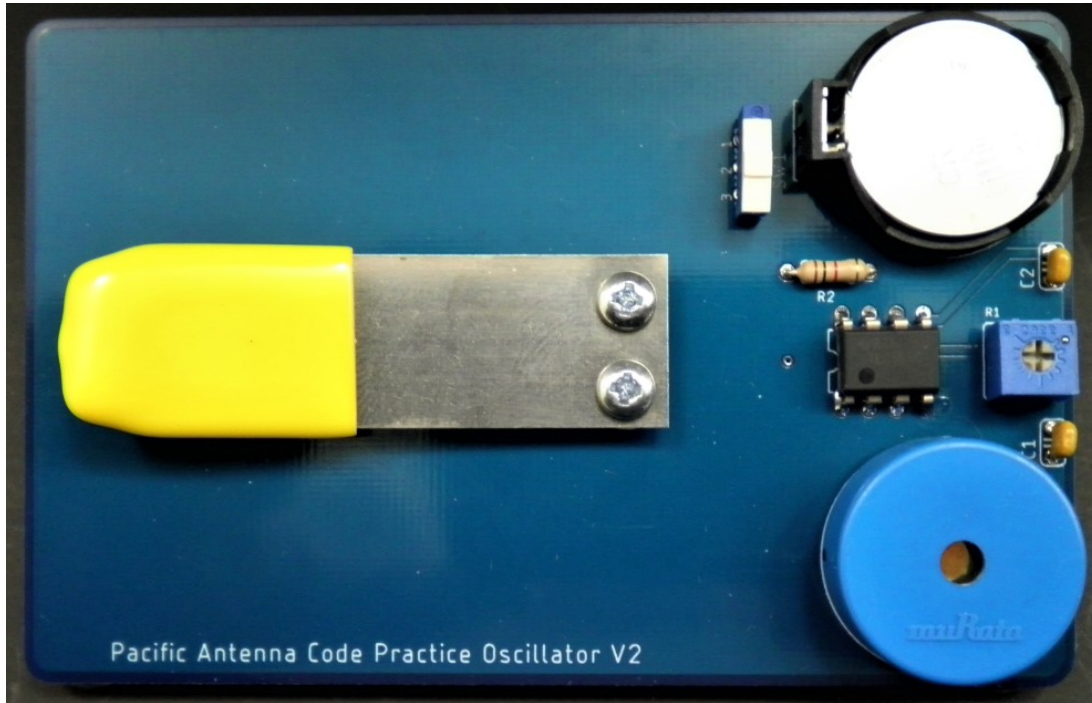


Pacific Antenna Code Practice Oscillator Kit



Description

A code practice oscillator (CPO) produces a tone when the key lever is pressed.

A CPO is used to practice Morse code

A perfect kit for new builders, Scout or club groups and anyone interested in learning Morse code.

This is a basic and very easy to assemble kit.

Requires one hour or less to build.

Includes all electronic and mechanical components.

Features a professionally fabricated printed circuit board.

Includes a 2032 coin cell battery for operation.

The frequency of the tone generated may be varied to the user's preference.

Note: Requires use of tools and soldering therefore, young builders should have adult supervision.

