

Carlson SuperProbe ABS Case Kit Assembly

First, thanks for purchasing this kit. This case kit is intended to work with our other Carlson SuperProbe PCB kits. You should watch Carlson's original YouTube video on the probe. This kit incorporates our battery pack kit with an ABS Hammond machined case and speaker. The typical Li-Ion prismatic cell is nominally rated at 3.6-3.7VDC and will be as high as 4.2VDC when freshly charged.

The kit includes a 720-800mAh internally protected cell and a TP4056 1A micro-USB charger module with LED indicators, along with some wire & connectors & screws and nylon spacers. The TP4056 needs to be rigidly fastened into the provided holes so that the micro-USB connector is accessible on the side & dual LEDs are visible through the top. The kit also includes the speaker assembly that fits into the top panel slots. **CAUTION: Do pay attention to battery polarity both in wiring the TP4056 and connecting the power supply through a switch to the SuperAmp.**

Assembly

Use the attached pictures to organize component locations. The amp PCB mounts using the top PCB holes. The battery is fitted between the unused lower case posts. The protection incandescent bulb is fitted next to the stereo jack and held in place with hot glue, UV epoxy or similar. The 4056 charger is mounted with the included screws and nylon stand-offs. The POTs and power switch are fitted to the control panel. If needed, carefully bend POT pins to face to the back of the POT.

Recommended Assembly Sequence

1. Assemble power switch, 2K & 5K POTs to the control panel. Bend POT pins to the back for clearance.
2. Fasten Amp PCB to case bottom with included #4 screws using the 2 risers nearest the speaker.
3. Position the battery between the lower unused mounting risers in the case bottom. Press tightly against lower PCB edge to provide wiring clearance around pots. Use sticky pad if desired. Do not connect until all assembly is complete.
4. Prepare the stereo jack by soldering a 2" pigtail (BLK) to the common terminal (pin 1), and a 5" pigtail to tip terminal (pin 2). It is important to use the correct terminal as they must mate with the probe. Tiny numbers are marked on the rear of the jack. Use heat-shrink tubing to insulate connections.
5. Mount stereo jack into case top with unused terminal (pin 3) facing up.
6. Mount the 4056 charger to the case top using included hardware. Nylon spacers are to be fitted between the case and 4056 to stand off 4056 parallel to case.
7. Position the lamp against the case top just above the stereo jack. It is delicate, so take care. Using a scrap of #22 wire insulation ~3/8" connect one lamp wire to the stereo jack ring terminal (pin 3). Solder a 5" pigtail to the remaining lamp wire and insulate the connection. Holding the lamp in position, glue the lamp with some fast setting adhesive such as hot glue or UV epoxy.
8. Position speaker in top slots and solder speaker wires to speaker pads on Amp PCB.
9. Trim male battery connector leads to ~1" and insert stripped ends into the 4056 solder pad holes as shown in photo Don't solder yet. **Observe polarity.** Several connections to terminals need to be made and it is unlikely all wires will fit into the existing holes. Therefore surface soldering to the pads is necessary.
10. Assemble the power LED (D1) by trimming the ballast resistor R9 (430-470) leads to ~1/4" and the LED anode (long) lead to ~1/4" and lap soldering the ballast resistor to the anode. Next trim a 3" wire and lap solder to the remaining resistor terminal. Trim the remaining LED lead (cathode) to ~1/4". Strip and attach another 3" wire to

the remaining LED lead. Separately insulate the resistor and LED wires. Super glue the LED into the hole above the power switch.

