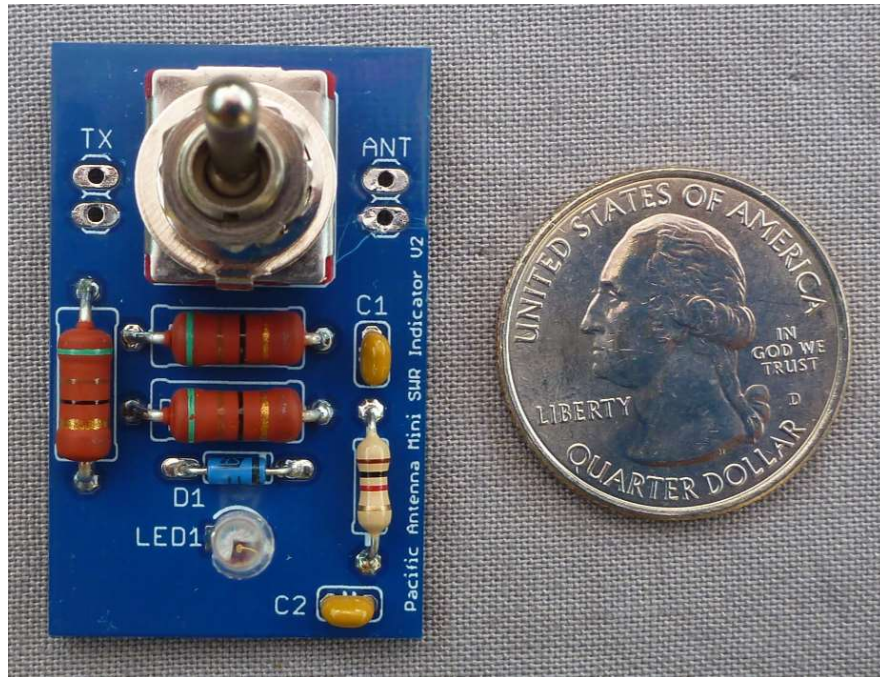


Pacific Antenna Mini SWR Indicator Kit



Description

Our Mini SWR Indicator visually shows the match between an antenna and transmitter. Simply adjust your antenna or tuner for the minimum LED brightness. In most cases, the LED will completely extinguish when a good match is achieved.

Features and Specifications

Indicates reflected power (SWR) as the brightness of an LED.
Recommended for power levels from 0.25 to 5 watts.
Covers 160M to 6M.
Size of approximately 1 by 1.5 inches for easy incorporation into tuners or small cases.
Limits the mismatch seen by the transmitter during tuneup.
No coils or toroids to wind.
No adjustments required.
Easy to assemble.
A great kit for new or returning builders.

Tools Needed

- Temperature Controlled Soldering Station with small tip or 15-35 watt soldering iron with small tip
- Solder 60/40 or 63/37 Tin-Lead
- Small Diagonal Cutters
- Small Needle Nose Pliers
- Pencil, Pen, and/or Highlighter
- BRIGHT work light

Optional

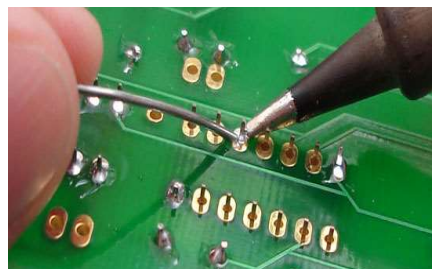
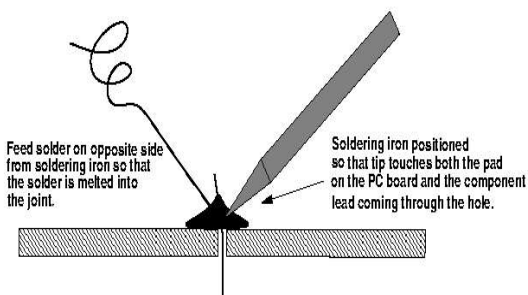
- Magnifying headpiece or lighted magnifying glass
- Multi-meter
- Solder Sucker or Solder Wick
- Small multi-blade Screw Driver
- Knife or Wire Stripper
- Small Ruler
- Cookie Sheet to build in and keep parts from jumping onto the floor

Construction Techniques

- Please take time to inventory the parts before starting and report any shortages to QRPKITS.com.
- Pre-sorting the resistors and capacitors can speed up the assembly and reduce mistakes.
- You can insert several parts at a time onto the board. When you insert a part, bend the leads over slightly to hold the part in place, then solder all at the same time. Clip the leads flush when soldered.
- Most parts should be mounted as close to the board as possible.
- It is best to use a Temperature Controlled Soldering Station with small tip or a 15-35 watt soldering iron with small tip. Conical or very small screw driver tips are best.
- If you are a beginner and/or new to soldering, there are a number of resources on the web to help.

