Field Shell Updates

Liz Triller

FS MSU Update

Rob: Bending jig made and tested, needs some tweaks but almost there

Mike: working on G10

FS G10

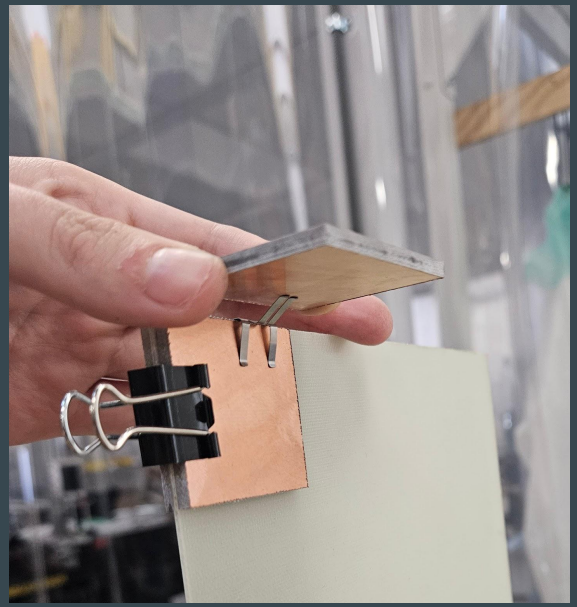
Got G10 from machine shop, Can ship to SLAC

Before shipping did you want any to chamfer any edges?

What parts are for MSU?

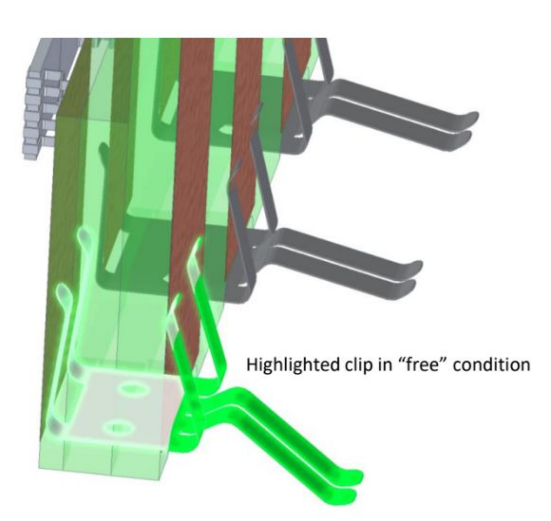
Test stand at MSU for clips?

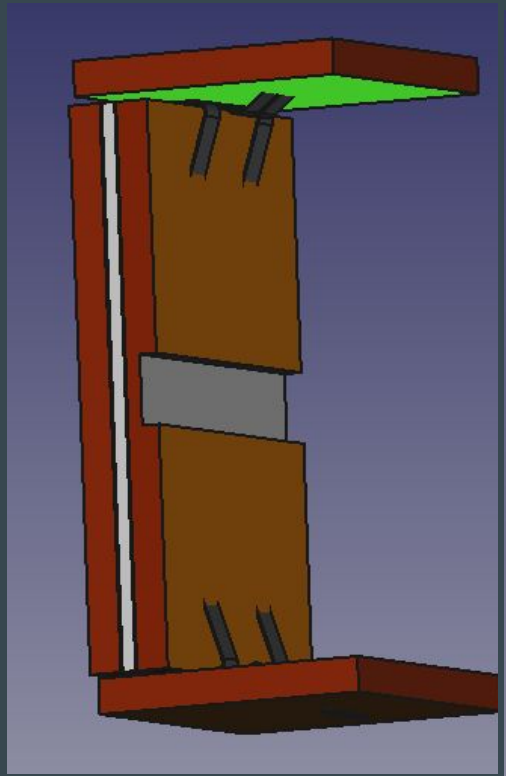
2, ⅛ in copper clad G10 + 1/16 in

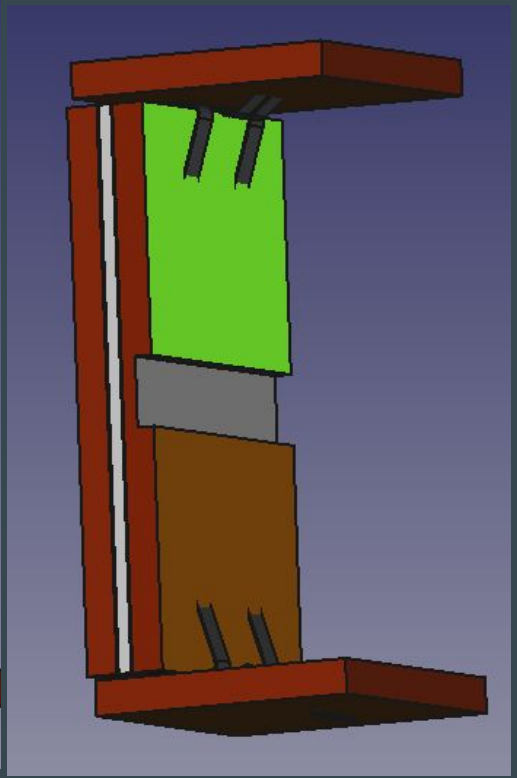


Clip Test stand

How are clips effixed?



