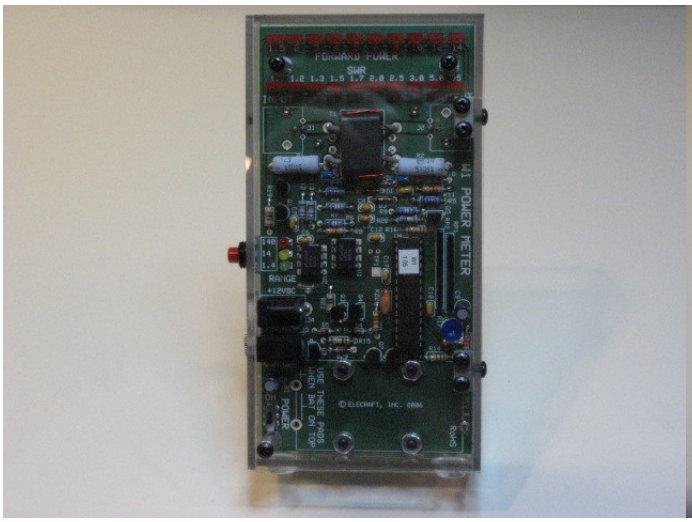
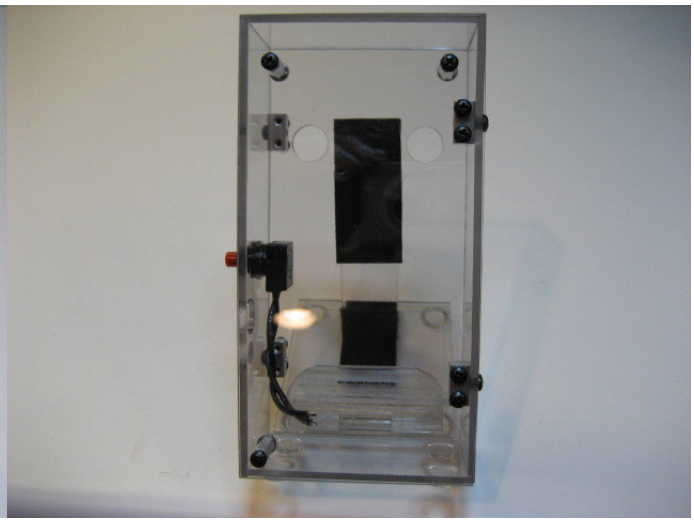
Elecraft W1 SWR/Wattmeter Enclosure

by W8FGU





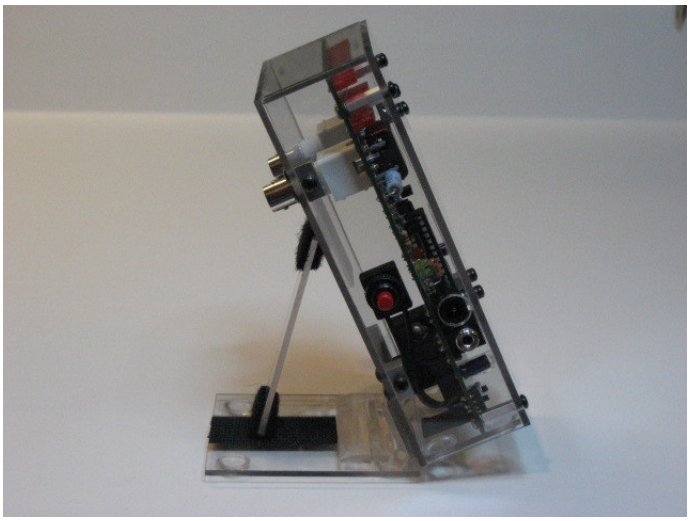
The W1 enclosure is made of Lexan®, a polycarbonate, which is very strong. It also has a UV blocking coating on one side and was assembled carefully with this side on the outside of the enclosure. Lexan® is more shatterproof than acrylic (Plexiglas® etc.) but is more prone to scratching than acrylic. Since my design goal was to use the W1 for portable applications, being exposed to dropping and falling off a table, I decided to go with the strength of a polycarbonate material.

