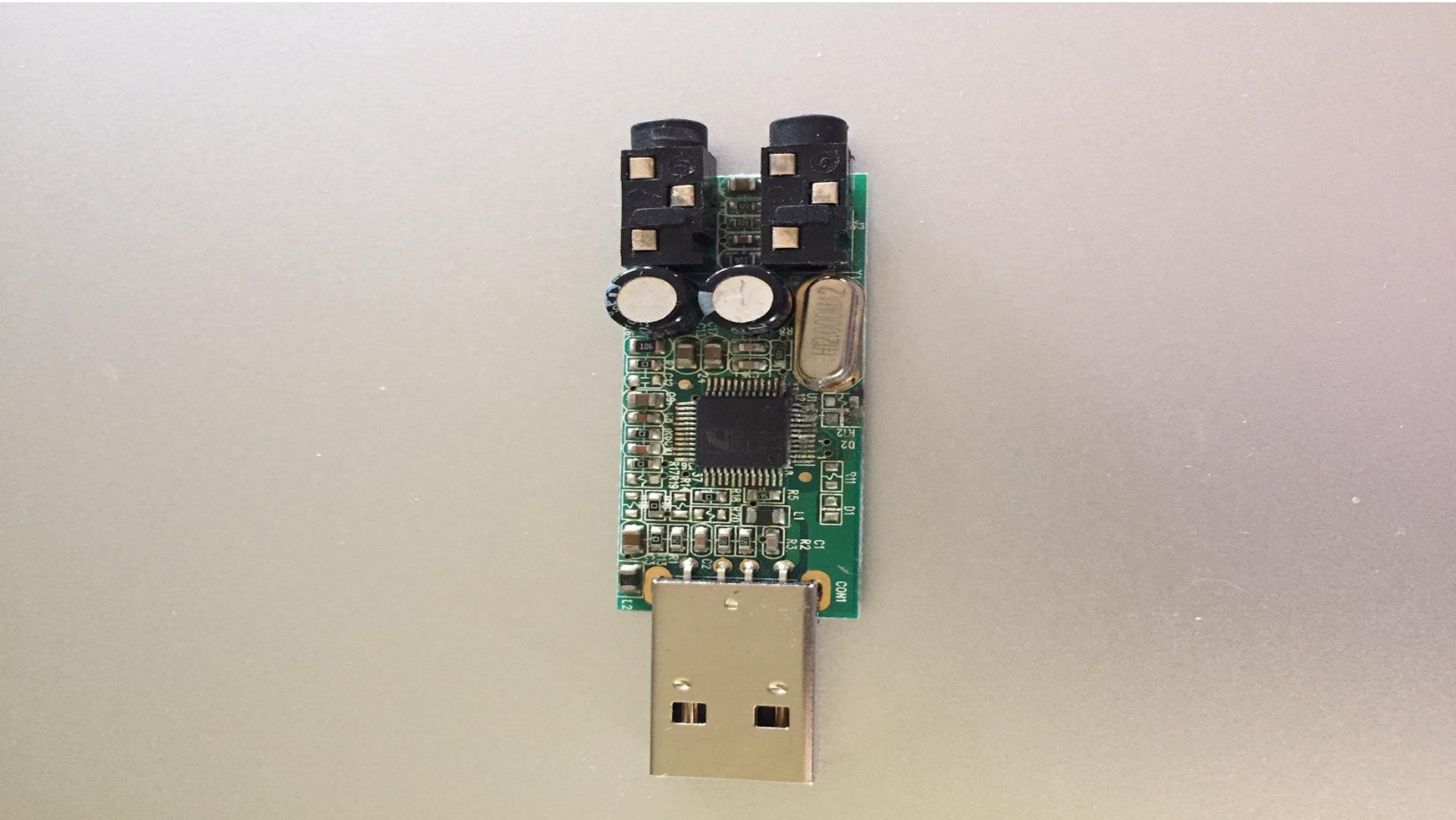
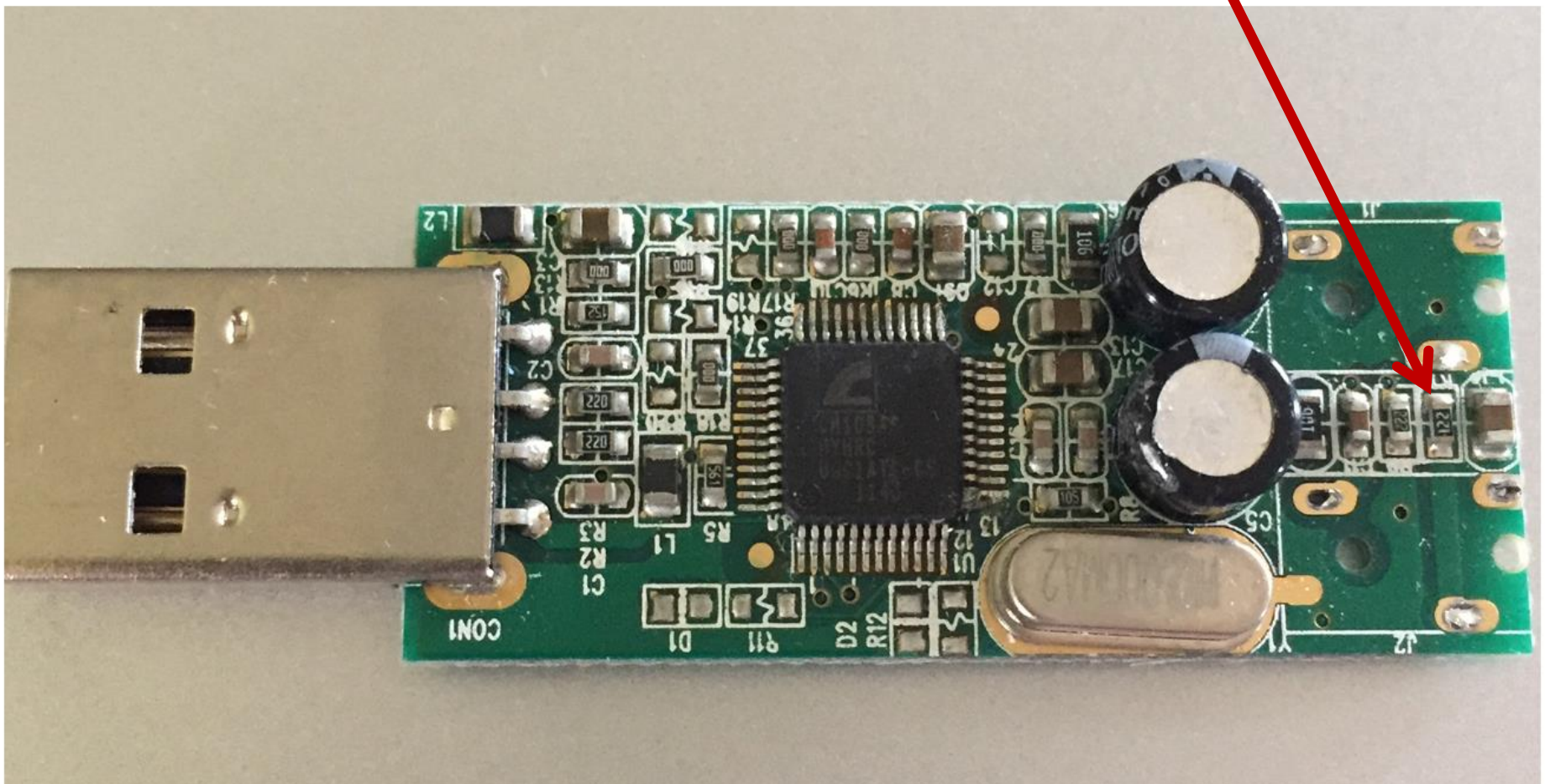
STARTECH ICUSB