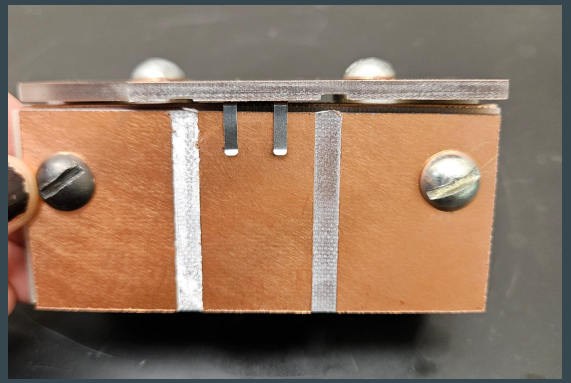


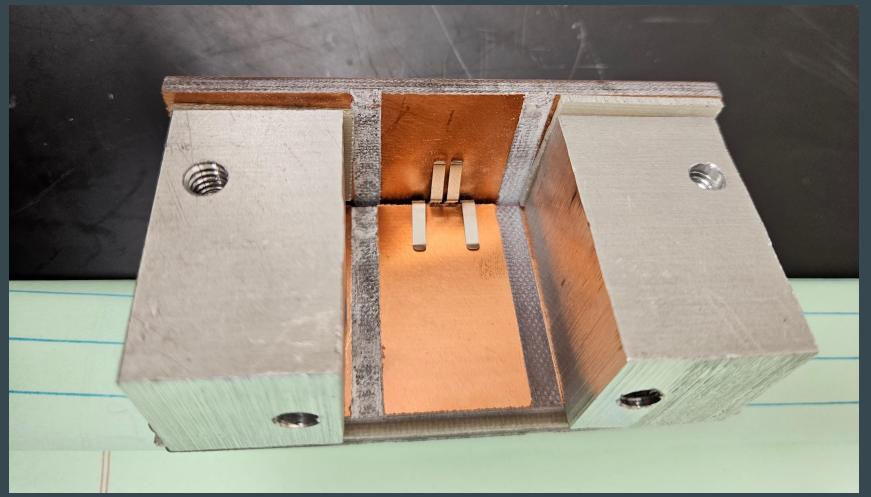


MSU Cold Testing

Dean made FEMB chip test stand

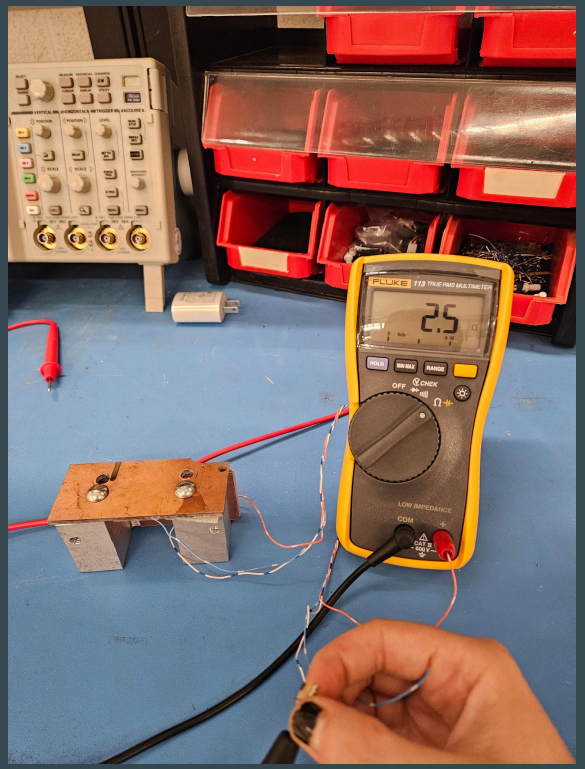
Clip Test Stand Prototype



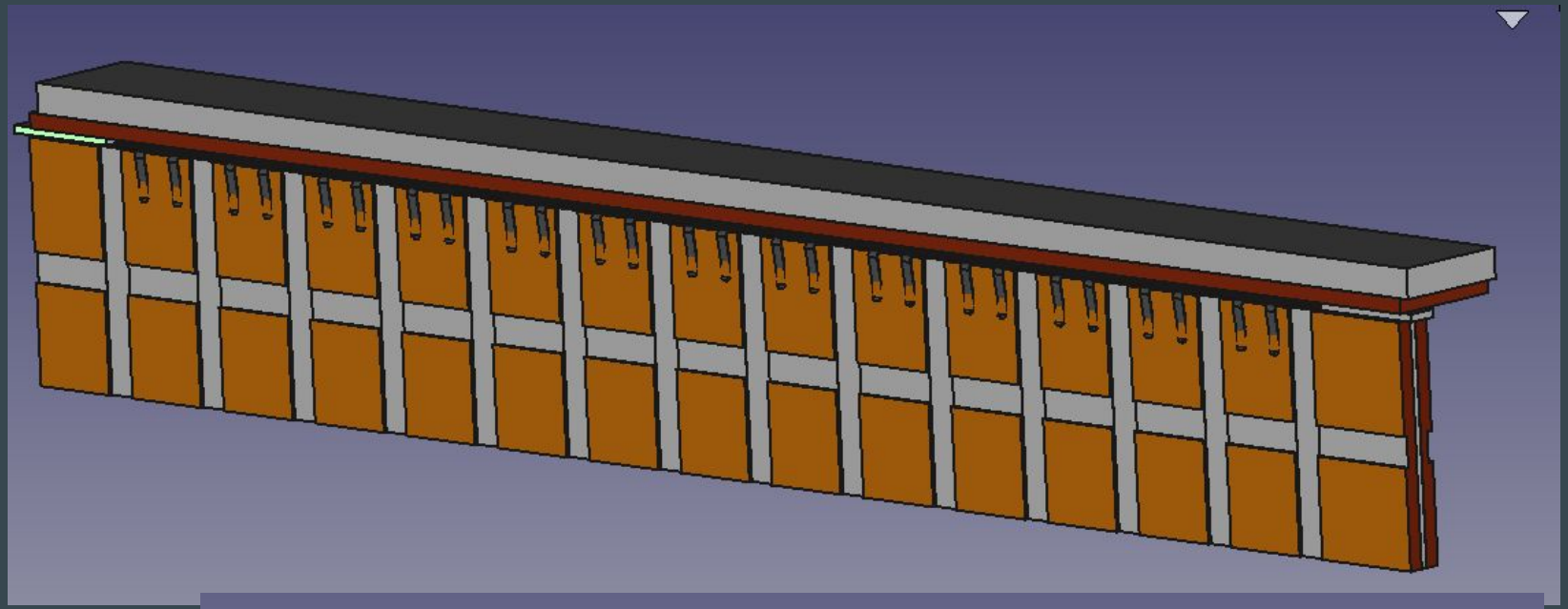


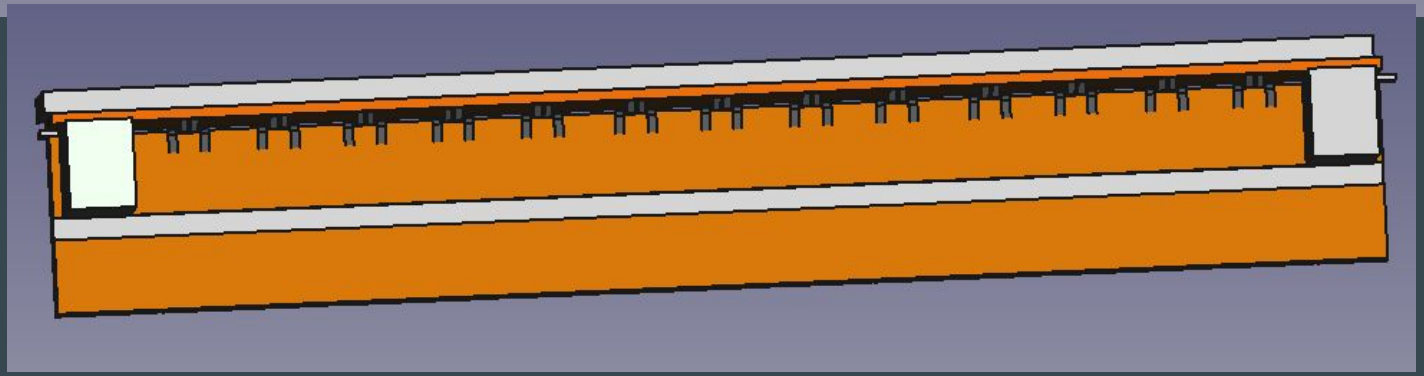
Test clip resistance

Bottom Connection



Top Conection

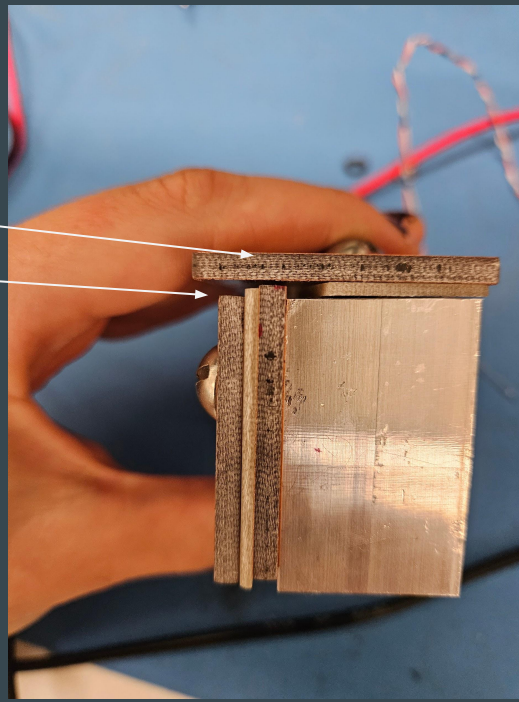




Changes

Quick job, take more time next round

- Add top stiffener
- Make G10 level
- Epoxy?
- More sturdy solder connections

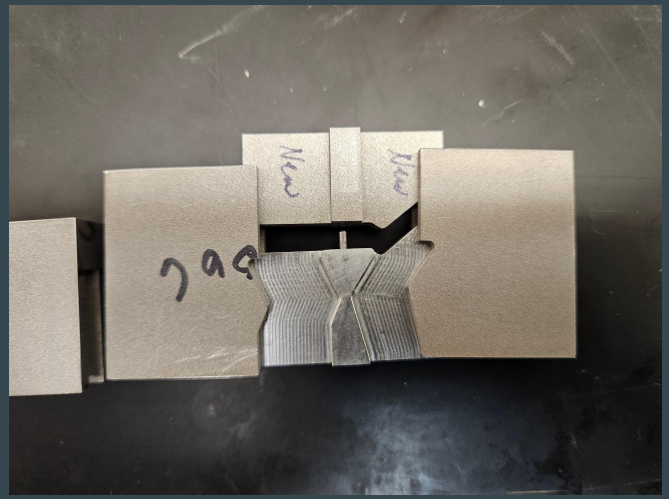


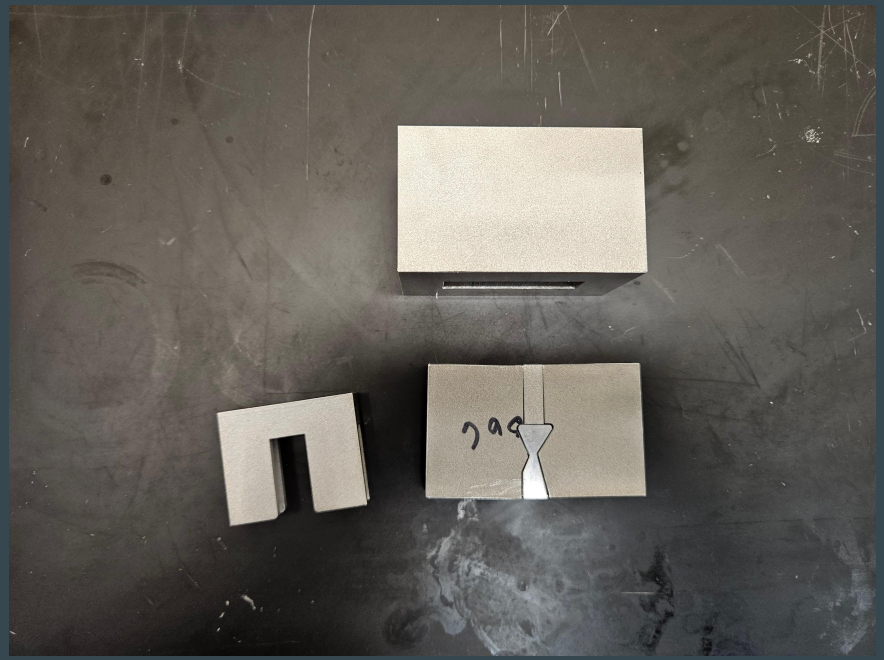
Clip jig

Rob delivered Clip Jig

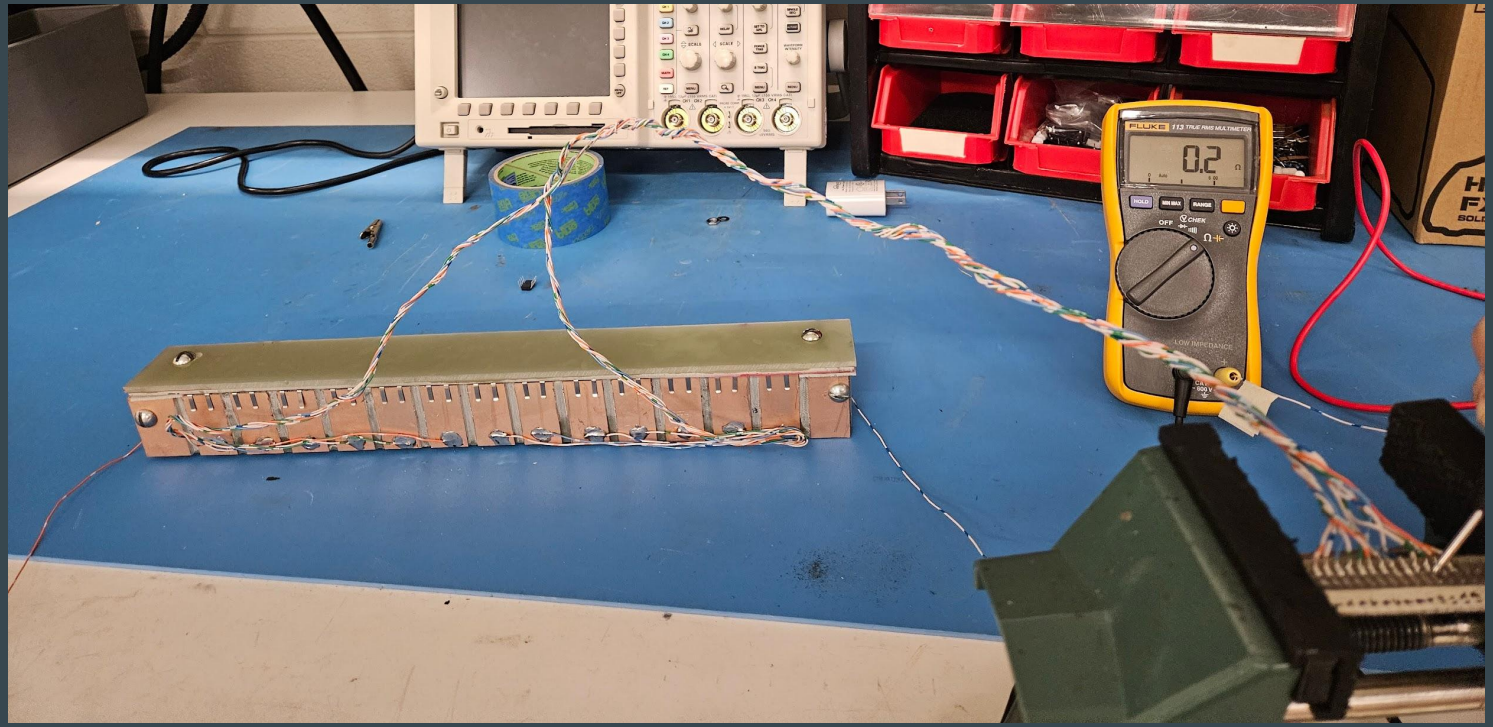
Clip mouth may not be as narrow as it should

Can iterate with Rob after testing?