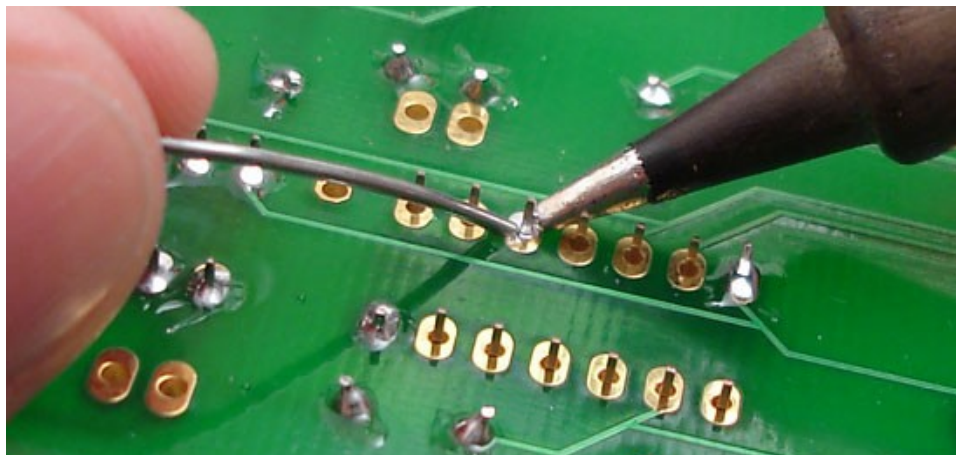
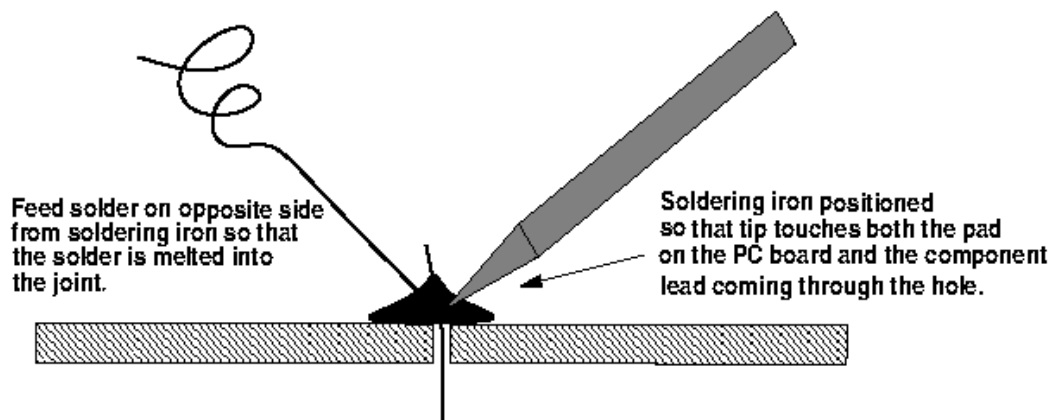
What is Needed to Assemble the Kit

A basic soldering iron
Solder
Small side cutters
Pliers
Small Phillips screwdriver.

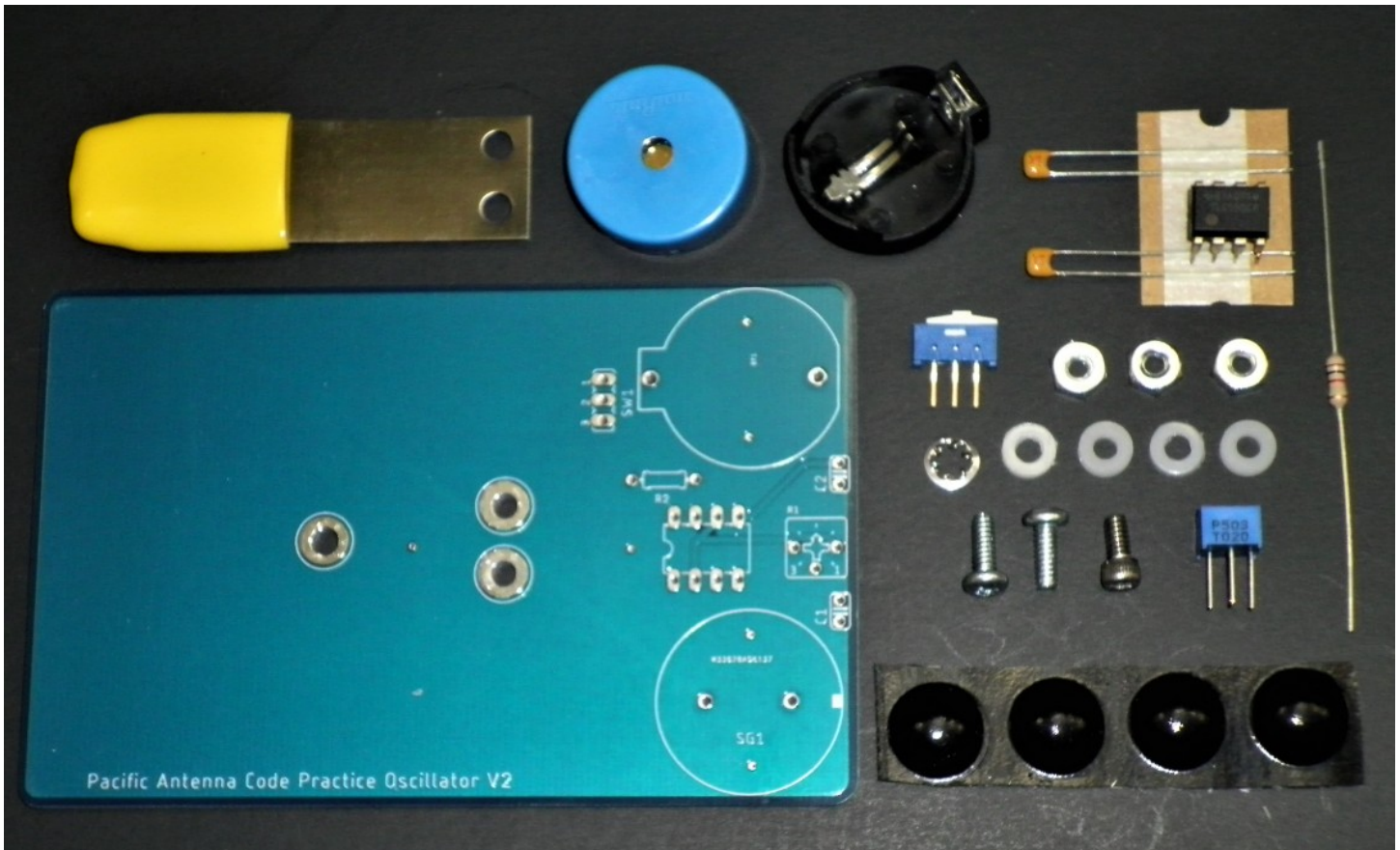
Note: Soldering is required to assemble the kit, so if you have never soldered components before, first seek assistance or tutorials to learn basic soldering techniques.