Mod by WA2KJC

Start the conversion by carefully opening the device. I use a pair of large pliers and Gently squeeze side to side until I can get in under the opening and pry the case off. Put the cases on the work bench in pairs as taken apart so they go back together.



I chose to remove the audio jacks , to many problems with the 3.5mm plugs/jacks.
This opens up the board and allows for easier removal of the mic bias resistor R122.
This chip resistor (R122 - 1.2k ohm) normally supplies voltage to the microphone.
This removes the voltage on the receiver discriminator audio input to the sound card eliminating the need for another coupling capacitor. Remove R122.



The next thing to do is solder a 1/8watt 10k resistor to pin 13 of the cm108 , if it doesn't go well you might as well stop, if successful, then hot glue the resistor to the top of cm108 for stability and to prevent any movement causing damage. Hot glue will also be used to glue the cases back together when finished. You will need a magnifying glass and fine point soldering iron.

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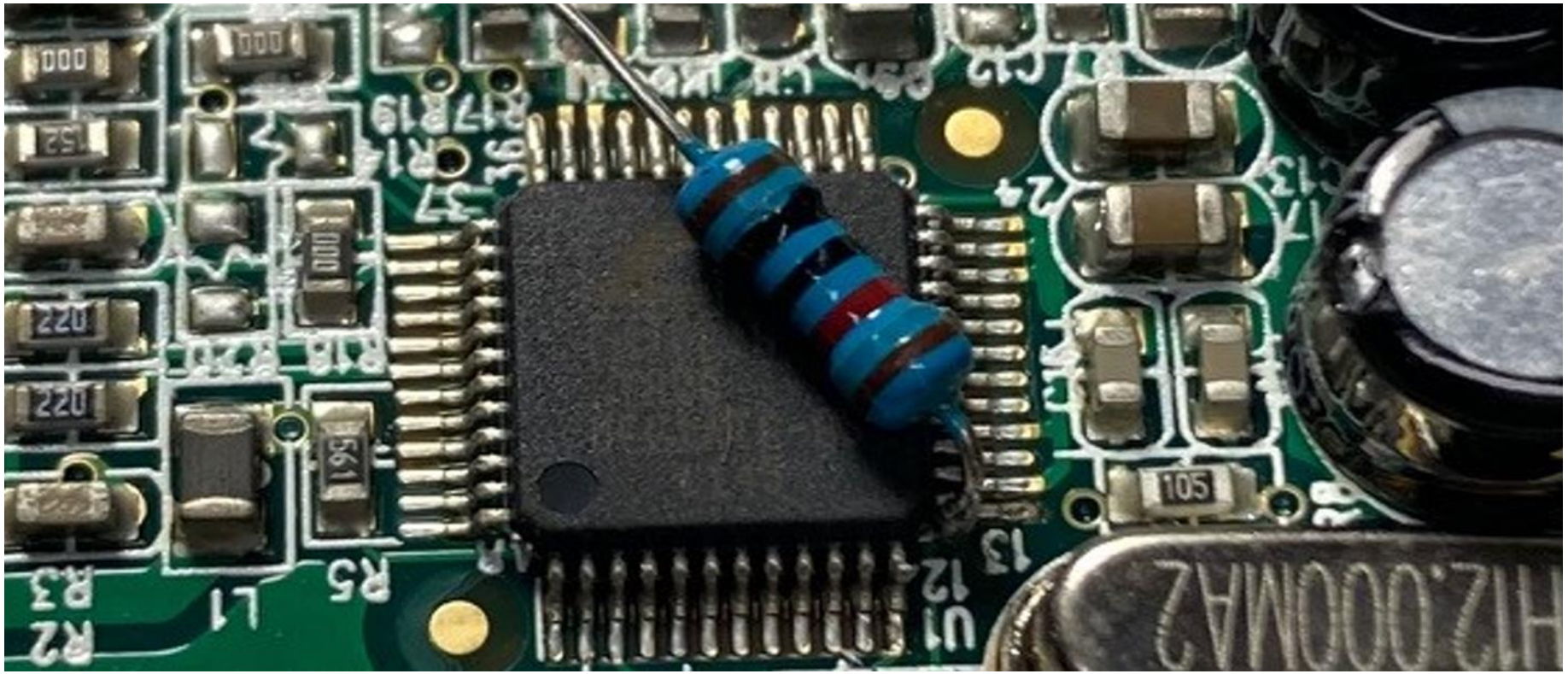
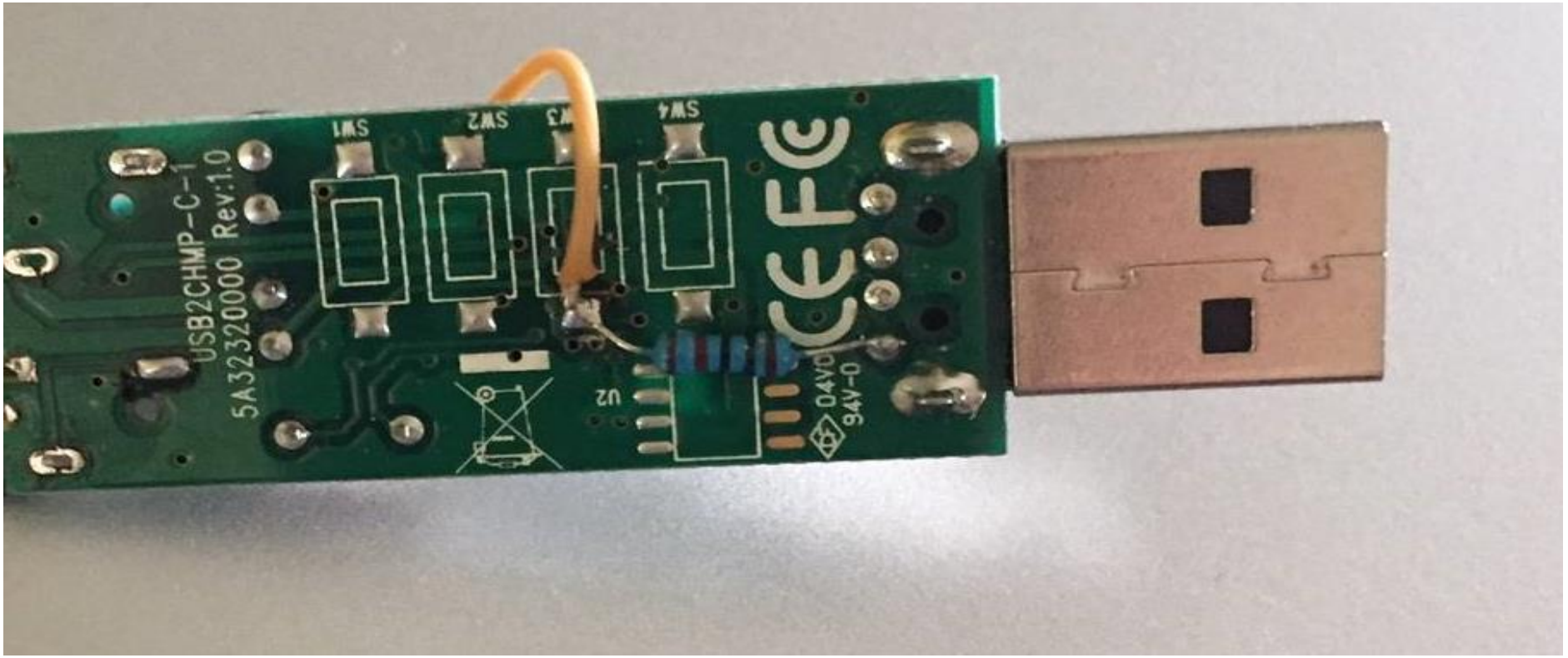
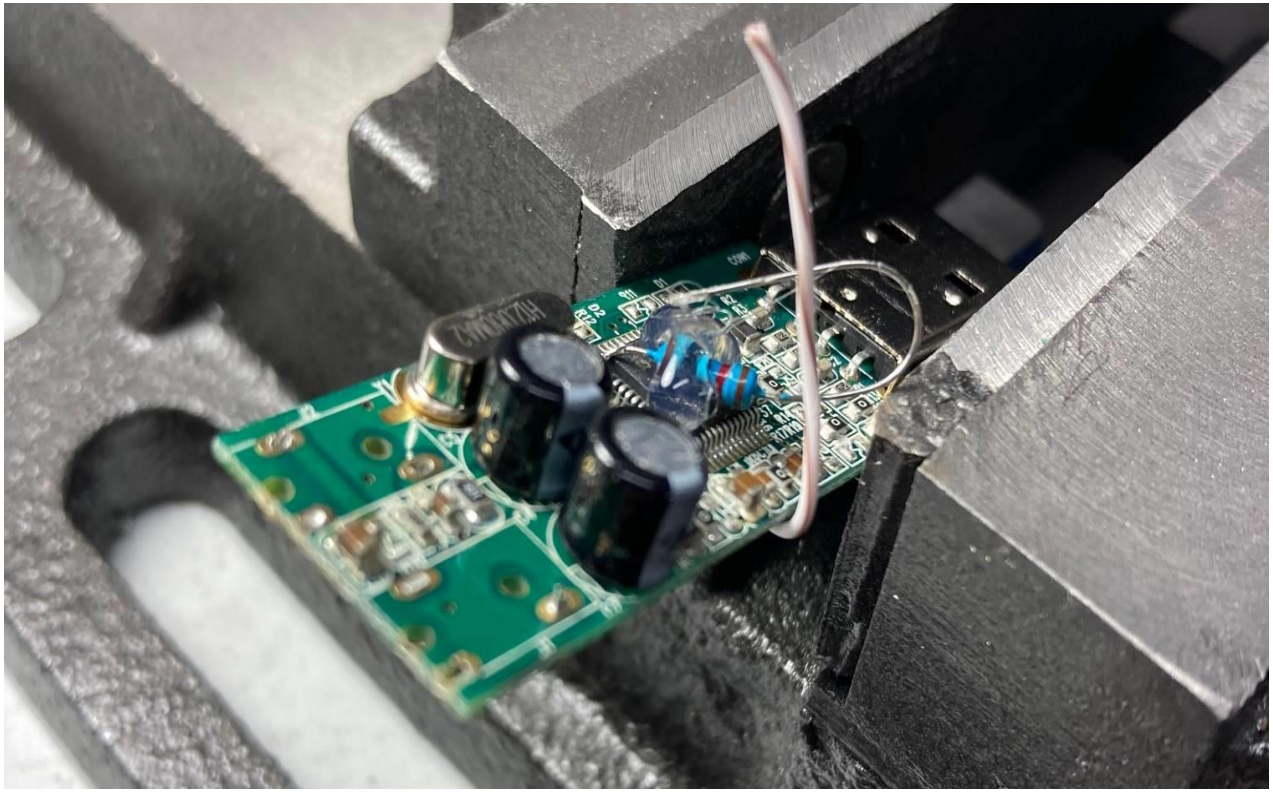