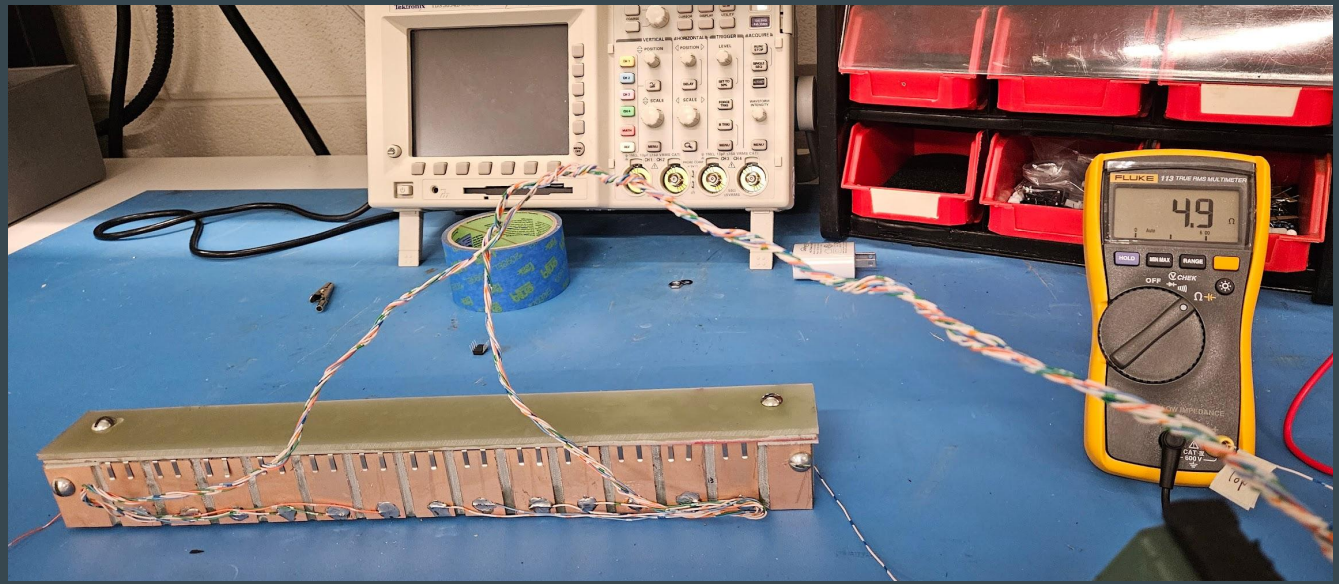




Larger test stand

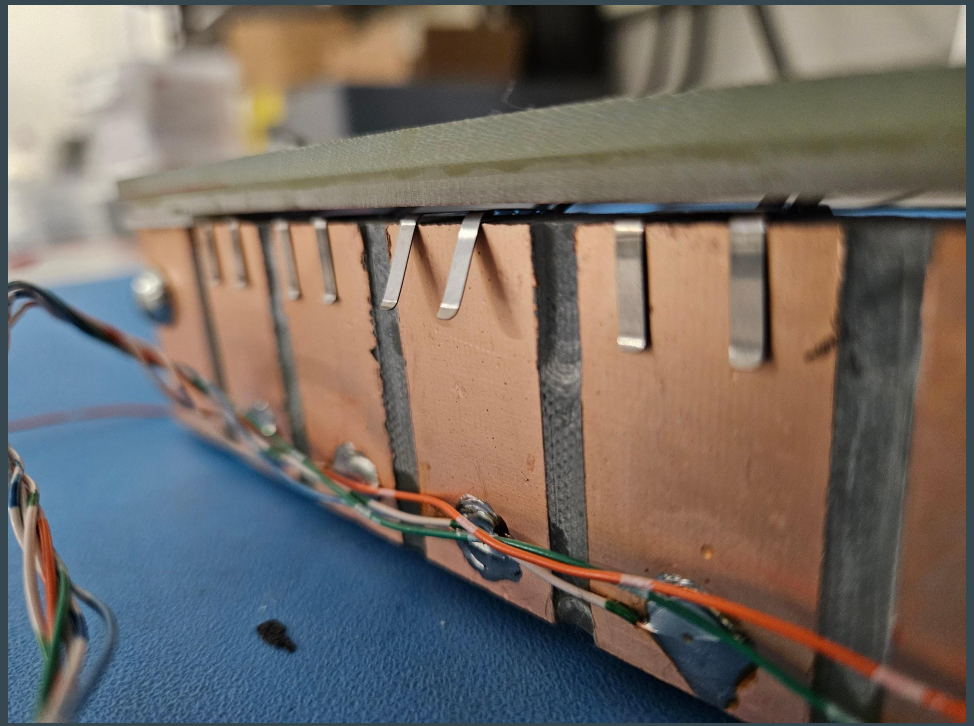


Using initial clips from Rob (not all done with current version of bending jig)



Just for fun:

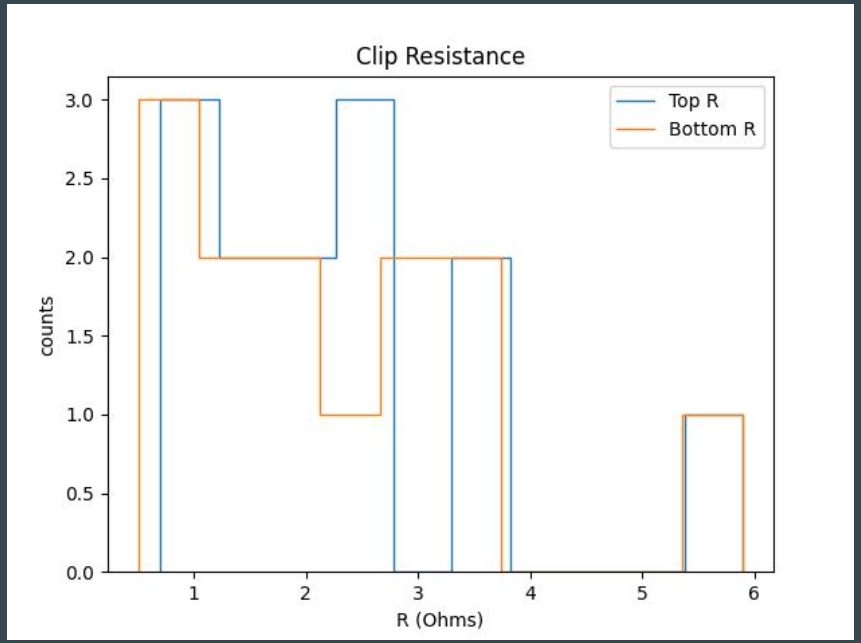
Even after a lot of bending still 2-5 Ohm



Resistance histogram

- Resistances of wires and rest of device not factored in

Can take more measurements per clip next time



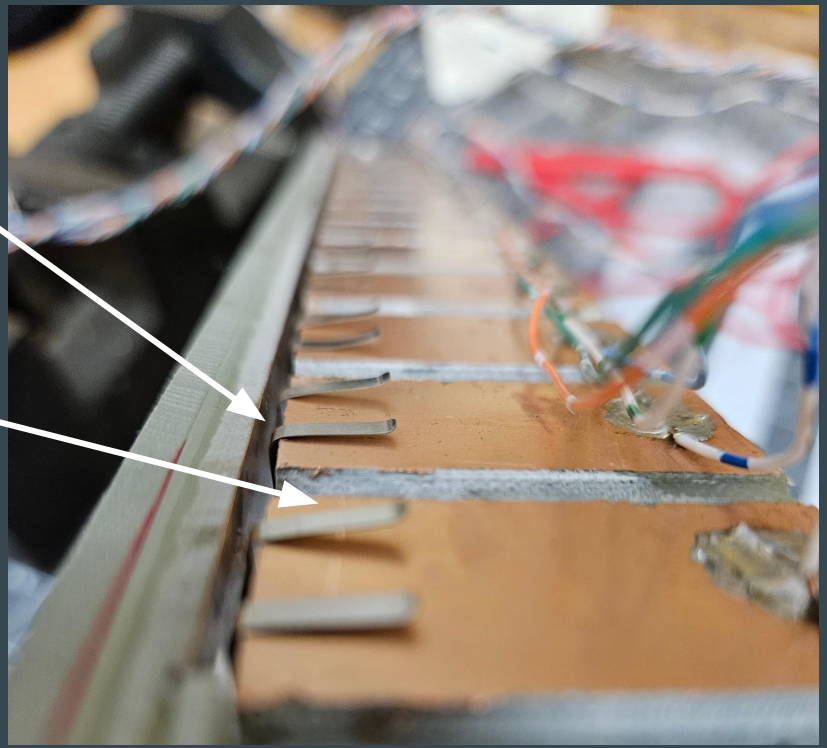
CTS

Fits in old cryo test stand

- Will work on cryo testing new set of clips after vacation

Made full set of clips Using current Jig

Most clip fingers are making little contact on the outside but still connecting at the corners



Measurement

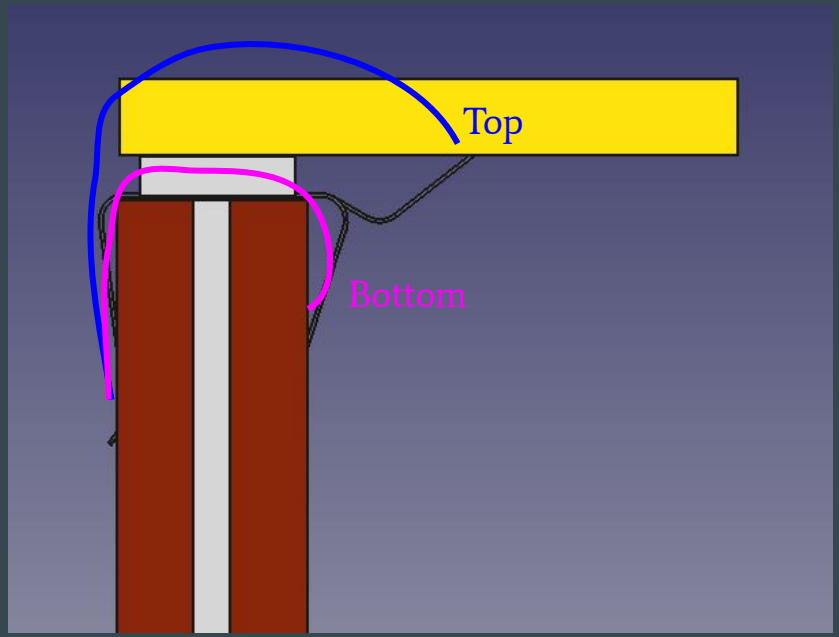
Took measurements in room temp and liquid nitrogen, of top and bottom connection resistance

