

CTR2-Mini v1.2 Headphone Jack Fix

3/12/22 – Lynn Hansen

The Problem

A design flaw has been identified on CTR2-Mini v1.2 Main boards. The 3-pin header that connects to the headphone jack was inadvertently designed with GROUND connected to the sleeve of the mono headphone jack instead of +5 volts. Because of this, an external speaker, headset, or amplifier plugged into this jack will not function properly because the required +5 volt power is not available. No other functions of CTR2-Mini are affected by this flaw.

The Solution

To remedy this design flaw, a new pin header needs to be added to +5 volt supply on the main PCB. This power rail can be tapped at pin 2 of PTT relay K1, just above JP2. This relay is not populated so a single header pin can be soldered into pin 2's hole as shown in Photo 1.

Once this has been done, the wire connected to the sleeve of the headphone jack it moved to this pin as shown in Photo 2. The GND pin on J2 is left open.



Photo 1 – New Pin Header installed in Pin 2

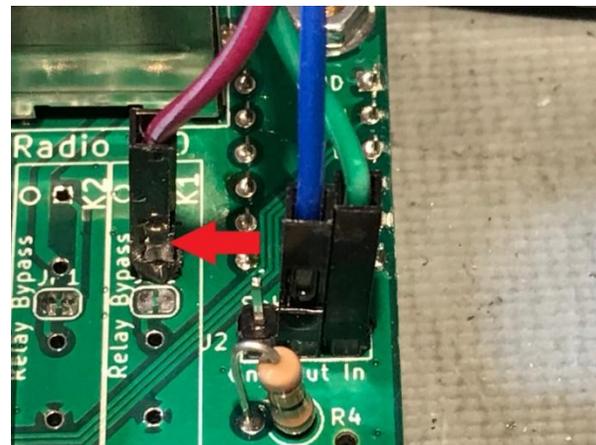


Photo 2 – Install Sleeve Wire on New Pin Header

WARNING! This modification makes the Mini's headphone jack's sleeve "hot". Only plug headphones or an external unamplified speaker into this jack. Use an inline 1:1 isolation transformer if you need to connect an amplified speaker to the Mini's headphone jack.

Procedure

To make this change CTR2-Mini needs to be disassembled and the Main board removed from the stand.

1. Gently pry the Wio Interconnect board out of the Wio's GPIO socket and pull it back.
2. Remove the screws on the bottom of the stand's base that secure the encoder housing and the main board.
3. Unplug the encoder assembly and set it aside.
4. Remove the main board from the stand and disconnect the three DuPont wires that connect from J2 to the headphone jack.
5. Install a single pin header in pin 2 of PTT relay K1 as shown in Photo 1. Pin 2 is directly above JP2, the **Relay Bypass** jumper.
6. Reconnect the wires from the headphone jack as shown on Photo 2. The wire going to the sleeve will be connected to the new pin header just installed. The other two wires, going to the TIP and Switch of the headphone jack are reinstalled in their original positions on J2 (IN and OUT). Photo 3 shows the wiring of the headphone jack. The colors on your jack will probably be different.
7. Re-install the main board into the stand. You may find it easier to slightly twist the board to get the wiring under the headphone jack. Once in the stand, insert the mounting screws but DO NOT tighten them at this time.
8. Plug the encoder assembly into the 6-pin socket on the main board. Be careful to lineup the pin headers on the encoder assembly with the socket on the main board and slide the two units together. This is best done while watching from the bottom of the stand base.
9. Install the self-tapping screws into the encoder assembly and lightly tighten them. Don't put too much pressure on them as they are tapered and can crack the acrylic base if over-tightened.
10. Lightly tighten the mounting screws on the main board.
11. Line up the Wio Interconnect board's pins with the GPIO socket on the Wio and gently press the interconnect board into the socket until it is flush with the stand face panel.

This completes the modification to the headphone jack wiring.

Headphone Jack Wiring

<u>J2</u>	<u>Jack</u>	<u>Color</u>
+5 V	Sleeve	VIOLET
Out	Tip	BLUE
In	Switch	GREEN



Photo 1 – Headphone Jack Wiring