Next I add another 1/8watt 10k resistor for bias to the COS insertion point.
The yellow wire will be attached to later with shielded miniature coax and a RCA Female connector that will have a blocking diode inserted in the center connection to prevent any voltage entering this connection point. It's best to add this even if you don't need it right away, most signaling is done with DSP ctcss in the software. I use cos for my remotes and let the remote radio use the ctcss if necessary so I don't have to keep rebooting the raspberry when making a change.

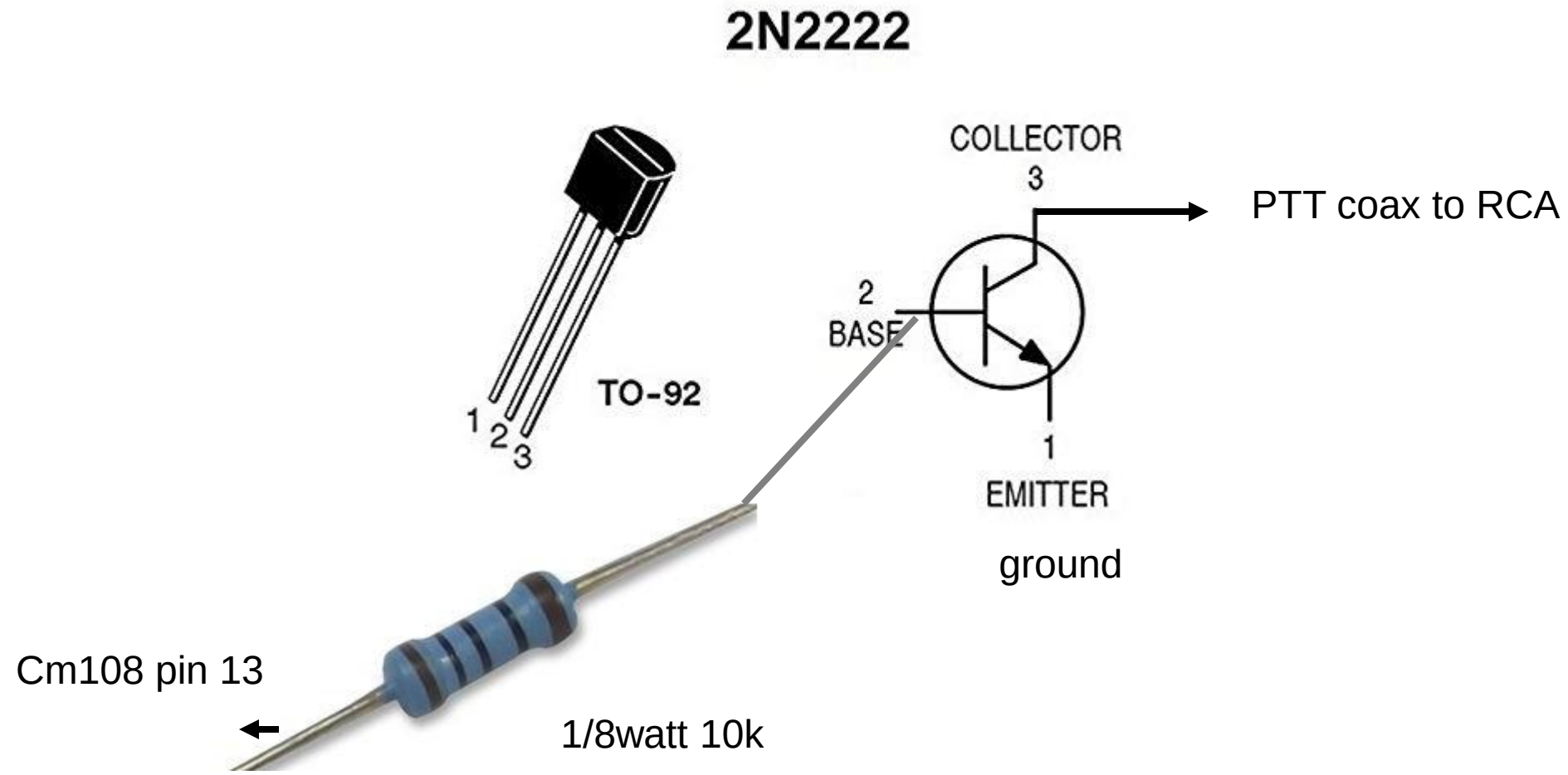