Results:

Cold increases resistance

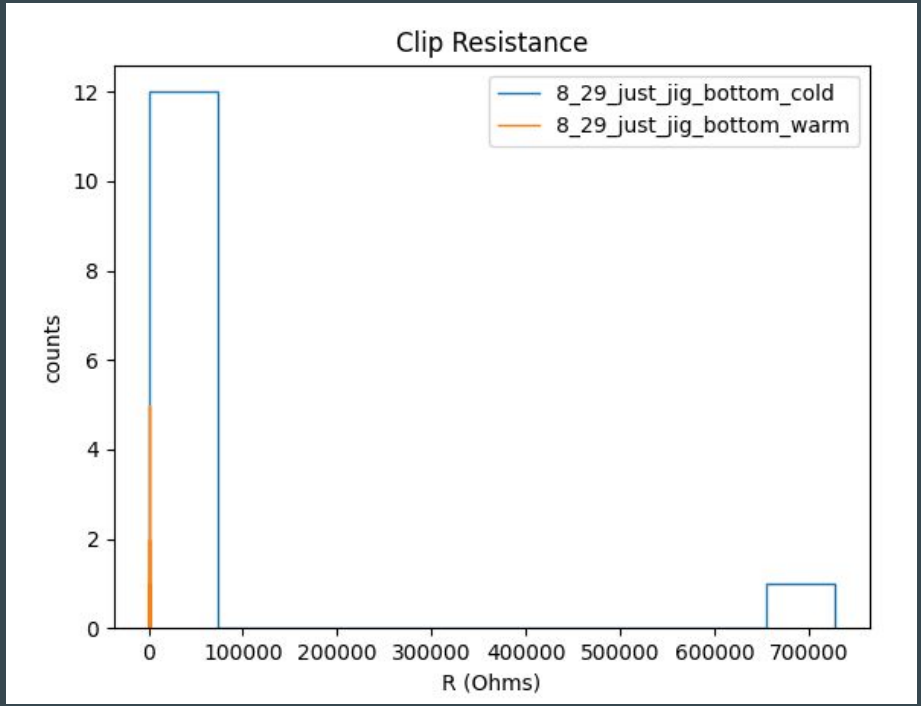
Bending bottom of clips further inward decreases resistance

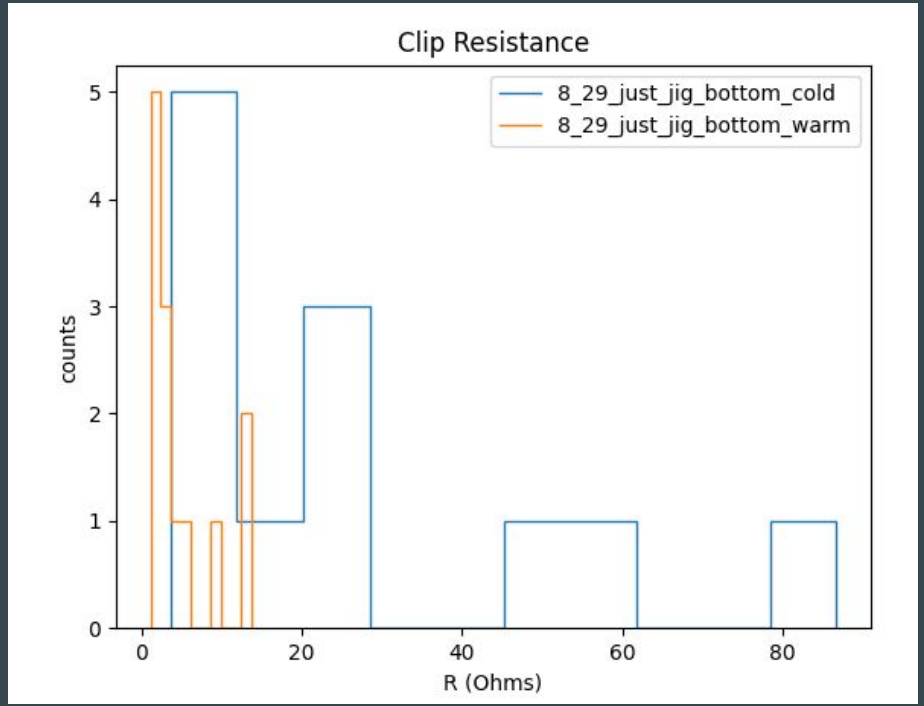
Forgive lazy binning in graphs



Clips made w jig as is Bottom Connection

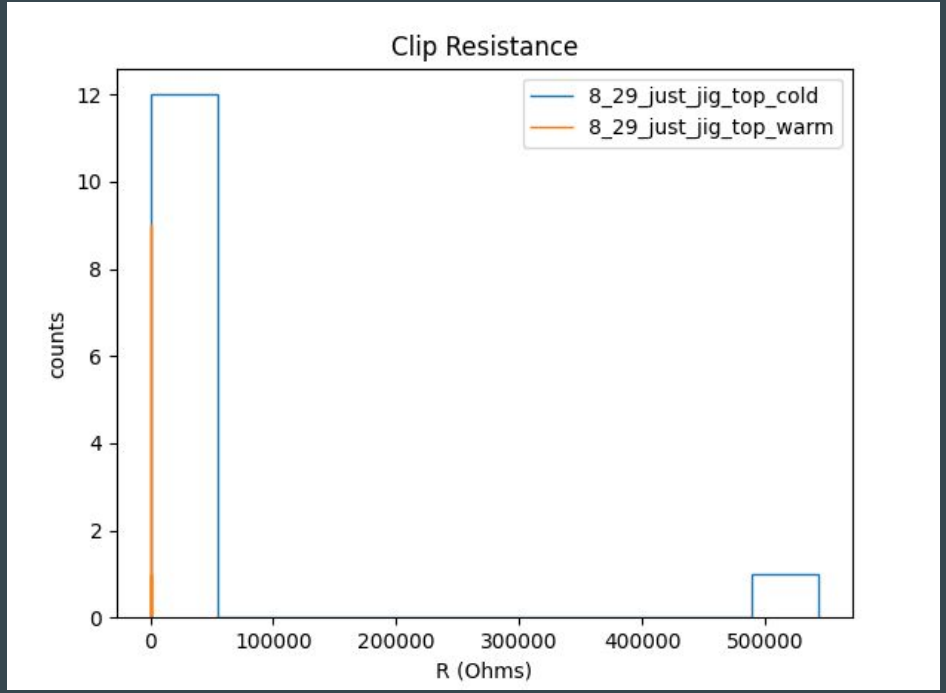
Remove 1 outlier (cold)