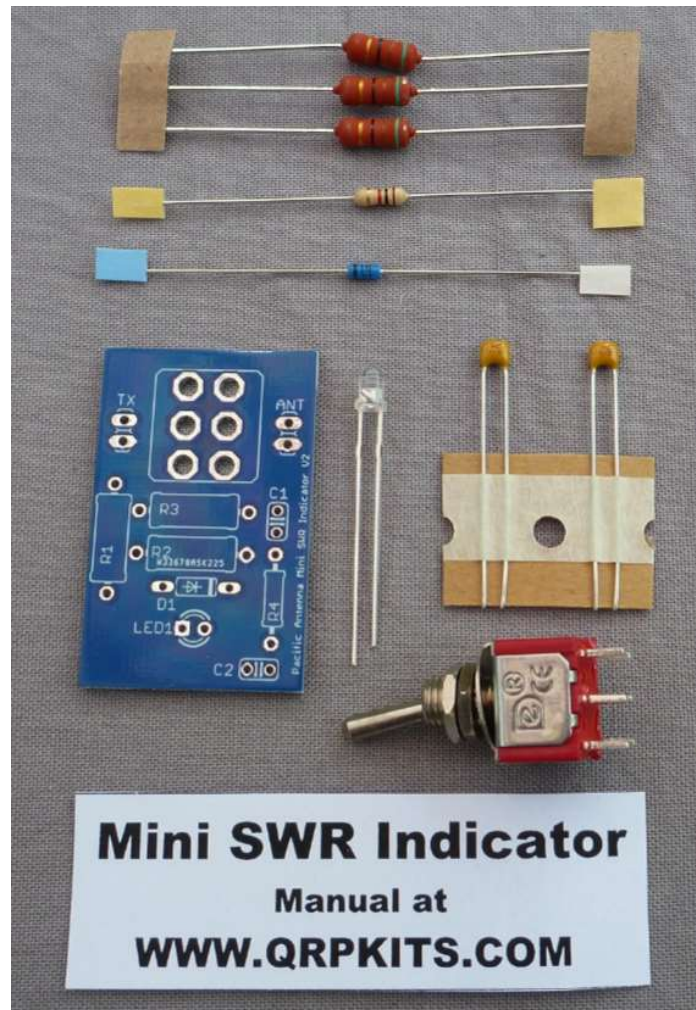
Here is one good example:

http://www.elecraft.com/TechNotes/NOSS_SolderNotes/NOSS_SolderNotesV6.pdf



Parts

Use the photograph below to help identify the parts in your kit.



Note that in some cases parts may vary slightly in appearance from those shown.

Use the first column of the table below to check the parts as you inventory them and use the second column to check the parts as you install them.

Parts List

Check	Installed	Quantity	Part	Value	Description
		3	R1,R2,R3	51 Ohm 2W	GRN-BRN-BLK-GOLD
		1	R4	1K Ohm 1/4W 5%	BRN-BLK-RED-GOLD
		1	D1	1N5711 diode	Schottky Diode,
		2	C1, C2	0.01uF Capacitor	Monolythic marked 103
		1	LED1	3mm Red LED	LED 3mm Red, clear body
		1	S1	DPDT Toggle Switch	Metal toggle, red body
		1	PCB	MINI SWR IND	SWR IND Circuit Board

Note: If the board has positions for both D1 and D2, D1 is not installed, only D2. Otherwise, there will only be only one position for a diode labeled D1.

Inserting the Parts

Install the components listed in the table.

For parts such as resistors and diodes, you should pre-form the leads by bending them down at a 90 degree angle.

Match the distance from the body to the holes in the circuit board where the part will be located.

Be sure to double check orientation of the diodes D1, D2 and the LED as they must be installed correctly.