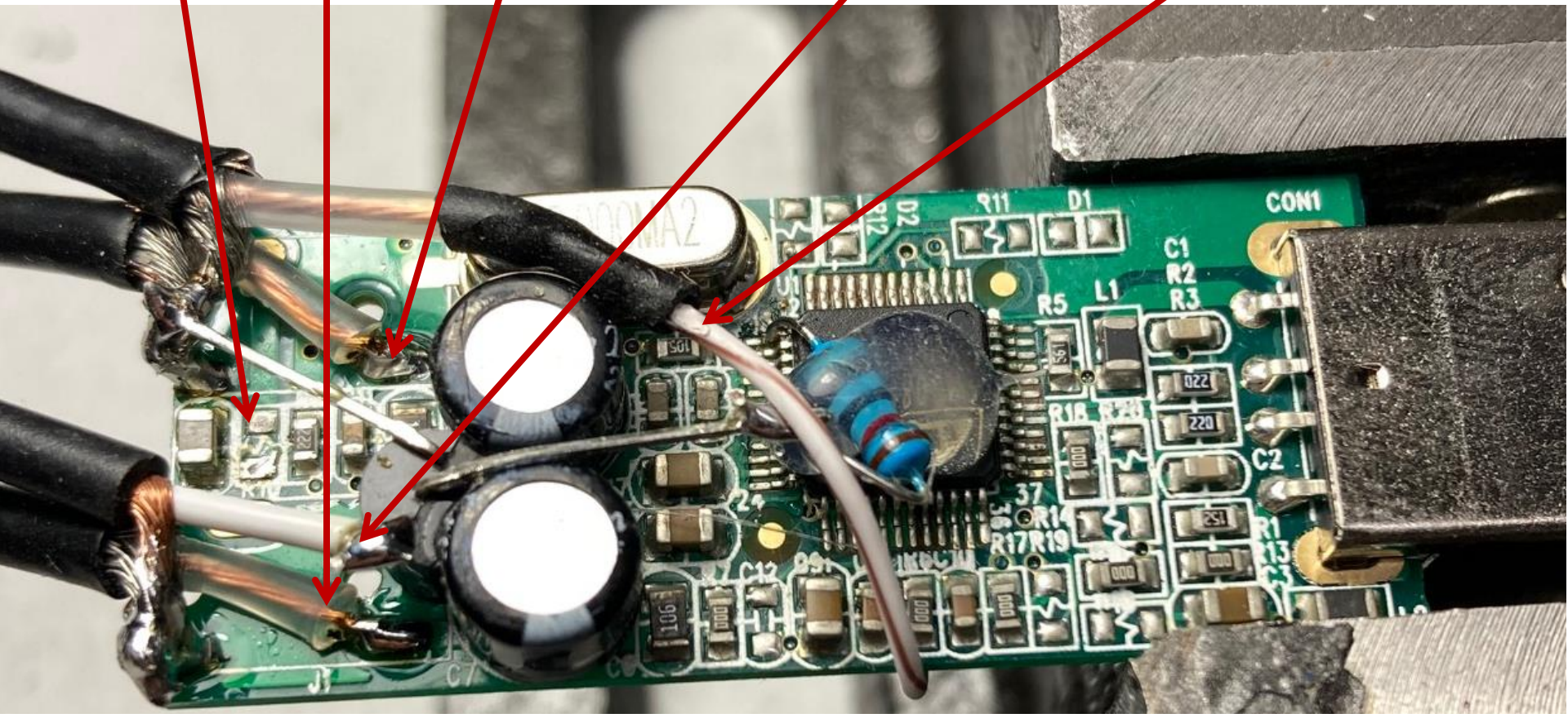
3.5mm jacks and R122 removed - 10k resistor pin13 hot glued to cm108 for stability- wire attached to cos 10k bias resistor. Ready to attach the miniature shielded coax Leads that will have RCA female connectors on the other end. The RXA connector will have a 470k resistor in series and a 68k resistor from the center pin to ground. The COS female RCA connector will have a diode in series with the center pin. The TXA will be straight through. The PTT will connect to the 2n2222 transistor collector And then straight to the center pin of the RCA female.