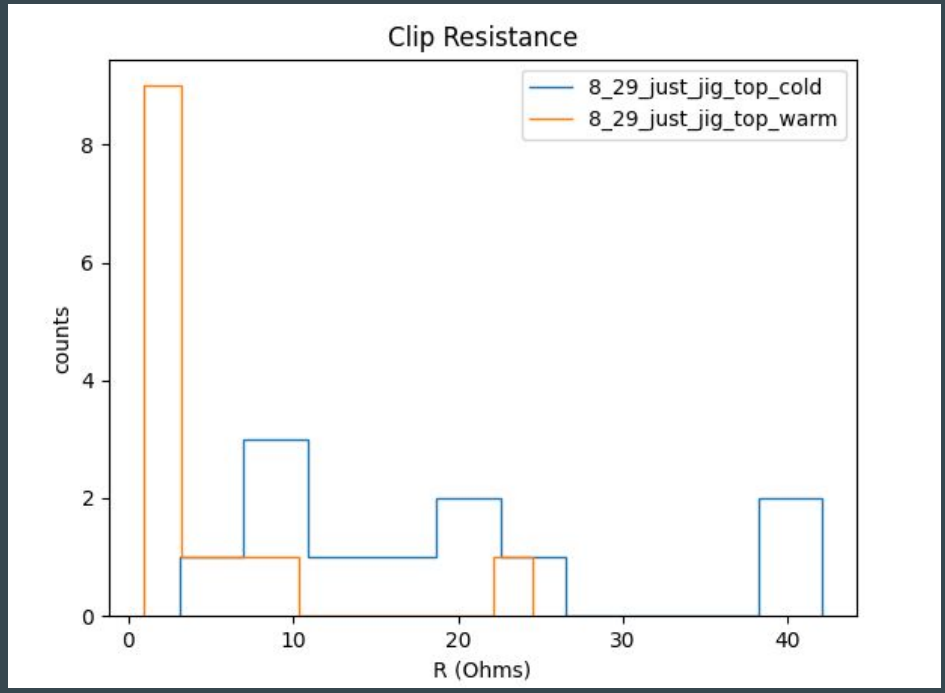




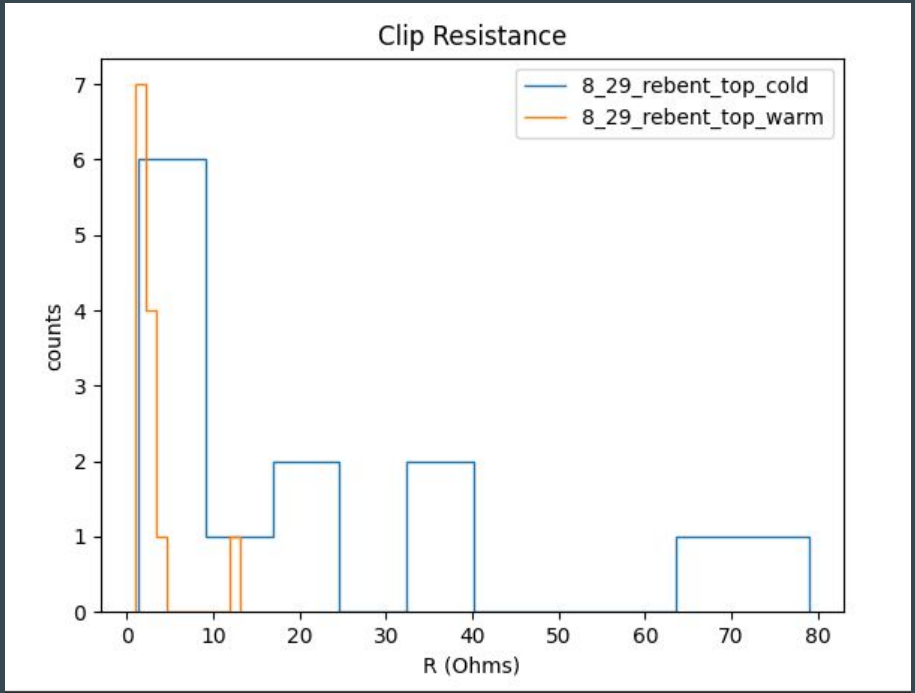
Clips made w jig as is Top Connection

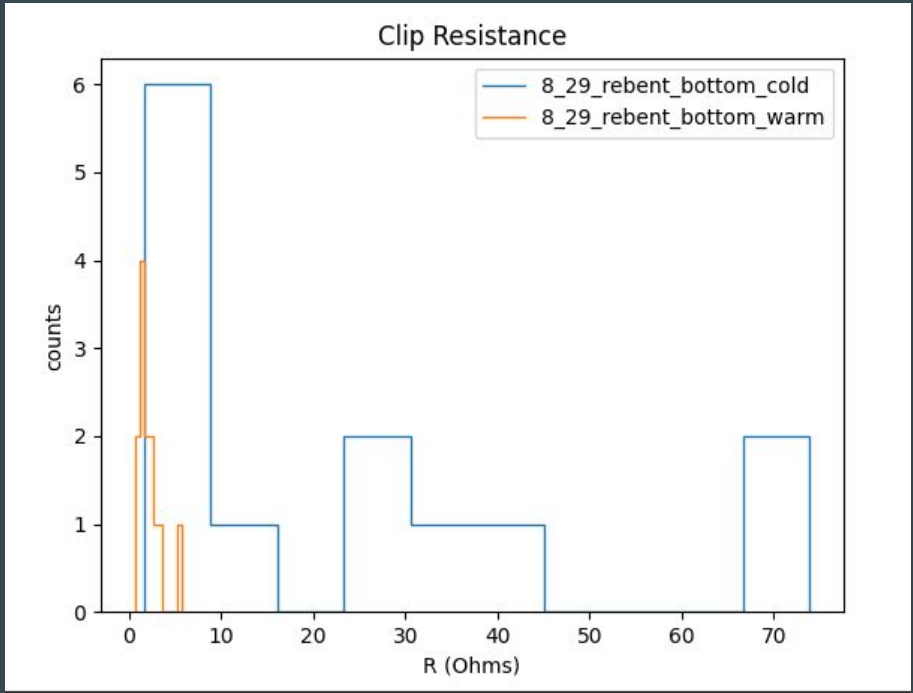
Remove 2 outliers (cold)



