5 – Save the Resonance Position

Select:

MENU-->SAVE POS

The controller will store:

- Current frequency
- Current capacitor position

Step 6 – Continue Across the Band

Repeat the process at multiple frequencies across the band.

The resonance map does not need to be completed in a single session. New resonance positions can be added gradually over days or weeks during normal operation, provided the learned memory is not cleared.

Over time the controller builds an increasingly accurate learned resonance map of the antenna.

Recommended Point Spacing

Large frequency gaps reduce interpolation quality.

Small gaps may trigger:

TOO CLOSE

which protects EEPROM memory and prevents unnecessary table clutter.

Evenly spaced resonance points generally produce the best interpolation behavior.

Understanding Interpolation

The controller does not need every frequency saved.

Saved resonance points allow the controller to predict nearby capacitor positions using interpolation.

As more high-quality resonance points are added, the controller becomes more accurate across the band.

Operational Notes

The best resonance maps are created using:

- Stable carrier signals
- Low SWR save points
- Even frequency coverage
- Real operating conditions

The controller always maintains safe RC1.1 fallback behavior when interpolation conditions are unsuitable



coverdrive Magnetic Loop Antenna Controller

Document: HOWTO – Building a Resonance Map

Purpose: Learned Resonance Mapping Workflow

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