3.5mm jacks removed. 10k soldered to pin 13 of cm108 chip, then hot glued to cm108 chip, 10k will connect to base of 2n2222 for PTT.

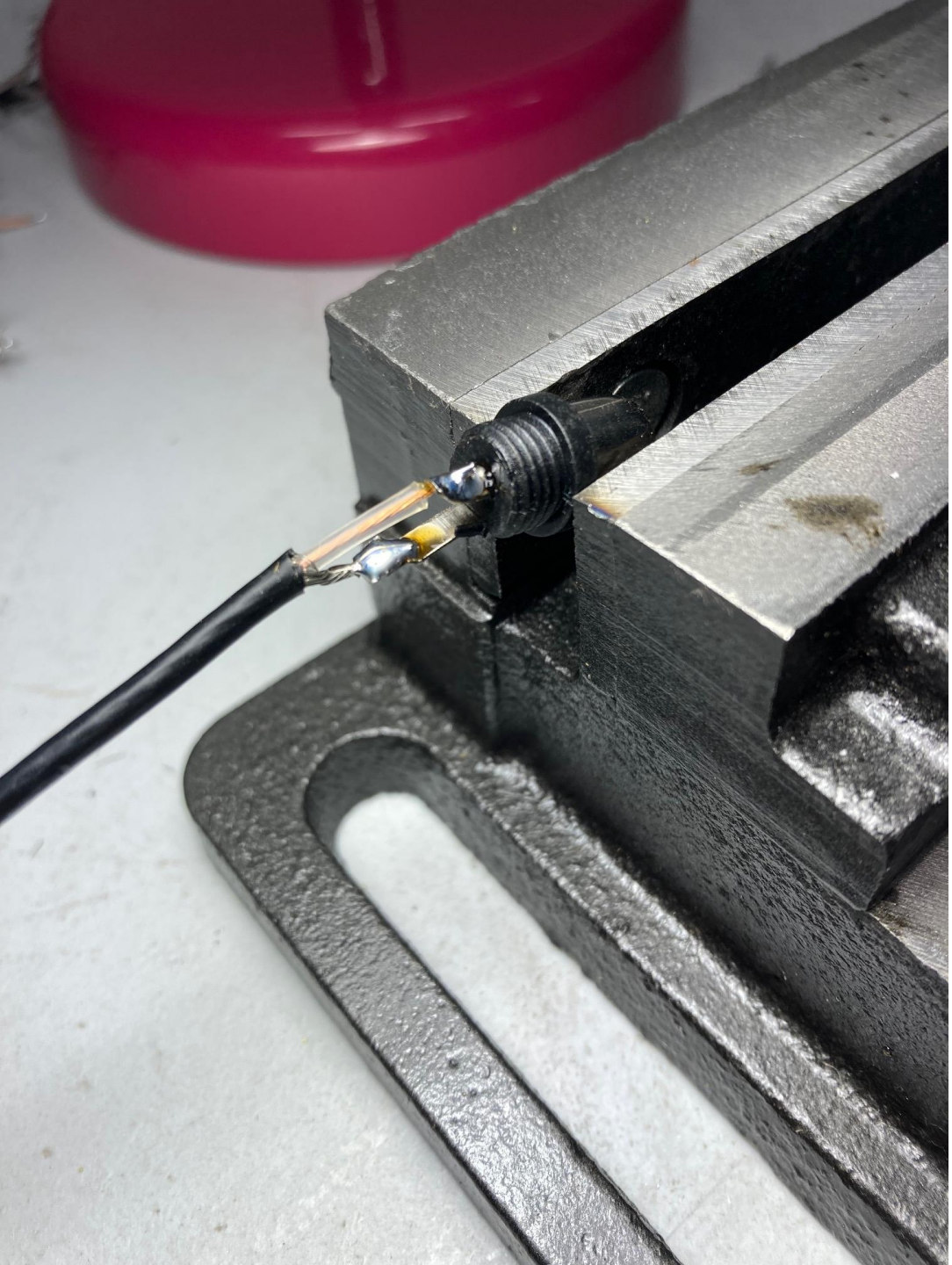
2n2222 flat side is super glued to output caps, E to gnd, C to rca PTT. Be careful adding the coax leads so as not to short against other surface connections.


2N2222
COLLECTOR
3
PTT coax to RCA
2
BASE
TO-92
1 2 3
1
EMITTER
ground
Cm108 pin 13
1/8watt 10k


R122
Removed
RXA
PTT collector of 2n2222
TXA
COS
CON1
D1
R11
C1
R2
R3
L1
R5
C2
R14
R17
R19
J1

COS diode in series with center wire in Female COS RCA connector. Shrink wrapped.