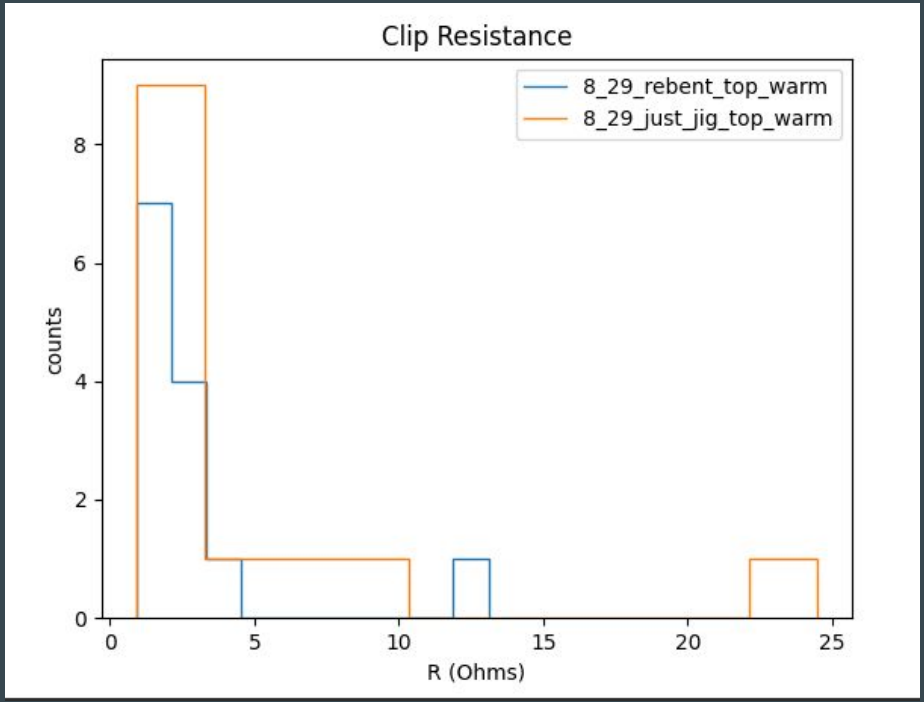


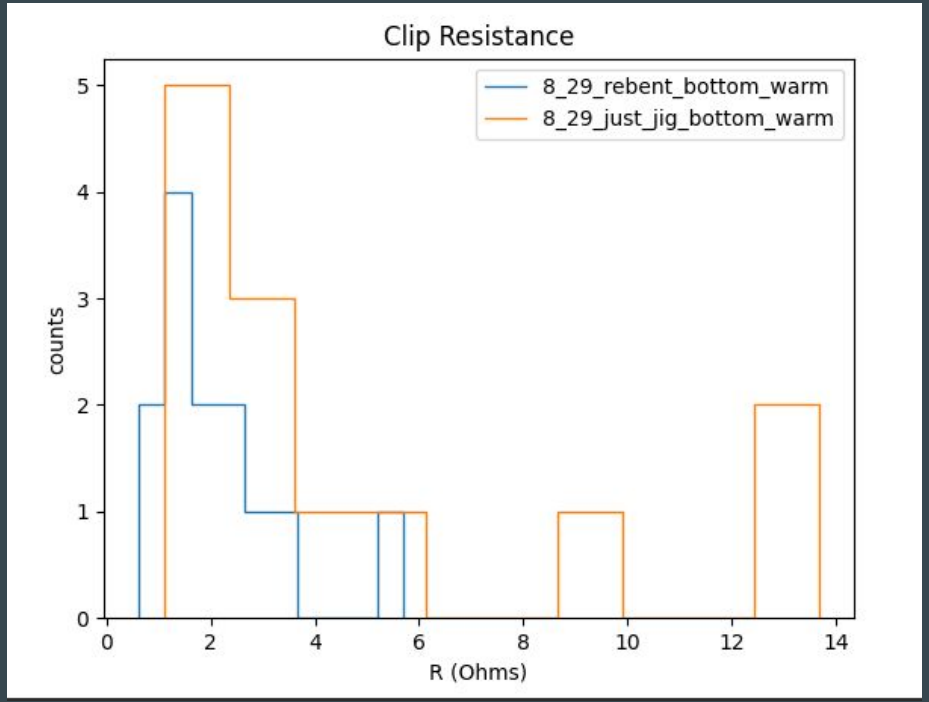
Rebent clips

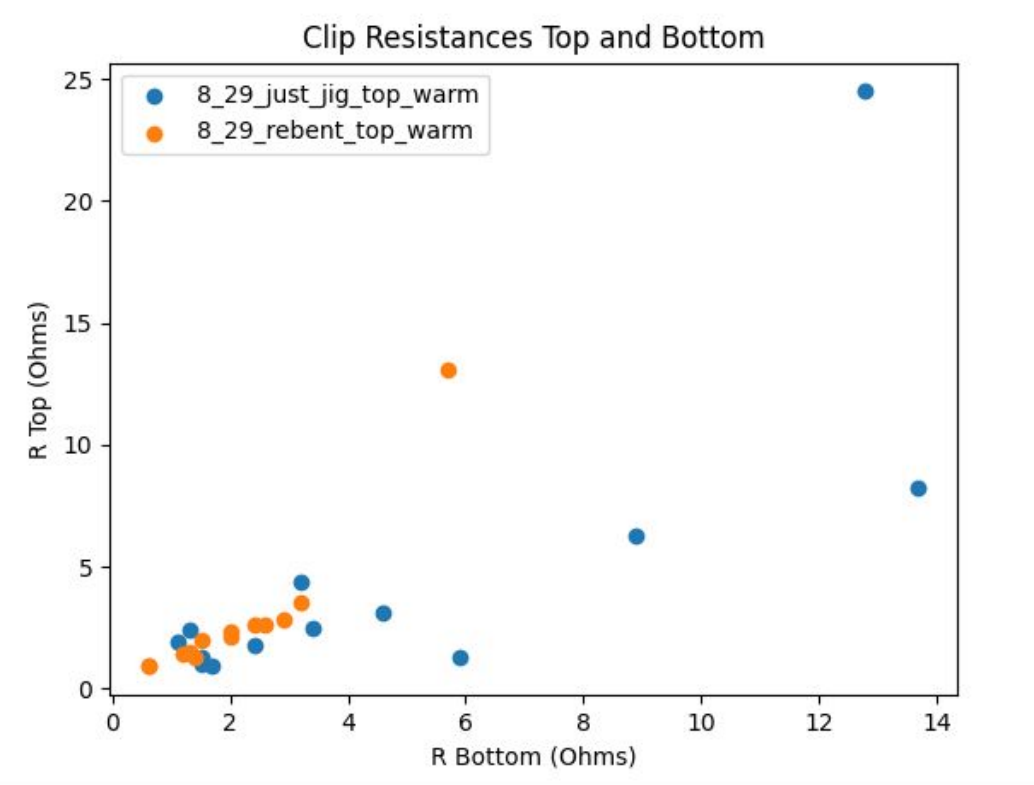




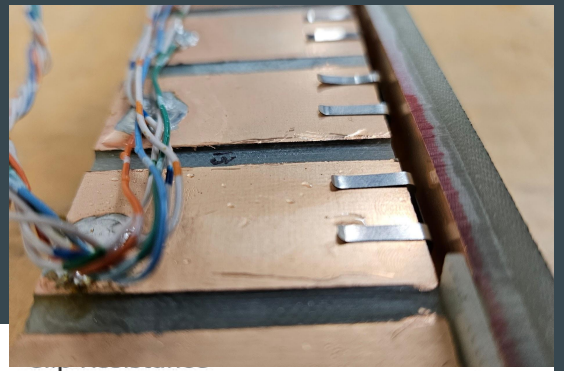
Comparing

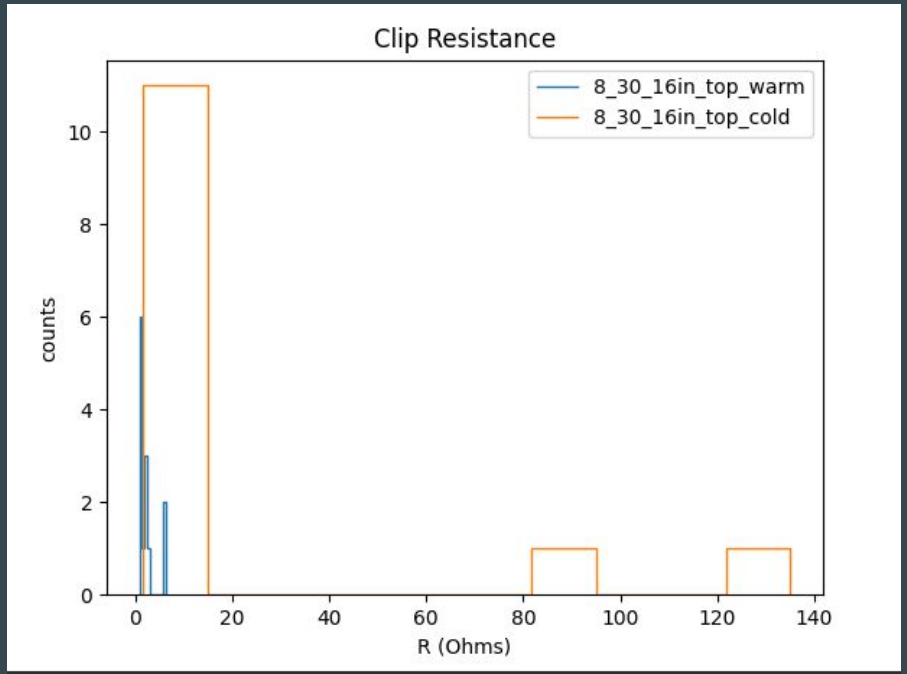

Clip Resistance
8_29_rebent_top_warm
8_29_just_jig_top_warm
counts
R (Ohms)
0
2
4
6
8
0
5
10
15
20
25

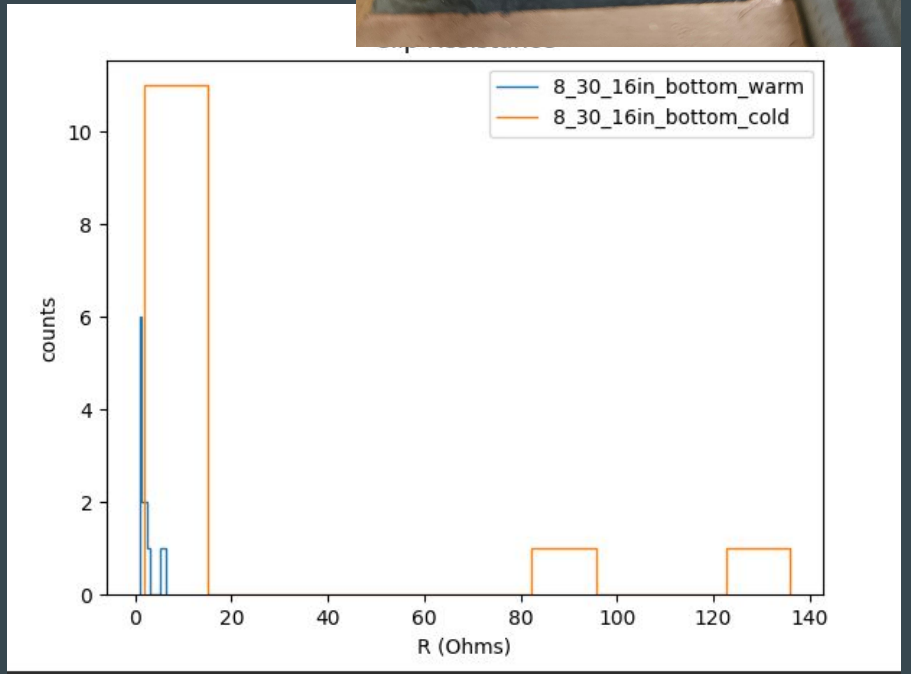

Clip Resistance
8_29_rebent_bottom_warm
8_29_just_jig_bottom_warm
counts
R (Ohms)
0
1
2
3
4
5
0
2
4
6
8
10
12
14


Clip Resistances Top and Bottom
8_29_just_jig_top_warm
8_29_rebent_top_warm
R Top (Ohms)
R Bottom (Ohms)
0
5
10
15
20
25
0
2
4
6
8
10
12
14

Rebent Clips to ~1/16in

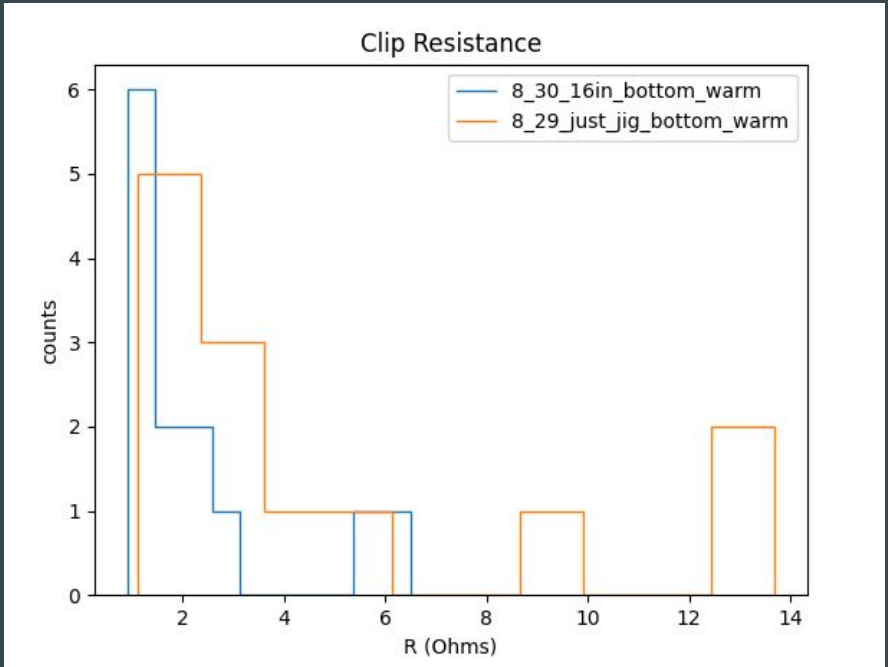




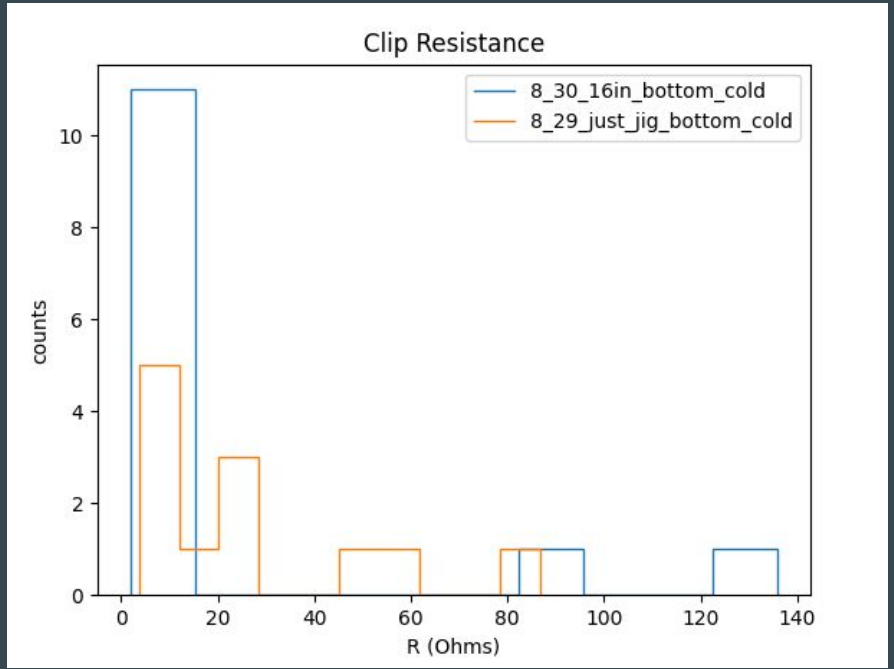


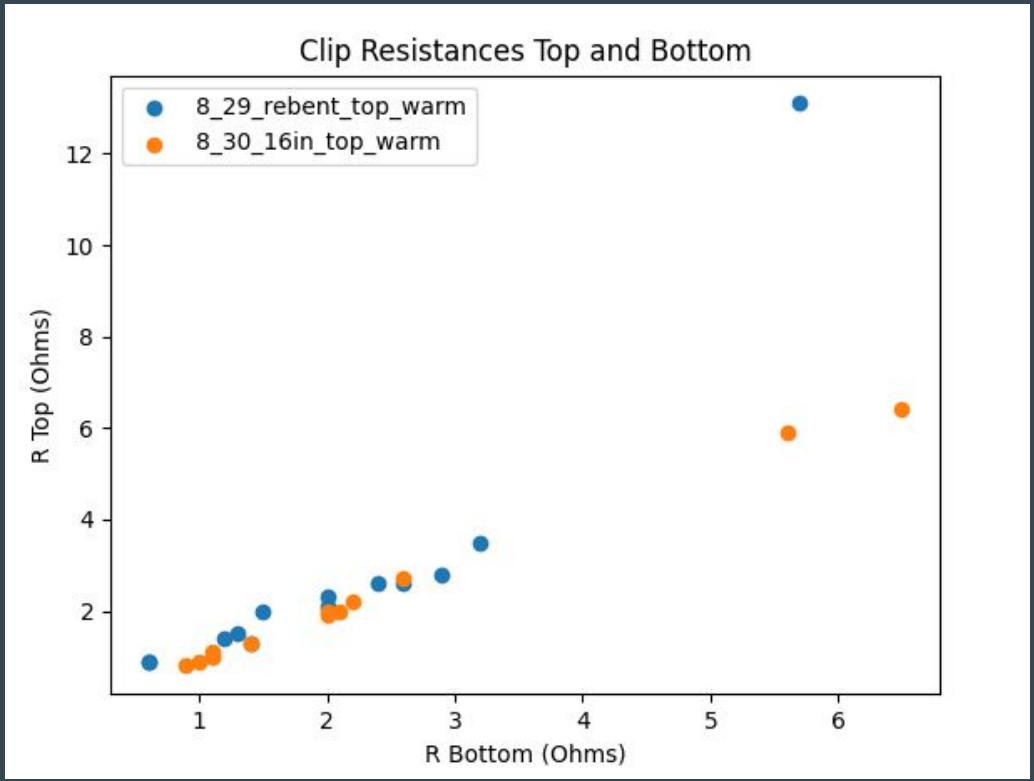
Jig vs ~1/16in

Warm



Cold (outlier removed from just jig)