There are three different designs of the enclosure to incorporate three different mounting methods of the BNC connectors (J1 & J2) to the W1 printed circuit board. They are:

- Top mounted, right angle BNC connectors (as supplied in the W1 kit).
- Bottom mounted, right angle BNC connectors (as supplied in the W1 kit)
- Bottom mounted, straight through BNC connectors (as supplied by W8FGU or Digi-Key® www.digikey.com, part number A32246-ND or Mouser Electronics® www.mouser.com, part number 571-2272226)

The first version is slightly thicker and designed to house W1 kits already built per the Elecraft W1 manual for use without an enclosure. It is still recommended to mount the battery connector on the back of the W1 PCB for regardless of the version to make it easier to change the battery when needed. If you have not yet built the W1 (or at least not mounted the BNC connectors to the top of the PCB) it is recommended to mount the BNC connectors (right angle or straight through, whichever is desired) on the back of the PCB and install it in the bottom mounted BNC versions of the enclosure.

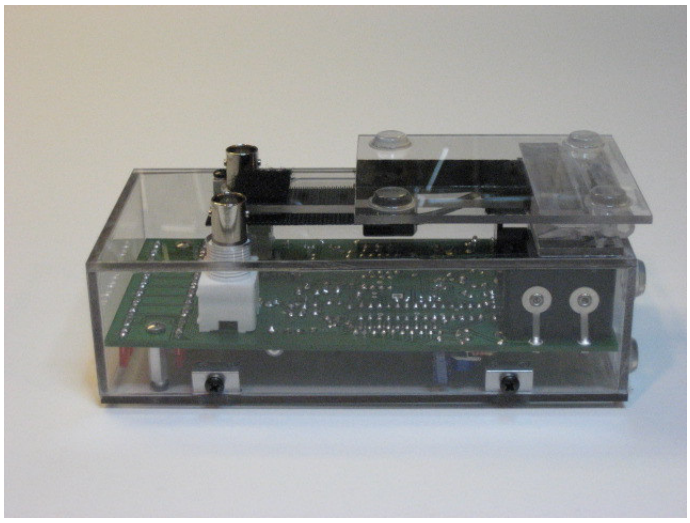
The power switch was also externalized to the side of the enclosure. A supplied, small push button SPST switch was mounted on the connector side of the enclosure and wired directly to the W1 PCB for power switching. The existing PCB mounted DPDT switch should be set in the off position.



All LED's are clearly visible in the enclosure and it may be tilted to any desired angle for viewing via a separately purchased custom tilt stand mounted to the back of the enclosure. The tilt stand can be folded flat to the back of the enclosure when not in use for easy and efficient storage. Plastic feet on the bottom of the enclosure and the tilt stand, keep the enclosure from moving around on hard surfaces.

The angle is adjusted with the tilt support piece fitted with Velcro® on both ends. There are reciprocating pieces of Velcro® mounted on the tilt stand and the back of the enclosure. The tilt support piece can be laid flat between the stand and the back, secured with the Velcro® for storage. This also helps to prevent it's misplacement.

The enclosure is constructed in two halves. These two halves are secured together via Elecraft custom 2-D fasteners and black anodized 4-40 screws. The top half contains the W1 PCB mounted to it via standoffs and the side that contains access to the power and data connector as well as the power switch. The bottom half contains the remaining side, ends and back of the assembly. Access to the inside of the enclosure is made by removing the four screws on the sides. Pulling the top half to the side for right angle BNC connectors or straight out of the enclosure for straight through BNC connectors, allows for changing the battery or access to the PCB.



