## 1     Motivation

Having discovered that the X Window-based Morse tutor program, xcwcp, is capable of interpreting keyed CW that it receives, I wanted to use a straight key instead of the computer mouse or keyboard. Also, I wanted to avoid needing to learn how to write a device driver to receive input from the straight key through the USB port, then find out how to get xcwcp to recognize the new input device.
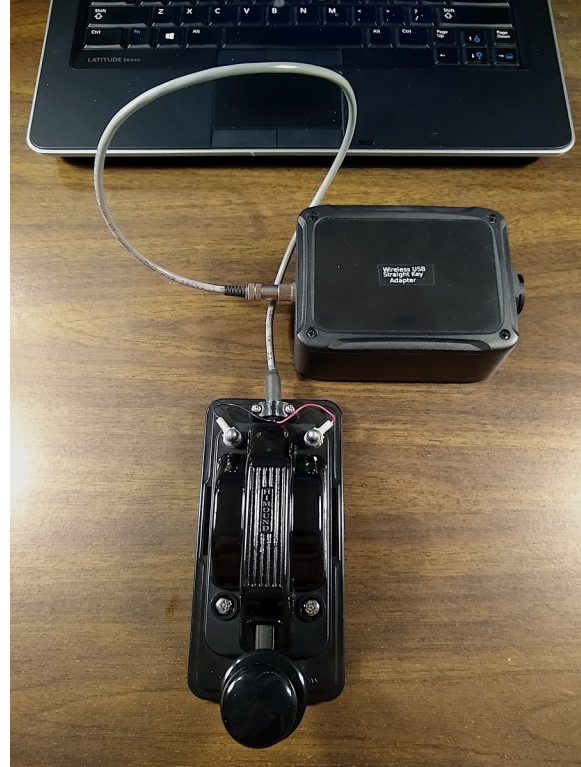
## 2     Scope

This adapter should work with any software application that can receive Morse input through a mouse. However, it solves a problem related to xcwcp running on a computer with GNU-Linux as the installed operating system. Your results may vary on other equipment, but the technique should be adaptable to different hardware and software.
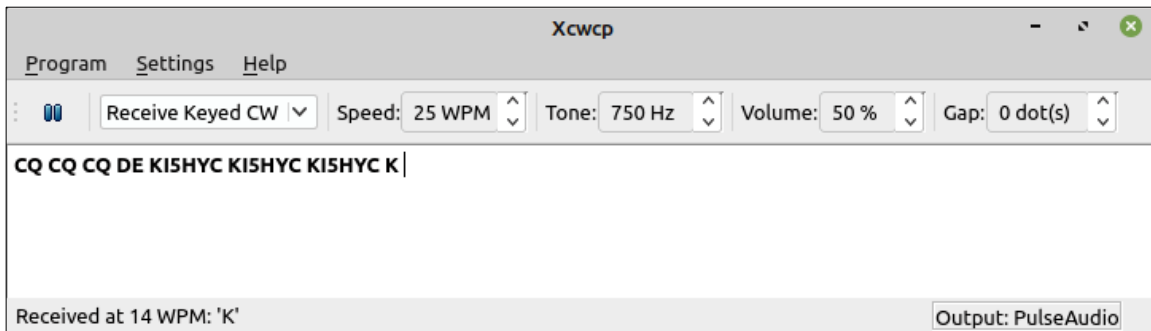


## 3     Solution

Since xcwcp can detect mouse-button inputs, I decided that the easiest solution is to disassemble a Logitech M325 three-button mouse and connect the straight-key contacts across the center button. xcwcp configures the left and right buttons of the mouse to work like an iambic paddle keyer. Pressing down on the scroll wheel provides straight key functionality.

## 4     Conclusion

This is a convenient and easy way to practice Morse code with minimal equipment, giving instant feedback on one's ability.

## 5    Construction

Construction is little more than repackaging the M325 circuit board in a project box with provision for external connection of the straight key and storage for the USB wireless receiver module.

Though this isn't the cheapest way to go, it does produce a neat, reasonably compact, self-contained package that includes storage for the USB receiver.

A lithium AA-battery is essentially leak-proof, which means it can remain installed for years until it discharges below operating voltage and must be replaced.

Obviously, a plastic enclosure is essential to permit wireless connectivity.

### 5.1    Materials

◆   1 × Logitech M325 three-button mouse, or similar

◆   1 × Bud Industries, ABS black plastic enclosure, PW-12846, Digi-Key 377-PW-12846-ND, or similar

◆   1 × AA-battery holder, Digi-Key 36-2461-ND, or similar

◆   1 × USB2.0 connector receptacle, Digi-Key 1754-1129-ND, or similar

- 1 × Stereo 3.5 mm panel-mount jack, Digi-Key 839-1411-ND, or similar

- 1 × Lithium AA 1.5V battery

- Hookup wire as required

- 2-inch wide strip of Velcro hooks and eyes as required, or similar

- Labels as required

## 5.2  Mouse Circuit Board

To disassemble the mouse case, open the battery compartment, peel the nameplate data-label to reveal the retaining screw, then remove the screw and separate the circuit board from the case.

Note that the mouse circuit board has more buttons and functions than necessary for a simple three-button mouse.

## 5.3  Battery Connections

Cut the stiff-wire battery connections long, so that you can solder the wires of the battery holder to the ends away from the circuit board. Note the polarity of the connections.

## 5.4  Plastic Enclosure

Drill holes to match the 3.5 mm stereo jack and USB connector, in opposite ends of the enclosure.

Stick the strip of Velcro eyes to the bottom of the enclosure.

## 5.5  Circuit Board

Use a multimeter to probe the continuity of the scroll-wheel button and locate the pins across the contact closure.

There are four pins connected in pairs, across which gap the contact closes.

It doesn't matter which of the two paired contacts you use, solder two pieces of hookup-wire, one to each side of the contact closure. Make the wires long enough to pass through the 3.5 mm jack hole in the enclosure. You are putting the straight key in parallel with the scroll-wheel button.

## 5.6  Battery Holder

Solder the wires of the battery holder to the ends of the stiff battery wires that you trimmed after removing the circuit board. Take care to make connections with the correct polarity.

## 5.7 Pre-assembly Test

- Open xcwcp on the computer, select Receive Keyed CW, select Start, and then position the cursor in the received CW pane of the program window.

- Insert the USB receiver in a vacant port.

- Install the battery in the battery holder.

- Manually press the scroll-wheel button to verify that it works.

- Touch the bared ends of the two fly-leads together to verify that they work.

- Remove the battery.

## 5.8 Assembly

(a) Stick the strip of Velcro hooks to the solder-side of the circuit board. Attach the board in a location that allows room for attachment of the battery holder.

(b) Mount the 3.5 mm jack, oriented so that you can reach the solder-lugs.

(c) Solder the fly-leads to the 3.5 mm jack: one to the tip, and the other to the outer ring.

(d) Install the USB storage receptacle.

(e) Stick a strip of Velcro hooks to the underside of the battery holder, then fix the battery holder to a vacant area of Velcro eyes.

(f) Install the AA-battery.

(g) Retest using your straight key.

(h) Install the enclosure cover.

## 6 Expansion

Though I haven't tried it, there is no obvious reason to prevent modifying the adapter to work with paddles.