Pacific Antenna Code Practice Oscillator Kit

Description

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

Used to practice sending and receiving Morse code

A perfect kit for new builders, groups and anyone interested in learning Morse code

An easy kit to assemble

Requires one hour or less to build

Includes all electronic and mechanical components

Features a professionally fabricated printed circuit board

Includes a 2032 coil cell battery for operation

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

Note: As this kit requires use of tools and soldering, young builders should have adult supervision

Recommended to Assemble the Kit
A basic soldering iron or soldering station
Solder
Small side cutter pliers
Needle nose or slip joint 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
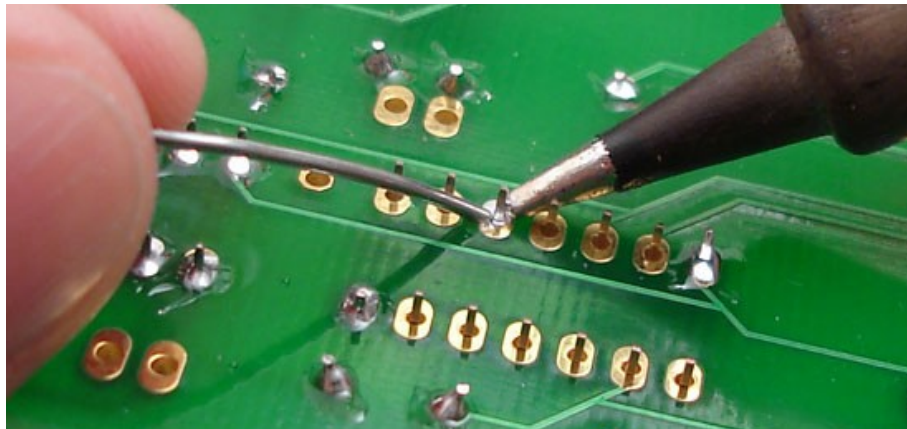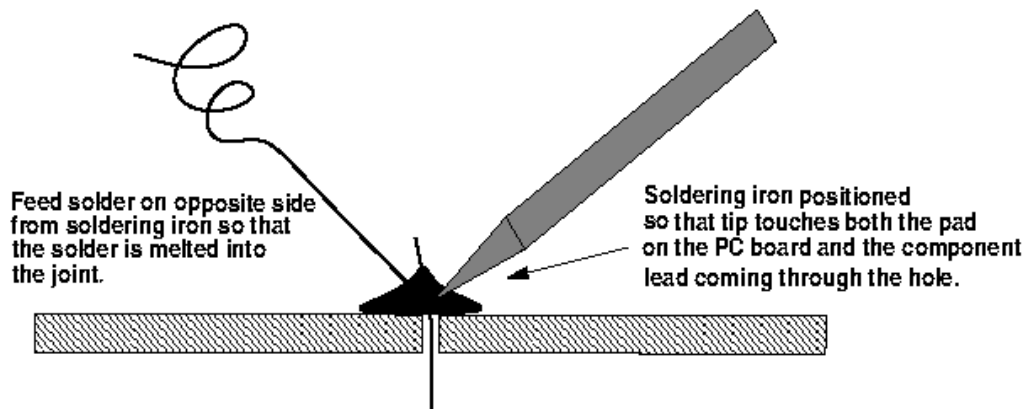
Soldering Suggestions
Use a soldering iron with a small tip

Conical or very small screw driver soldering tips are best

DO NOT use a large soldering iron or soldering gun

If you are new to kit building, there are numerous resources on the web to help you learn soldering

Search "Soldering Techniques" online for tutorials and tips.

Feed solder on opposite side from soldering iron so that the solder is melted into the joint.

Soldering iron positioned so that tip touches both the pad on the PC board and the component lead coming through the hole.

Typical parts:

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

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

Parts List

Quantity	Check	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 or NE555	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	Slide switch
1		8mm spacer	M3 x 8mm spacer	Silver or gold hex spacer, short
2		10mm spacer	m3 x 10mm spacer	Silver or gold hex spacer, longer
1		M3 x 6mm flathead screw	Flathead M3 x 6mm screw	Short flat head screw
5		M3 x 4mm panhead screw	Panhead M3 x 4mm screw	Short round head screw
1		CPO Lever	PCB tab V3 with yellow cover	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
1		Printed circuit board	PCB for CPO V3 or later	Circuit board V3