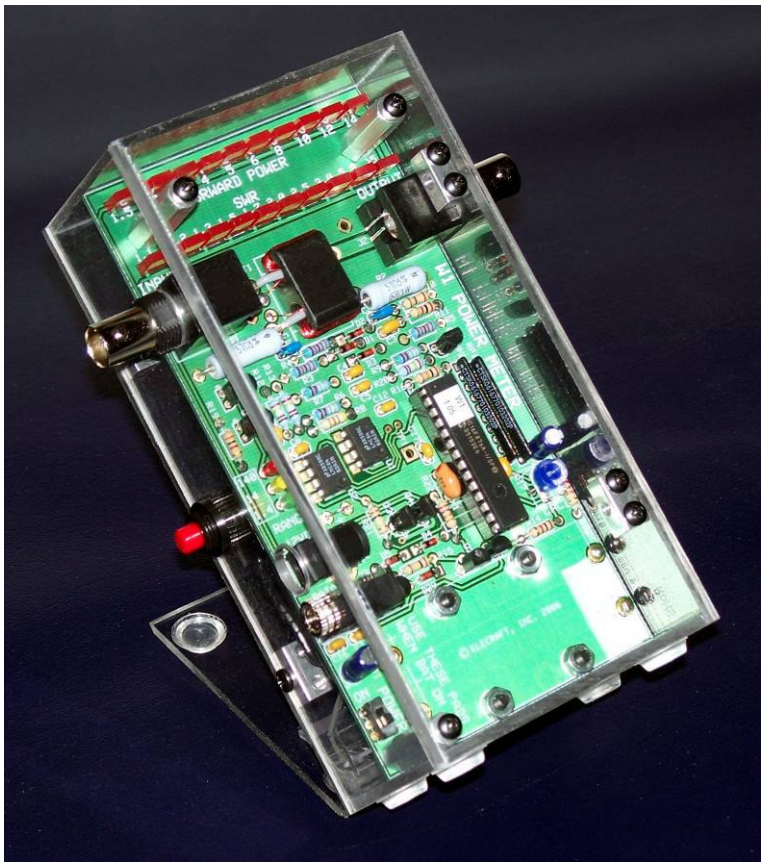
During initial installation, be aware that the enclosure has been designed with tight tolerances with regard to the internal size of the enclosure as it relates to the size of the W1 PCB. Keeping the mounting hardware loose until everything is lined up will help make sure the PCB is oriented properly. There is enough tolerance built into the size of the mounting holes to allow for slight adjustments during installation and insure that all of the enclosure edges are square and seams tight.

It should be noted that two hole side of the custom 2-D fasteners are drilled slightly off center. The holes in the enclosure for mounting the 2-D fasteners are aligned so that the thicker side of the 2-D fastener is positioned at the outside edge of the enclosure half.

All mounting hardware is provided for mounting the W1 into the enclosure as well as the externalized power switch. All parts are listed below:

- 3 – 1/2” hex standoffs
- 3 – 4-40 lock washers
- 3 – 4-40 1/4” screws
- 4 – custom 2-D fasteners
- 15 – black anodized 3/16” screws
- 1 – SPST power switch with red button
- Top half of enclosure with power switch and standoffs mounted
- Bottom half of enclosure with tilt stand mounted

The enclosure is shipped assembled with the 2-D fasteners and black anodized screws.



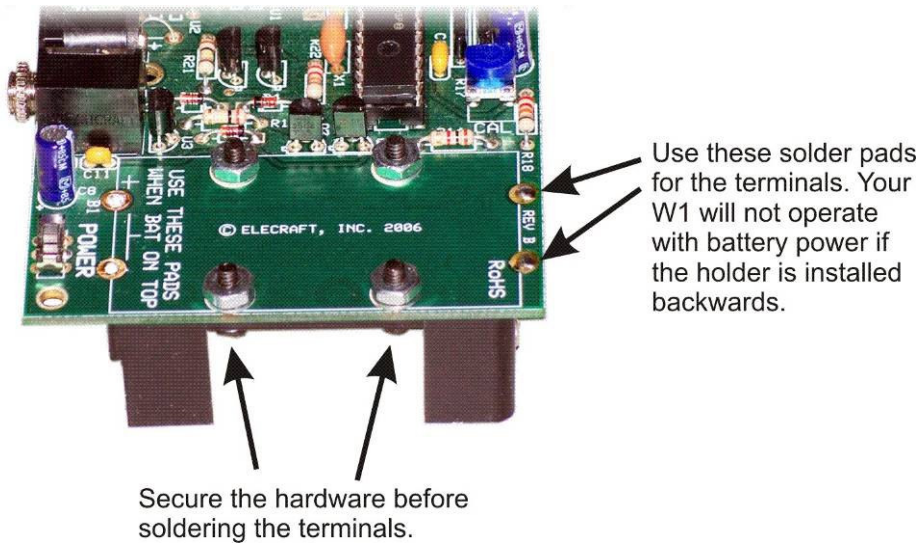
The W1 Enclosure Version with top mounted, right angle BNC’s.