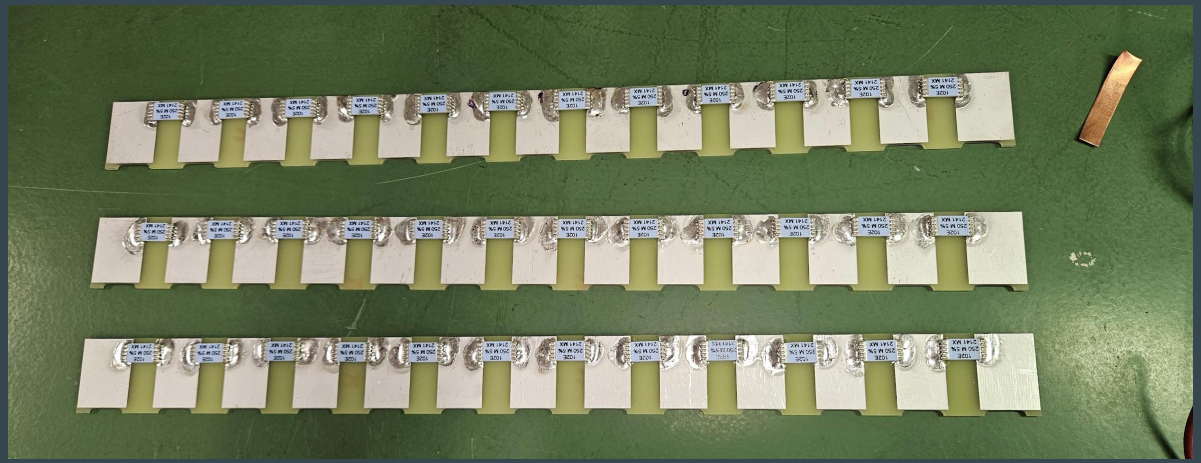




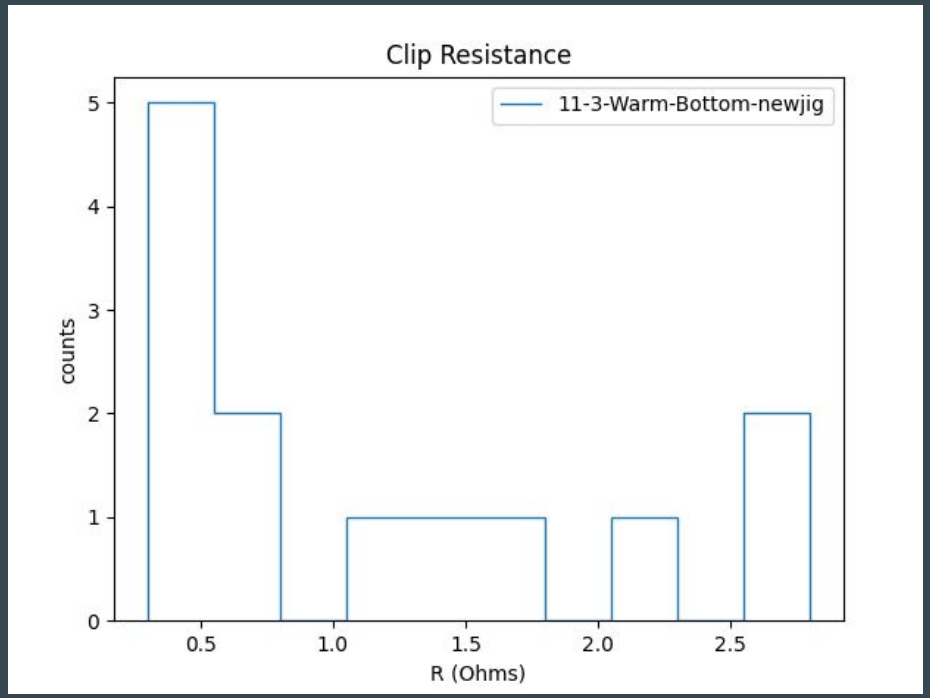
Over bend outside one

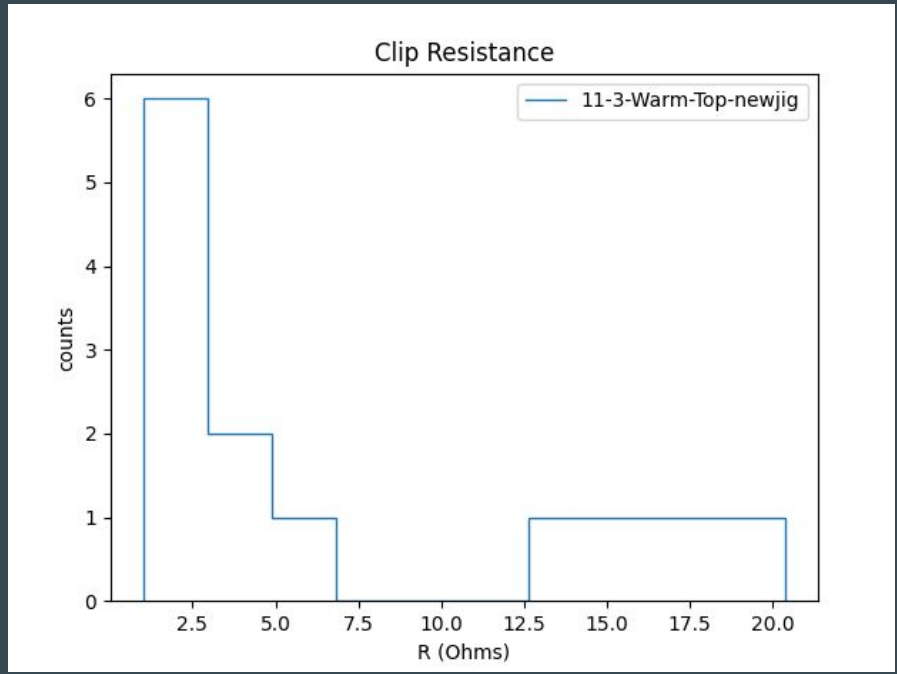

.100

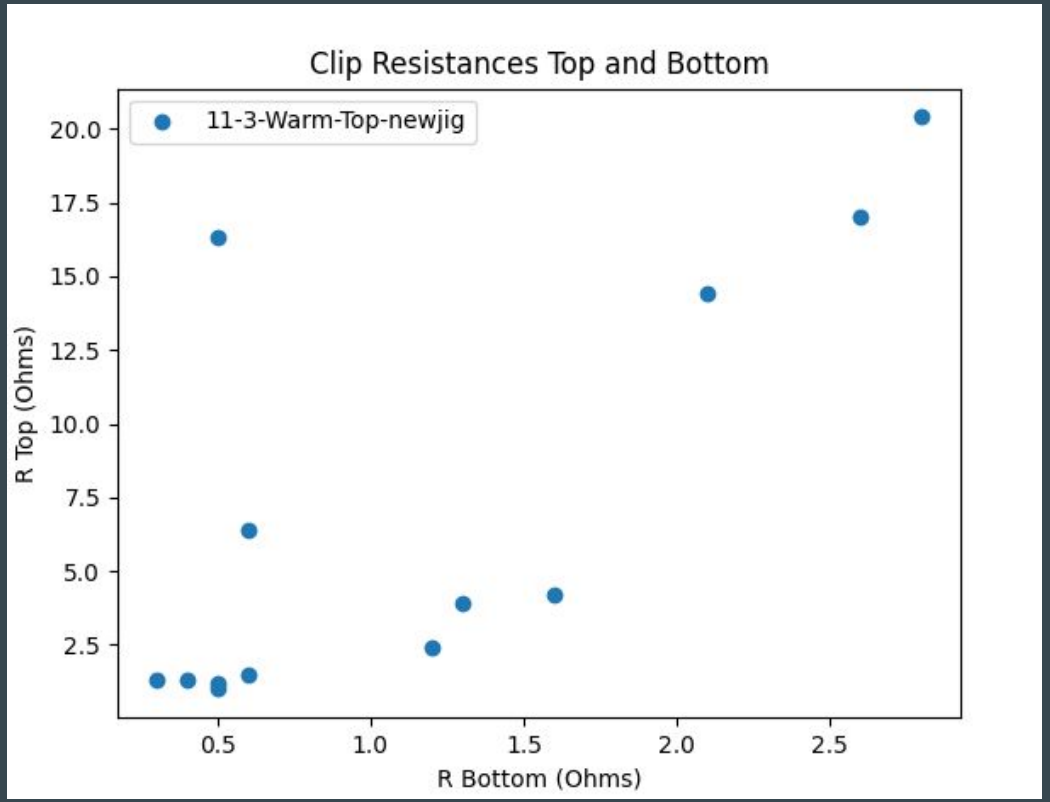
Resistor Chain



New Jig


Clip Resistance
11-3-Warm-Bottom-newjig
counts
R (Ohms)
0
1
2
3
4
5
0.5
1.0
1.5
2.0
2.5

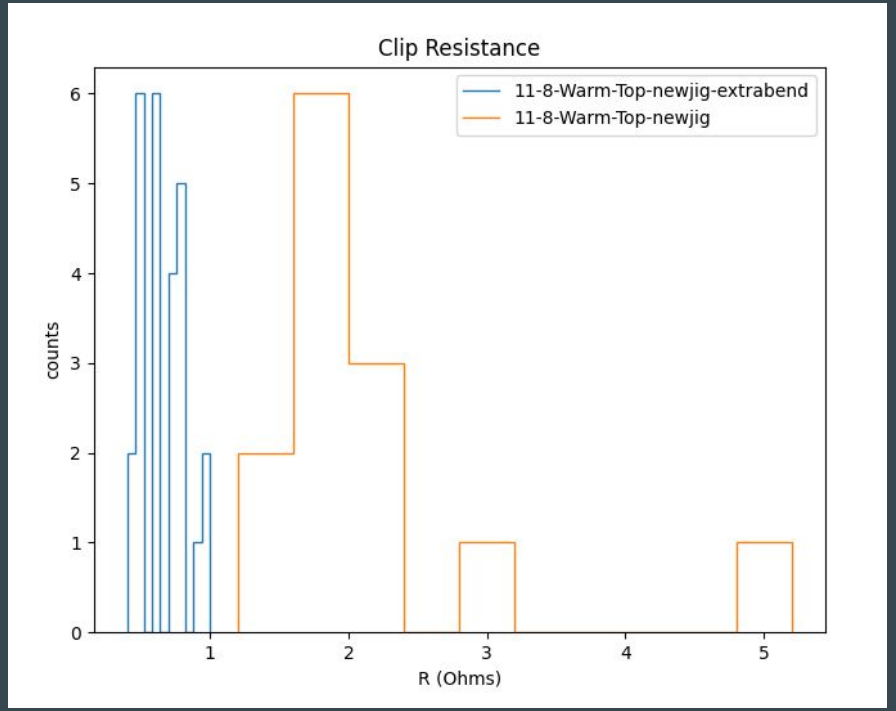

Clip Resistance
11-3-Warm-Top-newjig
counts
R (Ohms)
0
1
2
3
4
5
6
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0