Installing the CPO parts

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

It is recommended to check the parts off in the parts list as they are installed

Examine the circuit board and note the parts locations, outlines and labels
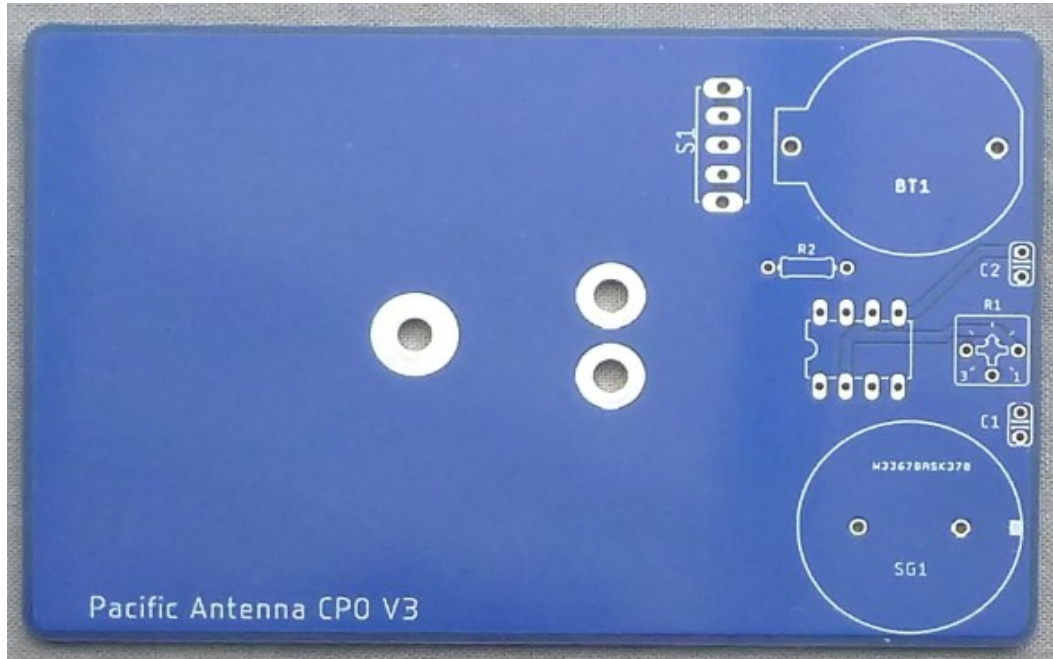
Start by installing R2-This is the 1K ohm resistor with color code brown-black-red-gold

Orientation does not matter

Next, install R1- the 50K ohm board mounted potentiometer

 It is a blue square box with 3 leads

Note that it will only fit into the board in one direction.

Install C2 and C2- the 0.01uF capacitors in the locations indicated above and below R1

These capacitors have the value code 103 printed on them

The orientation does not matter
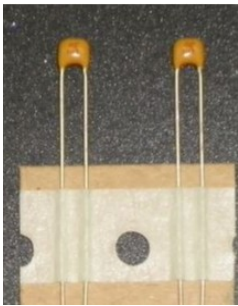
**Install U1-** This is an 8 pin 555 Timer IC labeled TLC555 or NE555

One end of the IC will have either a notch or a dot and should aligned with the notch shown in the board outline below

You may need to carefully adjust some of the leads to allow insertion into the board if they do not line up with the holes

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

Solder one pin of U1 checking that it is seated to the board; if not reheat and press into board until it seats

Now, solder the remaining pins one at a time and then trim any excess leads on the back of the board
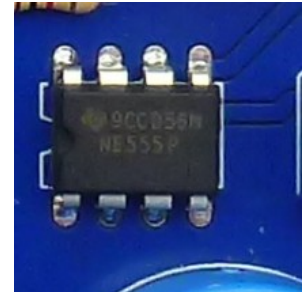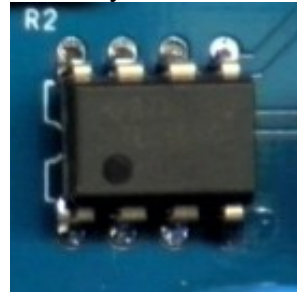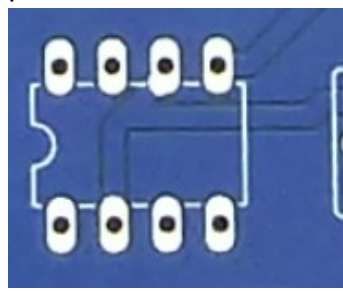
Install the battery holder BT1- This is a black plastic part with metal electrodes for holding a coin cell battery

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
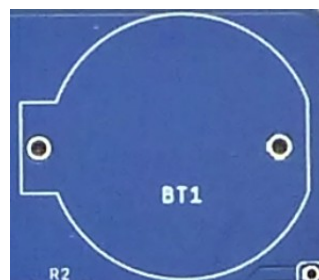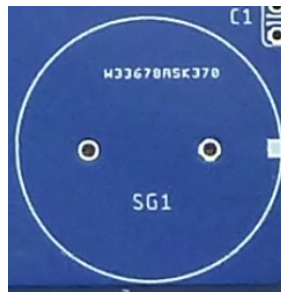
Install S1- the power slide switch in the location marked on the board