11. Attach a 6" wire to the power switch common (middle) terminal and a 4" wire to the bottom terminal (for UP=ON). Insulate with shrink tubing.
12. Prewire the POTs. The upper terminals of the POTs are ground (common pin 3). Solder a bridge wire from 5K-pin 3 to 2K-pin 3, then attach another ~4" pigtail to 2K-pin 3 which will eventually go to the Amp ground. Attach 3" pigtails to the remaining terminals of 5K & 2K POTs and insulate.
13. Attach POT leads to the Amp. Route the 5K Pot leads #1 & #2 along the right side of the case bottom. Trim length and leads to reach the PCB audio pads. The #22 wire will fit in the appropriate holes from the top. Match the pad numbers to the POT terminal numbers. Carefully solder each wire to the respective pad. Repeat for the 2K POT leads #1 & #2 routing them on the left side of the bottom. Route the POT common wire to pad #3 of the 5K pot, trim to fit and solder in place. This leaves the remaining 2K POT terminal #3 for another ground connection.
14. Trim and solder connect both the short switch lead and the LED anode (+/resistor) to the Amp terminal marked BATT.
15. Trim the LED cathode (-) lead and insert in the 2K POT pad #3 (common) and solder.
16. Route the long lead of the switch to the positive (BAT+) terminal of the 4046, trim and solder two connections there.
17. Route and trim the short (common) lead from the jack (J1) to the 4046 negative (BATT-) pad. Prepare and trim another common wire ~6" and solder along with the other 2 common wires to the 4046 (BATT-) terminal. Route and trim this common wire to the Amp PCB ground (COM) in the upper left corner of the PCB.
18. Route, trim and solder the remaining wire from the lamp (DS1) to the PCB pad marked "Probe Supply".
19. Route, trim and solder the remaining lead from the jack (J1 pin #3) to the PCB pad marked "Probe In".

All connections should now be complete. This is a good time to review all connections for good solder joints and agreement with the Amp schematic.

Testing

Do the following *before* connecting the battery.

1. Using an ohm meter, check the resistance between the PCB (Batt) and ground. It should be in the Kohm range.
2. Check "Probe In" to ground. It should be ~4.7K.
3. Check "Probe Supply" to ground. It should range from 0-2K based on Probe Gain POT position.
4. Check the resistance between PCB "Batt" and 4056 (Batt+) terminal. It should be 0ohms with the switch "ON" and open-circuit with the switch off.
5. Check and verify the red/black polarity wiring of the battery connectors.
6. Finally check the resistance from each speaker terminal to ground to verify neither is grounded. Resistance should be in the Kohm range.
7. Correct any errors or discrepancies.
8. Connect the battery and switch the power ON. The LED should light. Because the probe is not connected and the preamp transistor has no input signal the speaker should be quiet. You can inject noise or a signal at the PCB "Probe In" terminal to further test the amplifier.
9. Measure the battery voltage at the 4056 (Batt+) & (Batt-) terminals. You should get 3.2-4.2V depending on the battery charge state.
10. Plug in the charger cable and power the charger to verify that the 4046 charges the battery. **Red** is charging and **Blue** is charged.

The SuperProbe Amplifier is now complete. Route wires around the screw bosses (4) and close the clamshell case. If it won't close tightly, you gave wires interfering! Fasten the 2 case sides with the provided screws. You are now ready to assemble the SuperProbe Probe unit. If your probe is completed you can now plug it in and test the complete SuperProbe. I would recommend a final verification that you have the tip/ring/common wiring in the probe matching the jack (J1) in the amplifier. Once connected you should get hissing, popping and myriad other noises from the speaker depending on the POT settings in the Amp and Probe.

Feedback

If you find errors, omissions, or if you have suggestions on the instructions, kit, packaging or anything else, I would be happy to receive feedback.

The easiest way to provide feedback would be by email to:

Kevin
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ppsales@hwcz.com

SP-CaseKit Parts List Included		
USBC1	1	TP4056 micro Li-Ion Charger
BT1	1	800maH Li-Ion Protected Battery
J1A	1	Male battery cable
Wire	4ft 22awg	Misc hookup
HST	12"	Misc shrink tube
Screws	2 – #0-80 w/nut & lock	TP4056 fasteners
Spacers	2 – nylon	TP4056
Speaker	2 -1W 8ohm	Mounted and wired in parallel
Case	1593LBK	Machined Case
Screws	4 – 1" FH	Case screws
Screws	2 - #4	PCB mounting
Pad	foam sticky	Opt battery hold-down
Cable	USB	USB charger cable 1ft

References

<https://www.youtube.com/watch?v=uVkJqqZroN0&t=2583s>

<https://www.instructables.com/Carlsons-Super-Probe/>

https://www.hollywoodcontrols.com/phpSP/MCSP_CaseKit.php