***(Courtesy of Ron D’Eau Claire)*.**

Pre-Installation Notes

Battery Holder

Regardless of the enclosure version you have chosen, it is strongly recommended to mount the battery holder on the back of the W1 PCB. Even if you've already mounted the battery holder on top, it may be easily removed and placed on the bottom. Care should be taken to insure that the terminals for the battery holder are mounted to the clearly marked holes on the back of the PCB and not the holes for mounting it on top.



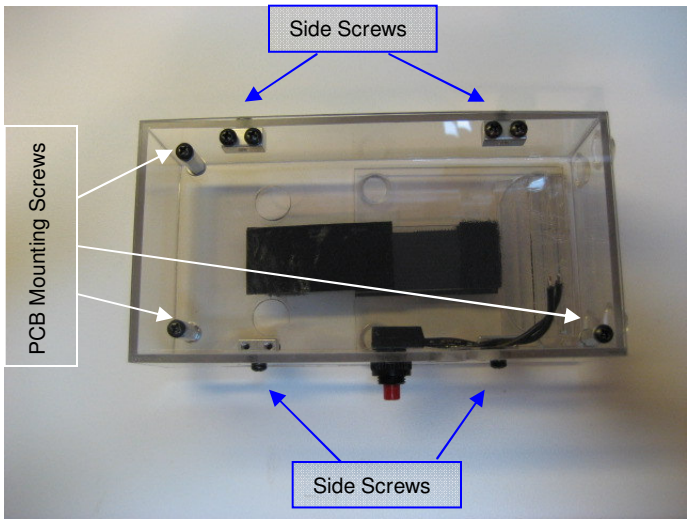
Before soldering the terminal connections, secure the battery holder with the mounting screws and properly align the holder on the PCB, then solder the terminals in place.

Rubber Feet

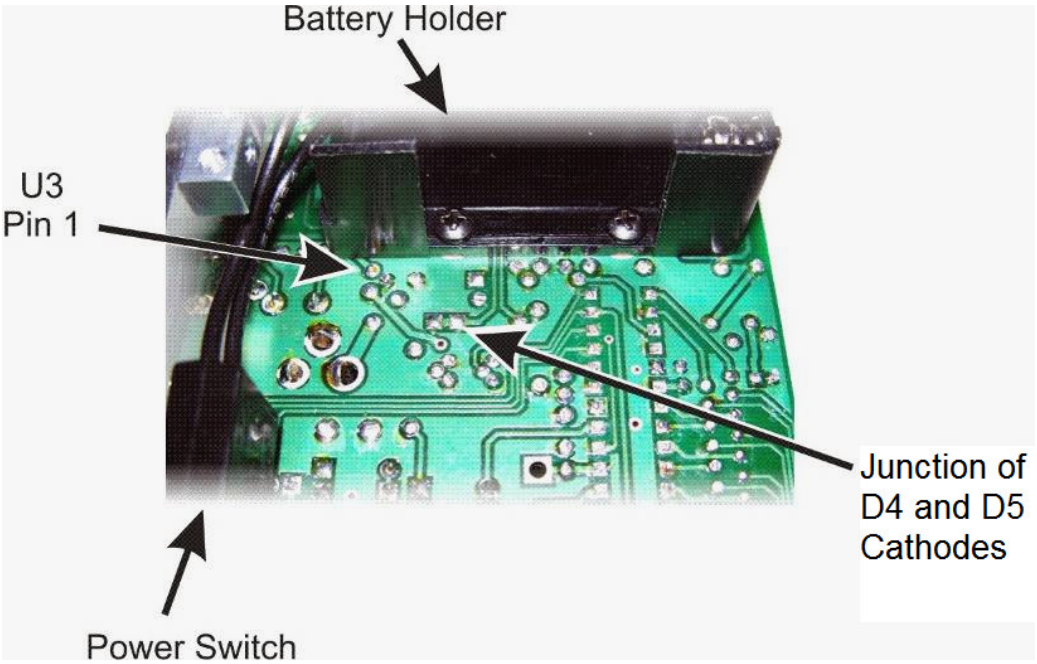
If you previously built your W1 with the rubber feet installed, they will need to be removed to expose the PCB mounting holes for installation with the provided standoffs and hardware.