Soldering Suggestions

- Use a soldering iron with a small tip.
- Conical or very small screw driver soldering tips are best.
- DO NOT use a large soldering iron or soldering gun.
- If you are a beginner, or someone new to soldering, there are a number of resources on the web to help you get on the right track soldering like a pro. Google “Soldering Techniques”.



Parts Identification:



Note: Appearance of parts may vary slightly due to supplier changes.

Always verify the part label or if possible measure with a meter to be certain.

Parts List

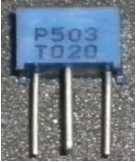
Quantity	Part	Value	Description
1	R1	50k ohm potentiometer	Blue square labeled 503 on side
1	R2	1K ohm resistor	brown-black-red-gold
2	C1 and C2	0 .01 uF capacitors	Small Tan, labeled 103
1	U1	TLC555	555 timer, 8 pin Integrated circuit
1	SG1	Piezoelectric transducer	Blue or black disk with two leads
1	Battery holder	2032 coin cell holder	Black with metal battery contacts
1	SW1 Switch	Single pole double throw switch	blue and white with 3 pins
1	Printed circuit board	PCB for CPO v2	Circuit board V2
1	4-40 x 1/4" socket head screw	Stainless socket head screw	Metal socket head screw
2	4-40 x 5/16" pan head screw	Phillips pan head screw 5/16"	Small phillips round head screw
4	#4 nylon washer	White nylon washer, 1/16" thick	Small white plastic washer
3	4-40 nut	Metal 4-40 nut	Metal nut
1	#4 Washer	Metal #4 star washer	Metal washer with internal teeth
1	CPO Lever	Metal tab with yellow end	Flat tab with yellow cover on end
4	Rubber Feet	Black or Clear rubber feet	Feet for bottom of circuit board
1	Battery	2032 coin cell battery	Silver disk battery

Identifying the parts

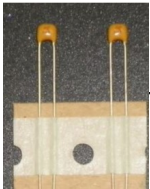
Start by laying out and familiarizing yourself with the individual components, and matching them to the pictures below.



R2: 1K ohm resistor, (brown-black-red-gold)



R1: 50K ohm board mounted potentiometer



them.

C1 and C2 capacitors are yellow in color and have the value code printed on

The mark of 103 is a 0.01uF capacitor



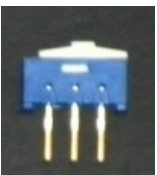
U1 – TLC555 8 pin Integrated circuit



SG1 – Piezoelectric transducer



Battery holder



SW1 – Power Switch



Socket Head Screw, 4-40 x 1/4" and Lockwasher



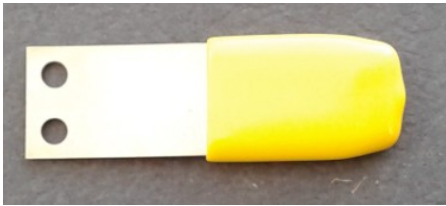
Pan head 4-40 x 5/16 Phillips head screws



4-40 nuts



#4 Nylon Spacers



Spring metal strip with yellow vinyl cap to form key lever



Rubber feet



2032 coin cell battery



Printed Circuit Board V2

Place each component into the area marked on the board one at a time and double check it is correctly installed.