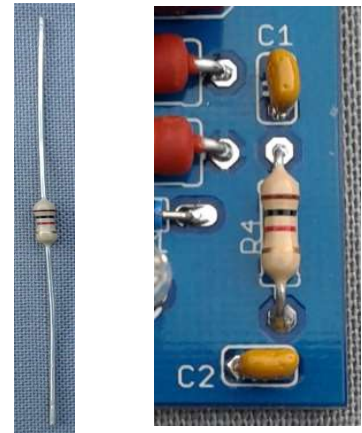
Once each part is installed, bend its leads on the bottom of the board to hold it in place, solder the leads and clip off the excess lead.

Resistors

Install R4

Locate and install the 1K Ohm resistor R4 in the marked location on the board.

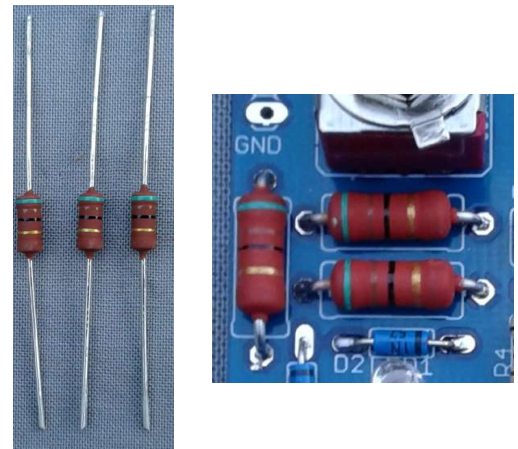
It is the only small, ¼ watt resistor in the kit and is color coded Brown-Black-Red-Gold.



Install R1, R2 and R3

Now locate and install R1, R2 and R3 in the locations marked on the circuit board.

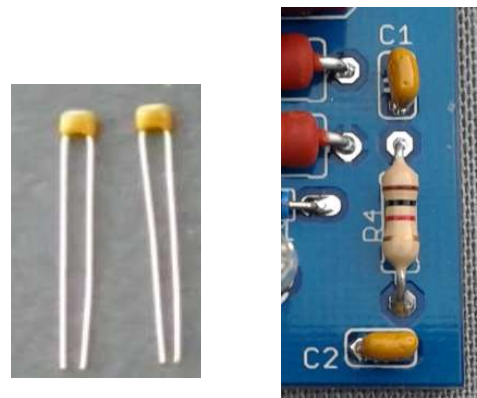
These are larger body, 51 Ohm, 2W resistors with color code Green-Brown-Black-Gold.



Capacitors

Install the capacitors C1 and C2 (marked 103) in the locations indicated on the board.

They do not have any specific orientation.



Diode

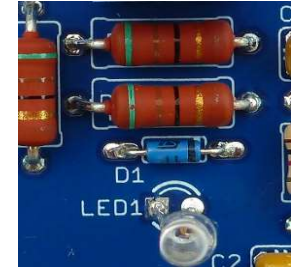
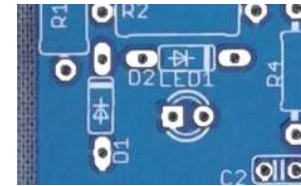
Install the diode. Note that some earlier boards may have a position for both D1 and D2. For those boards, only one diode will be installed at position D2.

Otherwise, there is only one diode position on the board and it will be labeled D1.

Note that the diode has a black band on one end.

The outline on the circuit board also shows a band on one end of the diode location.

Be sure to orient the diode bodies so that the band on the diode matches the outline on the circuit board as shown in the photos here.



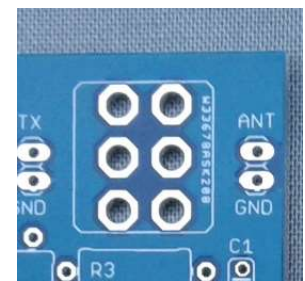
Switch

Install the supplied DPDT switch in position S1 on the board. The orientation does not matter.

Solder 1 pin first and check that the switch is level and seated on the board.

If not, heat the soldered pin while pressing the switch into the board and hold it while the solder solidifies.

Repeat this with a pin on the opposite end of the switch. This will hold the switch in place while the other 4 pins are soldered.



LED

Install the indicator LED.

If the SWR Indicator is to be mounted in a case or other enclosure, you will not want to seat the LED on the board.

