

Carlson SuperProbe2 MK3A Kit Assembly

This addendum provides additional instructions for the following kits:

MK3A SuperProbe2 Kit including a Machined Aluminum Probe Housing & 45 Parts MK3AX Upgrade Kit for MK2/MK2ASM SuperProbe2 Kit

This is an advanced SMD skill PCB build. Please take your time!

First, thanks for purchasing this kit. These instructions are for our MK3A probe kit with 45 unique components including all parts needed for the hand-held shielded metallic probe. Please follow the assembly procedures in the **SuperProbe2** instructions provided to complete the 2 PCBs.

MK2 Kit

The MK2 version of the SuperProbe2 kit contains essentially all of the parts for both the Amp and Probe except the *cases, battery & holder & speaker*. It includes everything for the PCBs, knobs for control POTs, probe shielded connection cable, probe plug & jack, power switch and LED, #22GA Teflon inter-connect wire & shrink tube.

MK2ASM Kit

The MK2ASM is identical to the MK2 kit, but the PCBs are fully populated and tested. On the Probe PCB the LED remains to be attached pending the particular probe housing choice.

New MK3A/MK3AASM Kit

The SuperProbe2 MK3B/MK3BASM version adds 7 components to complete the shielded metallic probe. (See parts list included.) First assemble the complete SuperAmp and SuperProbe PCBs according to the included instructions. Then assemble the aluminum probe.

Amplifier Case

Almost anything can be used to house the amplifier, and we have included a quality 3.5mm 4-wire jack & plug. The amplifier can be powered using 3.5-5.5VDC from a variety of sources. But 4-AA batteries are the limit for the integrated power IC in the amplifier. Do stick with some form of 4 ohm 2 watt speaker, as reviewers complain about performance with other speakers. You may also purchase our **SP-CaseKit** offering a very compact ABS plastic housing, speaker, battery, charger and USB cable.

Aluminum Probe Body Assembly

The probe case **must** be all metal and connected to the common of the probe PCB (bottom). This is also connected to the shield of the wire probe tip and common of cable to the amplifier. A bare metal probe case can be a hazard around high-voltage circuits. Use insulation and safety techniques any time the voltage is greater than 48VDC. And even then, remember that a 10A 48V supply can do some real damage! A length of 1" heat-shrink tubing is provided for optional external insulation.

If you have not already mounted the POP LED to the probe PCB, now is the time. Paying attention to the LED polarity, (long lead is the anode +), insulate, bend and fit the LED next to the slide switch as shown in the pictures. The LED should protrude about as far as the switch slider and at the same elevation. Solder the LED in place.

The probe is assembled last by feeding the cable pigtail end through the rear of the Delrin endcap and slipping the 1" x ¼" shrink-tube over the cable where it will protect the cable from the integral cable clamp set-screw in the rear cap. Shrink this in place at the end of the cable insulation. Next attach the 4-conductor signal wire to the PCB output end. Make note of wire colors so that you wire the 3.5mm jack in the SuperAmp correctly. Please refer to the following table color code.

Cable & Jack Wiring			
Schematic Pins	Pin Name	Cable Coloring	Jack Pin
1	sleeve	black	1(M)
2	tip	red	2
3	ring 1 (outer)	white	3
4	ring 2 (inner)	yellow or green	4

The endcap has a 4-40 set-screw to provide strain/pull relief. Tighten gently after everything is assembled. Trim and attach the probe tip to the front of the PCB using the photos as a guide. The rigid coax shield is trimmed and flattened and used as a ground and bottom support for the probe wire. When completed, check carefully to see that the inner conductor is not shorting to the shield at the PCB. Make every effort to contain the shield solder within the span of the cutout in the mounting boat (carrier).

Fasten the PCB to the carrier with the provided #0-80 screws (3) and attach the adhesive side of the copper strip to the bottom of the carrier and up to the probe end ground and solder it to the front ground shield. *(Clear a small patch of copper foil from around the 4-40 hole to facilitate assembly.)* Slide the carrier into the aluminum probe body aligning the switch and LED with the slot. Fasten the carrier with a #4-40 screw. Slide the rear endcap onto the aluminum body and align the #0-80 hole in the body with the tapped hole in the end cap. Use an included #0-80 FH screw to fasten the endcap. Trim the probe tip as desired for about a 1/16" - 1/8" exposed tip. Slide the front cap over the coax and align the holes as before. Using a #0-80 FH screw, fasten the front cap in place. Remember to gently tighten the rear endcap set screw using a 0.050 Allen wrench if not already done.

The included 1" heat-shrink tubing can be used in a variety of ways to insulate the probe, and some creativity is needed to fit it. The tube can be shrunk on to the aluminum probe after assembly and the switch & LED trimmed out with an Exacto knife. Alternately, the shrink tube can be trimmed to cover the tube slot from the LED to the endcap.

Stainless Steel Probe Part List

The following components are used in the Aluminum probe body.

1. Machined aluminum probe body
2. Machined Delrin end pieces
3. Machined acetyl PCB carrier
4. Copper adhesive grounding tape
5. 3 #0-80 x 1/8" RH PCB mounting screws
6. 1 #4-40 x 1/4" BH carrier screw
7. 2 #80 x 5/16" FH end cap screws
8. 1 x 1/4" heat shrink tube for cable protection
9. Heat shrink tube to optionally insulate the metal probe

Feedback

It takes quite a bit of effort to put kits like this together, and it is easy to make a mistake or omission. 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.

- Is the cable long enough?
- Are there enough extra SMD parts?
- Are the instructions adequate?
- Do you have tweaking feedback for us?

I would encourage you to add your implementation to the Instructables "I Made This" section!

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

Kevin
hcsales@hwc.com or ppsales@hwc.com

References

<https://www.youtube.com/watch?v=uVkJqqZroN0&t=2583s>
<https://www.instructables.com/Carlsons-Super-Probe/>
https://www.hollywoodcontrols.com/phpSP/CSP2_SelectionGuide.php
https://www.hollywoodcontrols.com/phpSP/CSP2_MK3A.php

Here is a great UT video of Carlson using the SuperProbe2 to locate a noisy component inside a complex transceiver. He makes it seem so easy, and with the SuperProbe2 it is!
<https://www.youtube.com/watch?v=uiK1BD7HILo>