Installation

- Separate the enclosure by removing the four side screws. Place the halves on something soft to prevent scratching them.
- Remove the Enclosure PCB mounting screws and standoffs from the top half.
- Separate the standoffs from their PCB mounting screws and lock washers.
- Mount the standoffs to the top side of the PCB in the three mounting holes. Place the lock washers between the standoff and the PCB and screw from the bottom of the PCB.

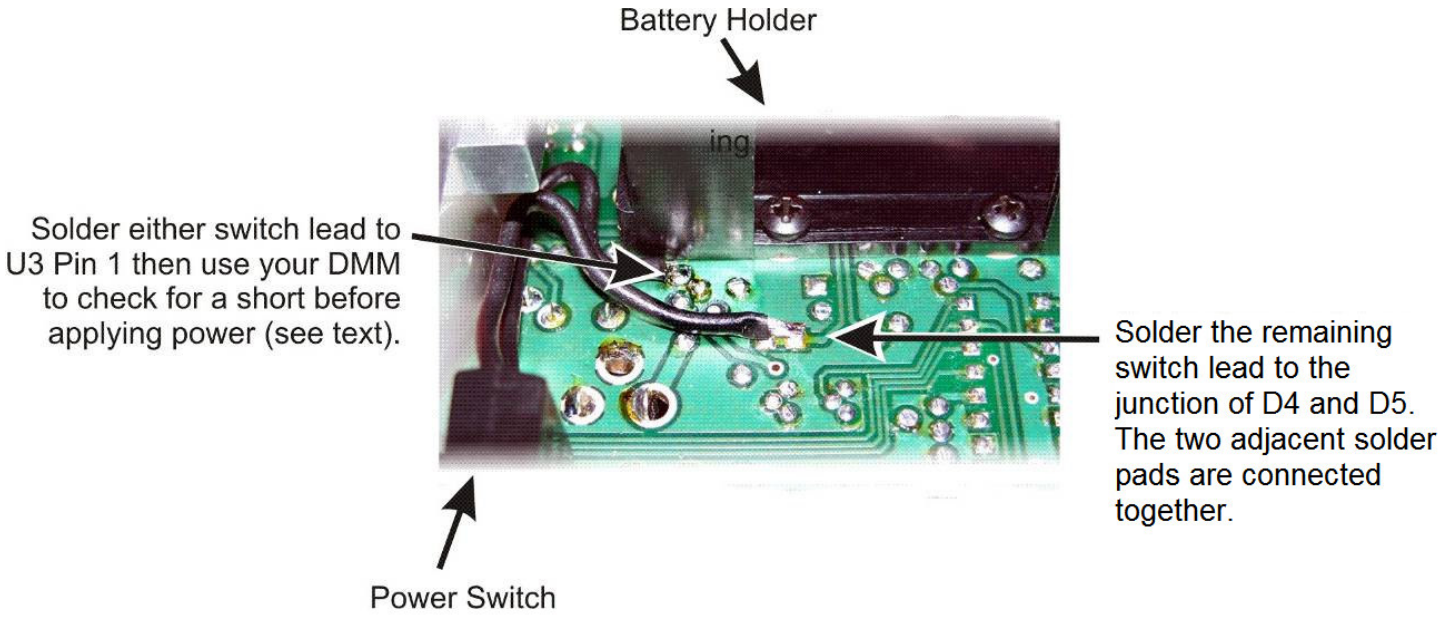


- Locate the PCB power switch, SW1, and insure that it is in the “off” position.
- With the top half facing down, place the PCB on the enclosure near its intended orientation within the enclosure. Locate U3 pin 1 and the junction of D4 and D5.