Resistors and capacitors on this board do not matter which way they are installed.

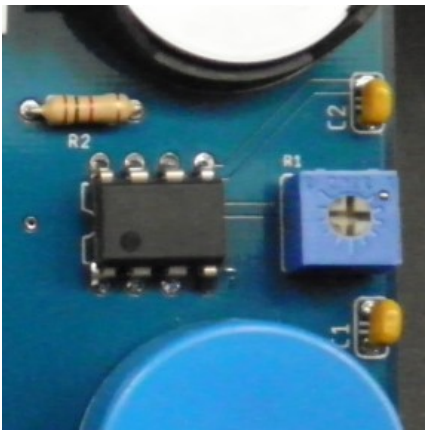
Other components should be installed in the correct orientation. Some will only fit one way.

Once you are certain the part is correctly in the board, solder the component leads on the backside of the board.

Check that the part is seated to the board and if so, trim the component lead on the back side.

If not, reheat one lead at a time and press the part gently until it seats in the board.

Installation of Parts



Install the parts following the steps below:

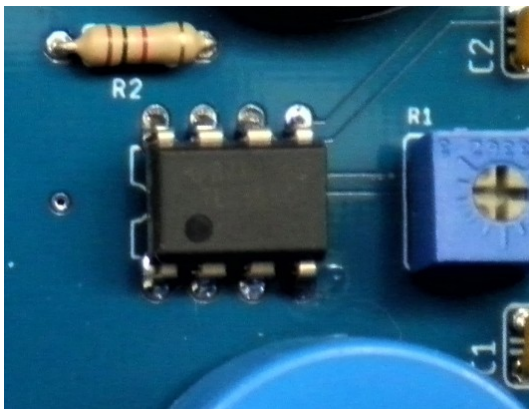
R1 – 50K ohm potentiometer. Note that it only fits one way in the board.

R2 – 1K ohm resistor (brown-black-red-gold). Orientation does not matter

C1 - .01uF capacitor (labeled: 103) Orientation does not matter

C2 - .01uF capacitor (labeled: 103) Orientation does not matter

U1 – TLC555 8 pin DIP, Integrated circuit.



Note: that U1 will either have a notch on one end or a small dot on the top of one corner.

This is used to indicate where its Pin 1 is located to correctly orient it in the board.

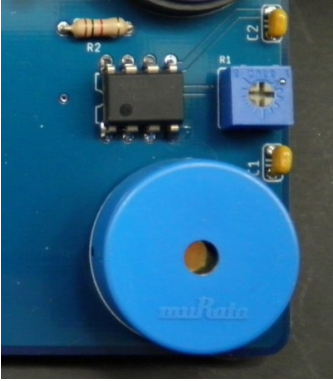
Install U1 so that its pin #1 end is located on the same end as the notch in the outline on the printed circuit board as shown in this photo.

Note: Before soldering, double check the U1 orientation, because this component is difficult to remove after soldering.

Solder one pin of U1 and check that it is seated to the board. If not reheat the pin and seat the IC.

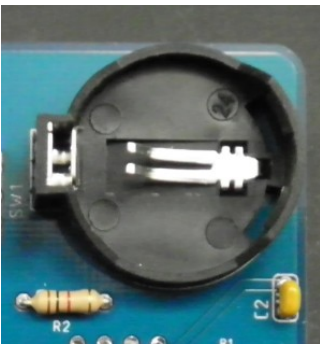
Once it is seated, solder the remaining pins of U1 one at a time and trim on the back of the board.

Piezoelectric transducer SG1



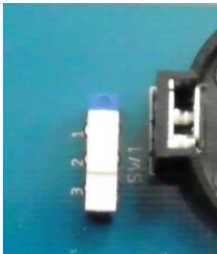
Install the transducer, making sure it is oriented as shown in this photo with the label closest to the board edge.