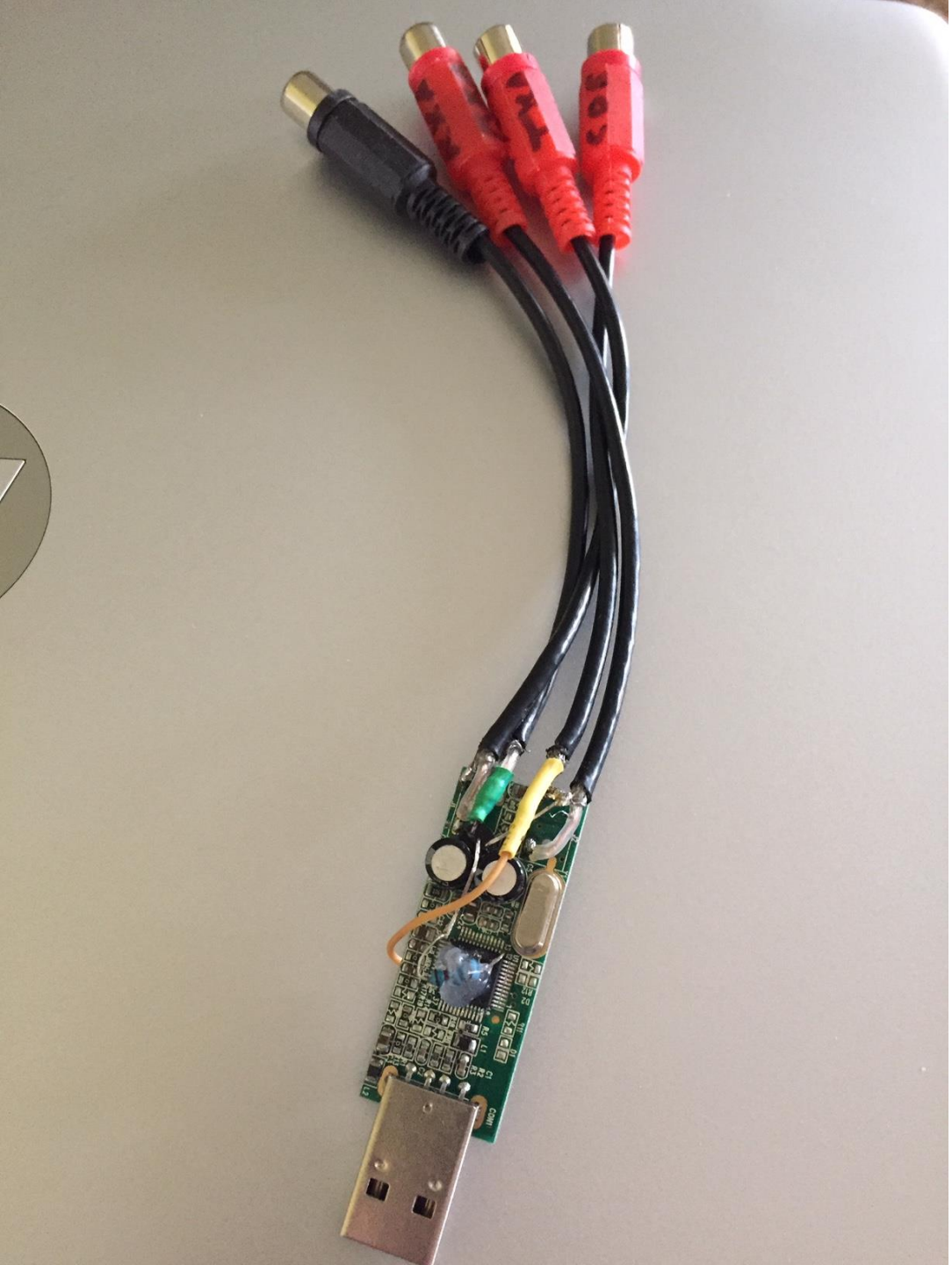
RXA female, flat discriminator audio passing through 470k resistor covered with the yellow shrink wrap, 68k resistor from center pin to ground. Both 1/8 watt.



PTT RCA female straight connection from the 2n2222 collector pin.

Do the same with the TXA, straight through connection from the sound card to the female RCA.

Notice I cut the fins off the rca ground connection to help avoid any unwanted contact with the center pin.

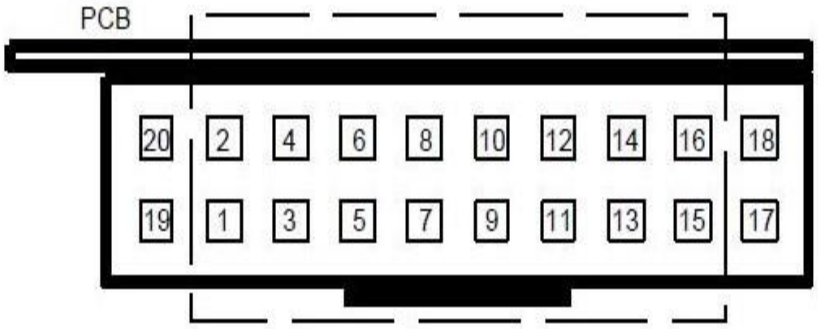


Test everyone before you put the cover back on with hot glue.