The LED has specific polarity and must be installed only one way in the board or it will not work.

It has one lead that is longer (the anode) and one shorter (the cathode)

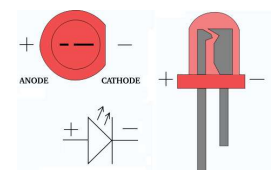
The body of the LED will usually have a flat on the same side as the short lead.

The circuit board has a round pad and square pad at the LED location.

To install, insert the LED so that the short lead goes into the square pad on the board and the longer lead into the round pad.

For now, when soldering the LED, leave the leads as long as possible above the board to allow adjustment when you are ready to install it into an enclosure.

A good guide when installing the SWR Indicator into a case is to align the base of the LED with the top of the switch body where the switch sits against the inside of the enclosure panel.



Congratulations on completing your Pacific Antenna Mini SWR Indicator Kit!

Initial Tests

Inspect the board for any bad solder joints, shorts or other problems and correct before use.

Confirm proper orientation of the LED and diodes.

Using a multi-meter in resistance mode, measure the resistance between the TX and GND pads on the board.

With the switch down for Operate mode, (toggle lever down toward the resistors), the resistance should indicate open or infinite.

With the switch up for Measure mode, (toggle lever up away from the resistors) the resistance should be approximately 100 Ohms.

Repeat this check on the output pads labeled ANT and GND.

With the switch up, in Operate mode, the resistance should indicate open or infinite resistance.

With the switch down in Measure mode the resistance should be approximately 150 Ohms.

Next, check resistance from the TX to the ANT Pads.

With the switch in Operate, you should see a very low resistance, usually less than 1 ohm.

With the switch in the Measure position, you should measure approximately 50 Ohms between TX and ANT.



Measure



Operate

Functional Tests

We will now test by connecting a transmitter or other RF source (5W maximum) to the TX input of the Mini SWR Indicator.

With the switch up in Measure Position, leave the output unconnected and very briefly key the transmitter.

You should see the LED light indicating correct installation of the diodes and LED.

Optional: If a 50 Ohm resistor or dummy load is available, connect it to the output (ANT connections) and briefly key the transmitter to verify that the LED does not light.

This completes functional testing and your Mini SWR Indicator is ready to install and use!

Support

PACIFIC ANTENNA
WWW.QRP KITS.COM
qrpkits.com@gmail.com

Installation

The kit can be used as is or installed into a case with BNC or other connectors for input and output.

This kit is used for SWR indication in many of our Antenna Tuner kits and can be added to other antenna tuning units for visual indication of a match.

When installing in a case, you will want to adjust the height of the LED above the board so that the LED extends through the case or is visible through an opening.

A good guide when installing into a case is to align the base of the LED with the top of the switch where the switch sits against the inside of the enclosure panel.

Usage

Our Mini SWR Indicator provides a means to monitor the match between your antenna and transmitter to avoid damage and ensure maximum power transmission.

When the Switch S1 is toward the edge of the board, the SWR bridge is connected (Measure) and will indicate mismatch by the brightness of the LED.

When the switch is down (toward the resistors), the SWR bridge is bypassed for normal operation.

Adjusting your antenna or antenna tuner will cause the LED to dim and in most cases, completely extinguish when you have a good match.

Once a match is achieved, switch the Mini SWR Indicator out of the circuit by placing the switch in the Operate position as shown below.

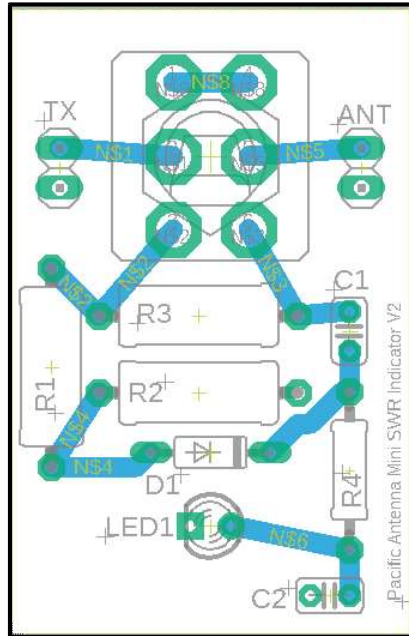


Measure



Operate

Board Layout



Schematic Diagram