Clip Resistances Top and Bottom
11-3-Warm-Top-newjig
R Top (Ohms)
R Bottom (Ohms)
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.5
1.0
1.5
2.0
2.5

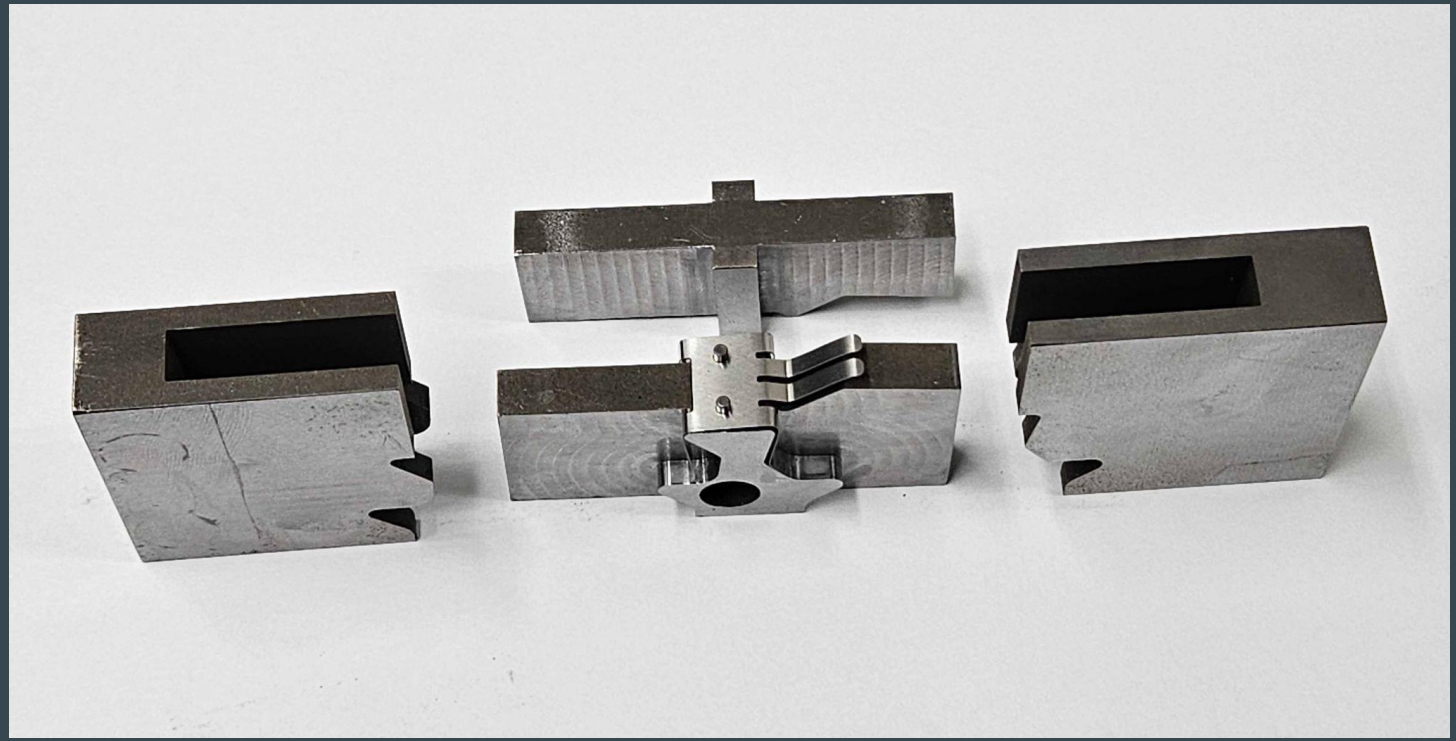
11-8 Update

New bending jig

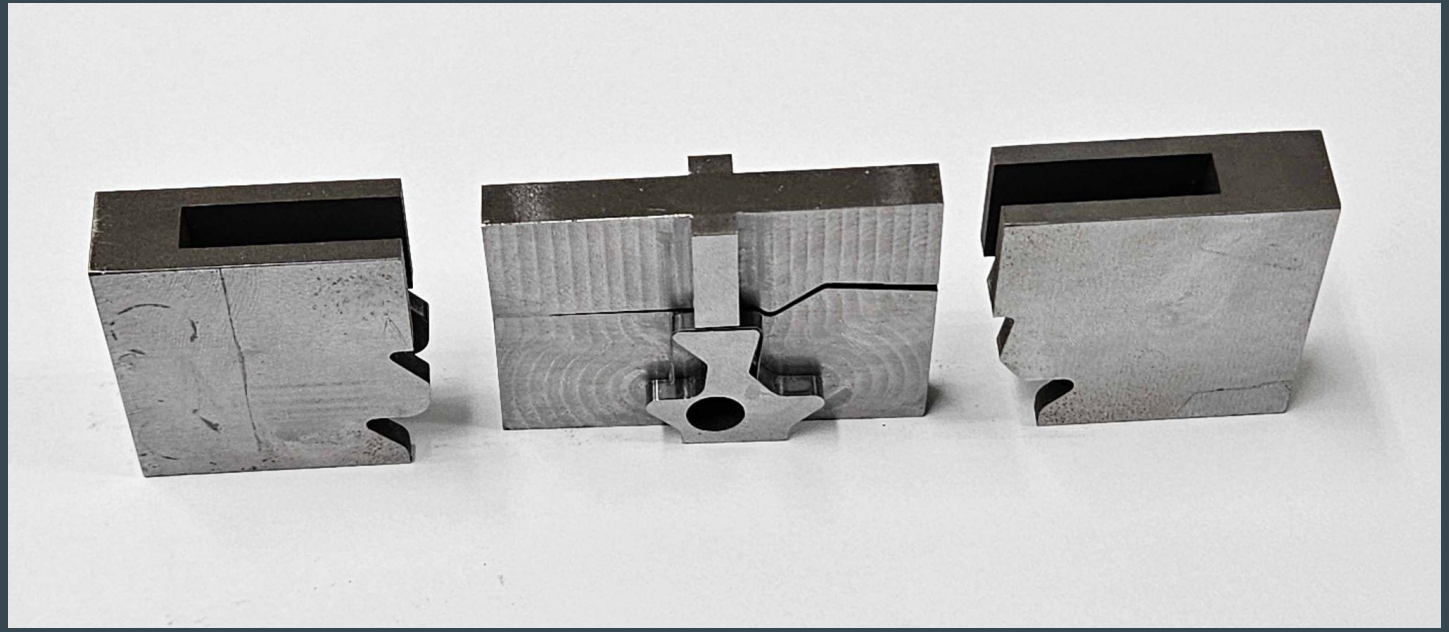
- Add extra bend to 2 sides of clip reduces resistance



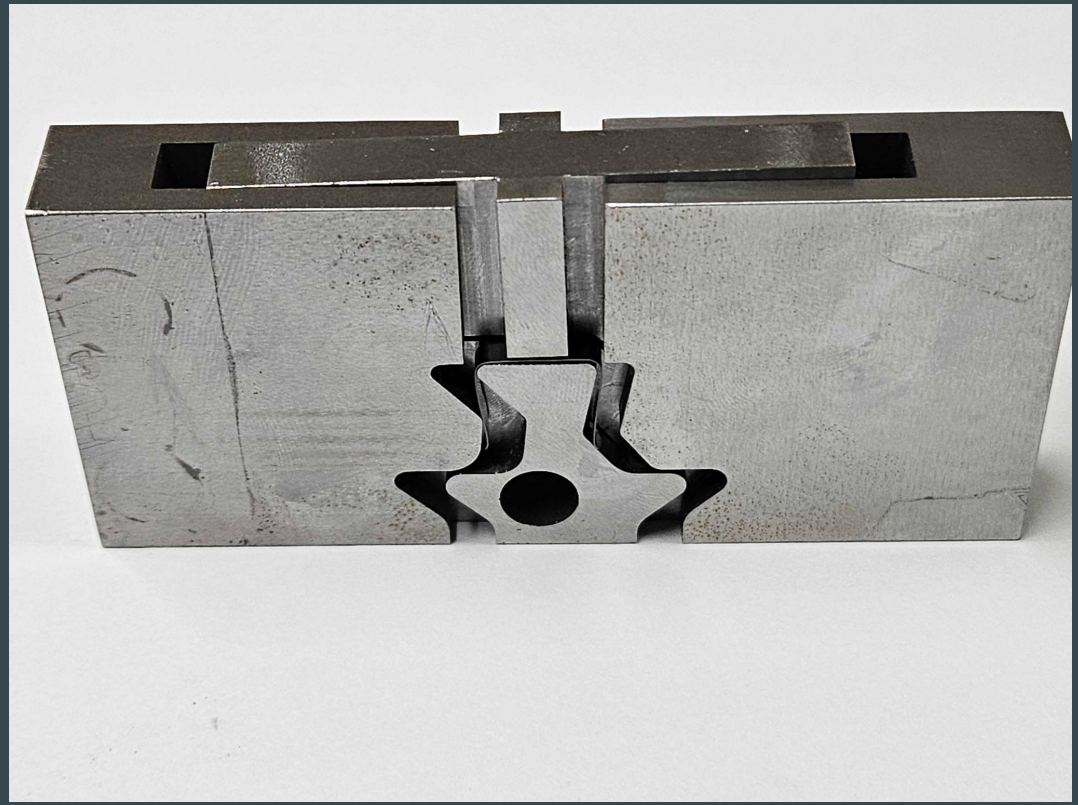
Jig



Jig



Jig



Clips

Zinc test stand

Used some edged of vivid sprayed Zn on G10

Not yet soldered