Accessory Connector Orientation:

The diagram below was extracted from the Detailed Service Manual. Note that the locking tab for the accessory plug is on the bottom edge of the connector, which is closest to the bottom of the radio when looking at it from the rear.

1	SPEAKER-
2	EXT_MIC_AUDIO
3	DIG_IN1
4	DIG_OUT2 (EXTERNAL_ALARM)
5	FLAT_TX_AUDIO
6	DIG_IN_3 = Sel5/MDC UART_RX = MPT
7	GROUND
8	DIG_IN_OUT_4 = Sel5/MDC UART_TX = MPT
9	DIG_IN_5 WITH WAKEUP (EMERGENCY)
10	DIG_IN_6 WITH WAKEUP (IGNITION)
11	FLAT/FILTERED_RX_AUDIO
12	DIG_IN_OUT_7
13	SWB+
14	DIG_IN_OUT_8
15	RSSI
16	SPEAKER+
17	BUS+
18	BOOT_CNTRL
19	N.C.
20	N.C.



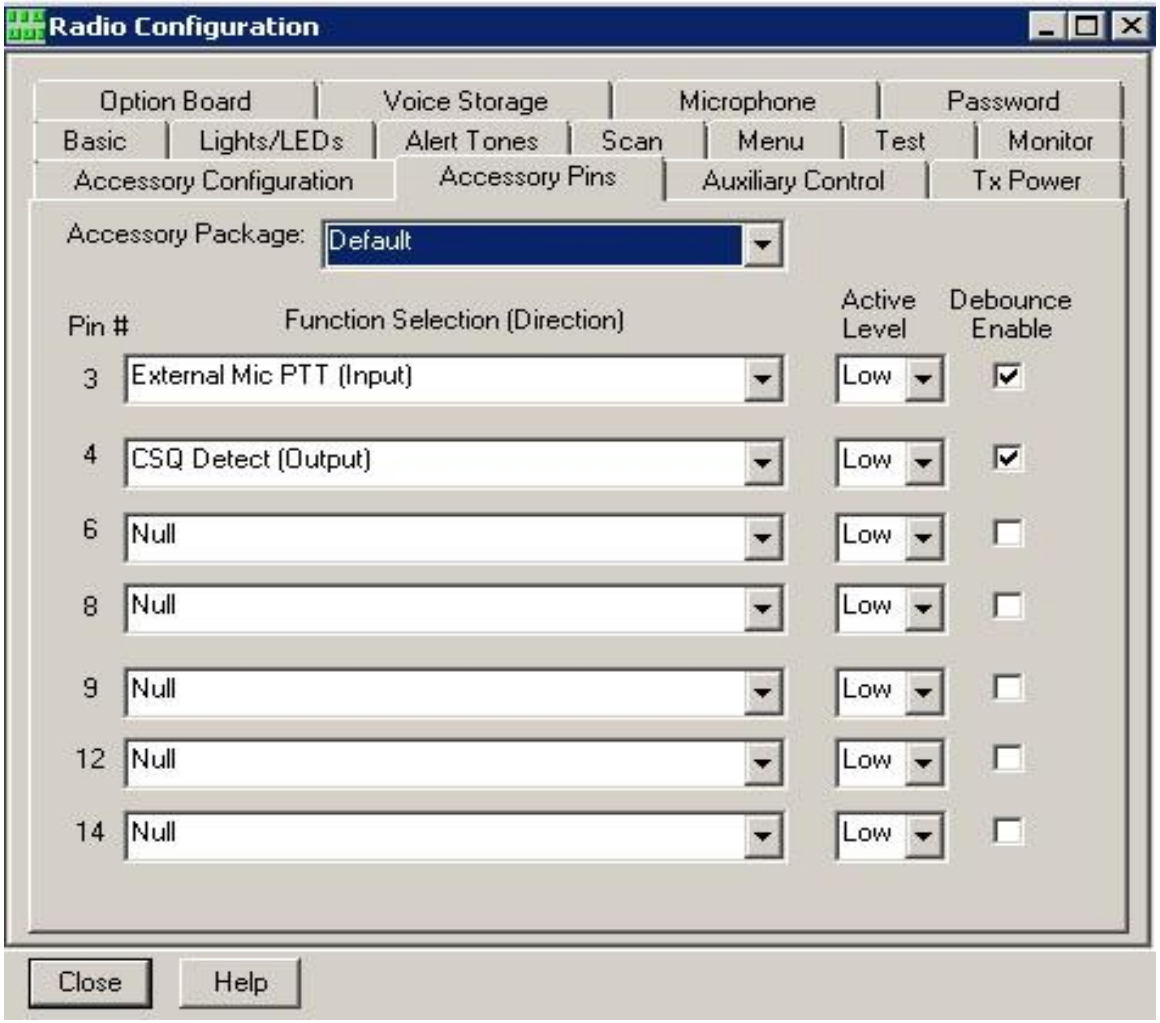
REAR VIEW

Pin 1 to 16 used for standard accessories
Pin 17 to 20 for special use

J0501
ACCESSORY
20-PIN CONNECTOR

This is a CDM remote radio pin out.

Pin 3 PTT low, Pin 4 COS low, Pin 5 TXA, Pin 11 RXA, Pin 10 ignition sense, Pin 7 Ground.



Code plug radio configuration, pin 4 COS detect output.