Install SG1- the Piezoelectric transducer which will be usually be blue or black in color

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

This completes the installation of electronic components on the board

Next, install the hardware for the key lever to operate the CPO allowing you to generate morse code tones

Key Lever Installation
Locate the hex standoffs and screws shown below

Note that there will be one flat head screw and five round head screws

Using two round head screws, install the two longer hex standoffs

Insert the round head screws through the bottom of the board and install the hex standoffs on the top side of the board one at a time

The longer standoffs are located at the two side by side holes and the shorter one is located at the single pad so that it looks like the photos below

Now, insert the flat head screw into the shorter single standoff to make a contact point for the CPO lever

At this point, the board should look like this:

Install the CPO lever onto the two taller standoffs, using the remaining two round head screws

The circular contact pad should be toward the standoff topped with flat head screw

Lastly, install rubber feet on the bottom corners of the board to prevent it moving and scratching tabletops during use
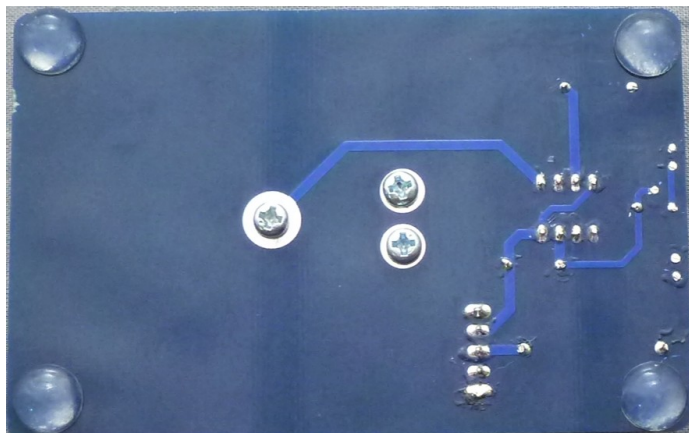
Congratulations, this completes assembly of your
Pacific Antenna Code Practice Oscillator Kit!

We hope you have fun learning to send and receive Morse Code!

Your completed CPO will now look like the this:
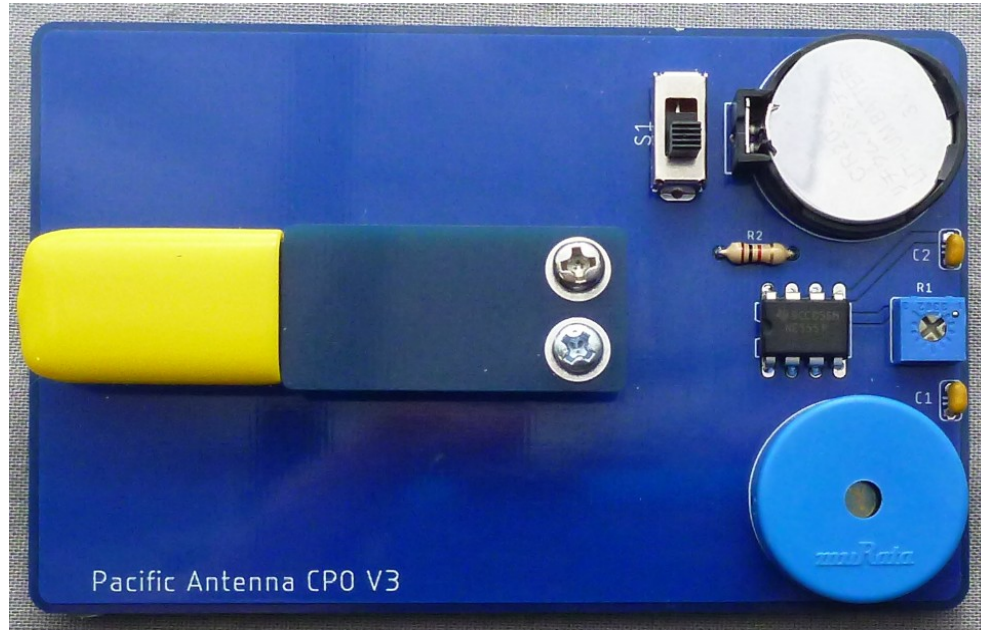
Using your CPO

Install the battery with the + marking facing up

Turn the switch to on by moving the slider toward the middle of the board

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

The tone frequency is adjusted by carefully turning the potentiometer (R1) with a small screwdriver

The tone will be clearer and possibly louder at some frequencies due to the 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

Troubleshooting

If nothing is heard, the most common faults are bad solder joints or loose connections

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

It is sometimes difficult to see your own mistakes and helpful to have another person check your work

Should you need assistance contact Pacific Antenna by email: **qrpkits.com@gmail.com**

Schematic

Morse Code Chart

International Morse Code