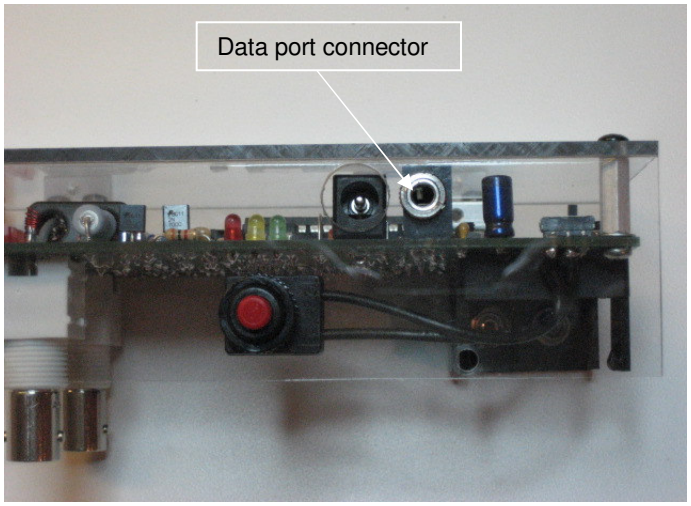


- Cut the switch wires for fit and tin the ends of the wires.

- Solder one wire to U3 pin 1 by holding the wire with one hand and apply the soldering iron to the pad just until the solder melts. Repeat this process for the other wire soldered to the junction pads of D4 and D5. Orientation of the switch wires is not important.

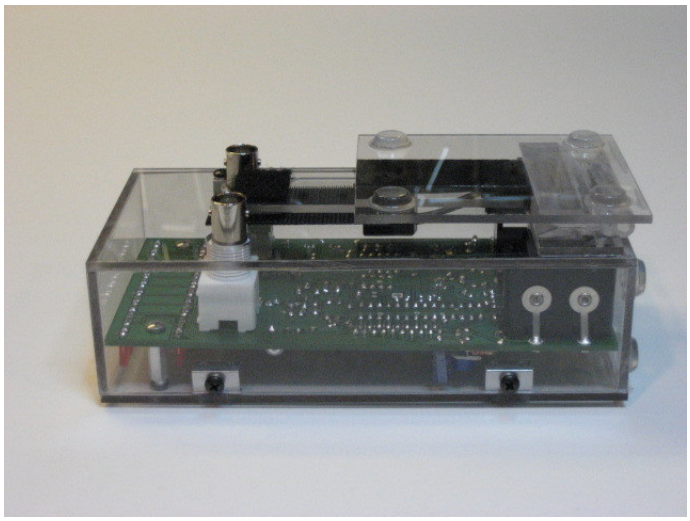


- Insert the data port connector through its mounting hole in the side of the top half of the enclosure. If your BNC connectors are side mounted, insert this connector through the side panel as well.



- Secure the connector to the side panel with the connector mounting nut. Do not tighten the nut at this time. (In some cases, the data port connector may not protrude completely through the side panel, prohibiting the application of the mounting nut. This is of no concern since the mounting nut is not necessary in mounting the PCB to the enclosure. Simply leave off the mounting nut).
- Secure the PCB to the enclosure with three black anodized screws in their respective mounting holes. Do not tighten the screws at this time.
- You may also want to install the battery at this time.
- Again, be sure that the PCB power switch, SW1, is in the off position before assembling the enclosure.

- Assemble the two halves of the enclosure by feeding the BNC connectors through the rear holes (for the rear mounted connectors) or through the remaining hole in the side of the bottom half.
- Secure the halves together with the four side screws. Insure that all of the seams of the enclosure are tight and that all of the edges of the enclosure line up. Hand tighten each of the side screws.
- Now hand tighten the PCB mounting screws on the face insuring that the PCB is squared inside the enclosure.



- If using the data port mounting nut, tighten the mounting nut as well, again only hand tight. Do not overtighten.
- The installation is now complete.
- To replace the battery or gain access to the PCB, simply remove the four side screws and pull the halves apart.

Miscellaneous Pictures