

# Pocket Tutor

## Build a handheld version Of the Morse Code Tutor

### Part 1: Overview



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In the [Morse Code Tutor](#) series, I describe a fun and useful project for any ham interested in CW: a microcontroller-based device for learning Morse Code. You can build it for under \$30! It is a great project that I have found very useful.

Have you ever built something and then wondered: can I make it better? My biggest wish for the Morse Tutor was to make it more portable. And that meant two things: 1) make it handheld, and 2) make it battery operated.

That should be easy enough. It runs on batteries already – you just have to be careful with your battery choice (see my [battery notes](#)). And, if you are good with your hands, you can shoehorn all of the components into a smaller space. Ultimately, I decided on a different approach, rebuilding the project using discreet, surface-mount devices. In the process I learned a lot.



The size/shape I had in mind is my Casio FX-260 calculator, which measures 125 x 65 mm. These dimensions give me ample room for a 3.2" LCD display and two rotary controls. I made the Pocket Tutor slightly smaller at 110 x 60 mm (roughly 4¼" x 2¼").

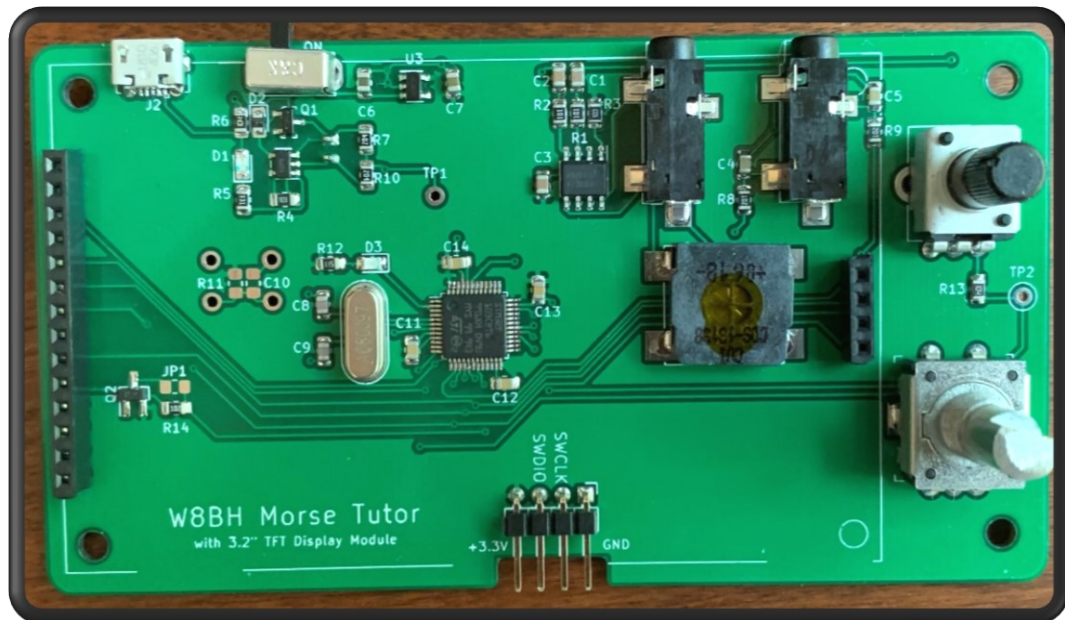
Vertical height, as measured from the front of the faceplate to the back of the main PCB, is 12 mm. It is thicker than my 8 mm Casio, but still pocketable.



This project isn't for everyone. Building a surface-mount board with tiny parts requires good light, good magnification, a steady hand, and a healthy assortment of SMD tools. But the result is a portable and powerful

microprocessor-driven circuit with a decent-sized display. As such, it can be modified and used as the basis for many ham projects.

Main  
PCB:



The Morse Code Tutor articles focused on software development. For the Pocket Tutor project, I will concentrate on the hardware aspects of its design.

I will present this project in several parts.

- Part 1: Overview (this document)
- Part 2: [Power Supply](#)
- Part 3: [Microcontroller](#)
- Part 4: [Audio Circuit](#)
- Part 5: [PCB Design](#)
- Part 6: [Build Instructions](#)

Finally, the full schematic and PCB gerber files will be made available on my [github account](#).

This project description is a work-in-progress. I will post sections as soon as they are ready.

73, Bruce.