Battery holder:



Place the battery holder on the board and solder the two pins making sure it is aligned to the board markings and seated on the board.

Switch SW1:



Install the on/off switch SW1 in the marked location on the board. Orientation does not matter.

Contact Screw:



Install the socket head screw into the single hole in the board placing the lockwasher under the screw head as shown.

Secure on the bottom of the board with one of the hex nuts and tighten.

This serves as the contact for the key lever.

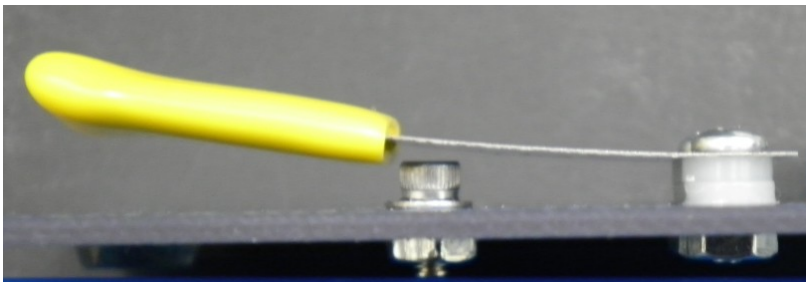
Key lever:



Place the two 5/16" pan head screws through the holes in the metal lever and add two nylon spacers to each screw.

This will result in a stack of two washers under each screw of the key lever. This is to raise it a bit above the board to allow room to press the lever.

Put the screws through the pair of holes in the circuit board and secure on the bottom with the remaining two hex nuts.



Tighten the screws to secure the lever in place

Gently bend the lever upward slightly (if needed) so that it sits just slightly above the contact screw.

The keying lever should only make contact when it is pressed down.

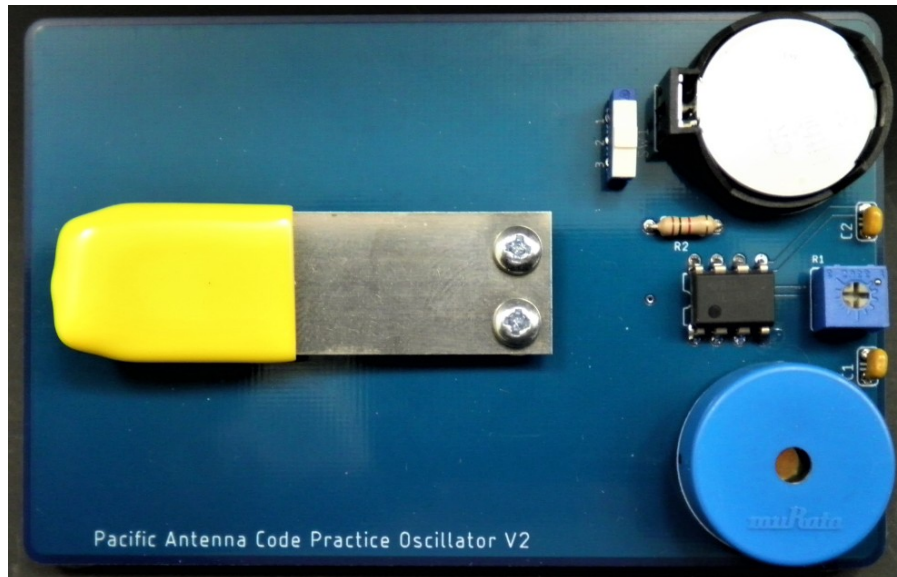


The lever should look like this when completed

Lastly, apply the four rubber feet, on the bottom of the board at the corners.

Congratulations, this completes assembly of your Pacific Antenna Code Practice Oscillator Kit!

The finished board should now look like the this:



Install the battery and turn the switch to on (slide the white slider toward the closest edge of the board)

Press the key lever downward to contact the socket head screw and you should hear a tone.

The tone frequency can be adjusted by turning the potentiometer, R1.

You will note that the tone will be louder at some frequencies due to the frequency response of the piezoelectric transducer.

Note: When your CPO kit is not in use, you should switch off the switch located near the battery holder to prevent draining the battery.

Troubleshooting:

If nothing is heard, the most common fault is bad solder joints.

Inspect the board carefully with a magnifying glass, and correct any bad connections.

However, sometimes it is difficult to see your own mistakes, so have another person look at your work.

Should you need assistance contact us by email: qrpkits.com@gmail.com

